Evolution/Creationism Controversy: Analysis of Past and Current Policies in Public Schools and the Practice of Allowing Students to Opt-Out of Learning Evolution Concepts

Jacquelyn Hoffmann Speake
University of South Florida, jackie_speake@ccps.k12.fl.us

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Evolution/Creationism Controversy:

Analysis of Past and Current Policies in Public Schools and the Practice of Allowing Students to Opt Out of Learning Evolution Concepts

by

Jacquelyn Hoffmann Speake

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Department of Educational Leadership and Policy Studies
College of Education
University of South Florida

Major Professor: Darlene Y. Bruner, Ed.D.
William Black, Ph.D.
Bobbie Greenlee, Ed.D.
Yi-Hsin Chen, Ph.D.

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Dedication

I dedicate this dissertation to the graduate students who are in the process of pursuing a doctoral degree. No matter how many dead ends you encounter, no matter how many friendships you neglect, no matter how difficult your daily life becomes, there is a light at the end of the tunnel, and true friends will forgive you.
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Abstract

Recent anti-evolution legislation, in the form of Academic Freedom bills, has been introduced in many state legislatures over the last three years. The language in the proposed Academic Freedom bills may allow different interpretations of what can be taught in the science classrooms, and possibly spur parents to take advantage of their perceived parental rights to request their child be opted-out of class when the scientific theory of evolution is taught. Five research questions guided the analysis of participant responses to questions and perception statements focusing on secondary school administrators’ actions, perceptions, and awareness as they relate to their decision to allow or not allow a student to opt out of academics, specifically evolution, through the collection of data using a web-based survey. Opt out policies are typically invoked to excuse students from activities to which they or their parents may have religious objections (Scott & Branch, 2008). Florida statutes allow parents to opt out their child from human sexuality and animal dissection. The population consisted of 281 Florida public secondary school administrators, who were divided into two subgroups based on whether they have allowed or would allow a student to opt out of evolution, or have not allowed or would not allow a student to opt out of class when the scientific theory of evolution is taught. Results found that over 70% of the administrators who completed the survey have allowed or would allow parents to opt out their child from learning about the scientific theory of evolution. There was a significant relationship between the decision
to allow opt out and the following variables: (a) Free and Reduced Lunch population, (b) grade level served, (c) support for teaching evolution and alternative theories, and (d) the perception that parent rights supersede state statute requiring students to learn evolution.

In Florida, any scientific concept that is based on empirical evidence is included in the state-mandated curriculum. If administrators are influenced to believe teachers have the academic freedom to teach alternative ideas that are not scientifically valid, they may be intentionally or unintentionally allowing subject matter relevant to a student’s academic success to be suppressed or distorted, which is also a violation of state statute. The implications from this study indicated that many participants would allow a student to opt out of class when evolution is taught, including assigning an alternative assignment. Since the scientific theory of evolution is infused into the biological sciences, and therefore, the Florida State Standards for science, evolution concepts are assessed on the Florida Comprehensive Assessment Test (FCAT) and the Biology End-of-Course exam. Allowing students to opt out of class when evolution is taught may have a negative impact on student success on state mandated assessments, which can directly impact school grades and state and federal funding that is tied to Adequate Yearly Progress.
Evolution has long been a controversial topic in education. Teaching evolution in the public schools has been challenged many times, which has required the Supreme Court to interpret the language of the Constitution, specifically the First Amendment’s Establishment Clause and how it impacts the teaching of scientific theories and religious beliefs in the public schools. The Supreme Court rulings have upheld that certain religious and teaching practices in the school system violate the Establishment Clause, yet the teaching of evolution continues to be challenged.

Science is a method of inquiry that stresses empirical evidence and effective method (Moore & Cotner, 2009). Recently there has been a considerable effort by the science education community to improve the effectiveness of teaching and learning of the concepts of evolutionary biology, as demonstrated through the revisions many states have made to their state science curriculum frameworks to include evolution as a central theme in the biological sciences. The Florida Next Generation Sunshine State Standards (NGSSS) for Science require a different type of teaching and learning, including critical thinking about scientifically investigable questions, empirical evidence, and the importance of scientific theories. The standards state that “the scientific theory of evolution is the fundamental concept underlying all of biology . . . [and is] supported by multiple forms of scientific evidence” (NGSSS, 2008). No “alternative views” to the scientific theory of evolution are identified in the standards, and they specifically state
that students “identify which questions can be answered through science and which
questions are outside the boundaries of scientific investigation, such as philosophy, and
religion” (NGSSS, SC.912.N.2.2). Immediately following the adoption of the NGSSS for
Science by the Florida State Board of Education in February 2008, politicians supporting
alternative views to evolution introduced two bills during the spring 2008 Legislative
session: Senate Bill 2692 and House Bill 1483, both entitled the “Academic Freedom
Act.” If passed, these bills would have afforded teachers “the affirmative right and
freedom to objectively present scientific information relevant to the full range of
scientific views regarding biological and chemical evolution” (HB 1483, p. 2, lines 35-
40). Although neither of these bills became law, if they had passed, the language of these
two bills may have opened the door to teaching creationism, intelligent design (ID), or
other religious ideas as alternative views to the scientific theory of evolution without
punitive consequences. Florida Senate Bill 2692 (2008) specifically stated that teachers
“may not be disciplined, denied tenure, terminated, or otherwise discriminated against for
objectively presenting … the full range of scientific views regarding biological or
chemical evolution” (lines 42-45).

Academic Freedom bills have been designed to protect teachers from punitive
consequences when they incorporate alternative views of evolution based on religious
ideology into science classrooms. These alternative views may include creationism and
intelligent design. Creationism is the literal interpretation of the Bible, and intelligent
design is the belief that the universe was created by an intelligent being. At the same
time, legislators sponsoring the Academic Freedom bills claimed the intent is not to
promote teaching religion in the science classes. The Academic Freedom bills claimed
that for students to be critical thinkers, problems solvers, they must be allowed to question the validity of the scientific theory of evolution based on their personal beliefs.

Parents have begun requesting their children be opted out of classroom discussions that involve controversial topics in an effort to prevent their children from learning about evolution as a scientifically proven theory. According to a recent survey conducted by Fowler and Meisels (2010), some school administrators are allowing this opt out request from parents, and even going so far as discouraging the teaching of evolution in the science curriculum. This practice of allowing opt out of topics included in the State adopted curriculum contradicts current state law.

According to sections 1003.41(1) and 1003.42(2) of the Florida Statutes, public K-12 educational instruction in Florida is based on the *Sunshine State Standards*. Public school teachers . . . shall teach efficiently and faithfully, using the books and materials required . . . following the prescribed courses of study. Currently, Florida has two opt-out policies that parents may exercise in regards to state-approved curriculum: animal dissections and sex education. These two permitted exemptions (with written requests from parents) from academic instruction are described below:

- Section 1003.42(3) provides an option for parents to request exemption for their child(ren) from the “teaching of reproductive health or any disease, including HIV/AIDS, its symptoms, development, and treatment” and;
- Section 1003.47(1) provides an option for students to be excused from participating in animal dissections.

No other academic exemptions are identified by Florida statute. Teachers are required to teach the concepts and benchmarks identified in the state-approved course descriptions.
Statement of the Problem

Opt-out policies are typically invoked to excuse students from activities to which they or their parents may have religious objections (Scott & Branch, 2008). In Fields v. Palmdale School District (2005), the parents filed suit against the school district regarding a survey that contained questions related to sexual topics, and that the questions violated their constitutional rights to make decisions concerning the care, custody, and control of their children as stated in Amendment 14 of the U.S. Constitution. The district court ruled that parents do not have due process or privacy rights to override the decisions of public schools as to the information to which their children will learn while enrolled as students (Fields v. Palmdale School District, 2005). Parents were given the opportunity to opt out their child from participating in the survey only, not the concepts taught in the classroom.

There are a number of cases that have upheld the constitutionality of school programs that educate children in sexuality and health: Leebaert v. Harrington, (2003); Parents United for Better Sch., Inc. v. School Dist. of Philadelphia BOE, (1998); Citizens for Parental Rights v. San Mateo County BOE, (1975). The U.S. Constitution does not vest parents with the authority to interfere with a public school’s decision as to how it provides information to students or what information it teaches in the classrooms. This authority extends to state adopted standards and district approved curriculum.

However, individual district-based or school-based administrators may go beyond the boundaries of state law, either intentionally or unintentionally, by allowing opt-out policies to extend beyond the requirements of the state statute. Some administrators may be allowing students to opt out of controversial issues because of parent “demand” to
have their child be opted out of activities and instruction that involve the concept of evolution, even in the absence of any formal opt out policy (Scott & Branch, 2008).

Viewed from the political frame, politics is the process of making decisions in a context of divergent interests (Bolman & Deal, 2003). Faced with a request from parents to opt out their child from any and all activities that involve the concept of evolution, what decision do school administrators make and do they allow or not allow opting out of academics because the decision may conflict with state curriculum requirements or perceived parental rights?

The Florida NGSSS for science are clear about what the public school science curriculum must include and Florida statutes are specific about which topics parents can choose an opt out option for their children. Administrators may allow this opting-out of evolution inadvertently by extending the current opt out policy to academics other than health education and animal dissections, to support the politics of the community, their personal beliefs, or their awareness of required curriculum and the limits of parent opt out rights. Administrators may be deliberately or subconsciously non-compliant with the current opt out policy to avoid confrontations with parents or community members that do not support the teaching of evolution, or they may think they are compliant by allowing opt out because of transference of policy language from sections 1003.42(3) and 1003.47(1) of the Florida Statutes, which allow opt out of human sexuality and animal dissection.

A synthesis of current research shows that many studies have focused on science teachers and students perceptions on the teaching of evolution or on the public’s understanding of evolution (Froehle, Kiernan, & Greenwald, 2006; Moore & Cotner,
Several dissertations on this topic focus on science teachers and/or students through the use of survey methodology (Bilica, 2001; Hermann, 2007; Strauss, 2008; Warrington, 2008). The Florida Sunshine State Standards (SSS) for Science (1996), previous to the current NGSSS adopted in 2008, referred to the concept of evolution as “change over time” and never specifically mentioned the word *evolution*. For this reason, science teachers in Florida may have assumed they were not required to teach students concepts of evolution beyond mutation and adaptation. This may be why most of the research on attitudes and perceptions about evolution has focused on science teachers and not administrators. Administrators may never have been put in the position to make a decision on opting out of evolution because the concept was not addressed in the Florida state standards. Research that specifically focuses on secondary school administrators and whether they apply opt-out practices to evolution concepts has not been found in the current literature. This study was designed to determine if opt-out practices are being implemented by secondary administrators, specifically principals and assistant principals, in regards to the scientific theory of evolution and sought to examine administrators' rationale for allowing or not allowing students to opt out of class when the scientific theory of evolution is taught.

**Background and Rationale for the Study**

The purpose of this study was to determine if Florida public secondary school administrators have allowed or would allow students to opt out of academics other than human sexuality and animal dissection, specifically the topic of evolution. The study also sought to address reasons school administrators may or may not allow students to opt out
of instruction on the scientific theory of evolution. “Start your research by thinking about issues that concern you politically or socially, reflect your personality, and are based on experiences that leave you frustrated” (Rubin & Rubin, 2005, p. 43). Evolution has been a political and social issue since the publication of Darwin’s *Origin of the Species*. As a Curriculum Specialist for Science in a Florida school district, the researcher has received opt out requests from parents, teachers, and administrators in the form of alternative assignments when the scientific theory of evolution is taught. The Florida NGSSS are explicit in what students should know and be able to do upon graduation from the K-12 public school system, and the scientific theory of evolution is among the annually assessed benchmarks on the Florida End-of-Course (EOC) Biology exam starting in spring 2012 (see Appendix A). Understanding how theories are developed over time, and based on sound scientific evidence, is a major theme in the 2008 NGSSS for science, which are required to be taught in all Florida K-12 public schools:

- **Fourth Grade Benchmark SC.4.N.2.1** requires students to explain that science focuses solely on the natural world (NGSSS, 2008).

- **Sixth Grade Benchmark SC.6.N.3.1** requires students to recognize and explain that a scientific theory is a well-supported, widely accepted explanation of nature and is not simply a claim posed by an individual; and the use of the term theory in science is very different than how it is used in everyday life (NGSSS, 2008).

- **Eighth Grade Benchmark SC.8.N.3.2** requires students to explain why theories may be modified but are rarely discarded (NGSSS, 2008).

- **High School Benchmark SC.912.N.2.1** requires students to identify what is
science, what clearly is not science, and what superficially resembles science but fails to meet the criteria for science (NGSSS, 2008).

• High School Benchmark SC.912.N.3.1 requires students to “explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer” (NGSSS, 2008).

Understanding the nature of science is a critical component for scientific literacy and assists students in being globally competitive problem solvers. The nature of science is a way of knowing and learning about the natural world through reasoning and critical thinking. But critical thinking must be based on the rules of reason and evidence, and not all criticisms, or controversies, are scientifically valid (National Academy of Sciences [NAS], 2008). Science educators are responsible for teaching the best scholarship in all fields of science and to identify and correct student misconceptions (NAS, 2008). If students are not given the opportunity to learn key concepts about the nature of science because they are allowed to opt out of academics, it may be misleading students and unconsciously allowing the misconception that a scientific theory is simply speculative.

There appears to be very little difference in instruction about evolution in states that have standards with evolution as a unifying theme in biology and states with very little mention of evolution as a unifying theme in biology in their standards (Bowman, 2007). This may be due to local decisions on and pressure about the specific topics that are assessed at the secondary level. Determining if and why secondary school
administrators allow the practice of opting-out of instruction when the scientific theory of evolution is taught is the focus of this study.

**Significance of the Study**

The battle over teaching evolution in the public school system has been in the mainstream media for more than 80 years. It is easy to understand why teachers and administrators want to avoid controversy in their school and allow the topic of evolution to be “skipped” or downplayed in the science curriculum. Since evolution is the underlying principle of all the biological sciences (National Science Teachers Association [NSTA], 2003; NAS, 2008, American Association for the Advancement of Science [AAAS], 1993), and is going to be annually assessed on the Florida Biology EOC starting in spring 2012, not teaching evolution concepts may be doing an injustice to students by putting them at a significant disadvantage compared to students from other countries that have learned this core concept of the biological sciences. Through the use of international comparison studies, including the 2007 Trends in International Mathematics and Science Study (TIMSS) and the 2006 Progress for International Student Assessment (PISA), American high school students lag behind their counterparts worldwide in science and math achievement. Between 1995 and 2007, these assessments showed no measurable change in average science scores for U.S. fourth graders, and seven countries moved their fourth graders from scoring below the U.S. in 1997 to scoring higher than the U.S. in 2007 (National Center for Education Statistics [NCES], 2009). In 2000, 15-year-olds in eight countries outperformed their U.S. peers in terms of average scores: Australia, Austria, Canada, Finland, Japan, Korea, New Zealand, and the United Kingdom (NCES, 2009). In 2006 these same eight countries again outperformed the U.S. along with eight
additional countries that did not measurably differ from the U.S. in 2000 (Belgium, the Czech Republic, Germany, Hungary, Ireland, Sweden, and Switzerland. This statistic is not likely to improve if students are continually denied the opportunity to learn about scientific theories and what constitutes a scientific theory.

In the field of education, leaders contend with different social interests surrounding educational policy and practice (Apple, 2003). Research conducted by Apple (2003, 2004, 2006) focused on the conservative practices of educational movements and reforms and showed contradictions within policies and practices, which resulted in the framing of educational issues in terms of the conservative agenda. For educational leaders to offset the growing strength of the antievolutionary movement, they must become more knowledgeable about what defines good science the history of the evolution debates, and how to make informed decisions on controversial issues such as the theory of evolution.

The significance of this study was (a) to contribute to the literature on the application and interpretation of opt-out policies as they apply to evolution, (b) to review current policy and legislation as it applies opt-out practices and the scientific theory of evolution, and (c) to provide recommendations that may assist district and school policy-makers at the state and local level in identifying conflicting policies and practices in allowing or not allowing students to opt out of instruction on the scientific theory of evolution.

Need for the Study

The majority of empirical studies on perceptions and understandings of evolutionary concepts through survey research has focused on teachers and students
(Bandoli, 2008; Baumgartner & Duncan, 2009; Bowman, 2007; Cavallo & McCall, 2008; Donnelly & Boone, 2007; Moore, et al 2008, 2006, 2005, 2002; Nehm & Schonfeld, 2007; Rutledge & Mitchell, 2004, 2002). The results from these studies produced similar results as they pertain to student and teacher misconceptions about evolution.

Student misconceptions may be a direct result of teacher misconceptions (Baumgartner & Duncan, 2009). Evolution instruction has been mandated through the adoption of state science standards in most states. However, students have reported that they have received little instruction in evolutionary concepts in their high school biology classes, and many reported that creationism was given equal time during instruction, even though evolution was required by state standards (Bandoli, 2008). Many students had the misconception that evidence for evolution is contradictory and there are several theories, or educated guesses, to explain evolution (Moore et al., 2006). The goal of teaching evolution is not to change beliefs; it is to understand the processes of science through thoughtful analysis of physical evidence, which applies to any scientific theory. By identifying these misconceptions, teachers could have a positive influence on learning. Opting students out of learning about evolution concepts does not give teachers the opportunity to address the misconceptions the students may have in regards to evolutionary concepts.

There is evidence that a large percentage of biology teachers across the country do not emphasize evolution in their classes and about 20% of this same group teach and support creationism in the science classroom (Moore et al., 2006; Moore, 2002). In a 1993 survey, many biology teachers felt pressured to avoid teaching evolution, but recent data showed that biology teachers felt pressured to teach evolution, but in conjunction
with creationism or “alternative views” (Fowler & Meisels, 2010; Moore et al., 2006; Moore & Kraemer, 2005). In a comparative study done by Moore and Kraemer (2005), data from a 1993 survey were compared to data from a 2003 survey, which showed an increase in the number of biology teachers who included evolution in their instruction, but also showed an increase in the number of biology teachers who included creationism in conjunction with evolution.

In a recent study conducted by Fowler and Meisels (2010) on teacher attitudes about teaching evolution, 24% of the teachers stated they “felt comfortable teaching evolution” but reported they had been criticized by students/parents for teaching evolution. In this same sub-group, 28% stated they know of others who have been criticized by students/parents for teaching evolution. This study expanded the survey research to include secondary school administrators since they are likely the ones ultimately making the decisions to allow students to opt out of academic time that includes learning about controversial issues, specifically the theory of evolution. The data from this study may assist local school districts in identifying potential policy and language misconceptions and misinterpretations that prevent students from learning important science concepts assessed on state science tests.

**Research Questions**

Five research questions guided the analysis of participant responses to questions and perception statements focusing on secondary school administrators’ actions, perceptions, and awareness as they relate to their decision to allow or not allow a student to opt out of academics, specifically evolution, through the collection of data using a web-based survey (see Appendix B).
1. Is there a correlation between community and school demographics and secondary school administrators’ choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

2. Is there a correlation between individual characteristics and secondary school administrators’ choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

3. How do secondary school administrators’ actions relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

4. How do secondary school administrators’ personal attitudes and perceptions relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

5. How do secondary school administrators’ awareness of opt-out policies and required standards relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

Descriptive statistics were used to determine a correlation between secondary school-level administrators’ actions with science teachers to support the teaching of evolution and alternative assignments, perceptions about evolution and other theories, awareness of evolution concepts and opt-out policies, and whether they would allow or not allow students to opt out of academics that specifically include evolution. Three questions identified the placement of the participants into two subgroups: (a) those who allow students to opt out of class when evolution is taught; and (b) those who do not allow students to opt out of class when evolution is taught. Data were collected for
participants’ community characteristics (Florida region and urbanization) and school demographics (student population, grade levels served, type of school, and free/reduced lunch). Five action items had two answer choices: yes or no. The Likert (1932) scale was used for the assessment of nine survey items that focused on respondent’s perceptions and awareness of opt-out policies, required state curriculum, and parent rights using the following levels of agreement: strongly agree, agree, undecided, disagree, and strongly disagree. Through the use of the IBM SPSS Statistics Student Version™ (PASW Statistics 18) program, descriptive statistical analysis was used to determine relationships with participants’ actions, perceptions and awareness, and the decision to allow or not allow opt out. Because this was a multinomial study and the participants were separated into two subgroups, Chi-square analysis was used to determine if a relationship existed between the two subgroups and the variables specified in hypotheses below:

H01: There is no statistically significant difference in community and school demographics and use or non-use of opt-out practice.

- H01(a): There is no statistically significant relationship between Florida region and use or non-use of opt-out practice.
- H01(b): There is no statistically significant relationship between urbanization and use or non-use of opt-out practice.
- H01(c): There is no statistically significant relationship between size of school and use or non-use of opt-out practice.
- H01(d): There is no statistically significant relationship between free and reduced lunch population and use or non-use of opt-out practice.
• $H_01(e)$: There is no statistically significant relationship between grade levels served and use or non-use of opt-out practice.

• $H_01(f)$: There is no statistically significant relationship between type of school (magnet, charter, virtual, academy) and use or non-use of opt-out practice.

• $H_01(g)$: There is no statistically significant relationship between type perceived parent involvement and use or non-use of opt-out practice.

$H_a1$: There is a statistically significant difference in community and school demographics ($H_a1(a) = \text{Region}$, $H_a1(b) = \text{urbanization}$, $H_a1(c) = \text{size of school}$, $H_a1(d) = \text{free and reduced lunch population}$, $H_a1(e) = \text{grade levels}$, $H_a1(f) = \text{type of school}$, and $H_a1(g) = \text{perceived parent involvement}$) and use or non-use of opt-out practice.

$H_02$: There is no statistically significant relationship between individual participant characteristics and use or non-use of opt-out practice.

• $H_02(a)$: There is no statistically significant relationship between tenure in education and use or non-use of opt-out practice.

• $H_02(b)$: There is no statistically significant relationship between experience as a school administrator and use or non-use of opt-out practice.

• $H_02(c)$: There is no statistically significant relationship between certification subject area and use or non-use of opt-out practice.

• $H_02(d)$: There is no statistically significant relationship between highest degree attained and use or non-use of opt-out practice.

$H_a2$: There is a statistically significant relationship between individual participant characteristics ($H_a2(a) = \text{tenure in education}$, $H_a2(b) = \text{experience as a school}$
administrator, \( H_a2(c) \) = certification subject areas, and \( H_a2(d) \) = highest degree attained) and use or non-use of opt-out practice.

\( H_03 \): There is no statistically significant difference in secondary school administrators’ actions and use or non-use of opt-out practice.

- \( H_03(a) \): Action of supporting teaching evolution at the school.
- \( H_03(b) \): Action of supporting teachers’ academic freedom to teach alternative theories.
- \( H_03(c) \): Action of meeting/discussing with the science teachers that they are required to teach evolution concepts.
- \( H_03(d) \): Action of asking science teachers to de-emphasize the teaching of evolution in their classes.
- \( H_03(e) \): Action of allowing a student to be assigned an alternate assignment when evolution is taught in the science classes.

\( H_{a3} \): There is a statistically significant difference in secondary school administrators’ actions and use or non-use of opt-out practice.

\( H_04 \): There is no statistically significant difference in secondary school administrators’ perceptions about evolution and use or non-use of opt-out practice.

- \( H_04(a) \): Perception that statements of belief cannot be proved or disproved through scientific investigation.
- \( H_04(b) \): Perception that there are other theories, such as intelligent design, that should be taught in conjunction with the theory of evolution.
- \( H_04(c) \): Perception that evolution is a central and unifying theme in biology.
• $H_{04}(d)$: Perception that the world is too complex to have come about without the active and repeated intervention of a higher power.

• $H_{04}(e)$: Perception that all students should have the opportunity to learn about evolution.

• $H_{04}(f)$: Perception that parents should have the right to opt out their child from class when evolution is taught.

$H_{4}$: There is a statistically significant difference in secondary school administrators’ perceptions about evolution and use or non-use of opt-out practice.

$H_{05}$: There is no statistically significant difference in secondary school administrators’ awareness of opt-out policies and required standards and use or non-use of opt-out practice.

• $H_{05}(a)$: Awareness that all students are required to learn about the theory of evolution, regardless of parent or student beliefs.

• $H_{05}(b)$: Awareness that there is pressure from parents in the community to avoid teaching evolution concepts.

• $H_{05}(c)$: Awareness that the majority of parents of students who attend the school support the teaching of evolution.

$H_{5}$: There is a statistically significant difference in secondary school administrators’ awareness of policies and required standards and use or non-use of opt-out practice.

Limitations

Trustworthiness. Admitting that they allow students to opt out of topics that are considered controversial, school administrators may be self-reporting that they are not
complying with the Florida statutes on which topics students are allowed to request opt out. The survey questions were phrased in such a way that the participants understood the data collected were only used to identify trends in practice, not compliance with policy. It could not be determined from the survey used in this study whether administrators were allowing opt out of the topic of evolution because of their lack of knowledge on the theory of evolution, past court cases that have defined what is science, and/or current state policies. The decision to allow opt out could also be due to a disagreement that students are required to learn about evolution, a deliberate non-compliance with state opt-out policies, and/or the perception that parent rights supersede state policies on required curriculum if the topic conflicts with a religious belief.

**Subjectivity.** Demographics, community culture, and background experience of the participants may have had an impact on the answers submitted because of their perceived truths about pressures from their community and interpretation of opt out policy. The researcher has a strong background in science and is familiar with the Florida state standards and assessments. The researcher acknowledges the impact that personal experiences and perspective may have on the interpretation of the data, and quantitative analysis of the survey items helped prevent biased reporting of the data. Even through the use of statistical analysis using the Likert-type scale, interpretation of the data and the formation of hypotheses were constructed by the researcher.

**Measuring intent.** Past research on purchasing behavior suggests that measuring intentions can influence behavior (Aizen, 1995; Fishbein & Aizen, 1975; Shepard, Hartwick, & Warshaw, 1998 as cited in Morwitz, Johnson, & Schmittlein, 1993). Answering an intent, or attitude, question can change behavior by making attitudes more
accessible and result in a behavior change consistent with the identified attitude (Fazio, Powell, & Williams, 1989; Kardes, Allen, & Pontes, 1993 as cited in Morwitz, et al., 1993). Sherman (1980, 1983) has shown that the act of making a prediction about one's behavior can induce substantial behavioral change (Morwitz, et al., 1993). One component that leads to behavior is the attitude toward performing a behavior, and behavior can be motivated by social concerns (Ajzen, 1985; Ajzen & Fishbein, 2005; Ajzen & Madden, 1986 as cited in Henningsen, Valde, Russell, & Russell, 2011).

**Survey research.** Survey research can be used to generate quantitative data through the use of questionnaires or structured interviews. The researcher was the data collection and analysis instrument, and interpreted the data based on the researcher’s insight into the research area of interest (Janesick, 2004; Merriam, 1998; Weber, 2004). Survey research is considered quantitative, depending on the questions and the data the researcher is trying to collect. The survey items measured individual perceptions about evolution and opt out policy, so answers may not have been consistent among participants from the same school district or among schools with similar demographics. Because the participants may have interpreted the survey statements differently than they were intended, items were tested for validity through interviews with individual administrators to discuss their interpretation of the survey items as they read them. A test/retest pilot study was conducted with a small group from the targeted population determined survey reliability using a correlation coefficient between the two sets of responses. Data collected from the test/retest pilot study was not included in this study.

Since survey participation was voluntary, this may have contributed to the high non-response rate, and anonymity prevented the verification of receipt of the survey
request by the targeted participants. This brings up the question of whether those that did respond to the survey request represented the targeted group as a whole, including the non-responders, or whether the participants self-selected because of their interest in the topic of study. The desire for a high response rate also limited the number of questions, items and open-ended statements on the survey instrument, and content within the questions was limited.

Assumptions

Political. According to Bolman and Deal (2003), the political frame views organizations, including school systems, as coalitions of diverse individuals and interest groups. There are differences among individuals and groups in values, beliefs, interests, and perceptions. School administrators make decisions based on the interests of their stakeholders, and stakeholder interests drive practice.

Religious beliefs. Different worldviews and religious beliefs may have played a role in decision-making regarding opting out of controversial topics.

Opt-out policies. When the survey was administered, it was assumed that there were only two allowable opt-out policies in the state of Florida: human sexuality and animal dissections. Florida statute requires K-12 public school teachers to teach the Next Generation Sunshine State Standards as identified by state-approved course descriptions.

The following were the assumptions of this study:

1. All participants were secondary school-based administrators certified in Educational Leadership in the State of Florida.
2. Participants were not be asked their religious affiliation, specific religious beliefs, or lack there of, so religious affiliation did not affect their willingness to participate in the survey.

3. Participants were honest in their reporting.

According to Tversky and Kahneman (1982), the influence and application of personal beliefs on decision making can impede the ability to reason objectively (as cited in Nadelson & Sinatra, 2009).

This study used descriptive and Chi-square statistics to interpret the data collected through the questions and items on the survey. Two open-ended questions were used to determine trends within responses and to validate participant responses to action questions and Likert-type items. It was assumed that the data collected were from a representative sample from a fixed population of secondary public school administrators as identified by the Florida Department of Education (FDOE).

**Theoretical Framework**

The theoretical framework is the position that the researcher brings to the study (Merriam, 1998). According to Crotty (1998), positivist research is verified by factual observations and experience of the senses of the quantifiable world and carried out via the scientific method. Positivism is objectivist and research conducted from this viewpoint relied on the epistemology of objectivism (Crotty, 1998). Objectivist epistemology holds that meaning exists separate from consciousness. Deductive reasoning is used to hypothesize what can be tested, and the results either support the hypothesis or require revision of the hypothesis to better predict reality (Trochim, 2006). According to the verification principle, no statement is meaningful unless it can be
verified. Unverifiable metaphysical viewpoints and religious beliefs are not part of a positivist’s world because beliefs can not be proven using the empirical sciences. Bringing all of these ideas together allows a constructivist approach to research.

The real world is a quantifiable world, and according to Auguste Comte (1798-1857), the scientific method, or positivism, has the same features whether applied in the natural sciences or the human sciences, and no social fact can have scientific meaning until it is connected to another social fact (Crotty, 1998). This logical positivism applies the scientific method to the social sciences and has played a major role in the development of modern day positivism. Popper (1902-94) and Kuhn (1922-96) embraced probability through inductive reasoning instead of certainty through deductive reasoning for the understanding of scientific knowledge, leading the way to a more constructive approach to scientific thinking as it applies to human sciences.

According to Trochim (2006), recently positivist researchers have shifted to a post-positivist way of thinking and accept that scientific reasoning and common sense reasoning are essentially the same process. Even with objectivity there lies researcher bias in the interpretation and analysis of the data. Figure 1 shows the researcher’s theoretical framework:

Post-positivists, including Popper, Dewey, and Rescher, believe that human knowledge is not based on unchallengeable, rock-solid foundations and there is subjectivity in the interpretation of the all data (Crotty, 1998). Post-positivist thinking allows for a more constructive view of reality instead of the rigid objectivist viewpoint. Constructivist research assumes that reality exists in the thoughts and perceptions of each individual.
This study focused on the actions, perceptions, and awareness of secondary school administrators, school demographics and community characteristics, and their relationship to the application of opt-out practices.

**Definition of Terms**

**Academic Freedom bills:** Academic Freedom bills permit, but do not require, teachers and students to introduce creationist material into science classes. Because these bills are permissive rather than prescriptive, they may have a better chance of surviving judicial scrutiny than has past antievolution legislation (NCSE, 2008). As per the National Center for Science Education (2010), there are two main strains of Academic Freedom bills. The first strain mandates that teachers be able to discuss the full range of scientific views regarding biological and chemical evolution and offers students protection for subscribing to a particular position on views regarding biological or chemical evolution. The second strain cites the need to help students develop critical thinking. 

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**Figure 1:** Researcher’s Theoretical Framework and Perspective

- **Epistemology:** Constructivism
- **Theoretical Perspective (Paradigm/Worldview):** Post-Positivism
- **Methodology:** Quantitative & Qualitative
- **Instrument:** Survey
  - Analysis: descriptive statistics

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thinking skills on controversial issues and permits teachers to discuss the scientific strengths and weaknesses of existing scientific theories. From 2004 to 2010, more than 30 Academic Freedom bills have been filed, but only the Louisiana Science Education Act has been signed into law (NCSE, 2010).


Scientific theory of evolution. Evolution in the broadest sense can be defined as the idea that the universe has a history; that change through time has taken place (NSTA, 2010). Evolution is the unifying paradigm and the organizing principle of the biological sciences. Explanations of natural phenomena that are not based on physical evidence but on myths, personal beliefs, religious values, and superstitions are not scientific. There is no longer a debate among scientists about whether evolution has taken place, but there is considerable debate about how evolution has taken place.

The evolution/creationism dichotomy. Many Americans think of the creation and evolution controversy as a dichotomy with creationists on one side, and evolutionists on the other. This assumption leads to the unfortunate conclusion that because creationists are believers in God, that evolutionists must be atheists (Scott, 2001).

Opt out. For the purpose of this study, opt out refers to choosing not to participate in class when the scientific theory of evolution is taught.

Secondary schools. Secondary schools in this study were defined as a public educational institution serving grades 6 through 12 with students between the ages of 10 and 19 years.
Secondary school administrators. Secondary school administrators in this study were defined as educators certified in Educational Leadership and employed at a Florida public school. Their responsibilities include overseeing the performance or management of administrative operations of the facility and staff at the school.

Community and school demographics. Community and school demographics in this study included Florida region, urbanization, size of the population of the school, free and reduced lunch (F/RL) population (greater than 50% F/RL qualifies for Title I funding), grade levels served (6-8, 9-12, 6-12, or K-8), type of school (charter, magnet, virtual, or academy), and parent involvement (minimally = less than 20% of the parents participate in school activities; sometimes = less than 50% of the parents participate in school activities; often = more than 50% of the parents participate in school activities; and very often = more than 75% of the parents participate in school activities).

Individual characteristics. Individual characteristics included participants’ background knowledge and experience, specifically years in education, years as a school administration, highest degree earned (master’s degree and beyond), and subject area certification (English, Reading, Math, Science, Social Studies, Health, Physical Education, Fine Arts, or multiple certification areas).

Actions, perceptions, and awareness. Participant actions for this study referred to supporting teaching evolution, supporting teacher academic freedom, discussing required curriculum, and assigning alternative assignments. Participant perception for this study referred to knowledge about the scientific theory of evolution, the limits of scientific investigation, and personal beliefs about religion and parent rights. Participant
awareness for this study referred to state requirements, community politics, and parent support for the teaching of evolution.

**Summary**

The purpose of this study was to determine if secondary school administrators are allowing students to opt out of learning about the theory of evolution because it is a controversial topic. State standards specifically state that evolution is a unifying concept in the biological sciences and is the most powerful explanation scientists have to offer. There is no statute in Florida that allows opting out of academics other than human sexuality education and animal dissections.

Chapter 2 reviews the past and current literature on the evolution/creationism controversy and policy interpretation as it applies to public school education. The literature review is organized by the following categories: (a) Policy Implementation Research in K-12 Education; (b) Court Cases on Evolution that have Impacted Policy; (c) Legislation and Policy on Evolution; (d) Florida Legislation and Policy on Evolution; (e) People and Institutions Against Evolution; (f) Science and People for Evolution; (g) Misconceptions about Evolution that have Impacted Policy; and (h) How this study contributes to the current research.
Chapter 2: Literature Review

Evolution is among the most controversial topics in education today. Over the past 80 years, teaching evolution in the public schools has been challenged many times and has resulted in necessary Supreme Court rulings to interpret the language of the Constitution and how this interpretation applies to teaching controversial topics, specifically how the First Amendment’s Establishment Clause impacts the interpretation of the definition of a scientific theory and how it is applied to teaching evolution in public schools. Through the analysis of specific court cases tied to teaching evolution in conjunction with religion in public schools, this review addressed why certain religious practices in the school system violate the Establishment Clause of the First Amendment of the U.S. Constitution, how past court cases on evolution and balanced treatment of religion affect the teaching of present-day science curriculum, and the interpretation of policy language found in the Academic Freedom bills may contribute to administrators allowing students to opt out of specific controversial science topics. Academic Freedom bills are designed to protect teachers when they incorporate “alternative views” of evolution into the science classrooms. Although, legislators have gone on record stating that the Academic Freedom bills in no way promote teaching religion in the science classes, the language in the various state bills is verbatim from the model bill (see Appendix C) released by the Discovery Institute’s Center for the Renewal of Science and Culture, the intelligent design (ID) think tank. Discovery Institute members claim that the
academic freedom of scientists, teachers, and students are under attack for questioning evolution. Discovery Institute is the nation's leading public policy center that defends teaching the controversy about the strengths and weaknesses of Darwinian evolution. Academic Freedom bills are designed to protect teachers from punitive measures if they choose to present “alternate scientific views,” which could be interpreted to include ID because the Discovery Institute promotes ID as a viable alternative scientific view to evolution (see Appendix D for language of various Academic Freedom bills). Most of the Academic Freedom bills have died on the legislative floor (Louisiana is the exception). Recently, there has been an increase in requests from parents to opt their student out of controversial topics, specifically evolution, which, if allowed, would prevent their children from learning about evolution as a scientifically proven theory in the public school science curriculum (Scott & Branch, 2008). The language in the Academic Freedom bills is closely aligned with the language in the model Academic Freedom bill that was released by the Discovery Institute in September 2007. This language may become the de facto policy if education leaders misinterpret the language and allow opting out of required science content.

The literature review is organized by the following categories: (a) policy implementation research in K-12 education; (b) evolution court cases that have impacted policy; (c) legislation and policy on teaching evolution; (d) people and institutions against evolution; (e) science and people for evolution; (f) misconceptions about evolution that have impacted policy; and (g) how this study contributes to the current research. Figure 2 summarizes the schema for the literature review for this study.
Figure 2: Schema for Literature Review
Policy in K-12 Education

Viewed from the political frame, politics is the process of making decisions, and members with common interests need political power to accomplish their goals (Bolman & Deal, 2003). Traditional policy analysis has focused on the evaluation of a policy prior to legislation but has extended to evaluating policies after they have been enacted and the impact on implementation practices (Yanow, 2000).

The State Science Writers and Framers Committee recommended to the FDOE, science standards that included evolution as a unifying theme in the biological sciences. After minor revisions by the State Board of Education (SBOE) to include “the scientific theory of evolution” in lieu of “evolution” the new science standards were approved in February 2008. In March 2008, Senate Bill 2692 was filed during the Florida legislative session. According to the Florida Academic Freedom bill sponsor, Senator Storms, the bill was intended to address the teaching of evolution in response to the adoption of the new Florida science standards, and had the strong backing of the Discovery Institute. On April 23, 2008, the Florida Senate voted 21-17 in favor of a bill to allow teachers and students to use "scientific information" to challenge evolution. The House version, HB 1483, sponsored by Representative Hays, was filed because “current law does not expressly protect the right of teachers to objectively present scientific information relevant to the full range of scientific views regarding chemical and biological evolution” (HB 1483, lines 19-22). The bills failed to pass presumably because the language in the House and Senate versions were considerably different. A similar 2009 Senate bill (SB2396), which failed to pass and no House companion bill was filed, was filed in the March 2009 session, and sponsored by Senator Wise, stating that teachers will provide a
“thorough presentation and critical analysis of the scientific theory of evolution.” The Florida science standards, adopted in 2008, specifically require students to, “Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented (SC.912.N.1.3). The filing of these Academic Freedom bills may signify the controversy over the teaching of evolution continues in spite of state adopted science standards.

Education leaders cannot avoid implementation of policies, be it federal, state, or local policies. Leaders must be prepared to guide districts, schools, and teachers through the difficult tasks of change in pedagogy, new expectations and expansion of programs, even if the policy is unpopular and objectionable (Fowler, 2009). According to Fowler (2009), “Implementation is the stage of the policy process in which a policy formally adopted by a governmental body is put into practice” (p. 270). Policy implementation is as political as the adoption of statues in legislation, and there are formal implementers (government officials or the superintendent) and intermediaries (district curriculum specialists) who delegate responsibility to help with implementation. The point most school policies have an impact is at the teacher and student level because it is where school policy dealing with curriculum and pedagogy is implemented (Fowler, 2009).

Policy implementation research has gone through three generations of research, and the difficulty of policy implementation has become easier from the first to third generation as more and more research has been conducted in this area (Fowler, 2009). Lessons learned in the first generation of policy research include: (a) policies are implemented only if formal implementers and intermediaries work together; (b) short in-
service sessions on the new policy are not enough training; (c) implementers lacked the knowledge and skills to implement the policy; and (d) lack of resources. Second generation research attempted to understand why some policies were implemented and others were not; research revealed that successful implementation would not happen with “cookbook” processes and that a “mutual adaptation” had to occur (Fowler, 2009, p. 274). Highly successful implementations occurred only when district office administration were deeply committed to the new program and provided the resources, training, and support over an extended period of time during the implementation. Second generation lessons learned revealed most policy implementation is “watered down” from the original version and if “mutual adaptation” occurred then intent of the new policy does not take place. According to Fowler (2009), formal implementers and intermediaries must make concrete recommendations to ensure the intent of any policy is implemented.

Third generation research began around 1990 with the emergence of ambitious educational reforms (Fowler, 2009). The Florida Academic Freedom bills have gone through two generations (legislative sessions) and have evolved to include more scientific-sounding language and have been paired with proposed required civics education (SB 2396).

Many of the new programs have required administrators and teachers to make significant changes in teaching and researchers began to focus on the reasons teachers, and administrators had difficulty interpreting the complex reforms (Fowler, 2009). According to Spillane, Reiser, and Reimer (2002), research on human condition suggests that “new information is always interpreted in light of what is already understood” (Fowler, 2009, p. 279). People naturally draw on their background knowledge and past
experiences to interpret new information, and may focus only on superficial or concrete parts of a policy instead of the less obvious parts (Fowler, 2009; Spillane, 2000). Therefore it may be reasonable to assume that if parents are allowed to opt their child out of human sexuality education and animal dissections as per sections 1003.42(3) and 1003.47(1) of the Florida Statutes, they could also be allowed to opt their child out of controversial topics that contradict the family’s religious beliefs.

Teachers and administrators draw on experiences to interpret policies causing variations in the forms of policy implementation. Opportunities for implementers, especially teachers, to discuss the language and intent of the policy allow them to interpret the meaning together (Fowler, 2009). In a study conducted by Spillane (2000), it was recommended that the leaders of the reform or policy must acknowledge that implementers (administrators and teachers) must understand the deep meaning of the reform or policy and may require significant time (five to ten years) and effort (including training and resources). Third generation research has extended the understanding of “implementers as learners” and discussion on the meaning of new policies is necessary for successful implementation (Fowler, 2009, p. 284), which includes implementation and interpretation of new curriculum standards that have been adopted by State Boards of Education.

For policy formation to be successful, policy proposals must be adoptable and implementation of policy must be seen as evolution (Theodoulou, 1995). According to Theodoulou (1995), there are three types of policy implementation: (a) programmed implementation; (b) adaptive implementation; and, (c) premeditated implementation. Programmed implementation is clear and rationale and seeks to remove ambiguity from
policies. An example of programmed implementation may be the development and implementation of new state curriculum standards. The second, adaptive, allows for adjustments to the original policy as events unfold. This could be clarification of state statutes and FDOE rules and regulations that require implementation of new standards, such as revisions to the Florida a science curriculum. The third, premeditated, involves behavior that is deliberately aimed at preventing implementation from occurring (Theodoulou, 1995). The introduction of Academic Freedom bills may be an intentional attempt to prevent the evolution standards as adopted by the SBOE from being implemented into the public schools.

**Policy Analysis**

Policy analysis, or evaluation, can be categorized into two categories of evaluation: process evaluation and impact evaluation (Theodoulou & Cahn, 1995). Process evaluation focuses on the extent to which a policy is implemented according to stated guidelines. Impact evaluation examines the extent to which a policy causes a change in the intended direction (Theodoulou & Cahn, 1995). State tests that assess new standards may ensure implementation, but allowing students to opt out of required content may change the intended direction of the state standards. It is not known if the proposed Academic Freedom bills have caused a change in how evolution standards are implemented into classroom instruction nor the number of schools where opting-out of required instruction of the scientific theory of evolution in science is allowed.

Kingdon (2003) identified three policy streams: problems, politics, and visible participants. Agenda items appear and disappear from governmental agendas because they either do or do not address problems that have been deemed “priorotu” by
legislators. The political stream, and therefore the legislative agenda, can change with people’s perceptions, as with interest group pressure and demands on government (Brown, 2007; Kingdon, 1995; 2003). Interest group influence over education policy depends on the importance and prominence of the issue with the general public (DeBray-Perlot & McGuinn, 2009; Kingdon, 2003). “Interest groups are often able to block consideration of proposals they do not prefer, or adapt to an item already high on the governmental agenda by adding elements to their liking” (Kingdon, 1995, p. 107). Blocking policies is relatively easy if the interest group is powerful enough to persuade the general public (Moe, 2001). In May 2009, the Pew Research Center conducted a poll of public attitudes toward science. The poll showed that only 32% of the general public fully embraces Darwin’s theory; 22% believe that evolution has occurred but that it has been guided by a supreme being; and 31% contend that humans and other living things have existed in their present form since the beginning of time (The Pew Forum, Debates Over Evolution and Other Issues, para. 10). The Discovery Institute’s Center for Renewal of Science and Culture produced a document, the Wedge Document (see Appendix E), confirming their intent “to defeat scientific materialism and its destructive moral, cultural and political legacies” through the use of the national media targeting the general public, specifically Christians. In contrast to Kingdon, a study conducted by DeBray-Perlot and McGuinn (2009) revealed that interest groups, specifically the two major teacher unions, had less influence over past federal education policy than is often believed.

**Policy streams.** The policy stream literature looks at policy alternatives as a selection process, similar to biological natural selection, and many ideas transform into new ideas and form combinations and recombinations of different policies (Kingdon,
The Discovery Institute, a self-proclaimed ID think-tank, is a special interest group that focuses on the implementation of alternative theories to evolution into the science curriculum, specifically ID. The goal of Discovery Institute is to change the ground rules of science to make room for religion, specifically Christianity (Kitzmiller v. Dover, 2005; Discovery Institute, 1998). ID is characterized as a vague form of creationism that is marketed as a form of “academic freedom for teachers.” This appeals to many Americans because it offers a critique of evolution using the language of science (Johnson, 2006). Because none of these Academic Freedom bills mentions social studies or religious studies, and only mentions the teaching of “alternate views” in regards to chemical and biological evolution as taught in science classes and because of the language in the Discovery Institute model bill is similar to proposed legislation, it appears to be a concerted effort to get ID into the science curriculum. The issue of alternative theories becomes important because the general public is led to believe there is something missing from the science curriculum. ID advocates assert that the students are being misled and not given all the information so they may decide for themselves what to believe. Evolution, and other scientific theories such as gravity and cell theory, are scientifically proven ideas and not based on one’s ideological beliefs.

Policy language. According to Cobb and Elder (1995), an issue is defined as, “a conflict between two or more identifiable groups over procedural or substantive matters relating to the distribution of positions or resources” (p. 96). One method of initiating an issue can be linked to a person or group who manufacture an issue to advance their agenda. The evolution/creationism dichotomy is an example of this type of issue initiation, and educational policy relies on differing viewpoints, values and ideas about...
the role of schools in today’s society. Perry (2009) maintains that different groups may support competing values, or different groups may agree on a value but interpret it differently. The challenge for policy makers is to find common ground among competing ideologies and be clear on the ultimate vision of the policy. Effectively promoting one’s viewpoint at the demise of another viewpoint can create enough doubt in the general public to influence public policy. If people are led to believe there are opposing theories to evolution, then they may support policy that requires these theories be taught to students, regardless of whether or not the alternative is scientifically valid.

Policy proposals that are deemed not feasible, for whatever reason, are less likely to survive, but recombination of familiar elements, or coupling, is more important than mutation in policy survival process (Brown, 2007; Kingdon, 1995, 2003). According to Kingdon (1995, 2003), if a policy proposal is coupled to a problem as its solution, or presented as a problem-solution package that has political receptivity, it is more likely to move forward in legislation. The “coupling” of the combination of problem, policy, and political receptivity increases a policy proposal’s likelihood of rising on a decision agenda (Brown, 2007; Kingdon, 1995; 2003). An open policy window is the opportunity for interest groups to bring attention to their issue, and interest groups, including the Discovery Institute, may wait for problems to arise and then attach their “solution” to the problem. The Florida Academic Freedom bill introduced in the 2009 legislative session, SB 2396, was coupled with civics education, or government education. If passed, the bill would have “required instructional staff of a public school to teach a thorough presentation and critical analysis of the scientific theory of evolution and certain governmental, legal, and civic-related principles” (SB 2396, lines 3-7). Although the
2009 Academic Freedom bill did not pass, legislation (HB 105) has passed that requires 7th grade students to pass a Civics End-of-Course exam starting in 2014.

One example of an open window is legislative sessions, where problems linked to proposed solutions, and proposals, linked to problems or solutions, run rampant. If one looks at a legislative agenda, the same senator names appear on multiple policy proposals and many of these proposals do not make it and die on the floor, such as the recent flurry of Academic Freedom bills in various state legislatures in 2008 and 2009. One of the major political activities involved in the formulation of programs and policies is advocacy (Ripley, 1985). “Different persons or groups advocate different points of views and alternatives and seek to build supporting coalitions in support of their views” (Ripley, 1985, p. 159). In program or policy implementation, the law needs to be interpreted, and ambiguity can be seen as either a defect in understanding or as a pertinent and inevitable characteristic of public policy (McCool, 1995). According to Kingdon (1995), policy entrepreneurs invest their resources in return for future policies they support for “self-serving benefits” (p. 112). The Discovery Institute, and other ID advocates, may be considered policy entrepreneurs. The model academic freedom bill (September 2007) originated from the Discovery Institute in anticipation of conservative legislators that would be willing to sponsor the Academic Freedom bills, such as in the 2008 Florida legislative sessions (see Appendices C and D). Numerous variations of Academic Freedom bills have been introduced in state legislative sessions over the last few years (Alabama HB923, 2008; Arkansas HB2548, 2001; Iowa HB183, 2009; Louisiana HCR50, 2003; Louisiana SB733, 2008; Michigan SB1361, 2008; Mississippi HB25, 2009; New Mexico SB433, 2009; Oklahoma SB320, 2009; South Carolina SB1386,
The increase in the support for the inclusion of creationism into science curriculum may be compounded by the different interpretations of the language in these Academic Freedom bills.

Policy-related controversies generally involve two competing understandings or definitions of the same policy and have different meaning for different people (McCool, 1995). McCool stated, “Policy is ambiguous and manipulable . . . and it is a struggle to get one meaning established as the accepted one, and a policy may have no relevant meaning until someone interprets it because some policies are more ‘adaptive’ than others” (1995, pp. 223-224). The constructivist approach to social science relies on socially constructed meanings and therefore social reality, and even when policy language is “spelled out” there is still interpretation of the meaning of a policy, which can be determined only by those people involved in the policy process (McCool, 1995). It should be no surprise that such ambiguity leads to conflict (scope, impact, motive, and values) and result in disagreements about the meaning of a policy thereby producing political controversy.

In 1996, Yanow stated, “Interpretive policy analysis presupposes a commitment on the researchers’ part to work with the understandings of policymakers and to allow the relevant categories of analysis to emerge out of those interpretations” (p. 44). Analysis of policies is a human activity and involves human perception and interpretation, so there is no single, correct solution. Language conveys meaning that is open to interpretation by legislators and other stakeholders. Policy as a concept evolves over time and interpretations of this policy are more powerful than facts, and this picture is further complicated if policies are considered as “expressive statements” and “texts” that are
interpreted by various stakeholders (Yanow, 1996, pp. 22, 23). According to Spillane, Reiser, and Reimer (2002), “Sense-making is fraught with ambiguity and difficulties” (p. 390). Researchers have investigated various dimensions of this sense-making process and how it influences implementation, through prior knowledge, social situation, community history, professional expertise and discourse, and networks (Spillane et al., 2002). As local school districts grapple with new curriculum standards, their own understandings of subject matter, especially science, shape the interpretation of meaning, which is then transferred to the classroom teacher (Hill, 2001). In a study done by Spillane and Callahan (2000), there was implementation failure of state science standards as they were intended because of different interpretations of the intent of the standards as they related to epistemology and pedagogy. In the state science standards, language played a major role in the writing of comprehensive, state-approved science big ideas and benchmarks (Tully, personal communication, April 10, 2008). Words like “explore, discover, design” are found throughout the Florida State Standards but these words are interpreted and applied at the local and classroom levels. Is the intent of the language written by the State Standards Writing Committee being implemented as it was intended, especially the Nature of Science standards that deal with scientific theories including evolution? Section 1003.41 of the Florida Statutes states that public K-12 educational instruction is based on the Sunshine State Standards that establish the core content of the curricula to be taught in the state of Florida and specify the core content knowledge and skills that K-12 public school students are expected to acquire.

Science standards must establish specific curricular content for . . .

the nature of science, earth and space science, physical science,
and life science. The standards must include distinct grade level expectations for the core content knowledge and skills that a student is expected to have acquired by each grade level.

Section 1003.42 of the Florida Statutes states that “each district school board shall provide all courses required for middle grades promotion, high school graduation, and appropriate instruction designed to ensure that students meet State Board of Education adopted standards.” This includes the expectation for teachers to effectively teach the science standards, including evolution, as written in the course descriptions, which lists the state adopted standards and benchmarks for each course. In spite of this, state legislatures, including Florida, are introducing Academic Freedom bills to “protect teachers” and open the door for intelligent design and other religious beliefs to be taught in conjunction with evolution in science courses. The language, if interpreted to include the teaching of pseudoscience, directly contradicts the State-adopted science standard, Big Idea 2, The Characteristics of Scientific Knowledge that specifically requires direct instruction on the difference between science and religion and what is taught in science classes. The Big Idea states that scientific knowledge is based on empirical evidence, and is appropriate for understanding the natural world, but it provides only a limited understanding of the supernatural, aesthetic, or other ways of knowing, such as religion (NGSSS, 2008). The Florida Test Development Center has developed a revised Grade 8 Science FCAT 2.0 and an End-of-Course Biology exam, for implementation in spring 2012, and both include assessment on this standard.

According to Yanow (1996), “Legislative language is often intentionally ambiguous in order to resolve contending positions and get a bill passed” (p. 129). One
only has to read the language of the recent Academic Freedom bills to verify their ambiguity and conflicting meaning. In her book, *The Language War*, Robin Lakoff (2000) states “We want to regulate language in order to . . . control the course of real world events [and] there are words that win wars in the name of politics. . . and religion” (pp. 41, 87). Policy legislation is designed so the language of proposed bills is influenced by the writer’s values and beliefs (Yanow, 1996). Words imply ideas or actions ascribed to them by communities, and meanings for specific words can vary across communities because of different interpretations (Hill, 2001). “Local interpretations of state policy figure centrally in standards-based reform efforts” (Hill, 2001, p. 289). Policy makers write from research and draw on their own experiences, which allows for bias and ambiguity. Implementation of policy “eludes understanding” and the attempt to study implementation raises the question about thought and action because ideas are based on behavior (Giandomenico & Wilavsky, 1995, p. 140). “Words become deeds . . . and can create expectations and . . . influence behavior” (Giandomenico & Wilavsky, 1995, p. 143). Spillane and Callahan (2000) stated that teachers ultimately decide the fate of national and state science standards, and district policy makers contribute to how those standards are implemented through their interpretation of the intent of the standards.

**Policy Implementation**

What a policy means for those implementing the policy is based on the interaction of their knowledge, beliefs, attitudes, and situation. How the implementing agents understand the policy’s language is defined by the interaction of these dimensions (Spillane et al., 2002). Implementation failure focuses on the failure of principals to make clear policy outcomes and the inability of state or federal policymakers to write clear and
consistent directives. Implementing agents ignore, either intentionally or selectively, policies that are inconsistent with their interests (Firestone, 1989) and policies that fit their agendas are more likely to be implemented. According to Spillane et al., (2002):

Teachers’ prior beliefs and practices can pose challenges not only because teachers are unwilling to change in the direction of the policy but also because their extant understandings may interfere with their ability to interpret and implement the reform in ways consistent with the designers’ intent. (p. 390)

Interpretation of language is intertwined with behavior, and the person interpreting the policy language is whose point of view is used. Policy problems can arise during implementation because implementers interpret the design of a policy and this influences what implementers do and do not do based on their knowledge and beliefs they use to make sense of the policy language (Spillane & Callahan, 2000; Spillane et al., 2002). In a study conducted by Spillane and Callahan (2000), they determined that the language that district policy makers used was not a precise indicator of their understanding of the science standards and their ideas were distinctly different when interpreting the science standards.

Although most of the 2008 and 2009 Academic Freedom bills died on the floor, the language of these bills appeared in some state standards, such as Ohio and Kansas. “If an epistemological paradigm is going to use language that is unique or different from the way the people who you want to reach use language, then you better teach your desired audience the language” (Wexler, 2007, p. 59). Language matters because it is the primary material used to interpret experience, thereby constructing social realities. To
make informed decisions about public school policies, administrators and teachers need to know how to interpret policy language, especially those policies that affect student learning. In 2006, Manna stated, “In any policy system where actors at one level of government depend on other levels to . . . [implement] their objectives . . . a combination of enforcement and persuasion is required for policy success” (p. 473). Framing public policy implementation through the coordination of loosely coupled policy networks, such as required science standards and the ambiguous language of the Academic Freedom bills creates challenges for public school administrators and teachers to implement policies as they are intended.

Manna (2006) stated that standards and accountability in education allow federal leaders to control local leaders to produce the desired results and policy as a battle for control with federal and state leaders on one side (although they are often on opposite sides when policy implementation must occur) and local leaders and teacher unions on the other side. Leaders from different chains of command contribute to policy implementation, but the success of any policy implementation relies on the stakeholders who are actually implementing the policy, such as classroom teachers and school-based administrators. At the state level, multiple actors develop, produce, and implement K-12 education policy, including legislatures, state board of education, and state education agencies. These different actors exert different types of influence over policy implementation, through either control or persuasion, which leaves little room for interpretation of policy language.

The politics of education policy assumes that political factors shape policies . . . and defined in general terms “what gets taught, how, and by whom” (McDonnell, 2009,
According to McDonnell (2009), “Policy influences the context in which learning occurs” but historical education policies can shape current and future political dynamics (p. 417). People or groups, who mobilize because of a common interest in blocking or opposing current policies or statutes, create negative policy feedback. Standards-based accountability has been a top-down policy promoted by political and business elites, and with limited public opinion data (Gallup, 2008), very little is known about this policy, including how its framing and language have affected public perceptions of the educational system (McDonnell, 2009). The differing perceptions of the policy by the business community and the school community have led to over testing and unfair comparisons of schools, which have created much controversy in cultural and curricular arenas (McDonnell, 2009; Meier, 2004). McDonnell (2009) maintained that future research should focus on the interpretive effects of policy by examining special-interest groups’ influence on education policies, through resources, strategies and effectiveness.

**Court Cases and the Evolution/Creationism Controversy**

The trial and conviction of the Italian astronomer Galileo Galilei in 1633 is often cited as the first prominent example of the conflict of religion with modern science (Alexander & Alexander, 2005; Barbour, 2003; Miller, 2008). Galileo proposed that the Earth and planets revolve in orbits around the Sun, which contradicted Aristotle and challenged the authority of the Catholic Church at a time when it felt threatened by the Protestant Reformation (Alexander & Alexander, 2005; Barbour, 2003). It was not until 1992 that the Catholic Church finally acknowledged that Galileo was right (Alexander & Alexander, 2005). It would be two centuries later, as scientific inquiry became more
popular, when Charles Darwin published *The Origin of Species* culminating a controversy that lasted for more than 100 years.

John Scopes, a science teacher who, in 1925, introduced his high school class to Darwin’s *Origin of Species*, resulting in Scopes going to trial in Tennessee for teaching the theory of evolution. The "Monkey Trial" was a dramatic showdown between the three-time Democratic presidential candidate William Jennings Bryan and Scopes’ defense lawyer, Clarence Darrow (Larson, 1997). The jury found Scopes guilty, and the antievolution statute, known as the *Butler Act*, stated that it was “unlawful to teach any theory that denies the story of divine creation as taught by the Bible and to teach instead that man was descended from a lower order of animals” (Tennessee Evolution Statutes, 1925). The *Butler Act* remained on the books in Tennessee until the 1970s (Larson, 1997). It took forty-three years after the Scopes trial to deem that banning of the teaching of evolution was unconstitutional, and *creation science* was born.

Early court cases have set the precedent for modern-day court battles challenging the Establishment Clause of the First Amendment through teaching of religion in the public schools. The central issue in an Establishment Clause analysis is whether the government has endorsed a religion by its actions and the court must then examine both what the government intended to communicate and what message its conduct actually conveyed. Table 1 summarizes some of the prominent court cases from the last 80 years that dealt with violation of the Establishment Clause and antievolution.
<table>
<thead>
<tr>
<th>Year</th>
<th>Court Case</th>
<th>Implications and Importance</th>
</tr>
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<tbody>
<tr>
<td>1633</td>
<td>Trial &amp; conviction of Galileo Galilei</td>
<td>First prominent example of the conflict of religion with modern science. Galileo proposed the Earth and planets revolve in orbits around the Sun, which challenged the authority of the Catholic Church.</td>
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<tr>
<td>1925</td>
<td>Scopes Trial</td>
<td>Introduced his high school class to Darwin’s <em>Origin of Species</em>, resulting in Scopes going to trial for violating the Tennessee <em>Butler Act</em> and teaching the theory of evolution.</td>
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<td>1952</td>
<td>Zorach v. Clauson</td>
<td>The Supreme Court ruled public school students could get “release time” to attend religious programs off school grounds.</td>
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<tr>
<td>1962</td>
<td>Engel v. Vitale</td>
<td>The Supreme Court ruled New York schools violated the Establishment Clause by starting school days with a prayer written by school officials.</td>
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<tr>
<td>1963</td>
<td>Abington Township v. Schempp et al</td>
<td>The district court ruled the statute that required public school employees read a verse from the Holy Bible and have students recite the Lord’s Prayer at the beginning of each school day violated the First Amendment and therefore unconstitutional.</td>
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<td>1968</td>
<td>Epperson v. Arkansas</td>
<td>The judgment of the Supreme Court of Arkansas that the antievolution law did not violate the 14th Amendment was reversed by the U.S. Supreme Court, who concluded that the motivation of the law was to suppress the teaching of a theory which denied the divine creation of man.</td>
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<td>1971</td>
<td>Lemon v. Kurtzman</td>
<td>Resulted in the three-pronged Lemon test, specifically the first prong, whether the statute was “enacted for the purpose of endorsing religion”?</td>
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<td>1981</td>
<td>Segraves v. State of California</td>
<td>The court found the California State Board of Education’s <em>Science Framework</em> discussions origins should focus on “how” not “ultimate cause.” This was extended to cover all areas of science, not just those concerning evolution.</td>
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<tr>
<td>1981</td>
<td>McClean v. Arkansas</td>
<td>A federal court held that a balanced treatment as required by <em>Arkansas Act 590</em> violated the Establishment Clause because it required public schools to give balanced treatment to <em>creation-science</em> and <em>evolution-science</em>.</td>
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<tr>
<td>1987</td>
<td>Edwards v. Aguillard</td>
<td>The Supreme Court affirmed the lower court's decision that Louisiana’s <em>Creationism Act</em> was unconstitutional because it prohibited the teaching of evolution except when accompanied by instruction in creation science.</td>
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<tr>
<td>1990</td>
<td>Webster v. New Lennox SD</td>
<td>The Seventh Circuit Court found the school district can prohibit a teacher from teaching creation science because it endorses religion.</td>
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<tr>
<td>1994</td>
<td>Peloza v. Capistrano SD</td>
<td>The Court determined a teacher’s First Amendment right was not violated when a school district required teachers to teach the science standards, which included evolution.</td>
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<tr>
<td>1997</td>
<td>Freiler v. Tangipahoa Parish BOE</td>
<td>Court rejected a policy requiring teachers to read aloud a disclaimer policy to promote critical thinking whenever they taught evolution.</td>
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<tr>
<td>2000</td>
<td>LaVake v. Independent SD 656</td>
<td>The case was dismissed when a teacher argued his right to teach evidence “for and against the theory” of evolution. The judge declared the teacher did not have a free speech right to override the required curriculum established by the school board.</td>
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<tr>
<td>2000</td>
<td>Selman v. Cobb County SD</td>
<td>The Court ruled that an evolution warning label on textbooks violated the Establishment Clause.</td>
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<tr>
<td>2005</td>
<td>Kitzmiller vs. Dover</td>
<td>The U.S. District court ruled the intelligent design (ID) policy that required teachers to announce to their students that ID was an explanation for the origin of life that differed from Darwin’s view violated the Establishment Clause because of ID’s creationist roots.</td>
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<tr>
<td>2006</td>
<td>Hurst v. Newman</td>
<td>The U.S. District Court ruled that public schools can not offer any course that promotes or endorses creationism, creation science, or intelligent design.</td>
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Note. BOE = Board of Education; SD = School District
After the famous *Scopes* trial in Tennessee, conservative Christians led grassroots battles nationwide through the 1970s and education became the focus of the *New Christian Right* led by Jerry Falwell, a Biblical literalist, in the 1980s (Deckman, 2004; Larson, 1997). Evolution was literally eliminated from the high school science curriculum until the Soviet Union launched Sputnik in the late 1960s. Pro-evolution groups, mainly scientists and academics, claimed this anti-evolution movement was a censorship of academic freedom (Deckman, 2004; Larson, 1997), which is similar to the claim made by pro-ID supporters that teachers and students need academic freedom and protection from censorship of *alternative scientific views*.

Two courts cases, *Engel v. Vitale* (1962) and *Abington Township v. Schempp et al* (1963) both found that praying and reciting verses from the Bible at the beginning of the school day were unconstitutional and violated the Establishment Clause. Despite the ruling on these two court cases, in 1965 Arkansas, Tennessee, Louisiana, and Mississippi still had antievolution laws (Scott & Branch, 2006). In 1968, the Arkansas Education Association decided to challenge the states antievolution law.

In 1968, a public school biology teacher in Arkansas was faced with the dilemma that if she used a new textbook that contained a chapter on the Darwinian theory of evolution, she would be subject to dismissal for committing a criminal offense in violation of the Arkansas statute prohibiting any teacher in the state’s schools from teaching such theory (*Epperson v. Arkansas*, 1968). The statute was a product of the upsurge of "fundamentalist" religious fervor of the twenties and the Arkansas statute was an adaptation, through less explicit language, of the famous Tennessee "monkey law" which that State adopted in 1925 (*Epperson v. Arkansas*, 1968). A parent of children
attending the public schools intervened in support of the action and this appeal challenged the constitutionality of the "anti-evolution" statute which the State of Arkansas adopted in 1928 to prohibit the teaching in its public schools and universities of the theory that man evolved from other species of life (Epperson v. Arkansas, 1968). The Chancery Court held that the statute violated the Fourteenth Amendment to the United States Constitution; but on appeal the Supreme Court of Arkansas reversed the decision, sustaining the statute as an exercise of the state’s power to specify the curriculum in public schools (Epperson v. Arkansas, 1968). The judgment of the Supreme Court of Arkansas was reversed by the U.S. Supreme Court, stating “there can be no doubt that Arkansas sought to prevent its teachers from discussing the theory of evolution because it is contrary to the belief of some” and that the Book of Genesis must be the “exclusive source of doctrine as to the origin of man” (Epperson v. Arkansas, 1968). Although the Arkansas statute did not include direct references to the Book of Genesis or to the fundamentalist view that religion should be protected from science, the Supreme Court concluded that the intent of the law was the same: to suppress the teaching of a theory which denied the divine creation of man.

**Court Cases Dealing with Balanced Treatment**

In 1982, in McLean v. Arkansas Board of Education, a federal court held that a balanced treatment (meant to be neutrality) as required by Arkansas Act 590 (passed in 1981) violated the Establishment Clause of the U.S. Constitution stating that the Arkansas statute required public schools to give balanced treatment to creation-science and evolution-science. The court declared that creation-science is not a science and that the theory of evolution does not presume either the absence or the presence of a creator.
This was the first court case to specifically deny creationism as a legitimate, testable science. Fundamentalist organizations were formed to promote the idea that the Book of Genesis was supported by scientific data. The terms creation science and scientific creationism have been adopted by fundamentalists as descriptive of their study of creation and the origins of man (Barlow, 2006). The judge for the McLean case stated that, “this contrived dualism” suggests that one must either accept the literal interpretation of Genesis or believe in the “godless system” of evolution.

Similarly, in Edwards v. Aguillard (1987), the Supreme Court affirmed the lower court's decision that Louisiana’s Creationism Act requiring balanced treatment of creation-science and evolution was unconstitutional because it prohibited the teaching of evolution except when accompanied by instruction in creation-science. The Court applied the three-pronged Lemon test to determine whether legislation was violating the Establishment Clause. Since the law was determined to have been “enacted for the purpose of endorsing religion” (the first prong of Lemon), no consideration of the second or third criteria was necessary (Alexander & Alexander, 2005). The Court stated the purpose of the Creationism Act was to restructure the science curriculum to conform to a particular religious viewpoint, and because this Act endorsed only one religious belief, it was in violation of the First Amendment. School sponsorship of a religious message is impermissible because it sends the ancillary message to members of the audience who are non-adherents that they are outsiders, not full members of the political community, and an accompanying message to adherents that they are insiders, and therefore favored members of the political community (Kitzmiller v. Dover, 2005). The Edwards decision
made *national* the prohibition against teaching creation science in the public school system (Barlow, 2006).

In *Kitzmiller et al. v. Dover* (2005), the U.S. District Court issued a declaratory judgment in favor of the parents that the Board’s Intelligent Design Policy violated the Establishment Clause of the First Amendment *and* the Pennsylvania Constitution. This was the first case where both the endorsement test and the *Lemon* test were adopted as standard practice, by conducting the endorsement inquiry first and subsequently measuring the challenged conduct against *Lemon’s* “purpose” and “effect” standards (*Kitzmiller v. Dover*, 2005). The first prong of the *Lemon* test, the judge concluded that the ID policy violated the intent criterion, finding that the original school board clearly had a solely religious intent in adopting this policy (Zirkel, 2006). The second prong of *Lemon*, he ruled that the new policy had a primary religious effect, and the third prong of the *Lemon* test concluded that the policy violated the endorsement test, which prohibits religious activities in the public schools (Zirkel, 2006). The judge in the *Kitzmiller v. Dover* (2005) case concluded in his written opinion:

Not a single expert witness . . . identified one major scientific association, society or organization that endorsed ID as science. . . [and] defense experts concede that ID is not a theory as that term is defined by the National Academy of Sciences (NAS) and admit that ID. . . has achieved no acceptance in the scientific community (p. 70). Defendants have consistently asserted that the ID Policy was enacted for the secular purposes of improving science education and encouraging students to exercise critical thinking
skills (p. 130). We find . . . the Board's real purpose, which was to promote religion in the public school classroom, in violation of the Establishment Clause. Repeatedly, scientific experts testified that the theory of evolution… is overwhelmingly accepted by the scientific community, and that it in no way conflicts with, nor does it deny, the existence of a divine creator. (pp. 132, 136)

The U.S. District court ruled that the ID policy requiring teachers to announce to their classes that ID is an explanation for the origin of life that differs from Darwin’s view (and references the book *Of Pandas and People* as an alternate textbook to understand ID) violates the Establishment Clause because of ID’s creationist roots. The judge, in order to prevent other states from attempting to put ID into the science course, stated that “the inanity of the Board's decision is evident when considered against the factual backdrop which has now been fully revealed through this trial” (*Kitzmillerv. Dover*, 2005). The United States Supreme Court has held that the belief that a supernatural creator was responsible for the creation of human kind is a religious viewpoint so teaching creation science, and therefore ID, is prohibited in the public school system. It was apparent to the Court that ID failed to meet the essential ground rules that limit science to testable, natural explanations and science cannot be defined differently for Dover students than it is defined in the scientific community. ID's failure to meet the ground rules of science was sufficient for the Court to conclude that it is not a scientific theory and therefore cannot be taught in public schools.
Court Cases Dealing with Curriculum

Several states have recently revised their Science Content Standards in response to the No Child Left Behind Act (2001), and advocates for ID have used the revisions as an opportunity to have their voices heard at the state level. In Segraves v. State of California (1981), the court found that the California State Board of Education's Science Framework dealing with discussions of human origins should emphasize that scientific explanations that focus on how, not ultimate cause, and any speculative statements concerning origins, both in texts and in classes, should be presented conditionally, not dogmatically. The State Court extended the lower court's ruling to cover all areas of science, not just those concerning evolution.

In Hurst et al. v. Newman et al. (2006), the U.S. District Court in Lebec, California ruled that “No school over which the School District has authority, including the High School, shall offer, presently or in the future, the course entitled Philosophy of Design (formerly titled Philosophy of Intelligent Design) or any other course that promotes or endorses creationism, creation science, or intelligent design” (Hurst v. Newman, 2006). This was a clear message that the courts upheld the decision that religion should not be taught in public schools, and religious interest groups needed another strategy to get creationism into the science classrooms; and critical analysis of alternative views was introduced through Academic Freedom bills.

Court Cases Dealing with Freedom of Speech

Historically, the First Amendment to Free Speech was a “thorn in the conservatives side” because it offered protection to nonmajoritarian views, also known as “extremists” (Lakoff, 2000, p. 100). Challenges to the First Amendment are usually in
support of keeping the sanctity of “the American Way” (Lakoff, 2000, p. 110). There has been a recent advocacy from the Right to protect First Amendment rights, and through several court cases requesting “academic freedom to teach the controversy” have been put to the test with claims of suppression of free speech. In *Webster v. New Lennox School District* (1990), the Seventh Circuit Court found that the school district can prohibit a teacher from teaching creation science because it endorses religion. In *Peloza v. Capistrano School District* (1995), the Ninth Circuit Court of Appeals upheld the district court decision that a teacher’s First Amendment right was not violated by school district’s requirement to teach evolution in Biology class as it upholds the state statute that teachers must teach the state approved science standards, which include evolution. In *LeVake v. Independent School District 656* (2000), the case was dismissed when a teacher argued his right to teach evidence “for and against the theory” of evolution, but the judge declared that the teacher did not have a free speech right to override the curriculum [and the state standards] established by the school board. In addition, the teacher's due process rights are not violated when a school board's established curriculum and a course syllabus are provided to the teacher. In the *Selman v. Cobb County School District* (2000) court case, the U.S. District Court ruled that an evolution warning label on textbooks violated the Establishment Clause. This “viewpoint discrimination” claim had already been introduced to the court system in 1997 in *Freiler v. Tangipahoa Parish Board of Education* (1997). The U.S. District Court rejected a policy requiring teachers to read aloud a disclaimer policy to promote critical thinking whenever they taught evolution, conveying the message that evolution is a religious viewpoint. These cases
could set the precedent for the Academic Freedom bills that have been filed in various state legislatures over the past few years.

**Legislation and Policy on Evolution**

**Historical legislation and policy on evolution.** The first public schools were founded on religious principles in 1642 (Berkeley & Fox, 1978; Deckman, 2004). The *Olde Deluder Satan Act* mandated that teachers be appointed for every fifty households with the express purpose to teach children to read the Bible (Deckman, 2004). Puritan leaders viewed the public school system as the primary means to pass their religious values from one generation to the next, and the first textbook used was based almost exclusively on Bible stories. After the ratification of the First Amendment to the U.S. Constitution in 1791, which called for the separation of church and state, public schools continued to use textbooks with religious themes, and the common school movement became a means to indoctrinate immigrants into the “American Way” (Deckman, 2004; Larson, 1997). Catholics and Jews immigrated to the country and the common school movement, led by Horace Mann and others between 1820 and 1850, feared that teaching a particular sectarian creed jeopardized the original intent of public education: to produce productive citizens with common values, which led to a de facto establishment of Christianity in the public schools (Deckman, 2004; Larson, 1997). Mann did support daily Bible readings as long as the teachers did not comment on the passages read, similar to present-day evangelical concepts (Deckman, 2004). By the 1920s, liberally educated Americans rejected the idea that public education should promote any particular religious or political viewpoint, and the ACLU began the fight for academic freedom in public school classrooms (Larson, 1997). Bible reading remained as part of the beginning of the
school day in public schools until the Supreme Court banned this practice in 1963 with its decision in *School District of Abington v. Schempp* (Deckman, 2004; Larson, 1997).

When Darwin’s theory of evolution was introduced into the classroom, it challenged the religious views of conservative Protestants and resulted in the mobilization of Christian fundamentalists, most notably William Jennings Bryan who led the evolution battles in the 1920s and was successful in introducing anti-evolution laws into Florida legislature in 1923 (Deckman, 2004). Between 1921 and 1929, opponents of evolution succeeded in proposing 45 anti-evolution bills in 21 state legislatures: only five passed. When legislation did not pass, the Christian fundamentalists succeeded in influencing the content of textbooks, and evolution was literally eliminated from the science curriculum until the 1960s.

**Recent legislation and policy on evolution.** According to Apple (2001), in the field of education the Right consists of four coherent groups, one of which is the Christian Right who believe God should be in all institutions (Kumashiro, 2008). One of the most important agenda items of the rightist movement is to change the public’s common-sense by altering the meanings of the most basic key words used to understand the social and educational world (Apple, 2001; Kumashiro, 2008). Other agenda items for the Right include developing a network of Conservative policy think tanks for research and support of privatization and school vouchers and using the media effectively to reach the public to spread the Rightist ideologies and coordinate strategies (Kumashiro, 2008). The ability to frame the debate depends on the language used to convey the concept, but also depends on the way the language is communicated to the public, and pursuing academic freedom may be the next anti-evolution movement.
States and local school boards are generally afforded considerable discretion in operating public schools, but requiring schools to teach creation science, or ID, with evolution does not advance academic freedom. The *Louisiana Balanced Treatment for Creation-Science and Evolution-Science in Public School Instruction Act* (1981), also known as the *Creationism Act*, was designed to “protect the secular interest of academic freedom” (Brownfield, 2007). The Court determined in 1987 that the legislative history clearly indicated that the rationale behind the Act was to narrow the science curriculum and was ruled unconstitutional because it prohibited the teaching of evolution unless creationism was also taught (Brownfield, 2007; Scott & Branch, 2006). The *Creationism Act* did not add any rights to the ones already in existence so did not grant teachers a flexibility they did not already possess to supplant the present science curriculum with the presentation of theories, besides evolution, about the origin of life (*Edwards v. Aguillard*, 1987). The *Creationism Act* did not further the purpose of academic freedom and instead singled out creationism (Alexander & Alexander, 2005).

Culture is the construction of shared meaning and those in political control have the power to make language and, through it, meaning (Lakoff, 2000). This play on words has become more prevalent in legislation over the last few years, through the No Child Left Behind Act (2001) and Academic Freedom bills, and is winning the favor of public opinion. These bills do not need to win in legislatures to be successful, as long as the public comes to share the underlying assumption (Kumashiro, 2008). “The common sense of an idea is determined by its fit within a frame currently accepted by a majority of influential people, and once accepted it becomes very resistant to change…even when these ideas are discredited” (Lakoff, 2000, p. 49). Common sense is considered
“mainstream” and whoever can gain the favor of this frame has the power and can create and define terminology. Those outside this frame are labeled as extremist (Lakoff, 2000). During the past decade, the Conservative Right has been in control of this political frame.

**Santorum Language (2001)**

In *Freiler v. Tangipahoa Parish Board of Education* (1997), the U.S. District Court rejected a policy requiring teachers to read aloud a disclaimer policy to promote critical thinking whenever they taught evolution because the policy singled out evolution and students were already encouraged to think critically as per the state science standards.

Santorum expressed a concern common to all antievolutionists. “If humans are a ‘mistake of nature’ then there are no moral demands on us and therefore the standards of human behavior will fall to its lowest level (Miller, 2008, p. 139). The amendment, written by a well-known ID leader, Johnson, singled out evolution as controversial science, and consisted of two sentences:

- Good science education should prepare students to distinguish testable theories of science from religious claims that are made in the name of science. Where biological evolution is taught, the curriculum should help students to understand the full range of *scientific views* [italics added] that exist. (Forrest & Gross, 2004, p. 245)

A spokesperson for the Discovery Institute stated, “Intelligent design is among the full range of *scientific views* [italics added] . . . and all we need is one state to stand up and say we are going to permit academic freedom on this issue” (Forrest & Gross, 2004, p. 245). The language was never officially placed into the No Child Left Behind Act (2001)
but anti-evolutionists use it as a “legal crutch” to infiltrate the science frameworks with scientific sounding language such as critical analysis and full range of scientific views (Forrest & Gross, 2004; Miller, 2008; Scott & Branch, 2006). This critical analysis language has made its way into many state standards discussions and Academic Freedom bills, including Ohio, Pennsylvania, Florida, Missouri, Louisiana, and others (see Appendix D for language).

The Christian Right is involved in education policy issues, and some are explicitly about religion and some are not, which include teaching creationism or ID as an alternate to evolution (Kumashiro, 2008). Advocates of creationism and ID word their attacks on evolution to put fear in the public’s mind that teaching evolution in schools will demoralize children (Miller, 2008). Even former congressman DeLay linked the Columbine killings directly to Darwinism (Miller, 2008).

Science Curriculum Frameworks and Textbooks

Although the Santorum amendment did not make it into statute language, it did appear in the joint explanatory statement and paved the way for critical analysis language in the Ohio (2002) and Kansas (1999, 2005) science standards. The Ohio standards debate came after Senator Rick Santorum proposed revisions to language in the No Child Left Behind Act (2001) one day prior to the vote to approve reauthorization (Forrest & Gross, 2004; Scott & Branch, 2006). In 2002, two bills were introduced into the Ohio legislature in response to the debate over the new science standards. The first bill mandated objectivity and academic rigor in the classroom by requiring teachers to explain that proving any of the theories presented is impossible and encouraging teachers to “even-handedly teach other origins theories, such as intelligent design” (Johnson,
The second bill required legislative approval before any of the new science standards were implemented (Johnson, 2006). Because of these bills, the writing team provided a new definition of science in the second draft to eliminate supernatural explanations of the origin of life (Johnson, 2006). In October 2002, the Ohio Board of Education passed a resolution of intent to adopt the science standards, with changes, including the ID catch-phrases such as critically analyze and more adequate explanations of natural phenomena (Science Excellence for All Ohioans, 2002). This same language was adopted by several other states during science standards revisions in upcoming years. According to the Wedge Document (1997), this is part of Discovery Institute’s long-term goal to incorporate Design theory “to reverse the stifling dominance of the materialist worldview, and to replace it with Christian and theistic convictions” (Discovery Institute, Five Year Strategic Plan Summary, 1997, para. 1).

Deputy Director of the National Center for Science Education said he expected to see some kind of organized efforts by evolution opponents to protest against the science standards as they are revised and adopted in different states (Cavanaugh, 2007). According to the NAS (2008), science curriculum should not be undermined with nonscientific ideas because it confuses students about what science is and is not, compromising the goal of high-quality science education.

In 1999, the Kansas State Board of Education voted to remove the term evolution from the science standards in an attempt to eliminate the scientific theory of evolution from the classroom since it would not be a topic on the state assessment (Deckman, 2004). Ultimately, this decision was reversed after two board members were voted out of office the following year. In 2006, the Kansas School Board revised their science
standards to neither mandate nor prohibit the inclusion of the theory of ID in the curriculum, and opened the door to supernatural explanations by revising the phrase *natural explanation* to *more adequate explanations* of natural phenomena (Forrest & Gross, 2004; Terry, 2007). This left the door open for interpretation of what *more adequate* means. So far the term *adequate* as it applies to natural phenomenon has not been defined by the legislators, but it has been labeled ID code for supernatural beliefs (Forrest & Gross, 2004, p. 318). In 2006, the Kansas School Board’s election established a pro-science majority, and restored the scientific theory of evolution to the Kansas science standards.

Recent changes to state standards have been much more inclusive of and specific to evolution, and have generated well-crafted language that is ambiguous and misleading. In the *Kitzmiller v. Dover* (2005) trial, the school board’s attorney argued that ID promoted science education and critical thinking, but ultimately this claim did not stand up in court (Miller, 2008). This devastating blow to ID has since prompted the support for Academic Freedom bills promoting critical analysis of scientific views and strengths and weaknesses of the theory of evolution.

The *Kitzmiller v. Dover* (2005) case is a landmark decision in the continuing battle between evolution and religion. After the Dover school board attempted to “back-door” the use of a creationist-based textbook, referred to as *Pandas*, that was to be used by the high school teachers as a supplemental text when they taught the theory of evolution, a lawsuit ensued. The Thomas More Law Center jumped at the chance to defend the school board’s use of the *Pandas* book in biology classes. Ironically, the Thomas More Center’s motto is “the sword and shield for people of faith” and their
mission statement is “defending the religious freedom of Christians” (Chapman, 2007, p. 21). The major theme of the trial focused on whether or not ID was in fact a religious theory or science (Chapman, 2007). One of the plaintiffs interviewed after the trial stated, “with the reelection of G.W. Bush, I think the fundamentalists in the U.S. felt emboldened and this case is a direct [result] of that” (Chapman, 2007, p. 82). One of the more disturbing statements that came from the trial transcripts was from Ken Miller, Biology professor at Brown University, author of the Biology textbook being used in the Dover schools, and one of the expert witnesses for the plaintiffs. The most recent edition of the Prentice Hall Miller-Levine Biology textbook (2004) contained an addition in the evolution section under the heading “Strengths and Weaknesses of Evolutionary Theory” (Chapman, 2007). Miller stated that the insertion was made because when the textbook was submitted to the state of Texas, “it was clear the only scientific theory the state board of education was interested in seeing strengths and weaknesses for was the theory of evolution” (Chapman, 2007, p. 95). The most disturbing thing about this “small edit” is that Texas became the driving force behind a controversial change that all other states would be forced to adopt and use in their biology curriculum. After reading some of the testimony at the recent (March 2009) hearings by the Texas School Board on the strengths and weaknesses of evolution, it appears even after Judge Jones ruled that ID was a religious belief, the Creationists continue to evolve their ideas to be more scientific sounding with each generation through Academic Freedom bills.

**Academic Freedom Bills**

The Discovery Institute proponents recently shifted tactics by promoting the teaching of anti-evolutionism, thereby downplaying the teaching of ID and promoting
teaching the controversy and critically analyzing the weaknesses and flaws of evolution as a scientific theory (Scott & Branch, 2006). This “viewpoint discrimination” has already been tried and rejected by the court system in Freiler v. Tangipahoa Parish Board of Education (1997), but recently the language has evolved from viewpoint discrimination to academic freedom.

In 2003, Louisiana House Concurrent Resolution No.50 stated that the “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 [italics added] that exist, and students are entitled to learn that there are differing scientific views on certain issues [italics added]” (p. 2, lines 1-11). Alabama House Bill 923 (April 2008) stated, “Every K-12 public school teacher …in the State of Alabama, shall have the affirmative right and freedom to present scientific information pertaining to the full range of scientific views [italics added] in any curricula or course of learning” (Alabama HB 923, § 3). Florida House Bill 1483 (April 2008) and Florida’s Senate Bill 2692 (April 2008) were similarly stated. Michigan Senate Bill 1361 and Missouri House Bill 2554, both filed in June 2008, stated that the district should “create an environment that encourages pupils to explore scientific questions, learn about scientific evidence, develop critical thinking skills, and respond appropriately and respectfully to differences of opinion about controversial issues, and…present the science curriculum in instances where that curriculum addresses scientific controversies” (Michigan SB1361, § 1292, p. 2, lines 7-17; Missouri HB 2554, § A. Chapter 170.335.1; and South Carolina SB1386, 2008, p. 1, lines 23-40).
A quick analysis of the language in several Academic Freedom bills suggests that there are two similar versions of the academic freedom bill that moved through various state legislatures in 2008 and 2009, all of which explicitly mention “critical analysis” or “scientific views.” According to Merriam-Webster Online Dictionary (2008), the definition for “view” is, “a mode or manner of looking at or regarding something; an opinion or judgment colored by the feeling or bias of its holder.” Using this definition may allow the inclusion of religious beliefs about evolution and the origin of life.

In 2008, several states had Academic Freedom bills that were presented during their legislative sessions: Alabama, Florida, Michigan, Missouri, and South Carolina. Louisiana and Arkansas had similar bills in 2003 and 2001 respectively. The Discovery Institute developed a “model academic freedom bill” that was used as a template for the Academic Freedom bills that died in most 2008 legislative sessions. Only Louisiana passed their Academic Freedom Bill in 2008. Louisiana’s Academic Freedom bill, titled Louisiana Science Education Act (LSEA) (Senate Bill 733), was signed in June 2008 to “help students understand, analyze, critique [italics added], and review in an objective manner the scientific strengths and scientific weaknesses [italics added] of existing scientific theories pertinent to the course being taught” (NCSE, 2008, para. 1). Local teachers were concerned that the bill may open the door to creationism but it is hoped that teachers will focus only on the state curriculum (NCSE, 2008). Most observers are expecting the passage of the LSEA by the state to prompt a series of Dover-style cases, as various local boards attempt to “find the line” of what is unconstitutional.
Florida Legislation and Policy on Evolution

Florida House Bill No. 691 (1925). In the early 1920s, fundamentalist Christians, including William Jennings Bryan who lived in Florida at the time many anti-evolution bills were introduced into state legislatures, organized to fight the introduction of Darwin’s theory of evolution into public classrooms (Deckman, 2004). This conservative Christian movement succeeded in swaying many state and local boards of education by influencing the content of science classrooms through the omission of evolution from science textbooks (Deckman, 2004). Bryan made anti-evolution legislation in the state one of his major targets. In 1923, Bryan was influencing lawmakers to introduce an anti-evolution resolution, which stated:

That it is the sense of the legislature of the state of Florida that it is improper and subversive to the best interests of the people of this State for any professor, teacher or instructor in the public schools and colleges of this State, supported in whole or in part by public taxation, to teach or permit to be taught atheism, agnosticism, or to teach as true Darwinism, or any other hypothesis that links man in blood relation to any other form of life. (Haught, 2008, Florida’s Greatest Menace I, para. 6)

Because the 1923 resolution was not being taken seriously, Bryan and other anti-evolutionists in Florida decided to try and pass new legislation with consequences in the 1925 legislative session. House Bill No. 691 was introduced in 1925 and after some revisions by the Committee on Education, the bill stated:
A bill to be entitled An Act to prohibit the teaching in any college, university, normal school or other school in this State, supported in whole or in part by the public funds of the State or any subdivision thereof, as fact, any theory which denies the divine creation of man, and to provide penalties for the violation thereof. (Haught, 2008, Florida’s Greatest Menace I, para. 6)

The bill died on the floor and consequences for those who defied the bill and taught evolution in the classroom were not listed (Haught, 2008a). A new bill was introduced in the 1927 House legislative session, and was a compromise to the original language:

> It shall be unlawful to teach as fact in any school supported in whole or in part by public funds in this state any theory that denies the existence of God, that denies the Divine creation of man, or to teach in any way atheism or infidelity. It shall be unlawful for any professor, teacher, instructor of textbook committee or commission to use or adopt for use in any school in this state, supported in whole or in part by public funds any textbook which teaches as fact any theory that denies the Divine creation of man, or which teaches atheism or infidelity or that contains vulgar, obscene or indecent matter. Violation shall be punishable by a fine not over $100.

(Haught, 2008b, Evolution Phoenix, para. 3)

When the bill went to the Senate, there was some last minute maneuvering to get the bill passed by introducing it only by the number, not the title, but the bill died on the Senate floor (Haught, 2008b). The use of the term “vulgar” had an impact, however, and the
senate passed Senate Concurrent Resolution No. 28, which established a committee to investigate the content in the textbooks used by state colleges.

**Florida House Bill 2937 (1972).** By 1970, evolution was virtually eliminated from science textbooks until the National Science Foundation formed the Biological Science Curriculum Study (BSCS) and produced textbooks that included the theory of evolution. Evolution was brought to the forefront again through House Bill 2937 in 1972, which required balanced treatment of evolution with creation science by “reading of appropriate religious passages dealing with creation and evolution including, but no limited to, chapters one and two of Genesis.” The Tennessee law requiring that Biblical creationism be given equal time with the teaching of evolution was denied by both the state’s Supreme Court and the U.S. Sixth Circuit Court of Appeals in 1975, so Florida lawmakers did not pass HB 2937 (Haught, 2008c).

**Florida House Bill 107 (1980).** In August 1975, a University of Texas professor and a Research Associate in Geosciences for the Institute of Creation Research (ICR) visited St. Petersburg to give a talk called “A Look at Creationism versus Evolution” and introduced a high school textbook that he had co-authored, called *Biology: A Search for Order in Complexity* (Haught, 2008c). Reverend Clarence Winslow donated 100 copies of this textbook to the Pinellas County school board as a “resource for biology teachers” and continued to promote this book to Hillsborough, Manatee, and other school districts. Eventually the idea of balanced treatment made its way to Tallahassee through the introduction of House Bill 11C.

An act relating to education: creating the *Balanced Treatment for Scientific Creationism and Evolution Act*; providing legislative
findings and intent; providing definitions; requiring balanced
treatment; prohibiting religious instruction under certain
circumstances; providing for nondiscrimination; providing
applicability; providing an effective date.

Legislators recognized that this bill was reminiscent of Tennessee in the 1920s and so the bill died because of lack of support.

In 1980, House Bill 107 entitled *Balanced Treatment for Scientific Creationism and Evolution Act*, which was based on the idea that natural geological features seen today could be explained by a catastrophic flood and that the earth is only thousands rather than billions of years old; the House education committee approved the bill 7-6, but eventually this bill died during legislative session (Haught, 2008d). An amendment (HB 776, Amendment 4) was added to the instructional materials bill stating, “The Council is herein directed to review, evaluate and … make recommendations to the Department of Education for the purchase of instructional materials that give instruction in Scientific Creationism” (Haught, 2008d, And in other news, para. 3). However, HB 107 did not make it into law.

**Florida Academic Freedom Bills in 2008 and 2009.** The Florida Next Generation Sunshine State Standards (NGSSS) for Science were adopted by the Florida State Board of Education in February 2008. The science standards, which were given top ratings for accuracy and depth and were developed by teachers and members of the scientific community, generated controversy over the description of evolution as a unifying concept of modern biology. Approximately two weeks after the new standards were adopted by the State, Rhonda Storms introduced an Academic Freedom bill to the
The state legislature to “protect teachers’ and students’ rights to express their views and positions” regarding evolution. Senate Bill 2692 stated:

The Legislature finds that current law does not expressly protect the right of teachers to objectively present scientific information relevant to the full range of scientific views regarding chemical and biological evolution. The Legislature finds that in many instances educators have experienced or feared discipline, discrimination, or other adverse consequences as a result of presenting the full range of scientific views regarding chemical and biological evolution. The Legislature further finds that existing law does not expressly protect students from discrimination due to their positions or views regarding biological or chemical evolution. The Legislature finds that the topic of biological and chemical evolution has generated intense controversy about the rights of teachers and students to hold differing views on those subjects. It is therefore the intent of the Legislature that this section expressly protects those rights. (SB 2692, 2008, lines 19-34)

The bill continued to state, “Students may not be penalized in any way because he or she subscribes to a particular position or view regarding biological or chemical evolution,” (lines 50-52) which may have allowed students to answer questions about evolution with statements such as, “I do not believe in evolution. God created man” and receive credit for this assignment. The bill clarified that the bill “shall not be construed to promote any
religious doctrine, promote discrimination for or against a particular set of religious beliefs, or promote discrimination for or against religion or non-religion.” As stated previously, whenever balanced treatment is mentioned in any court case, the “differing views” of evolution and creationism are the only two views discussed and mentioned.

A memo from the NGSSS Science Writers and Framers Committees to the Florida State Board of Education members, dated February 11, 2008, was sent in response to the proposed Academic Freedom bill sponsored by Senator Storms. The memo stated:

Widely acclaimed nationally and statewide by education experts and scientists, the standards have understandably generated opposition from special interest groups because of the standards’ honest and straightforward presentation of evolution as the only scientific theory able to explain innumerable facts and observations that have been gathered over 150 years. There is no longer any valid scientific criticism of the theory of evolution. (Framers and Writers Committee, personal communication, February 11, 2008)

The Florida HB 1483 passed in the House but SB 2692 died on the Senate floor and did not pass. One year later, Senator Wise, co-sponsor of Senator Storms’ bill in 2008, proposed another academic freedom bill in March 2009. SB 2396 proposed the amendment of section 1003.42 of the Florida Statutes “requiring that the instructional staff of a public school teach a thorough presentation and critical analysis of the scientific theory of evolution and certain governmental, legal, and civic-related principles.” This
bill also died on the floor, making little headway. Although both of these Academic Freedom bills did not pass, the media coverage was wide-spread.

**Anti-Evolution Tactics That Have Impacted Policy**

The United States is dominated by two powerful, antagonistic discourses, liberalism and Christian fundamentalism, and each group has a very different opinion of the United States and its citizens’ responsibilities. “Conservatives blame the moral degeneration of youth on the deterioration of family values, loss of school prayer, and the dilatory effects of progressive education” (Grande, 2007, p. 321).

**Evolution is a theory in crisis.** In 2001, Arkansas House Bill 2548 (2001) stated: “During classroom instruction … when any statement in instructional material is identified by the instructor to be a theory, the instructor shall instruct the class to make a marginal notation that the statement is a theory (p. 2, lines 7-11). Many ideas and evidences of prior scientific work once believed to be true have been proven false or even fraudulent in many cases, including, but not limited to the following: Haeckel’s Embryos; The Miller-Urey Experiment; Archaeopteryx as a missing link; Neanderthal Man (p. 3, lines 1-32); Homo erectus; Cro-Magnon Man; Lucy; Lobe-finned fish” (p. 4, lines 1-20). All of the “ideas” presented above are supported by a preponderance of physical evidence (Forrest & Gross, 2004; Miller, 2008; Scott & Branch, 2006; NAS, 2008).

So much evidence supports evolutionary theory that there is no longer a question about whether or not evolution happens. It is a fact that evolutionary change took place (Miller, 1999). The NSTA (2009) defines a theory as “a set of universal statements that explain some aspect of the natural world. Theories are firmly grounded in and based upon evidence; are logically consistent with other well-established principles; explain more
than rival theories; and have the potential to lead to new knowledge” (The Nature of Science and Scientific Theories, para. 2). Miller (2000) defines evolution as a scientific idea, and “scientific ideas rise and fall on the weight of the evidence” (p. 22). Miller also stated (2008) that evolution is on the strongest scientific ground that it has ever been.

“Evolutionary theory is not a guess; it is a well-defined, consistent, and productive set of explanations of how evolutionary changes take place” (Miller, 2000, p. 54). Scientists seek to develop theories that are firmly grounded in and based upon evidence and have been tested against a diverse range of phenomena (NSTA, Nature of Science, para. 1). Creationists sometimes refer to an “incomplete fossil record” as evidence that living things were created in their modern forms (NAS, 2008). This “full of gaps” claim by creationists is simply false as there is a preponderance of evidence of transitional fossils, and new discoveries continue to be reported (NAS, 2008). Creationists also refer to the idea that evolution must remain a hypothesis because “no one has ever seen evolution occur” (NAS, 2008, p. 39). An important characteristic of scientific thinking is inference and reasoning (NAS, 2008). “Individuals do not evolve, populations evolve” (Scott, 2008). Many areas of science have not been directly observed but are considered well-established facts, such as the Earth revolving around the sun and the existence of genes and atoms (NAS, 2008). If a hypothesis statement can not be falsified by experimental results, observation, or some other means, it becomes a scientific theory. “Science cannot be obfuscated by the clouds of astrology, metaphysics, alchemy, scientology, religion, or any other frame of reference that does not restrict itself to empirical observations of the natural world” (Tully, personal communication, April 10, 2008). “Science is not a democratic process: it does not matter that it is likeable, it
matters that it explains nature” (Scott, 2008). Science can not test supernatural beliefs through the process of scientific inquiry, so religious beliefs are not considered scientific.

Creationists unite in contending that living things show evidence of intelligent design (NAS, 2008, p. 40). The argument is that some biological structures are so complex that they could not have evolved through random processes of natural selection, a condition they refer to as “irreducible complexity” (NAS, 2008, p. 40). Some of the examples used for the concept of irreducible complexity include the bacterial flagellum, the human eye, the blood clotting mechanism, and the mammalian immune system (NAS, 2008; Miller, 2008; Scott and Branch, 2008; Forrest and Gross, 2004). All of these claims have been disproven by the findings of modern biology (NAS, 2008; Forrest and Gross, 2004; Miller, 2008). Simply put, disproving evolution does not prove creationism.

Evolution and religion are incompatible. Acceptance of evolution is not the same as a religious belief (NAS, 2008). “Many scientists and theologians have written about how one can accept both faith and validity of biological evolution” (NAS, 2008). Disagreements do exist, and there is a broad range of beliefs about science and religion, but it is those individuals that represent the extremes of this range that set the tone for these disagreements (NAS, 2008). Evolution is accepted by the scientific community because the concept has withstood extensive scientific testing over many years.

Teach the controversy. Because evolution has been placed by Christian Conservatives in direct opposition to the Biblical version of the origin of life, many scientists and science teachers have seen this as an attempt to water-down the science curriculum through integration of religious beliefs through state bills promoting the “academic freedom” of science teachers. “The focus of the political frame is not on
resolution of conflict, but on strategy and tactics” (Bolman & Deal, 2003, p. 197). After the Scopes trial, the president of the University of Tennessee stated after the university was cleared of charges that it was suppressing the teaching of evolution, “Fundamentalism is the most sinister force that has attacked freedom of teaching” (Larson, 1997). The drive for academic freedom spread from the universities to secondary education in the 1920s and the ACLU was involved in the defense of academic freedom as it pertained to free speech, and anti-evolution laws became a “chief concern” (Larson, 1997, p. 81). The ACLU formed the Committee on Academic Freedom to “deal with laws … prohibiting the teaching of evolution” (Larson, 1997, p. 82). The recent Academic Freedom bills were in complete contrast to the academic freedom battles of the 1920s, and are instead trying to get religion back into the public school classrooms. Recently, religious conservatives’ attempts to make inroads into the school curriculum through the teaching of creationism have shifted to proposals that include ID as a competing theory to evolution (Apple, 2008).

The proponents of intelligent design have been very clever linguistically by couching their arguments in the language of “balance” and “teach all sides,” and have been able to strategically employ the language of liberalism to support religious convictions that may not usually qualify as fitting under the umbrella of legitimate science. (Apple, 2008, p. 329-330)

The religious Right has demonstrated such linguistic talents before by comparing themselves to Dr. Martin Luther King, Jr. and other leaders of the civil rights movement, in this case the oppression of Christianity in the public schools (Apple & Buras, 2006;
Apple, 2008). In the *Dover v. Kitzmiller* trial (2005), an evolutionary biology professor at Brown University and expert witness for the plaintiff, explained why ID is not a scientific theory.

[Intelligent] Design is built upon a stunning lack of curiosity and remarkable unwillingness to embrace scientific discovery. Design rests ultimately on the claim of ignorance, upon the hope that science can not show evolution to be capable of producing complex organs, molecules, and biological information. If evolution can not achieve that, the argument goes, then [intelligent] design must be the answer. (Miller, 2008, p. 87)

Science is organized common sense. The most important factor for scientific success is the willingness of scientist to try out their own ideas and be individuals (Miller, 2008). Miller goes on to explain ID as a “hypothesis of progressive creationism” (p. 52) and states, “the hypothesis of design makes no testable predictions and suggests no new avenues for research . . . it is a literal dead end” (p. 87).

When equal time is not given to rightist religious beliefs in public schools, parents may try to censor their child’s education through the use of opt-out policies already instituted in various school districts in the U.S. for objectionable instruction and materials regarding sex education (Kumashiro, 2008). The concern of Americans to be fair and avoid discrimination is misguided and provides a “fertile field” for ID activists (Forrest & Gross, 2004, p. 11). The notion that one group should be able to teach what they want of the other group is teaching what they want presumes that the message from both sides is equal, and eliminates all other perspectives involved (Kumashiro, 2008). Another
argument regarding controversial issues is that schools should be “neutral” or silent and if “equal time” can not be given, then controversial issues should not be discussed at all unless both sides can be presented (Kumashiro, 2008). Again, this suggests that there are only two sides to a controversial issue, and in the case of evolution, according to the Right, those two sides are evolution and creationism.

According to The Pew Forum’s U.S. Religious Landscape Survey (2008), 78.4% of Americans identify themselves as Christian; 4.7% identify themselves as “other religions” (including Jewish, Buddhist, Muslin, or Hindu) and 16.1% are unaffiliated with any religion. The Pew Forum’s survey (2008) on Religion & Public Life finds that “most Americans have a non-dogmatic approach to faith” and a “strong majority of those who are affiliated with a religion do not believe their religion is the only way to salvation” (The Pew Forum, Summary of Key Findings, para. 1). This openness to a range of religious viewpoints coincides with the great diversity of religious affiliations that exists in the United States, and though the “overwhelming majority of the public expresses a belief in absolute standards of right and wrong,” the survey suggests that “this belief is shaped as much by practical experience as by religious beliefs” (The Pew Forum, Chapter 1: Religious Beliefs and Practices, para. 4). This certainly exemplifies many “sides” and equal time for all sides would result in a World Religions course.

**Critical analysis.** The most recent tactic is to allow teachers *academic freedom* to teach creationism as an *alternate scientific view* without fear of legal sanction. “Academic Freedom” bills are now running rampant through many state legislatures through promotion of *critical analysis of scientific views*. The phrase “critical analysis” is commonly used by ID advocates in their campaign to undermine the teaching of
evolution (Scott & Branch, 2006, p. 25). These bills generally describe evolution as “controversial” and state that teachers should be allowed to discuss “flaws in the theory” and have a right to raise doubts about that essential scientific theory [evolution] as a matter of free speech” (Cavanaugh, 2008, para. 3).

The goal of critical teaching is to “inform, provoke the imagination, support interpretive experimentation, provide tools of conceptual and creative analysis, produce new formulations of knowledge, and challenge assumptions” (Weiner, 2007, p. 66). Interestingly, these catch-phrases were first used during the Kitzmiller v. Dover (2005) court case during testimony by Barbara Forest, another expert witness for the plaintiff. When asked about the methodology she used to separate Darwinian evolution theorists from ID theorists, she stated she made a very careful distinction between people who are not using scientific critical analysis to clarify ideas and make careful distinctions with supporting evidence (Chapman, 2007, p. 146). Critical analysis is the verbiage used in almost every academic freedom bill filed the last two years.

**Opt-Out Policies**

“We should expect that this controversy will lead to even more parents withdrawing their children from public schools so that they do not have to confront traditions that do not conform to their specific biblically based worldview” (Apple 2006; Apple & Buras 2006; in Apple, 2008). This is quite possibly the most obvious opt out method of conservative Christians to prevent their children from being indoctrinated into evolutionism by their public school science teachers.

The task of educators today is to be “messengers of society’s curriculum … and requires linguistic competence through effective communication, coherent discourse, and
deep understanding of complexity of interpretation of human meaning across the disciplines” (Fowler, 2006, p. 120). The Florida NGSSS for science are clear about what the public school science teachers are required to teach. Section 1003.41 of the Florida Statutes states that public educational instruction is based on state adopted standards that establish the core content of the curricula to be taught and that K-12 public school students are expected to learn. This statute requires Florida public school teachers to teach the Next Generation Sunshine State Standards (NGSSS) as identified by state-approved course descriptions. In addition, Florida statutes are specific about which topics parents can opt out their children: human sexuality education and animal dissection. However, Florida statute 761.03(1), the Florida Religious Freedom Restoration Act (FRFRA), states that the Government is prohibited from substantially burdening acts that are “sincerely motivated by a religious belief,” absent a compelling governmental interest. Are school administrators allowing parents to opt out their children from science class because of religious beliefs? Which statute should school administrators adhere to if a parent requests their child be opted-out of class when the scientific theory of evolution is taught?

**People and Institutions Against Evolution**

**William Jennings Bryan (1925).** Between the 1920s and early 1960s anti-evolutionary sentiment based upon a religious social movement resulted in formal legal sanctions to remove evolution from the classroom (Barlow, 2006). The prevailing beliefs in 1925 were that there had been a Garden of Eden and there was such a thing as fire and brimstone (Larson, 1997).
William Jennings Bryan, Congressman from Nebraska and democratic presidential nominee in 1896, resigned from the Wilson administration in 1912 and turned his efforts toward advocacy of his deep Christian faith to remove the line between politics and religion (Linder, 2004). He was “profoundly suspicious of scientific elites… and rebelled at the suggestion that reason should test all things” (Linder, 2004, para. 7). Bryan held science responsible for a loss of morality, especially in the school system after World War I, and grew concerned about the influence of teaching evolution in the schools, believing it undermined the religious faith of children and “presented a danger to the country’s moral health” (Larson, 1997; Linder, 2004, para. 8). By 1920, Bryan was leading a full-blown attack on evolution through a Fundamentalist crusade to banish evolution from American classrooms, stating that science was “undermining the religious faith of students by substituting belief in Darwinism for belief in the Bible” (Linder, 2004). Bryan focused much of his efforts on securing state legislation banning the teaching of evolution in public schools and had succeeded in introducing this legislation in 15 states by 1923 (Linder, 2004). Two years later, 37 states had approved laws that prohibited teaching evolution in public schools (Molina, 2007). Even today, Americans think of the creation and evolution controversy as a “dichotomy with creationists on one side, and evolutionists on the other, and this assumption leads to the unfortunate conclusion that because creationists are believers in God, that evolutionists must be atheists” (Scott, 2001, Creation/Evolution Continuum, para. 2). After the Scopes trial, this dichotomy continued to be tried in the courts under the guise of Creation-Science and then, most recently, intelligent design.
Henry Morris and the Institute for Creation Science. The Institute for Creation Science (ICR), founded in 1972 by Henry Morris, is a “flagship of antievolution ministry” and promotes the dichotomous misconception that you can not believe in God and accept that evolution happens (Scott & Branch, 2006, p. 7). Creation science argues there are only two views: special creationism and evolution, any argument against evolution is in favor of creationism, so by default provides “evidence” for creationism (Scott & Branch, 2006). Henry Morris, a young-earth-creationist, refutes all evidence supporting evolution because, from his belief, if the Earth is only 10,000 years young, “then the fossil record is meaningless” (Miller, 1999, p. 61). Some critical pedagogues (Freire, 1970, 1993, 1998; Giroux, 1992, 2000, 2003) have “stressed the importance of critiquing traditional curriculum” and have “drawn attention to traditional curriculum and the inequalities it reproduces within society” (Shapiro & Stefkovich, 2005). When it comes to scientific theories, high school students are in no position to refute the evidence that supports these theories. Critique of scientific theories needs to be left to scientists.

Jon Buell and the Foundation for Thought and Ethics. The Foundation for Thought and Ethics (FTE) was founded by Jon Buell in 1980. The book, Of Pandas and People, was originally published in 1989 and revised in 1993 by FTE as a supplement to high school biology textbooks presenting the scientific rationale for ID as an alternative to Darwinism (Foundation for Thought and Ethics [FTE], 2008). In 1989, Pandas was originally named Creation Biology and then renamed Biology and Origins. Between 1989 and 1993, the term creator was substituted for the term intelligent agent (Scott & Branch, 2006). The term intelligent design appeared in the 1993 edition after the Edwards v. Aguillard decision identified creation science as unconstitutional to teach in
public schools (Scott & Branch, 2006). According to Scott and Branch (2006), the Pandas book teaches little that is accurate about the nature of science or evolution and is not recommended by scientists or educators.

According to court transcripts from the Kitzmiller v. Dover case in 2005, the ID movement was developed as a strategy to weaken the education of evolution by focusing students on alleged gaps in the theory of evolution. Fundamentalist opponents of evolution responded to the defeat of balanced treatment through the idea of intelligent design. ID was ultimately found to be unconstitutional under the First Amendment because it utilized scientific-sounding language to describe religious beliefs and then to require that schools teach creation science, or scientific creationism, as an alternative to evolution (Kitzmiller v. Dover, 2005). The Kitzmiller lawsuit began when one of the School Board members had an issue with the new Biology textbook, denouncing it for being “laced with Darwinism” and wanted a book that gave balanced treatment between Darwin’s theory and the biblical view of Christianity (Boston, 2005, p. 33). This same school board member also stated, “This country wasn’t founded on Muslim beliefs or evolution, it was founded on Christianity and our students should be taught as such” (Boston, 2005). The Board member announced that he would not support purchasing the new Biology text unless copies of FTE’s book, Of Pandas and People, were purchased also (Boston, 2005). Although the Board voted against the additional purchase of Pandas, the Board member who initiated the issue of adding Pandas to the textbook list received about 50 copies of the controversial book from an anonymous donor for use in the biology classes (Boston, 2005). The board accepted the donation and passed a resolution stating that “Dover students would be made aware of gaps/problems in Darwin's theory
and of other theories of evolution including, but not limited to, intelligent design” (Boston, 2005). Under the new policy, science teachers were required to read a statement to students stating that evolution was not a fact and that ID is an explanation of life that differs from Darwin's view (Boston, 2005). Parents in Dover, specifically Kitzmiller, became convinced that an alternate fundamentalist strategy through a thinly veiled version of biblical creationism was being introduced (Boston, 2005). The judge overseeing the case agreed with her.

The Center for Science and Culture. According to the Center for Science and Culture’s (CSC) website, Discovery Institute is the nation's leading public policy center that defends "teaching the controversy" about the strengths and weaknesses of Darwinian evolution. CSC has launched a national campaign to defend the rights of scientists, teachers, and students who are being threatened because they dare to raise critical questions about evolution (Center for Science and Culture [CSC], Free Speech on Evolution, para. 5). The Discovery Institute, founded in 1990, is an ID think-tank and author of the Wedge document claiming that the goal of ID is to change the ground rules of science to make room for religion, specifically, beliefs consonant with a particular version of Christianity (Kitzmiller v. Dover, 2005). The basis of ID is that wherever complex design exists, there must have been a designer because nature is complex, and therefore nature must have had a designer (Barlow, 2006). ID is characterized as a more vague form of creationism that is “slickly marketed to appeal to a broad segment of Americans” and offers a critique of evolution using the language of science (Johnson, 2006, p. 225). “The Discovery Institute’s creationists are …better educated than traditional creationists, and their public relations tricks are up to date and skillful…they
know how to manipulate the media” (Forrest and Gross, 2004, p. 9). Phillip Johnson, a
Berkeley law professor, is the unofficial spokesman for ID (Forrest and Gross, 2004;
Miller, 2008). Johnson is also the author of *Darwin on Trial*, which was lambasted by
Stephen Jay Gould in the July 1992 issue of *Scientific American* as “full of errors…and
based on false criteria” (Forrest & Gross, 2004, p. 18).

Across America, the freedom of scientists, teachers, and students
to question Darwin is coming under increasing attack by what can
only be called Darwinian fundamentalists. These self-appointed
defenders of the theory of evolution are waging a malicious
campaign to demonize and blacklist anyone who disagrees with
them. (CSC, 2009, para. 1)

Recently, the Discovery Institute has modified its Wedge campaign and are
currently promoting the “Free Speech on Evolution” campaign (CSC, Free Speech on
Evolution, para. 3). According to the Center for Science and Culture’s (CSC) DI website,
free speech and academic freedom are “cherished principles in America” and are “too
important to be sacrificed to the intolerant demands of extremists on any issue” (CSC,
Free Speech on Evolution, para. 3).

The weaknesses that the Academic Freedom bills are referring to are the result of
a clever strategy by Philip Johnson, a Berkley Law Professor whose controversial book in
1991, *Darwin on Trial*, was the first to introduce ID to the world as an alternative idea to
evolution (Miller, 1999). “Elites and opinion leaders often have substantial ability to . . .
impose the meanings and myths that define . . . beliefs and values…and these elites can
convince and support things not in our best interests” (Bolman & Deal, 2003, p. 195).
According to Miller (1999), Johnson skillfully attacked evolution, and true to his profession as a lawyer, did not need to prove his case, only to cast “reasonable doubt” by punching a few holes in the theory of evolution (p. 91). He further explained that none of the “so-called holes” is backed by any physical evidence or scientific research. The case Phillip Johnson and ID advocates bring against evolution is “not a scientific case…it is a legal brief…with an alternative of ‘design’ ” (Miller, 1999, 123).

The Wedge document. Intelligent design promoters from the Center for Science and Culture “operate under a detailed and ambitious plan called ‘The Wedge’” (Forrest & Gross, 2004, p. 7) (see Appendix E). The primary goal of the Wedge document is to change what is taught in science classrooms by “discrediting the naturalistic methodology that has been the working principle of all science” and that nature can only be understood with reference to supernatural causes (Forrest & Gross, 2004, p. 10, 11). Some goals of the Wedge strategy are:

- To defeat scientific materialism and its destructive moral, cultural and political legacies.
- To replace materialistic explanations with the theistic understanding that nature and human beings are created by God.
- To see ID theory as an accepted alternative in the sciences and scientific research being done from the perspective of design theory.
- To see major new debates in education, life issues, legal and personal responsibility pushed to the front of the national agenda.
- To see ID theory as the dominant perspective in science.
- To see design theory permeate our religious, cultural, moral and political life.
The CSC’s activities to implement these goals demonstrate “the existence of a well-orchestrated strategy for inserting creationism into the American cultural mainstream and to secure it as a dominant place in American education” (Forrest & Gross, 2004, p. 32).

ID cannot be passed off as science, much less an alternative to scientific theory through equal time, and is instead a “denial of science” (Forrest & Gross, 2004, p. 115). It is not a theory but a denial of a theory…and should not waste time in the science classroom. The claims of the Wedge document do not need to be scientifically accurate; they simply must convince the public, and politicians, that ID is based on scientific research and deserves equal time in science classes, asserting that ID and evolution are both sides of the issue. The use of phrases such as, *critical analysis of the strengths and weaknesses; balanced treatment; both sides of the issue; alternative theories; evolution is a theory, not fact; teach the controversy; and differing viewpoints* are typical “wedge-speak” (Forrest & Gross, 2004, p. 225, 228, 235).

**Jonathan Wells (Reverend) and icons for evolution.** After the Ohio school board adopted the ID language into its standards, requiring students to “critically analyze various aspects of evolutionary theory,” the board adopted a creationist lesson plan based on Jonathan Wells’ *Icons of Evolution*, a well-known ID source (Forrest & Gross, 2004, p. 319). The book, *Icons*, claims that science education, especially biology, ‘indoctrinates children with a dishonest, materialistic myth, known as Darwinism’ (Forrest & Gross, 2004, p. 89). The three “icons” most discussed in reference to Darwinism and the “criticisms” of evolutionary theory are the Miller-Urey experiment, Haeckel’s embryos, and peppered moths (Forrest & Gross, 2004; Miller, 2008). Wells “icons” are critiqued are discussed in detail in several books and publications (Forrest & Gross, 2004; Scott &
Branch, 2006, Scott, 2004; Miller, 2008) as a manipulation of the scientific data supporting these well-established scientific experiments.

William Dembski (1998) and the design inference. Dembski’s writings have been the target of scrutiny by many scholars and researchers, and his Design Inference uses mathematical inquiry to describe the improbability of evolution and has therefore, “proven design” (Forrest & Gross, 2004, p. 118). Dembski believes that through mathematics he can show that chance can not explain the diversity of life and he asserts that supernatural agency is the only acceptable answer to the source of the world’s diversity (Forrest & Gross, 2004, p. 121). Herein lies the supposed “gaps” in evolutionary theory, and this “irreducible complexity” argument is based on supposed probability statistics, that adaptation can not be merely random chance, and that a “designer” must be responsible for the diversity of life…very low probability does not mean impossibility (Forrest & Gross, 2004, p. 126). Evolutionary theory is not false just because the mathematical probability is so low; this is not an adequate explanation to support ID and definitely not evidence for ID.

The Science and People for Evolution

After Sputnik was launched in 1957, there was an increase in federal expenditure for science education to combat the “superiority” of the Russians and to address the dwindling population of students entering science careers (Dow, 1997). President Eisenhower established the position of Presidential Science Advisor, Congress created the National Aeronautics and Space Agency (NASA), and lawmakers increased funding for the National Science Foundation (NSF) for curriculum development (Dow, 1997). In 1963, the NSF and Biological Sciences Curriculum Study (BSCS) published textbooks
including evolution and human reproduction, and science curriculum was again the focus of creationists arguing that the classrooms were no longer neutral unless both evolution and creationism be taught (Scott & Branch, 2006). On October 18, 2002, the Board of the American Association for the Advancement of Science (AAAS) published a resolution opposing teaching ID in science classrooms:

   ID theory represents a challenge to the quality of science education; the ID movement has failed to offer credible scientific evidence [and so] makes it improper to include as part of science education; therefore AAAS urges citizens across the nation to oppose the establishment of policies that permit the teaching of ‘ID theory’ as part of the science curriculum in public schools.

   (Johnson, 2006, p. 233)

Voices for Evolution

In 2008, the National Center for Science Education published a book called *Voices for Evolution* as a defense against the continued attack on teaching evolution in the public schools (p. v). The first edition was published in 1989, and this updated edition includes a “comprehensive collection of position statements on the creationism/evolution issue” (p. vii). The book includes position statements, supporting evolution as the central organizing principle of all biological sciences, from 68 scientific organizations, 23 religious organizations, 44 educational organizations, and 10 civil liberties organizations. Among the organizations are the Roman Catholic Church, the Episcopal Church, the United Methodist Church, and the Lutheran World Federation. The number of organizations has contributed to the *Voices* book has increased from 68 position

Summary

Over time, the Academic Freedom bills evolved and became more insidious in nature through the use of “scientific sounding” language. Louisiana Senate Bill 733 (2008) states the bill is intended to promote students’ critical thinking skills and open discussion of scientific theories, and create an environment within public schools that promotes critical thinking skills, logical analysis, and open and objective discussion of scientific theories being studied including, but not limited to, evolution. The bill also states that it will support teachers regarding effective ways to help students understand, analyze, critique, and objectively review scientific theories. The Louisiana standards, and the Florida science standards, already support critical thinking, analysis, and objective review of scientific theories. The redundancy is what causes concern: why is the bill necessary if the standards already specify critical thinking?

None of these catch phrases has been tested in court but Peloza v. Capistrano School District (1995) and LeVake v. Independent School District 656 (2000) have set the precedent for the next round of evolution battles for free speech and academic freedom unless the standards change to include the critical analysis of scientific views and open the door to ID. “Teachers don't need this kind of protection-unless it's about teaching creationism; if teachers are teaching legitimate science, they're not going to get in trouble” (Cavanaugh, 2008, para. 7).

As long as evolution is being taught in the classroom, proponents of creationism will persist in their attempt to have a religious-based theory taught alongside, or in place
of, evolution, and it appears that no judicial opinion will ever sway their efforts (Brownfield, 2007). Supreme Court decisions have deemed both anti-evolution legislation and balanced treatment legislation as an infringement of the rights guaranteed by the First Amendment.

The task of educators today is to be “messengers of society’s curriculum and requires linguistic competence through effective communication, coherent discourse, and deep understanding of complexity of interpretation of human meaning across the disciplines” (Fowler, 2006, p. 120). This is one of the major causes of my angst – allowing anyone to interpret the language in these Academic Freedom bills thereby allowing opinions and dominant, religious hegemonic values to be included in the science curriculum. Teachers should be cognizant of how their teaching can shape the context for students (Carr, 2008, p. 83). “Students need to learn some common … curricular content, [but] they also need to learn how to learn, how to be, how to think, how to relate, how to critically examine, and how to understand and be a part of society” (Carr, 2008, p. 83). Science is religion-neutral and should allow students with a diversity of religious beliefs to speak the same language through scientific concepts that are fact-based, not opinion-based, and can be tested through the concrete and critical analysis of physical evidence.

The next chapter presents the methodology used in the study, including the research design and rationale, the data collection instrument, the pilot study (test-retest), population and sampling, data collection methods, description of the population sample, identification of subgroups, methods of data analysis, definition of variables; trustworthiness of the research, researcher role and ethical considerations, and data management and storage.
Chapter 3: Methodology

In the previous chapter, anti-evolution legislation and how it has evolved over time, including the recent Academic Freedom bills, was reviewed. From the literature review, it is clear that many people still do not accept the theory of evolution as a well supported scientific explanation based on current, physical evidence, and believe there are alternative non-scientific views that should be presented in conjunction with evolution. In 2009, the NCES (2009) reported American high school students lagged behind students in other countries in science and math achievement, and demonstrated no measurable improvement over the last 15 years. Educational reform at the national and state levels has focused on increased interest and achievement in Science, Technology, Engineering, and Mathematics (STEM) courses and careers. It is important that school-based administrators support this endeavor and ensure students are provided an education that includes learning the validity of scientific theories, including evolution.

The purpose of Chapter Three is to present the research methodologies as influenced by the stated problem and the purpose of the proposed research questions. As a result, the chapter assesses the main research questions and hypotheses, communicates the methods and procedures for data collection, instrumentation, and participant selection. This chapter is organized by the following sections: (a) restatement of the problem and purpose; (b) review of the research questions; (c) research design and rationale; (d) methods and participants; (e) data collection instrument, validation,
sampling, and data management; and (f) methods of data analysis, trustworthiness, variables, research role, ethical considerations, and data analysis.

Restatement of Problem

Opt out policies are typically invoked to excuse students from activities to which they or their parents may have religious objections (Scott & Branch, 2008). The Florida Next Generation Sunshine State Standards (NGSSS) for science are clear about what the public school science curriculum must include and Florida statutes are specific on two areas that parents may have their child excused from instruction – human sexuality and dissection of animals. The focus of this study was to determine if secondary school administrators were applying opt out policy to the scientific theory of evolution and what factors may have influenced the decision to allow or not allow a student to opt out of class. There have been many studies that have focused on science teachers and students and their perceptions on the teaching of evolution (Fowler & Meisels, 2010; Moore & Cotner, 2009; Moore, Froehle, Kiernan, & Greenwald, 2006; Nadelson & Sinatra, 2009; Rutledge & Sadler, 2007; Rutledge & Warden, 2000). However, research that specifically focuses on secondary school administrators and their interpretation and application of opt-out practices involving the teaching of the scientific theory of evolution has not been found in the current literature.

Since the school-based administrator is ultimately the school-based person who determines whether or not to honor a parent request to allow a student to opt out of class, it was necessary to explore the perceptions and attitudes of the administrators in order to better understand how opt-out practices are applied in the public schools. There is increasing recognition that an individual’s beliefs and prior experiences are the best
indicators of the decisions they make during the course of everyday life (Hill, 2001; Moore, 2005; Rutledge & Mitchell, 2004; Spillane & Callahan, 2000).

**Purpose of the Study**

The purpose of this study was to examine and describe secondary school administrators, limited for this study to principals and assistant principals in Florida public schools, perceptions, knowledge, and actions and the relationship to the practice of opting out of academics that specifically include evolution. Data was collected using a Likert-type survey for perception and awareness statements and included two open-ended questions to allow for elaboration on level of agreement or disagreement.

There have been many studies that have focused on science teachers and students and their perceptions on the teaching of evolution (Fowler & Meisels, 2010; Moore & Cotner, 2009; Moore et al., 2006; Nadelson & Sinatra, 2009; Rutledge & Sadler, 2007; Rutledge & Warden, 2000), but research that specifically focuses on public secondary school administrators and their interpretation and application of opting-out of academic subject matter has not been found in the current literature. This study may contribute to the understanding of policy implementation theory and practice in K-12 education research, specifically the interpretation and application of opt-out practices by secondary school-based administrators for controversial topics other than human sexuality and animal dissection.

**Theoretical Framework**

The constructivist researcher relies upon the participants' views of the situation studied and recognizes the results of the research may be influenced by the participants’ and the researcher’s prior knowledge and experiences (Creswell, 2007). Constructivists
aim to test a theory or describe an experience through quantitative and qualitative methods in order to support or expand the description of the phenomenon being studied (Mackenzie & Knipe, 2006). The key concept of the theoretical framework is to identify the factors that may impact the decision of secondary school administrators to allow or not allow a student to opt out of class when the scientific theory of evolution is taught. The variables that impacted this decision may have been demographics of the student population, background knowledge, or participant actions, awareness and perceptions of evolution, opt-out practices, state mandates, and parent rights.

**Research Questions**

This study was guided by the following basic research question: Why do public secondary school administrators allow or not allow students to opt out of class when the scientific theory of evolution is taught?

Five questions directed and guided the research:

1. Is there a correlation between community and school demographics and secondary school administrators’ choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

2. Is there a correlation between background knowledge and experience and secondary school administrators’ choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

3. How do secondary school administrators’ actions relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?
4. How do secondary school administrators’ personal attitudes and perceptions relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

5. How do secondary school administrators’ awareness of opt-out policies and required standards relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

**Hypotheses**

Data analysis allows the researcher to determine if the hypotheses are supported. Analysis of the data does not lead to a hypothesis being proven or not proven only supported or not supported (Grimm, 1993). Descriptive statistics were used to determine if significant relationships or correlations existed between administrators who allow opt out and administrators who do not allow opt out, and the variables specified in hypotheses listed below:

Ho1: There is no statistically significant relationship between community and school demographics and use or non-use of opt-out practice.

- H01(a): There is no statistically significant relationship between Florida region and use or non-use of opt-out practice.
- H01(b): There is no statistically significant relationship between urbanization and use or non-use of opt-out practice.
- H01(c): There is no statistically significant relationship between size of school and use or non-use of opt-out practice.
- H01(d): There is no statistically significant relationship between free and reduced lunch population and use or non-use of opt-out practice.
• $H_{01}(e)$: There is no statistically significant relationship between grade levels served and use or non-use of opt-out practice.

• $H_{01}(f)$: There is no statistically significant relationship between type of school (magnet, charter, virtual, academy) and use or non-use of opt-out practice.

• $H_{01}(g)$: There is no statistically significant relationship between parent involvement and use or non-use of opt-out practice.

$H_{a1}$: There is a statistically significant difference in community and school demographics ($H_{a1}(a) =$ Region, $H_{a1}(b) =$ urbanization, $H_{a1}(c) =$ size of school, $H_{a1}(d) =$ free and reduced lunch population, $H_{a1}(e) =$ grade levels, $H_{a1}(f) =$ type of school, and $H_{a1}(g) =$ perceived parent involvement) and use or non-use of opt-out practice.

$H_{02}$: There is no statistically significant relationship between individual participant characteristics and use or non-use of opt-out practice.

• $H_{02}(a)$: There is no statistically significant relationship between tenure in education and use or non-use of opt-out practice.

• $H_{02}(b)$: There is no statistically significant relationship between experience as a school administrator and use or non-use of opt-out practice.

• $H_{02}(c)$: There is no statistically significant relationship between certification subject area and use or non-use of opt-out practice.

• $H_{02}(d)$: There is no statistically significant relationship between highest degree attained and use or non-use of opt-out practice.

$H_{a2}$: There is a statistically significant relationship between individual participant characteristics ($H_{a2}(a) =$ tenure in education, $H_{a2}(b) =$ experience as a school...
administrator, $H_2(c) = \text{certification subject areas, and } H_2(d) = \text{highest degree attained}$ and use or non-use of opt-out practice.

$H_{03}$: There is no statistically significant difference in secondary school administrators’ actions and use or non-use of opt-out practice.

- $H_{03}(a)$: Action of supporting teaching evolution at the school.
- $H_{03}(b)$: Action of supporting teachers’ academic freedom to teach alternative theories.
- $H_{03}(c)$: Action of meeting/discussing with the science teachers that they are required to teach evolution concepts.
- $H_{03}(d)$: Action of asking science teachers to de-emphasize the teaching of evolution in their classes.
- $H_{03}(e)$: Action of allowing a student to be assigned an alternate assignment when evolution is taught in the science classes.

$H_{a3}$: There is a statistically significant difference in secondary school administrators’ actions and use or non-use of opt-out practice.

$H_{04}$: There is no statistically significant difference in secondary school administrators’ perceptions about evolution and use or non-use of opt-out practice.

- $H_{04}(a)$: Perception that statements of belief cannot be proved or disproved through scientific investigation.
- $H_{04}(b)$: Perception that there are other theories, such as Intelligent Design, that should be taught in conjunction with the theory of evolution.
- $H_{04}(c)$: Perception that evolution is a central and unifying theme in biology.
• $H_04(d)$: Perception that the world is too complex to have come about without the active and repeated intervention of a higher power.
• $H_04(e)$: Perception that all students should have the opportunity to learn about evolution.
• $H_04(f)$: Perception that parents should have the right to opt out their child from class when evolution is taught.

$Ha4$: There is a statistically significant difference in secondary school administrators’ perceptions about evolution and use or non-use of opt-out practice.

$H_05$: There is no statistically significant difference in secondary school administrators’ awareness of opt-out policies and required standards and use or non-use of opt-out practice.
• $H_05(a)$: Awareness that all students are required to learn about the theory of evolution, regardless of parent or student beliefs.
• $H_05(b)$: Awareness that there is pressure from parents in the community to avoid teaching evolution concepts.
• $H_05(c)$: Awareness that the majority of parents of students who attend the school support the teaching of evolution.

$Ha5$: There is a statistically significant difference in secondary school administrators’ awareness of policies and required standards and use or non-use of opt-out practice.

**Research Design and Rationale**

The researcher utilized a basic descriptive research design for this study. Descriptive research describes the who, what, when, where, and how of a situation, not
what caused it. Descriptive research involves gathering data and then organizing, tabulating, depicting and describing the data collection. In descriptive research, graphs and charts aid the reader in understanding the data distribution (Creswell, 2007; Grimm, 1993). Descriptive research is used to provide a systematic description that is as factual and accurate as possible. It provides the number of times something occurs, or frequency, lends itself to statistical calculations such as average number of occurrences or central tendencies. It also utilizes elements of qualitative and quantitative research methodologies (Trochim, 2006).

In this study, perception data were collected using an online survey with items designed by the researcher, with some items modified from the following surveys: (a) dissertation research conducted by Bilica (2001) on factors that influenced biology teachers’ decisions to teach evolution; (b) Fowler and Meisels (2010) on Florida teacher attitudes about teaching evolution; and (c) dissertation research conducted by Hermann (2007) on worldview theory to determine factors that influenced the understanding of evolution (see Appendix F). Data collected for this study was through a survey of public secondary school administrators in Florida, identified by the FDOE, on their actions, perceptions, and awareness of opt-out practices as they relate to the scientific theory of evolution. The survey included two open-ended questions that provided the opportunity for participants to elaborate on their perceptions and beliefs on opt-out practices.

Data Collection Instrument

The statements and questions in the survey instrument targeted secondary school administrators’ actions, perceptions, and awareness, and the application of opt-out practices involving the scientific theory of evolution and community and school
demographics, and individual characteristics (see Appendix B for survey items listed by research question). Efforts were made to maintain a balance of positively and negatively stated items, as suggested by Likert (1932), and to promote the clarity of items by keeping items to an optimum length and by avoiding double-barreled statements.

The questions sought to elicit from the respondents their attitudes and perceptions toward the practice of opt out as it is applied to academics, specifically the theory of evolution. The online survey consisted of 30 items: seven items identified community and school demographics; four items identified individual characteristics; four questions to identify subgroups; five action statements; six perception statements; three awareness statements; and two open-ended statements.

Through the survey, the researcher wanted to identify reasons used by public secondary school administrators as applied to opt out decisions and identify trends in decision-making in regards to opt-out practices. The online survey consisted of five sections. The first section focused on community and school demographics (urbanization, student population, free and reduced lunch, grade levels, type of school, and parent involvement). The second section consisted of individual participant information (highest degree earned, certification area, and years in education and administration). The third section consisted of three questions to identify subgroups (participants who have or would allow opt out and participants who have not or would not allow opt out) and one open-ended question requesting elaboration on why participants would or would not allow opt out. The fourth section focused on participant actions in regards to their support of the teaching of evolution. The last section consisted of perception and awareness statements about the scientific theory of evolution, alternative ideas, state requirements,
and parent rights. The items in this section were based on the Likert scale: strongly agree, agree, undecided, disagree, strongly disagree scale forcing a response that indicated the strength of participants’ agreement or disagreement with a statement. Respondents were requested to indicate their attitudes and perceptions by selecting the place on the scale that was most reflective of their beliefs about the statement. This section also included one open-ended question to allow the participants to speak to issues, concerns, and viewpoints about opt-out practices that were not addressed in the survey. Table 2 lists the items that were used to answer each of the research questions.

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Survey Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is there a correlation between community and school demographics and secondary school administrators’ choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?</td>
<td>1, 2, 3, 4, 5, 6, 7</td>
</tr>
<tr>
<td>2. Is there a correlation between background knowledge and experience and secondary school administrators’ choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?</td>
<td>8, 9, 10, 11</td>
</tr>
<tr>
<td>3. How do secondary school administrators’ actions relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?</td>
<td>16, 17, 18, 19, 20</td>
</tr>
<tr>
<td>4. How do secondary school administrators’ personal attitudes and perceptions relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?</td>
<td>21, 22, 23, 24, 25, 26</td>
</tr>
<tr>
<td>5. How do secondary school administrators’ awareness of opt out of academics involving the scientific theory of evolution?</td>
<td>27, 28, 29</td>
</tr>
</tbody>
</table>

*Note.* Subgroup identification was defined by items 12, 13, and 14. Items 15 and 30 were open-ended questions.
**Pilot study (test-retest).** According to Weber (2004), the researcher must validate that the items on the instrument reflect the meaning of the research and try to ensure the items on the instrument communicate the researcher’s meaning to participants. Because the items were modified from other studies designed to be used with public high school biology teachers, it may not have the same reliability and validity in assessing the support for teaching evolutionary theory by other populations.

Because the survey instrument was designed by the researcher, it is considered a new instrument and the validity of items had not been determined in a previous study. To verify the utility of the survey instrument, two levels of validation were conducted. First, two secondary school administrators were asked to read the questions and statements and discuss their individual interpretation of each item with the researcher to determine if items are interpreted as the researcher intended. Recommendations to specify the participants’ answers be based on their role as a school administrator were incorporated into the survey items prior to the test/retest.

A second level of validation was accomplished through a test/retest pilot study, which was limited to secondary school principals and assistant principals in the district where the researcher was employed. Ten secondary administrators completed the survey twice, with two weeks between survey administrations. Participants were tracked using a non-identifiable number. The Pearson correlation coefficient assumes that both tests were sampled from normally-distributed populations. Since the test-retest was sent to administrators in the researcher’s school district, questions about community and school demographics and individual characteristics were omitted from the survey to maintain anonymity. Table 3 shows the test-retest reliability statistics for the items in the survey.
Table 3

**Test-Retest Reliability Statistics and Item Analysis for Survey**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>2.519</td>
<td>10</td>
<td>.159</td>
<td>0.050</td>
</tr>
<tr>
<td>Retest</td>
<td>2.523</td>
<td>10</td>
<td>.135</td>
<td>0.043</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statistics for Scale</th>
<th>N</th>
<th>Mean</th>
<th>Variance</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>26</td>
<td>71.26</td>
<td>36.593</td>
<td>6.049</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Range</th>
<th>Max/ Min</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Means</td>
<td>2.741</td>
<td>1.139</td>
<td>4.422</td>
<td>3.283</td>
<td>3.884</td>
<td>1.157</td>
</tr>
<tr>
<td>Item Variances</td>
<td>1.259</td>
<td>.120</td>
<td>6.173</td>
<td>6.053</td>
<td>51.404</td>
<td>1.720</td>
</tr>
<tr>
<td>Inter-Item Correlations</td>
<td>.004</td>
<td>-.632</td>
<td>1.000</td>
<td>1.632</td>
<td>-1.582</td>
<td>.030</td>
</tr>
</tbody>
</table>

*Note. r = .942*

From the responses, reliability coefficients were calculated using the internal consistency method proposed by Cronbach (1951). Scales for reliability coefficients, like the Cronbach alpha, range from 0 (indicating no reliability) to 1.00 (indicating perfect reliability). Statistics were calculated by IBM SPSS Statistics Student Version™ (PASW Statistics 18) to measure internal reliability for each hypothesis. From the responses, a reliability coefficient was calculated for action, perception, and awareness items using the internal consistency method proposed by Cronbach (1951). Scales for reliability coefficients, like the Cronbach alpha, range from 0 (indicating no reliability) to 1.00 (indicating perfect reliability). Table 4 shows the reliability for the survey items for the test-retest for 10 subjects.
Table 4

**Pearson Correlation for the Survey Items for Test-Retest (N = 10)**

<table>
<thead>
<tr>
<th>Survey Item</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In which Florida Region is the school where you work located?</td>
<td>1.000</td>
</tr>
<tr>
<td>2. Which of the following best describes your school’s community?</td>
<td>.722</td>
</tr>
<tr>
<td>3. What is the student population at your school?</td>
<td>1.000</td>
</tr>
<tr>
<td>4. Describe you school (grade level served).</td>
<td>1.000</td>
</tr>
<tr>
<td>5. Is your school considered a charter, magnet, virtual school or academy?</td>
<td>1.000</td>
</tr>
<tr>
<td>6. Which of the following describes the involvement and participation of the parents in school events and school-sponsored activities?</td>
<td>.778</td>
</tr>
<tr>
<td>7. What percentage of students at your school qualify for and/or receive F/RL?</td>
<td>.802</td>
</tr>
<tr>
<td>8. How many years have you been working in the field of education?</td>
<td>.966</td>
</tr>
<tr>
<td>9. How many years have you been a school administrator?</td>
<td>.883</td>
</tr>
<tr>
<td>10. What is the highest degree you have earned?</td>
<td>.655</td>
</tr>
<tr>
<td>11. In what subject(s) are/were you certified to teach?</td>
<td>.988</td>
</tr>
</tbody>
</table>

Items 12-14 identified participant subgroups and item 15 was open-ended to elaborate on opt-out choice.

<table>
<thead>
<tr>
<th>Survey Item</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Do you support the teaching of evolution at your school?</td>
<td>.667</td>
</tr>
<tr>
<td>17. Do you support the science teachers’ academic freedom to teach alternative theories to evolution in science classes?</td>
<td>.764</td>
</tr>
<tr>
<td>18. Have you met and/or discussed with the science teachers that they are required to teach evolution concepts?</td>
<td>.764</td>
</tr>
<tr>
<td>19. Have you asked the science teachers to de-emphasize the teaching of evolution in their classes?</td>
<td>1.000</td>
</tr>
<tr>
<td>20. Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</td>
<td>1.000</td>
</tr>
<tr>
<td>21. Statements of belief cannot be proved or disproved through scientific investigation.</td>
<td>.959</td>
</tr>
<tr>
<td>22. There are other theories, such as Intelligent Design, that should be taught in conjunction with the theory of evolution.</td>
<td>.908</td>
</tr>
<tr>
<td>23. Evolution is a central and unifying theme in biology.</td>
<td>.683</td>
</tr>
<tr>
<td>24. The world is too complex to have come about without the active and repeated intervention of a higher power.</td>
<td>.656</td>
</tr>
<tr>
<td>25. All students should have the opportunity to learn about evolution.</td>
<td>.557</td>
</tr>
<tr>
<td>26. I think parents should have the right to opt out their child from class when evolution is taught.</td>
<td>.643</td>
</tr>
<tr>
<td>27. All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</td>
<td>.745</td>
</tr>
<tr>
<td>28. I have felt pressure from parents in my community to avoid teaching evolution concepts in science classes.</td>
<td>.732</td>
</tr>
<tr>
<td>29. The majority of parents of students who attend my school support the teaching of evolution.</td>
<td>.750</td>
</tr>
</tbody>
</table>

*Note.* Community/school demographics (items 1-7) $\alpha = .321$; Individual characteristics (items 8-11) $\alpha = .286$; Action statements (items 16-20) $\alpha = .130$; Perception statements (items 21-26) $\alpha = .388$; Awareness statements (items 27-29) $\alpha = .576$. Item 30 was open-ended to allow participants to elaborate on any previous items.
Population and Sampling

Survey instruments are an efficient and inexpensive method to gather information about a large population and allow the researcher to collect and evaluate data on participant perceptions (Alreck & Settle, 2004; Zikmund, 2000). Administrators who participated in the pilot study were not included in the research population sample. Before survey participation was solicited, the researcher’s committee and university IRB approval were acquired. The researcher obtained secondary school administrators’ emails from the FDOE Education Information Services department, which identified secondary school administrators employed in a Florida public secondary school, including virtual schools, magnet schools and secondary academies, in the 2009-2010 school year. For the purposes of this study, secondary administrators were principals and assistant principals employed in public schools that serve grades 6-12 in any configuration.

The researcher sent the request for participation in the study and the survey link through the university email system directly to the participants who were identified by the FDOE as secondary public school administrators. Survey data were solicited only from secondary school administrators because the Florida NGSSS for elementary science do not identify evolution as a K-5 concept. Since the Florida NGSSS apply to public schools in the state of Florida, private secondary school administrators were not surveyed. Administrators at special needs schools, adult and community education centers, Florida University Schools, career and technology centers, and juvenile justice centers were not surveyed since their academic requirements do not necessarily include the NGSSS for Science. Table 5 identifies the who, what, why, and how of this study.
Table 5

The Who, What, Why and How of the Study

<table>
<thead>
<tr>
<th>Who?</th>
<th>Florida public secondary school administrators from the 67 school districts who are currently working at the secondary school level housing any configuration of students in grades 6-12.</th>
</tr>
</thead>
<tbody>
<tr>
<td>What?</td>
<td>Application and interpretation of opt-out policies as they pertain to controversial topics, specifically evolution concepts and evolutionary theory.</td>
</tr>
<tr>
<td>Why?</td>
<td>Why are students being allowed to opt out of academics that specifically include the concept and theory of evolution?</td>
</tr>
<tr>
<td>How?</td>
<td>Survey to collect demographic data to correlate to items that focus on secondary school administrators’ perceptions, knowledge and actions about the theory of evolution and opt-out practices.</td>
</tr>
</tbody>
</table>

Based on 2010 data from the FDOE, there were approximately 3375 public secondary school administrators employed in the state of Florida. The researcher requested participation in the survey from the secondary administrators identified by the FDOE.

There is a relationship, statistical power, between the sample size and statistical significance: as the sample size increases, the probability of statistical significance increases (McREL, 2004). In studies with very large sample sizes (1000 or more), even small numerical differences can be statistically significant (McREL, 2004). The participants represented a subset of the population, since it is impossible to collect the information from all the individuals in the population. Because the sample represents an estimate of the population, the researcher needed to consider the uncertainty of this estimate. If the sample is representative of the population, the expected value of the sample mean is the same as the population mean. As the sample size increases, the standard error of the mean decreases and the smaller the confidence interval (CI).

Assuming the sample distribution was normal, using 50% to determine a general level of accuracy with a 95% confidence level, the CI was 5 and had a z-value of 1.96 standard
errors from the sample mean. The targeted number of completed surveys for a 95% confidence level was 346 participants.

Data Collection Methods

Data was collected through a web-based survey (see Appendix B) using SurveyMonkey and was available on-line for a period of 21 calendar days. Because this was an online survey, participants were able to respond to questions in privacy and may have been more likely to answer the questions truthfully rather than giving a politically correct response while in a face to face setting (Alreck & Settle, 2004).

When participants accessed the SurveyMonkey web link, they were directed to the informed consent page. Participants who agreed to voluntarily participate and gave their informed consent were given access to the survey. Participants who did not agree to the informed consent were redirected to the SurveyMonkey homepage.

SurveyMonkey has a built-in function that prevents duplicative survey completion as identified by computer IP address and their privacy policy, security statement, and terms of use were available to participants (Appendices I, J and K). At the end of the survey, participants were reminded that the data were confidential and anonymous and would only be used for the researcher’s dissertation study. The research presented no more than minimal risk of harm to the subjects and involved no procedures or activities for which written consent was not normally required outside of the research context.

Description of Participants

The sample population consisted of approximately 3375 Florida public secondary school administrators, identified by and obtained from the FDOE, Education Information Services 2010-11 email list, which is public record. Participants were solicited through
the university email system, with one reminder email sent 10 days after the original solicitation. Email addresses were uploaded into the researcher’s university email address book in groups of 500 listed alphabetically by email address. Only 2000 emails can be sent from this account per day so email solicitation occurred over two days. Approximately 90 email addresses were undeliverable and 35 emails returned out-of-office replies. It was estimated that approximately 3250 emails were delivered successfully, and 9% of the sample population \((n = 297)\) participated in the survey. Of the 297 participants who participated in the survey, 16 did not answer the question on whether they have or would allow opt out of class when the scientific theory of evolution was taught, and could not be placed into a subgroup.

Identification of subgroups. The 281 participants \((N = 281)\) who completed the survey were separated into two subgroups: (a) those participants who have allowed or would allow students to opt out of the scientific theory of evolution, identified as the “Yes” subgroup \((n = 213)\); and, (b) those participants who did not allow or would not allow students to opt out of the scientific theory of evolution, identified as the “No” subgroup \((n = 68)\).

Methods of Data Analysis

Using an interpretive analysis design, this study identified the actions, perceptions, and awareness relating to secondary school administrators and how they interpret and apply opt-out practices to the topic of evolution. Constructivist, or interpretive, researchers acknowledge the possible fallibility of human judgment (Yanow, 2006). Even post-positivists acknowledge that their personal experiences impact the results of their research (Hawkesworth, 2006). Statistical analysis was used to make
inferences about the relationship between the two subgroups and the variables. Table 6 shows how each item was analyzed to determine relationships between the participant responses.

Table 6

*Statistical Analysis for Each Research Question*

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Research Question</th>
<th>Statistical Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categorical</td>
<td>1. Is there a correlation between community and school demographics and secondary school administrators’ choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?</td>
<td>Descriptive Statistics, Chi-Square Analysis</td>
</tr>
<tr>
<td>Categorical</td>
<td>2. Is there a correlation between individual characteristics (background knowledge and experience) and secondary school administrators’ choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?</td>
<td>Descriptive Statistics, Chi-Square Analysis</td>
</tr>
<tr>
<td>Categorical</td>
<td>3. How do secondary school administrators’ actions relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?</td>
<td>Descriptive Statistics, Chi-Square Analysis, Yes/No Questions, df = 1</td>
</tr>
<tr>
<td>Categorical</td>
<td>4. How do secondary school administrators’ personal attitudes and perceptions relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?</td>
<td>Descriptive Statistics, Chi-Square Analysis, Likert-type Items, df = 4</td>
</tr>
<tr>
<td>Categorical</td>
<td>5. How do secondary school administrators’ awareness of opt-out policies and required standards relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?</td>
<td>Descriptive Statistics, Chi-Square Analysis, Likert-type Items, df = 4</td>
</tr>
</tbody>
</table>
Descriptive statistics were used to determine frequency of responses to items. Interpretations of the data were limited to identifying possible trends through Chi-Square analysis for community/school demographics and individual characteristics, Likert-type items for participants’ actions, perceptions, and awareness as they relate to allowing or not allowing students to opt out of class when the scientific theory of evolution is taught. A Chi-Square ($X^2$) statistic was used to investigate whether distributions of categorical variables differ from one another. The Chi-Square statistic was used to compare the tallies or counts of the categorical responses between the two sub-groups as identified by survey items 12, 13 and 14. Descriptive and Chi Square statistics were used to determine relationships between secondary school administrators’ community and school demographics, individual characteristics, actions, perceptions, and awareness, and the application of opt-out practices involving the scientific theory of evolution.

**Definition of variables.** Community and school demographics, including Florida region, rural versus urban, and parent involvement, school size and type, and free and reduced lunch numbers, and individual characteristics, including years in education and school administration; highest degree earned; and subject area certification, were included in the survey questions. Community and school demographic information was used to determine if there were any trends or relationships with participants’ actions, perceptions, and awareness of the practice of allowing or not allowing opt out of evolution topics. Answers to items 12, 13 and 14 were used to classify individuals into two groups: administrators who have or would allow opt out and administrators who have not or would not allow opt out of class when evolution is taught.
Analysis of open-ended questions. An open-ended question in a survey or public opinion poll is an unstructured question in which possible answers are not suggested, and the respondent answers it in his or her own words. The question is framed in such a way as to encourage the explanation of the answers and reactions to the question with a sentence, a paragraph, or even a page or more, depending on the survey. Two open-ended questions were included in the survey used in this study. The first open-ended question was placed after the group identification questions (see Appendix B) and asked participants to elaborate on their decision to allow or not allow a student to opt out of class when evolution is taught. The second open-ended question was placed at the end of the survey and asked participants to share concerns they may have had or issues that had not been addressed in the survey questions in regards to opt-out practices and the teaching of evolution in their school or district. Recurring themes in open-ended statements were identified: (a) parent rights, (b) alternative assignment, (c) pro-ID language, (d) conflict avoidance, (e) district policy, (f) transference of current opt-out policies, (g) required state standards and curriculum, and (h) freedom of religion. Direct quotes from the participants enhanced the creditability of the findings and conclusions.

Trustworthiness of the Research

Survey research is one of the most important areas of measurement in applied social research and involves asking questions of respondents (Trochim, 2006). Historically, survey research involving the Likert-type scale has been considered quantitative, or positivist in nature. Constructivist research has become more popular in quantitative studies and the line between positivist and interpretive research has become blurred (Yanow, 2006). Survey data use statistics to analyze quantitative data, but data
are still interpreted and applied to the research questions. The difference between natural sciences (positivism) and human sciences (interpretivism and constructivism) resides in what each focuses on in the study (van Manen, 1990). However, both positivism and constructivism are concerned with trying to improve understanding of the world and accept that there is bias and prejudice in the research (Weber, 2004). Survey research is economical and fast and can generate a high response level. The use of a web-based survey may have encouraged participants to give more honest answers to questions about sensitive topics.

By admitting that they allow students to opt out of topics that are considered controversial, school administrators may have believed they were self-reporting that they were not complying or were unfamiliar with the Florida statute requiring instruction on the scientific theory of evolution. The initial email request for participation (see Appendix G) stressed there was limited research in the area of opt-out practice at the school level as it applies to controversial topics, specifically evolution, and the participation in the survey added to the literature. The researcher also stated that the survey was voluntary and anonymous, and the demographic and individual information would be used only for data analysis purposes and could not be used for compilation of personal information. If the participants did not agree to the informed consent, they were redirected to an external browser. Participants who agreed to the terms of the informed consent were given access to the online survey questions. All responses to the online survey were kept anonymous. It could not be determined from the survey used in this study whether administrators were allowing opt out or not allowing opt out of the topic of
evolution to avoid self-reporting of non-compliance with state opt-out policies and required curriculum statutes.

**Researcher Role and Ethical Considerations**

Researchers are interested in understanding the meaning people have constructed and must understand this interpretation through the participants’ perspectives (Merriam, 1998). The researcher’s biases were not known to participants in the study, but participants’ characteristics were requested through survey questions and biases were identified through the open-ended questions. Personal and professional experiences of the researcher may have impacted bias error in the analysis. The researcher was aware and recognized the possible impact of subjectivity on the interpretation of the survey results.

The researcher completed a series of twelve, online modules provided by the Collaborative Institutional Training Initiative (CITI), including one module specific to the University of South Florida, on human research and ethics. These modules were designed to inform the researcher of proper procedures to protect human participants. A copy of the certificate of completion for the Basic IRB course are in Appendix H.

**Data Management and Storage**

Survey data were collected and examined by a password-protected electronic database. Each participant was coded alphanumerically to protect anonymity and maintain confidentiality requirements. All electronic data were downloaded as a spreadsheet and uploaded into an SPSS Statistics program.

No personal information was collected or stored. According to the SurveyMonkey Privacy Policy, no information collected from surveys will be used by SurveyMonkey (Appendices I, J, and K). All information from SurveyMonkey was downloaded to a USB
flash drive and deleted from the website after the study was completed. Data will be kept for 5 years on a password-protected flash drive in a locked cabinet belonging to the researcher and then discarded appropriately through a software overwrite process.

**Summary**

In this study, a Likert-type scale survey request was sent to approximately 3375 secondary public school administrators in Florida as identified by the FDOE. The online survey consisted of 30 items that focused on community and school demographics, individual characteristics, and school-based administrator actions, perceptions and awareness about students opting-out of class when evolution is taught. The Likert-type scale was chosen for the perceptions and awareness items because of its reliability when obtaining attitudinal data (Grimm, 1993). In addition to the Likert-type survey items, two open-ended questions were used to determine trends for reasons for allowing or not allowing opt out.

The researcher’s goal was to contribute to the literature as to why secondary school administrators may allow students to opt out of learning about the theory of evolution and examine conflicts in policy implementation. State standards specifically state that evolution is a unifying concept in the biological sciences, and is required to be taught in Florida public secondary schools.

The next chapter presents the findings from the study, including the relationships between the variables and decision to allow or not allow a student opt out of class when the scientific theory of evolution is taught.
Chapter 4: Results

The previous chapter described the study’s research design, sampling, instrumentation, data collection and data analysis procedures. This chapter presents a detailed analysis of the findings for each of the five research questions and the results from the survey.

The purpose of this study was to examine and describe secondary school administrators’ perceptions, knowledge, and actions and the relationship to the practice of opting out of academics that specifically include evolution. For this study, participants were limited to principals and assistant principals in Florida public schools. The sections in this chapter discuss the results from the survey, including: (a) restatement of the purpose, (b) theoretical framework, (c) research design and questions, (d) pilot study using test-retest methods, (e) review of methodology, (f) study instrumentation, (g) description of population sample, (h) identification of subgroups, (i) presentation of the findings, and (j) hypotheses validation.

Research Design

The research design of this study utilized a basic descriptive research design. Data for the study was collected via an electronic survey. Results were downloaded and analyzed using IBM SPSS Statistics Student Version™ (PASW Statistics 18). The online survey consisted of 30 items that centered on participants’ community and school demographics, individual characteristics, and their actions, perceptions and awareness of
opt-out practices as they applied to the scientific theory of evolution. Descriptive data included the number and percentage of responses for all survey items. Data was analyzed using Chi-square statistics, which had a default level of .05 (5%) allowance for Type I error reported as probability (p value). For each item, a 95% confidence interval (CI) was computed based on the sample mean and sample standard deviation. For questions where the p value was equal to or less than .05, the null hypothesis was rejected. Conversely, p values greater than .05 resulted in failure to reject the null hypothesis.

Variables that included community and school demographics were used to test Hypothesis 1. Community demographics included Florida region, rural versus urban, and parent involvement. School demographics included size and type of school, and free and reduced lunch numbers. Variables of individual characteristics were used to test Hypothesis 2, and included years in education and school administration; highest degree earned; and subject area certification. Action, perception, and awareness statements were used to test Hypotheses 3, 4, and 5 respectively.

**Presentation of Findings**

Descriptive statistical analysis was the first operation performed on the data. The 281 participants who completed the survey were sub-grouped as described previously as “Yes” group (n = 213) and “No” group (n = 68). In some instances, the 281 participants did not answer all items, and reported in the total count in all frequency tables. Of the 281 participants, only 12% (n = 33) stated they received requests from parents to opt-out their child from class when evolution is taught. Chi-square analysis was used to obtain the associated significance values (p value) to determine relationships between secondary school administrators’ community and school demographics, individual characteristics,
actions, perceptions, and awareness, and the application of opt-out practices as they apply to the scientific theory of evolution. Data tables list frequency ($f$) and percentage ($\%$) for each possible response.

**Relationship between community and school demographics and opt-out practices.** The survey asked seven questions (items 1 through 7) about the participants’ community and school demographics, including region, population density of the community (urbanization), student population, grade levels served, type of school, percentage of students receiving free and/or reduced lunch, and parent involvement. Significance values ($p$ value) less than 0.05 were considered directly related.

**Florida region.** Participants were asked to identify the Florida region in which their school is located. Figure 3 identifies the districts in each of the six Florida regions documented in this survey.

![Figure 3: Representation of Florida Regions](image)

Participants from the six Florida regions were represented in the study. Thirty percent ($n = 85$) of the participants were from the NE region; 27% ($n = 70$) were from the
SE region; and, 20% \((n = 59)\) were from the WC region. Only 14% \((n = 35)\) of the participants identified their region as Northwest (NW), Panhandle (P), and Southwest (SW). Those regions with a low response rate consisted of smaller school districts in rural areas. This was to be expected because NW and P regions have fewer secondary schools, and the researcher’s school district, which was eliminated from the data collection, was located in the SW region. Table 7 shows frequency results for participants’ region and the decision to allow a student to opt out of class when evolution is taught.

Table 7

*Frequency Results for Florida Region and Opt-out Practices \([H_0 l(a)]\)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Region</th>
<th>Have or would allow opt out</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>In which Florida Region is the school where you work located?</td>
<td>NE</td>
<td>Count ((n))</td>
<td>64</td>
<td>21</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>75.3%</td>
<td>24.7%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>NW</td>
<td>Count ((n))</td>
<td>10</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>100%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>Count ((n))</td>
<td>9</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>69.2%</td>
<td>30.8%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>Count ((n))</td>
<td>56</td>
<td>14</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>80.0%</td>
<td>20.0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>SW</td>
<td>Count ((n))</td>
<td>7</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>58.3%</td>
<td>41.7%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>WC</td>
<td>Count ((n))</td>
<td>41</td>
<td>18</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>69.5%</td>
<td>30.5%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Count ((n))</td>
<td>187</td>
<td>62</td>
<td>249</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>75.1%</td>
<td>24.9%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Note.* \(X^2(5) = 7.252, \ p = .203, \ N = 249,\) Fail to reject \(H_0 l(a),\) Effect-size (Cohen’s \(d\)) = 0.144
Analysis of the relationship between the “Yes” and “No” subgroups did not show any significant relationship with the region where the participant was employed and the decision to allow or not allow opt out \( [X^2 (5) = 7.252, p = .203] \), so the null hypothesis \( H_0 \) (a) was not rejected. There was not a statistically significant relationship between secondary school administrators’ Florida region where they are employed and use of opt-out practice. More participants stated they have or would allow a student to opt out of class when the scientific theory of evolution is taught, regardless of region.

**Population density of the community.** Fifteen percent \( (n = 43) \) of the participants in this study identified their community as rural, 47% \( (n = 130) \) identified their community as urban, and 38% \( (n = 105) \) identified their community as suburban. Table 8 shows frequency results for urbanization and the decision to allow or not allow opt out.

Table 8

*Frequency Results for Urbanization and Opt-out Practices [H\( _0 \)l(b)]*

<table>
<thead>
<tr>
<th>Item</th>
<th>Urbanization</th>
<th>Have or would allow opt out</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following best describes your school’s community?</td>
<td>Rural</td>
<td>Count ((n)) 31</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 72.1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suburban</td>
<td>Count ((n)) 73</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 69.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>32</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>Count ((n)) 106</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 81.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Count ((n)) 210</td>
<td>278</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 75.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>68</td>
<td></td>
</tr>
</tbody>
</table>

*Note. \( X^2 (2) = 4.865, p = .088, N = 278, \) Fail to reject \( H_0 \)l(b), Effect-size (Cohen’s \( d \)) = 0.251*
The “Yes” and “No” subgroups did not show any significant difference in population density of their community where they were employed. Chi-square analysis did not show a significant relationship in urbanization and the participants’ decision to allow or not allow a student to opt out of evolution \( X^2 (2) = 4.865, p = .088 \) and the null hypothesis \( H_0 \) was not rejected. There was not a statistically significant relationship between participants’ community urbanization where they are employed and use or non-use of opt-out practice. More participants stated they have or would allow a student to opt out of class when the scientific theory of evolution is taught, regardless of urbanization.

**Student Population.** About 67% \((n = 189)\) of the participants were employed at schools serving more than 1000 students. Seventy-eight percent \((n = 53)\) of the “No” subgroup was employed at a school serving more than 1000 students compared to 64% \((n = 136)\) of the “Yes” subgroup. Table 9 shows frequency results for student population and participants’ decision to allow or not allow opt out.

Chi-square analysis did not show a significant relationship between student population and allowing or not allowing a student to opt out of evolution \( X^2 (4) = 6.645, p = .156 \) and the null hypothesis \( H_0 \) was not rejected. There was not a statistically significant relationship between participants’ school population where they are employed and use or non-use of opt-out practice. More participants stated they have or would allow a student to opt out of class when the scientific theory of evolution is taught, regardless of the size of the student population.
Table 9  
*Frequency Results for Student Population and Opt-out Practices [H₀₁(c)]*

<table>
<thead>
<tr>
<th>Item</th>
<th># students</th>
<th>Have or would allow opt out</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the student population at your school?</td>
<td>100-400</td>
<td>Count (n)</td>
<td>14</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>87.5%</td>
<td>12.5%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>401-700</td>
<td>Count (n)</td>
<td>17</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>81.0%</td>
<td>19.0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>701-1000</td>
<td>Count (n)</td>
<td>46</td>
<td>9</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>83.6%</td>
<td>16.4%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>1001-1500</td>
<td>Count (n)</td>
<td>60</td>
<td>18</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>76.9%</td>
<td>23.1%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>1500+</td>
<td>Count (n)</td>
<td>76</td>
<td>35</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>68.5%</td>
<td>31.5%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Count (n)</td>
<td>213</td>
<td>68</td>
<td>281</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>75.8%</td>
<td>24.2%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Note.* $X^2(4) = 6.645$, $p = .156$, $N = 281$, Fail to reject $H₀₁(c)$, Effect-size (Cohen’s $d$) = 0.352

**Type of school.** Participants were asked if the school where they were employed was a considered a charter school, magnet school, virtual school or academy.

Approximately 75% ($n = 215$) of the participants identified their school as a public school, 17% ($n = 48$) of the participants identified their schools as a magnet school, and 7% ($n = 18$) of the participants identified their schools as a charter or virtual school or academy. Table 10 shows frequency results for type of school and the decision to allow or not allow opt out.
Table 10

Frequency Results for Type of School and Opt-out Practices [H₀₁(d)]

<table>
<thead>
<tr>
<th>Item</th>
<th>Type School</th>
<th>Have or would allow opt out</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Is your school a charter school, magnet school, virtual school or academy?</td>
<td>Charter (C)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Count (n)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>66.7%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Magnet (M)</td>
<td>Count (n)</td>
<td>39</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>81.3%</td>
<td>18.8%</td>
</tr>
<tr>
<td>Virtual (V)</td>
<td>Count (n)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>33.3%</td>
<td>66.7%</td>
</tr>
<tr>
<td>Academy (A)</td>
<td>Count (n)</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>83.3%</td>
<td>16.7%</td>
</tr>
<tr>
<td>None</td>
<td>Count (n)</td>
<td>161</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>74.9%</td>
<td>25.1%</td>
</tr>
<tr>
<td>Total</td>
<td>Count (n)</td>
<td>213</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>75.8%</td>
<td>24.2%</td>
</tr>
</tbody>
</table>

Note. X²(4) = 4.333, p = .363, N = 281, Fail to reject H₀₁(d), Effect-size (Cohen’s d) = 0.085

Chi-square analysis did not show a significant relationship between type of school and allowing or not allowing opt out [X² (4) = 4.333, p = .363] and the null hypothesis H₀₁(d) was not rejected. There was not a statistically significant relationship between type of school and use or non-use of opt-out practice. More participants stated they have or would allow a student to opt out of class when the scientific theory of evolution is taught, regardless of type of school.

Grade levels served. More than 60% (n = 42) of the participants in the “No” subgroup worked at schools serving grades 9-12 and 22% (n = 15) worked at schools that served grades 6-8. The “Yes” subgroup participants were equally distributed between
public middle schools serving grades 6-8 \((n = 90)\) and public high schools serving grades 9-12 \((n = 93)\). Those participants in both the “Yes” and “No” subgroups who serve students in grades 6-8 \((n = 115)\), 86% \((n = 90)\) of them have or would allow opt out. By contrast, participants who reported their school as serving grades 9-12 \((n = 135)\), less than 70% \((n = 93)\) have or would allow opt out. Nineteen participants identified their school as serving grades 6-12, and 84% \((n = 16)\) reported they have or would allow opt out. Five participants identified their school as serving grades K-8, and 80% \((n = 4)\) have or would allow opt out. Less than 5% of the participants selected “other” to describe the grade level served. Table 11 shows frequency results for grade level served and the decision to allow or not allow opt out.

Table 11

*Frequency Results for Grade Level Served and Opt-out Practices \([H_01(e)]\)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Grades</th>
<th>Have or would allow opt out</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe your school (grade level served)</td>
<td>K-8</td>
<td>Count ((n)) 4</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 80.0%</td>
<td>20.0%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6-8</td>
<td>Count ((n)) 90</td>
<td>15</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 85.7%</td>
<td>14.3%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6-12</td>
<td>Count ((n)) 16</td>
<td>3</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 84.2%</td>
<td>15.8%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9-12</td>
<td>Count ((n)) 93</td>
<td>42</td>
<td>135</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 68.9%</td>
<td>31.1%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>Count ((n)) 10</td>
<td>7</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 58.8%</td>
<td>41.2%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Count ((n)) 213</td>
<td>68</td>
<td>281</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 75.8%</td>
<td>24.2%</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* \(X^2 (4) = 12.593, p = .013, N = 281,\) Reject \(H_{01(e)}\), Effect-size (Cohen’s \(d\)) = 0.486
Chi-square analysis showed a significant relationship between grade level served and allowing or not allowing a student to opt out of evolution \[X^2 (4) = 12.593, p = .013\] and the null hypothesis \(H_01(e)\) was rejected. There was a statistically significant relationship between grade level served and use or non-use of opt-out practice.

Participants in this study who were employed in schools serving students in grades 6-8 and allowed opt out also perceived more than 50% of the parents were involved in school activities (see Table 15 for parent involvement).

**Parent involvement.** Choices for parent involvement included a) minimal, defined as less than 20% of the parents were involved in school activities; b) sometimes, defined as 20-50% of the parents were involved in school activities; c) often, defined as 50-80% of the parents were involved in school activities; and d) very often, defined as greater than 80% of the parents were involved in school activities. Seventy-seven percent \((n = 165)\) of the “Yes” subgroup reported the parent involvement at their school as minimal or sometimes. Table 12 shows frequency results for parent involvement and the decision to allow or not allow a student to opt out of class when evolution is taught.

Chi-square analysis did not show a significant relationship between parent involvement and allowing or not allowing a student to opt out of evolution \[X^2 (3) = 1.397, p = .706\] and the null hypothesis \(H_01(e)\) was not rejected. There was not a statistically significant relationship between parent involvement and use or non-use of opt-out practice.
Table 12

*Frequency Results for Parent Involvement and Opt-out Practices [H₀₁(f)]*

<table>
<thead>
<tr>
<th>Item</th>
<th>Involvement</th>
<th>Have or would allow opt out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Which of the following best describes the involvement and participation of the parents in school events and school-sponsored activities?</td>
<td>Minimal &lt;20%</td>
<td>Count (n)</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sometimes 20-50%</td>
<td>Count (n)</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Often 50-80%</td>
<td>Count (n)</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very often &gt;80%</td>
<td>Count (n)</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count (n)</td>
<td>213</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td>75.8% 24.2% 100%</td>
</tr>
</tbody>
</table>

*Note. X²(3) = 1.397, p = .706, N = 281, Fail to reject H₀₁(f), Effect-size (Cohen’s d) = 0.110*

**Free and/or reduced lunch (F/RL).** Participant responses were grouped into those below 50% F/RL population and those above 50% F/RL population because this is the cut-off used for Title I school eligibility. Forty-one percent (n = 28) of the participants in the “No” subgroup reported that more than 50% of their student population receiving F/RL. Sixty percent (n = 128) of the “Yes” subgroup participants identified that more than half of their student population received free and/or reduced lunch (F/RL). Table 13 shows frequency results for students receiving F/RL and the decision to allow opt out.
Table 13

*Frequency Results for F/RL* and Opt Out Practices [H01(g)]*

<table>
<thead>
<tr>
<th>Item</th>
<th>F/RL*</th>
<th>Have or would allow opt out</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>What percentage of students at your school qualify and/or receive free-and-reduced lunch?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population &lt;20%</td>
<td>Count (n)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>70.0%</td>
<td>30.0%</td>
</tr>
<tr>
<td>Population 20-50%</td>
<td>Count (n)</td>
<td>70</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>67.3%</td>
<td>32.7%</td>
</tr>
<tr>
<td>Population 50-80%</td>
<td>Count (n)</td>
<td>89</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>80.2%</td>
<td>19.8%</td>
</tr>
<tr>
<td>Population &gt;80%</td>
<td>Count (n)</td>
<td>39</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>86.7%</td>
<td>13.3%</td>
</tr>
<tr>
<td>Total</td>
<td>Count (n)</td>
<td>212</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>75.7%</td>
<td>24.3%</td>
</tr>
</tbody>
</table>

* Note. F/RL = Free and Reduced Lunch  

Note. X² (3) = 8.492, p = .037, N = 280. Reject H₀1(g). Effect-size (Cohen’s d) = 0.383

Overall, only 16% (n = 45) of the participants from both subgroups acknowledged more than 80% of their student population received F/RL. Eighty-seven percent (n = 39) of the participants who stated more than 80% of their student population received F/RL (n = 45) also stated they have or would allow a student to opt out of class when evolution is taught. Chi-square analysis showed a significant relationship between percentage of students on F/RL and allowing or not allowing a student to opt out of evolution [X² (3) = 8.492, p = .037] so the null hypothesis H₀1(e) was rejected. There was a statistically significant relationship between percentage of students receiving F/RL and use or non-use of opt-out practice. Participants in this study who reported that they are employed at a
school serving a student population greater than 50% receiving F/RL were also more likely to allow opt out when the scientific theory of evolution is taught.

In summary for research question 1, there was a correlation between grade-level served and percentage of students receiving F/RL and secondary school administrators’ decision to allow or not allow students to opt out of academics involving the scientific theory of evolution. Overall, 67% (n = 84) of the participants that served a student population with less than 50% receiving F/RL have or would allow opt out, compared to 82% (n = 128) of the participants that served populations with greater than 50% FRL allowing opt out.

Relationship between individual characteristics and opt-out practices. The survey asked four questions (items 8, 9, 10, and 11) to determine the participants’ individual characteristics, including years experience in education and as a school-based administrator, highest degree earned, and certification area. Significance values (p value) less than 0.05 were considered directly related.

Years experience in education. Collectively, more than 65% (n = 182) of the participants in this study have worked more than 15 years in the field of education and 28% (n = 79) had more than 25 years experience in education. There was no significant relationship between participants’ years of experience in education between the “Yes” and “No” subgroups. Table 14 shows frequency results for participants’ years experience in education and the decision to allow or not allow opt out.
Table 14

*Frequency Results for Years in Education and Opt Out Practices [H₀₂(a)]*

<table>
<thead>
<tr>
<th>Item</th>
<th>Years in Education</th>
<th>Have or would allow opt out</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Total</td>
</tr>
<tr>
<td>How many years have you been working in the field of education?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>Count (n)</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>75.0%</td>
<td>25.0%</td>
<td>100%</td>
</tr>
<tr>
<td>6-10</td>
<td>Count (n)</td>
<td>24</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>80.0%</td>
<td>20.0%</td>
<td>100%</td>
</tr>
<tr>
<td>11-15</td>
<td>Count (n)</td>
<td>46</td>
<td>16</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>74.2%</td>
<td>25.8%</td>
<td>100%</td>
</tr>
<tr>
<td>16-20</td>
<td>Count (n)</td>
<td>47</td>
<td>18</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>72.3%</td>
<td>27.7%</td>
<td>100%</td>
</tr>
<tr>
<td>21-25</td>
<td>Count (n)</td>
<td>27</td>
<td>11</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>71.1%</td>
<td>28.9%</td>
<td>100%</td>
</tr>
<tr>
<td>26+</td>
<td>Count (n)</td>
<td>64</td>
<td>15</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>81.0%</td>
<td>19.0%</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>Count (n)</td>
<td>211</td>
<td>67</td>
<td>278</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>75.9%</td>
<td>24.1%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Note. X² (5) = 2.452, p = .784, N = 278, Fail to reject H₀₂(a), Effect-size (Cohen’s d) = 0.072*

Chi-square analysis did not show a significant relationship between participants’ years experience in education and allowing or not allowing a student to opt out of evolution [X² (5) = 2.452, p = .784] and the null hypothesis H₀₂(a) was not rejected. There was no statistically significant relationship between years experience in education and use or non-use of opt-out practice. More participants stated they have or would allow a student to opt out of class when the scientific theory of evolution is taught, regardless of the number of years working in the field of education.
Years experience in administration. About 5% \((n = 15)\) of the participants in both subgroups stated they had less than one year experience in school administration.

Table 15 shows the frequency results for participants’ years experience in school administration and the decision to allow or not allow a student to opt out of class when evolution is taught.

Table 15

*Frequency Results for Years in Administration and Opt Out Practices \([H_02(b)]\)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Years in Admin.*</th>
<th>Have or would allow opt out</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count ((n))</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>How many years have you been a school administrator?</td>
<td>&lt; 1 Count ((n))</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 86.7%</td>
<td>13.3%</td>
</tr>
<tr>
<td></td>
<td>1-5 Count ((n))</td>
<td>79</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 75.2%</td>
<td>24.8%</td>
</tr>
<tr>
<td></td>
<td>6-10 Count ((n))</td>
<td>62</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 80.5%</td>
<td>19.5%</td>
</tr>
<tr>
<td></td>
<td>11-15 Count ((n))</td>
<td>28</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 68.3%</td>
<td>31.7%</td>
</tr>
<tr>
<td></td>
<td>16-20 Count ((n))</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 73.1%</td>
<td>26.9%</td>
</tr>
<tr>
<td></td>
<td>21-25 Count ((n))</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 75.0%</td>
<td>25.0%</td>
</tr>
<tr>
<td></td>
<td>26+ Count ((n))</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 75.0%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count ((n))</td>
<td>213</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% 76.1%</td>
<td>23.9%</td>
</tr>
</tbody>
</table>

*Note. Admin. = Administration*

*Note. \(X^2 (6) = 3.303, p = .770, N = 280\), Fail to reject \(H_02(b)\), Effect-size (Cohen’s \(d\)) = 0.114*
Overall, more than 70% (n = 197) of the participants in both subgroups had 10 years or less experience as a school administrator, and 43% (n = 120) of the participants in both subgroups had five or less years experience as a school administrator.

For Chi-square analysis, years experience was divided into two subgroups: less than or greater than 15 years experience in administration. Chi-square analysis did not show a significant relationship between participants’ years experience in administration and allowing or not allowing a student to opt out of evolution \( [X^2 (6) = 3.303, p = .770] \) and the null hypothesis \( H_0 \) (b) was not rejected. There was not a statistically significant relationship between years experience in administration and use or non-use of opt-out practice. More participants stated they have or would allow a student to opt out of class when the scientific theory of evolution is taught, regardless of the number of years in administration.

**Highest degree earned.** All participants had advanced degrees, the majority (72%) with master’s degrees or masters degrees plus post-secondary. About 25% of the participants had a specialist or doctoral degree. Table 16 shows frequency results for highest degree earned and the decision to allow or not allow a student to opt out of class when evolution is taught.

Chi-square analysis of the “Yes” and “No” subgroups did not show any significant relationship between highest degree earned and the decision to allow or not allow a student to opt out of class when evolution is taught \( [X^2 (3) = 3.716, p = .294] \) and the null hypothesis \( H_{01} \) (e) was not rejected. There was not a statistically significant relationship between highest degree earned and use or non-use of opt-out practice. More
participants stated they have or would allow a student to opt out of class when the scientific theory of evolution is taught, regardless of highest degree earned.

Table 16

Frequency Results for Highest Degree Earned and Opt Out Practices \([H_{02}(c)]\)

<table>
<thead>
<tr>
<th>Item</th>
<th>Degree</th>
<th>Have or would allow opt out</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the highest degree that you currently hold?</td>
<td>Master's</td>
<td>Count (n)</td>
<td>92</td>
<td>24</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>79.3%</td>
<td>20.7%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Master's + post grad</td>
<td>Count (n)</td>
<td>61</td>
<td>26</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>70.1%</td>
<td>29.9%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Specialist</td>
<td>Count (n)</td>
<td>34</td>
<td>7</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>82.9%</td>
<td>17.1%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Doctoral</td>
<td>Count (n)</td>
<td>26</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>72.2%</td>
<td>27.8%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Count (n)</td>
<td>213</td>
<td>67</td>
<td>280</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>76.1%</td>
<td>23.9%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note: \(X^2 (3) = 3.716, p = .294, N = 280\), Fail to reject \(H_{02}(c)\), Effect-size (Cohen’s \(d\)) = 0.067

Certification area. Participant certification areas were equally represented in the core subject areas (English/Reading, Mathematics, Science, and Social Studies). Sixteen percent \((n = 34)\) of “Yes” subgroup and 13% \((n = 9)\) of the “No” subgroup were certified in English and/or reading. About 15% of both subgroups were certified in mathematics. Eleven percent \((n = 24)\) of “Yes” subgroup and 21% \((n = 14)\) of the “No” subgroup were certified in science. Table 17 shows frequency results for certification area and the
decision to allow or not allow a student to opt out of class when the scientific theory of evolution is taught.

Table 17
*Frequency Results for Certification Area and Opt Out Practices [H₂(d)]*

<table>
<thead>
<tr>
<th>Item</th>
<th>Certification</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>In what subject(s) are/were you certified to teach?</td>
<td>English/Reading Count (n)</td>
<td>34</td>
<td>9</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>79.1%</td>
<td>20.9%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Math Count (n)</td>
<td>30</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>75.0%</td>
<td>25.0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Science Count (n)</td>
<td>24</td>
<td>14</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>63.2%</td>
<td>36.8%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Social Studies Count (n)</td>
<td>29</td>
<td>17</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>63.0%</td>
<td>37.0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Health /PE Count (n)</td>
<td>12</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>75.0%</td>
<td>25.0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Fine Arts Count (n)</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>60.0%</td>
<td>40.0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Other Count (n)</td>
<td>52</td>
<td>10</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>83.9%</td>
<td>16.1%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Multi Count (n)</td>
<td>29</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>93.5%</td>
<td>6.5%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Total Count (n)</td>
<td>213</td>
<td>68</td>
<td>281</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>75.8%</td>
<td>24.2%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note. $X^2 (7) = 15.868$, $p = .026$, $N = 281$, Reject $H_02(d)$, Effect-size (Cohen’s $d$) = 0.312

Chi-square analysis showed a significant relationship between certification area and the decision to allow a student to opt out of class when evolution is taught [$X^2 (7) = 15.868$, $p = .026$, $N = 281$, Reject $H_02(d)$, Effect-size (Cohen’s $d$) = 0.312]
\( p = 0.026 \) so the null hypothesis \( H_0 \) was rejected. There was a statistically significant relationship between certification area and the use or non-use of opt-out practice.

Participants in this study with a science subject area certification who were employed at high schools serving grades 9-12 (\( n = 18 \)) were less likely to allow students to opt out of the scientific theory of evolution than participants serving grades 9-12 with other certifications (see Table 11).

In summary, the participants’ individual characteristics for both subgroups were similar, with the exception of subject area certification. As expected, years in education did not coincide with years experience as a school administrator. There was a significant relationship between subject area certification and administrators allowing or not allowing students to opt out of the scientific theory of evolution. There was not a significant relationship between number of years in education or administration, highest degree earned and administrators allowing or not allowing students to opt out of the scientific theory of evolution. Items 12, 13, and 14 identified the participant subgroups.

**Relationship between participants’ actions and opt-out practices.** The survey asked five questions (items 16 through 20) to ascertain what actions administrators took that may relate to their choice to allow or not allow students to opt out of class when the scientific theory of evolution is taught. The degrees of freedom (\( df \)) for the five “yes” or “no” action statements was 1 (\( df = 1 \)). Variables with significance values (\( p \) value) less than 0.05 were considered directly related.

**Action of supporting the teaching of evolution.** Eighty-three percent (\( n = 165 \)) of the participants in the “Yes” subgroup supported the teaching of evolution at their school. More than 95% (\( n = 57 \)) of the “No” subgroup supported the teaching of evolution at
their school. Table 18 shows frequency results for the action of supporting the teaching of evolution at the school and opt-out practices.

Table 18

*Frequency Results for Action of Supporting the Teaching of Evolution and Opt-out Practices [H_03(a)]*

<table>
<thead>
<tr>
<th>Item</th>
<th>Answer</th>
<th>Have or would allow opt out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you support the teaching of evolution at your school?</td>
<td>Yes</td>
<td>Count (n) 165</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>74.3%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Count (n) 34</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>94.4%</td>
</tr>
<tr>
<td>Total</td>
<td>Count (n) 199</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>77.1%</td>
</tr>
</tbody>
</table>

*Note. X^2 (1) = 7.109, p = .008, N = 258, Reject H_03(a), Effect-size (Cohen’s d) = 0.472*

Chi-square analysis showed a significant relationship between the action of supporting the teaching of evolution at the school and the decision to allow a student to opt out of class when evolution is taught \[X^2 (1) = 7.109, p = .008\] so the null hypothesis \(H_03(a)\) was rejected. There was a statistically significant relationship between secondary school administrators’ action of supporting teaching evolution at the school and use or non-use of opt-out practice.

**Action of supporting the teaching of alternative theories.** Eighty-two percent \((n = 163)\) of the participants in the “Yes” subgroup supported the teachers’ academic freedom to teach alternative theories to evolution. Approximately 66\% \((n = 40)\) of the “No” subgroup supported the teachers’ academic freedom to teach alternative theories to
evolution. Table 19 shows frequency results for participant action of supporting the science teachers’ academic freedom to teach alternative theories to evolution.

Table 19

*Frequency Results for Action of Supporting the Teachers’ Academic Freedom to Teach Alternative Theories and Opt-out Practices [H₀3(b)]*

<table>
<thead>
<tr>
<th>Item</th>
<th>Answer</th>
<th>Have or would allow opt out</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you support the science teachers’ academic freedom to teach alternative theories to evolution in science classes?</td>
<td>Yes</td>
<td>Count (n)</td>
<td>163</td>
<td>40</td>
<td>203</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>80.3%</td>
<td>19.7%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Count (n)</td>
<td>36</td>
<td>20</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>64.3%</td>
<td>35.7%</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>Count (n)</td>
<td></td>
<td>199</td>
<td>60</td>
<td>259</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>76.8%</td>
<td>23.2%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Note.* $X^2(1) = 6.321, p = .012, N = 259,$ Reject $H₀3(b),$ Effect-size (Cohen’s $d$) = 0.328

Chi-square analysis showed a significant relationship between the action of supporting the teachers’ academic freedom to teach alternative theories in conjunction with the scientific theory of evolution [$X^2(1) = 6.321, p = .012$] so the null hypothesis $H₀3(b)$ was rejected. There was a statistically significant relationship between secondary school administrators’ action of supporting the teachers’ academic freedom to teach alternative theories in conjunction with the scientific theory of evolution and use of opt-out practice. Administrators, who participated in this study and indicated that they support the teaching of alternative theories, also supported teaching evolution (Table 21).

*Action of discussing that teaching evolution is required.* Collectively, less than 25% of the participants in this study met and/or discussed with the science teachers that
they are required to teach evolution concepts. By subgroup, 18% (n = 39) of the “Yes” group and 30% (n = 18) of the “No” subgroup met and/or discussed with the science teachers that they are required to teach evolution concepts. Table 20 shows frequency results for participant action of discussing with the science teachers that they are required to teach evolution concepts and allowing or not allowing opt out.

Table 20

*Frequency Results for Action of Discussing with the Science Teachers that they are Required to Teach Evolution Concepts and Opt-out Practices [H\textsubscript{0}3(c)]*

<table>
<thead>
<tr>
<th>Item</th>
<th>Answer</th>
<th>Have or would allow opt out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you met and/or discussed with the science teachers that they are required to teach evolution concepts?</td>
<td>Yes</td>
<td>Count (n)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Count (n)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Count (n)</td>
</tr>
</tbody>
</table>

*Note.* $X^2 (1) = 3.217, p = .073, N = 259$, Fail to reject $H_0\textsubscript{3(c)}$, Effect-size (Cohen’s $d$) = 0.255

Chi-square analysis did not show any significant relationship between the action of discussing with science teachers that evolution must be taught and the decision to allow or not allow opt out [$X^2 (1) = 3.217, p = .073$] and the null hypothesis $H_0\textsubscript{3(c)}$ was not rejected. There was not a statistically significant relationship between secondary school administrators’ action of meeting/discussing with the science teachers that they are required to teach evolution concepts and use or non-use of opt-out practice.
Action of asking the science teachers to de-emphasize the teaching of evolution.

Overall, almost none \((n = 1)\) of the participants have asked the science teachers to de-emphasize the teaching of evolution in their classes. Table 21 shows frequency results for action of asking teachers to de-emphasize the teaching of evolution and opt-out practices.

Table 21

*Frequency Results for Action of Asking Teachers to De-emphasize the Teaching of Evolution and Opt-out Practices \([H_03(d)]\)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Answer</th>
<th>Have or would allow opt out</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you asked the science teachers to de-</td>
<td>Yes</td>
<td>Yes</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>emphasize the teaching of evolution in their</td>
<td></td>
<td>%</td>
<td>100.0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>classes?</td>
<td>No</td>
<td>Count ((n))</td>
<td>200</td>
<td>58</td>
<td>258</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>77.5%</td>
<td>22.5%</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>Count ((n))</td>
<td></td>
<td>201</td>
<td>58</td>
<td>259</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>77.6%</td>
<td>22.4%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note. \(X^2 (1) = 0.290, p = .590, N = 259\), Fail to reject \(H_03(d)\)

Chi-square analysis did not show a significant relationship between the action of asking teachers to de-emphasize the theory of evolution in class and the decision to allow or not allow a student to opt out of class when evolution is taught \([X^2 (1) = 0.290, p = .590]\) and the null hypothesis \(H_03(d)\) was not rejected. There was not a statistically significant relationship between secondary school administrators’ action of asking the science teachers to de-emphasize the teaching of evolution in their classes and use of opt-out practice.
Action of allowing a student to be assigned an alternate assignment. Overall, 86% ($n = 222$) of the administrators who participated in the survey would allow a student to be assigned an alternative assignment when evolution is taught. Less than 50% ($n = 27$) of the participants in the “No” subgroup would allow a student to be assigned an alternative assignment when evolution is taught in the science classes. Eighty-eight percent ($n = 195$) of the participants in the “Yes” subgroup would allow a student to be assigned an alternate assignment. Since an alternative assignment could be interpreted as the same as allowing opt out, a high probability that these two variables are dependent on one another was expected. Table 22 shows frequency results for the action of allowing a student to be assigned an alternative assignment and the decision to allow or not allow a student to opt out of class when evolution is taught.

Table 22

<table>
<thead>
<tr>
<th>Item</th>
<th>Answer</th>
<th>Have or would allow opt out</th>
<th>Count ($n$)</th>
<th>%</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</td>
<td>Yes</td>
<td></td>
<td>195</td>
<td></td>
<td>87.8%</td>
<td>12.2%</td>
<td>222</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
<td>6</td>
<td></td>
<td>16.7%</td>
<td>83.3%</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>201</td>
<td></td>
<td>77.9%</td>
<td>22.1%</td>
<td>258</td>
</tr>
</tbody>
</table>

Note. $X^2 (1) = 91.162, p = .000, N = 258$, Reject $H_03(e)$, Effect-size (Cohen’s $d$) = 1.328
Chi-square analysis showed a significant relationship between the action of allowing a student to be assigned an alternate assignment when evolution is taught \( \chi^2(1) = 91.162, p = .000 \) so the null hypothesis \( H_0 \) was rejected. There was a statistically significant relationship between secondary school administrators’ action of allowing a student to be assigned an alternate assignment when evolution is taught and use or non-use of opt-out practice. Administrators, who participated in this study and indicated that they support the teaching of alternative theories, also supported assigning alternative assignments to students when evolution is taught.

In summary, there was a significant relationship between supporting the teaching of evolution, supporting teachers’ academic freedom to teach alternative theories, and administrators allowing or not allowing opt out of the scientific theory of evolution. There was also a strong correlation between opt out and allowing a student to be assigned an alternative assignment when the scientific theory of evolution is taught.

**Relationship between participants’ perceptions and opt-out practices.** The survey asked six questions (items 21 through 26) to determine the participants’ perceptions about the scientific theory of evolution, ID, and student and parent rights to opt out their child from class because of personal/religious beliefs. Perception statements were answered using the Likert-type scale: strongly disagree, disagree, undecided/do not know, agree, and strongly agree. Degrees of freedom \( (df) \) for all statements was 4 \((df=4)\). Significance values \( (p \ value) \) less than 0.05 were considered directly related.

**Perception that statements of belief cannot be proved or disproved through scientific investigation.** Less than 50% \((n = 11)\) of the participants in both subgroups agreed that statements of belief cannot be proved or disproved through scientific
investigation. This item was designed to determine participant background experience with the limits of scientific investigation. There was no significant relationship between the “Yes” and “No” subgroups and their agreement with this statement. Table 23 shows the frequency results for the two subgroups for the perception that beliefs cannot be proved or disproved through scientific investigation.

Table 23

*Frequency Results for Perception Statement that Beliefs Cannot be Proved or Disproved Through Scientific Investigation [H₀₄(a)]*

<table>
<thead>
<tr>
<th>Statement of belief cannot be proved or disproved through scientific investigation.</th>
<th>Agreement Level</th>
<th>Have or would allow opt out</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>Count (n)</td>
<td>20</td>
<td>6</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>76.9%</td>
<td>23.1%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>Count (n)</td>
<td>56</td>
<td>11</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>83.6%</td>
<td>16.4%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Undecided</td>
<td>Count (n)</td>
<td>33</td>
<td>11</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>75.0%</td>
<td>25.0%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>Count (n)</td>
<td>53</td>
<td>19</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>73.6%</td>
<td>26.4%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>Count (n)</td>
<td>31</td>
<td>8</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>79.5%</td>
<td>20.5%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count (n)</td>
<td>193</td>
<td>55</td>
<td>248</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>77.8%</td>
<td>22.2%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* $X^2 (4) = 2.306, p = .680, N = 248$, Fail to reject $H₀₄(a)$, Effect-size (Cohen’s $d$) = 0.095

Chi-square analysis did not show a significant relationship between administrators’ perception that statements of belief cannot be proved or disproved through scientific investigation and allowing or not allowing a student to opt out of
evolution \[ X^2 (4) = 2.306, \ p = .680 \] and the null hypothesis \( H_0^4(a) \) was not rejected. There was not a statistically significant relationship between administrators’ perception that statements of belief cannot be proved or disproved through scientific investigation and use or non-use of opt-out practice.

Perception that there are other theories, such as intelligent design, that should be taught in conjunction with the theory of evolution. Table 24 shows the frequency results for the perception statement that other theories should be taught in conjunction with evolution.

Table 24
Frequency Results for Perception Statements that Other Theories Should be Taught in Conjunction With the Theory of Evolution \( [H_0^4(b)] \)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agreement Level</th>
<th>Have or would allow opt out</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are other theories, such as ID, that should be taught in conjunction with the theory of evolution.</td>
<td>Strongly</td>
<td>Count (n) 21</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>% 72.4% 27.6% 100.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>Count (n) 30</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>% 76.9% 23.1% 100.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Undecided</td>
<td>Count (n) 59</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>% 80.8% 19.2% 100.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>Count (n) 57</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>% 78.1% 21.9% 100.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strongly</td>
<td>Count (n) 29</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>% 78.4% 21.6% 100.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Count (n) 196</td>
<td>251</td>
</tr>
<tr>
<td></td>
<td>% 78.1% 21.9% 100.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. \( X^2 (4) = 0.897, \ p = .925, \ N = 251, \) Fail to reject \( H_0^4(b) \), Effect-size (Cohen’s \( d \)) = 0.073
Less than 30% \((n = 51)\) of the “Yes” and “No” subgroups disagreed that other theories, such as ID, should be taught in conjunction with the theory of evolution, and about 30% \((n = 73)\) of both subgroups were undecided about this statement. About 25% \((n = 51)\) of the “Yes” subgroup and 31% \((n = 17)\) of the “No” subgroup strongly disagreed/disagreed that other theories should be taught in conjunction with the theory of evolution. Almost 45% \((n = 110)\) of the participants in both subgroups agreed that other theories, such as ID, should be taught in conjunction with the theory of evolution and allowing opt out.

Chi-square analysis did not show a significant relationship between administrators’ perception that other theories, such as ID, should be taught in conjunction with the theory of evolution and the decision to allow or not allow a student to opt out of evolution \(X^2 (4) = 0.897, p = .925\) and the null hypothesis \(H_0\) was not rejected.

There was not a statistically significant relationship between administrators’ perception that other theories, such as ID, should be taught in conjunction with the theory of evolution and use or non-use of opt-out practice.

**Perception that evolution is the unifying theme in biology.** Sixty-seven percent \((n = 37)\) of the “No” subgroup agreed that evolution is a central and unifying theme in biology, but 16% \((n = 10)\) of the “No” subgroup were undecided. Less than 50% \((n = 95)\) of the “yes” subgroup agreed that evolution is a central and unifying theme in biology and 27% \((n = 53)\) of the “Yes” subgroup were undecided. Table 25 shows the frequency results for participants’ perception that evolution is the unifying theme in biology.
Table 25

Frequency Results for Perception Statements that Evolution is a Central and Unifying Theme in Biology [H₀₄(c)]

<table>
<thead>
<tr>
<th>Likert-type Item</th>
<th>Agreement Level</th>
<th>Have or would allow opt out</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evolution is a central and unifying theme in biology.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly</td>
<td>Count (n)</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Disagree</td>
<td>%</td>
<td>88.2%</td>
<td>100%</td>
</tr>
<tr>
<td>Disagree</td>
<td>Count (n)</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>84.2%</td>
<td>100%</td>
</tr>
<tr>
<td>Undecided</td>
<td>Count (n)</td>
<td>53</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>84.1%</td>
<td>100%</td>
</tr>
<tr>
<td>Agree</td>
<td>Count (n)</td>
<td>74</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>74.7%</td>
<td>100%</td>
</tr>
<tr>
<td>Strongly</td>
<td>Count (n)</td>
<td>21</td>
<td>33</td>
</tr>
<tr>
<td>Agree</td>
<td>%</td>
<td>63.6%</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>Count (n)</td>
<td>195</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>78.0%</td>
<td>22.0%</td>
</tr>
</tbody>
</table>

Note. \(X^2 (4) = 7.848, p = .097, N = 250\), Fail to reject \(H₀₄(c)\), Effect-size (Cohen’s \(d\)) = 0.400

Chi-square analysis did not show a significant relationship between administrators’ perception that evolution is a central and unifying theme in biology and the decision to allow or not allow a student to opt out of evolution \([X^2 (4) = 7.848, p = .097]\) and the null hypothesis \(H₀₄(c)\) was not rejected. There was not a statistically significant relationship between administrators’ perception that evolution is a central and unifying theme in biology and use or non-use of opt-out practice.

**Perception that the world is too complex to have come about without the active and repeated intervention of a higher power.** About 48% \((n = 89)\) of the “Yes” subgroup agreed that the world is too complex to have come about without the active and repeated
intervention of a higher power, and about 27% \((n = 50)\) of the “Yes” subgroup was undecided. Similarly, 50% \((n = 27)\) of the “No” subgroup agreed that the world is too complex to have come about without the active and repeated intervention of a higher power, and about 22% \((n = 12)\) were undecided. Table 26 shows frequency results for the perception statement that the world is too complex to have come about without the active and repeated intervention of a higher power.

Table 26

*Frequency Results for Perception Statements that the World is too Complex to Have Come About Without the Active and Repeated Intervention of a Higher Power \([H_04(d)]\)*

<table>
<thead>
<tr>
<th>Likert-type Item</th>
<th>Agreement Level</th>
<th>Have or would allow opt out</th>
<th>(n)</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>The world is too complex to have come about without the active and repeated intervention of a higher power.</td>
<td>Strongly Disagree</td>
<td>Count ((n))</td>
<td>22</td>
<td>73.3%</td>
<td>8</td>
<td>26.7%</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>Count ((n))</td>
<td>25</td>
<td>75.8%</td>
<td>8</td>
<td>24.2%</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Undecided</td>
<td>Count ((n))</td>
<td>50</td>
<td>80.6%</td>
<td>12</td>
<td>19.4%</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>Count ((n))</td>
<td>35</td>
<td>70.0%</td>
<td>15</td>
<td>30.0%</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>Count ((n))</td>
<td>54</td>
<td>81.8%</td>
<td>12</td>
<td>18.2%</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Count ((n))</td>
<td>186</td>
<td>77.2%</td>
<td>55</td>
<td>22.8%</td>
<td>241</td>
</tr>
</tbody>
</table>

*Note.* \(X^2\ (4) = 2.982, \ p = .561, N = 241,\) Fail to reject \(H_04(c),\) Effect-size \((Cohen’s \ d) = 0.096\)

Chi-square analysis did not show a significant relationship between administrators’ perception that the world is too complex to have come about without the active and
repeated intervention of a higher power and the decision to allow or not allow a student to opt out of evolution \[X^2 (4) = 2.982, p = .561\] and the null hypothesis \(H_04(d)\) was not rejected. There was not a statistically significant relationship between administrators’ perception that the world is too complex to have come about without the active and repeated intervention of a higher power and use or non-use of opt-out practice.

**Perception that all students should have the opportunity to learn about evolution.** Table 27 shows frequency results for the perception statement that all students should have the opportunity to learn about evolution.

**Table 27**

*Frequency Results for Perception Statements that all Students Should Have the Opportunity to Learn About Evolution \([H_04(e)]\)*

<table>
<thead>
<tr>
<th>Likert-type Item</th>
<th>Agreement Level</th>
<th>Have or would allow opt out</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All students should have the opportunity to learn about evolution.</td>
<td>Strongly</td>
<td>Count (n)</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Disagree</td>
<td>% 75.0%</td>
<td>25.0%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>Count (n)</td>
<td>11</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>% 91.7%</td>
<td>8.3%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undecided</td>
<td>Count (n)</td>
<td>21</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>% 95.5%</td>
<td>4.5%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>Count (n)</td>
<td>116</td>
<td>32</td>
<td>148</td>
</tr>
<tr>
<td>% 78.4%</td>
<td>21.6%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>Count (n)</td>
<td>41</td>
<td>19</td>
<td>60</td>
</tr>
<tr>
<td>% 68.3%</td>
<td>31.7%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count (n)</td>
<td>195</td>
<td>55</td>
<td>250</td>
</tr>
<tr>
<td>% 78.0%</td>
<td>22.0%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. \(X^2 (4) = 8.534, p = .074, N = 250, \) Fail to reject \(H_04(e)\), Effect-size (Cohen’s \(d\)) = 0.317*
Only 80% \((n = 157)\) of the “Yes” subgroup agreed that all students should have the opportunity to learn about evolution, and more than 90% \((n = 51)\) of the “No” subgroup also agreed with this statement. More than 10% \((21)\) of the “Yes” subgroup was undecided but only 2% \((n = 1)\) of the participants in the “No” subgroup were undecided.

Chi-square analysis did not show a significant relationship between administrators’ perception that all students should have the opportunity to learn about evolution and the decision to allow or not allow a student to opt out of evolution \([X^2 (4) = 8.534, p = .074]\) and the null hypothesis \(H_0\) was not rejected. There was not a statistically significant relationship between administrators’ perception that all students should have the opportunity to learn about evolution and use or non-use of opt-out practice.

**Perception that parents should have the right to opt out their child from class when evolution is taught.** Sixty-seven percent \((n = 36)\) of the “No” subgroup disagreed that parents should have the right to opt out their child from class when evolution is taught, but only 7% \((n = 14)\) of the “Yes” subgroup disagreed with this statement. Table 28 shows the frequency results for the perception statement that parents should have the right to opt out their child from class.

Chi-square analysis showed a significant relationship between administrators’ perception that parents should have the right to opt out their child from class when evolution is taught and the decision to allow or not allow a student to opt out of evolution \([X^2 (4) = 102.326, p = .000]\) so the null hypothesis \(H_0\) was rejected.
Table 28

*Frequency Results for Perception Statements that Parents Should Have the Right to Opt Out their Child From Class When Evolution is Taught [H₀₄(f)]*

<table>
<thead>
<tr>
<th>Likert-type Item</th>
<th>Agreement Level</th>
<th>Have or would allow opt out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count (n)</td>
<td>Yes</td>
</tr>
<tr>
<td>I think parents should have the right to opt out their child from class when evolution is taught.</td>
<td>Strongly Disagree</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>18.8%</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>32.4%</td>
</tr>
<tr>
<td></td>
<td>Undecided</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>66.7%</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>92.7%</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>96.3%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>194</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>78.2%</td>
</tr>
</tbody>
</table>

*Note.* \(X^2(4) = 102.326, p = .000, N = 248,\) Reject H₀₄(f), Effect-size (Cohen’s \(d\)) = 1.713

There was a statistically significant relationship between administrators’ perception that parents should have the right to opt out their child from class when evolution is taught and use or non-use of opt-out practice. Many participants in this study who were employed in schools serving students in grades 6-8 also perceived parents should have the right to opt out their child from class when evolution is taught.

In summary, percentages for the “Yes” and “No” subgroups were similar for five of the six perception statements. Chi-square analysis showed there was a significant
relationship between participants’ agreement about parents having the right to opt out their child from class when the scientific theory of evolution is taught and the decision to allow or not allow a student to opt out of class when the scientific theory of evolution is taught. There is a direct relationship between the perception of parental rights and allowing or not allowing a student to opt out of class when evolution is taught.

**Relationship between participants’ awareness and opt-out practices.** The survey asked three questions (items 27, 28, and 29) to determine the participants’ awareness of the Florida state statute requiring students to learn the scientific theory of evolution and parent support for teaching evolution. Awareness statements were answered using the Likert-type scale: strongly disagree, disagree, undecided/do not know, agree, and strongly agree. Degrees of freedom (df) for all statements was 4 (df=4). Significance values (p value) less than 0.05 were considered directly related.

**Awareness that all students are required to learn about the theory of evolution.** Less than 15% (n = 30) of the participants in the “Yes” subgroup agreed that all students are required to learn about the theory of evolution, regardless of parent or student beliefs, and more than 70% (n = 39) of the “No” subgroup agreed with this statement. More than 70% (n = 135) of the participants in the “Yes” subgroup disagreed that all students are required to learn about the theory of evolution, regardless of parent or student beliefs. Table 29 shows frequency results for the awareness statement that all students are required to learn about the theory of evolution, regardless of parent or student beliefs.
**Table 29**

*Frequency Results for Awareness that all Students are Required to Learn About the Theory of Evolution, Regardless of Parent or Student Beliefs* [H$_{05(a)}$]

<table>
<thead>
<tr>
<th>Likert-type Item</th>
<th>Agreement Level</th>
<th>Have or would allow opt out</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</td>
<td>Strongly</td>
<td>Count (n)</td>
<td>37</td>
</tr>
<tr>
<td>Disagree</td>
<td>%</td>
<td>92.5%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Disagree</td>
<td>Count (n)</td>
<td>98</td>
<td>8</td>
</tr>
<tr>
<td>Undecided</td>
<td>%</td>
<td>92.5%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Agree</td>
<td>Count (n)</td>
<td>26</td>
<td>5</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>%</td>
<td>83.9%</td>
<td>16.1%</td>
</tr>
<tr>
<td>Agree</td>
<td>Count (n)</td>
<td>26</td>
<td>27</td>
</tr>
<tr>
<td>%</td>
<td>%</td>
<td>49.1%</td>
<td>50.9%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>Count (n)</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Agree</td>
<td>%</td>
<td>25.0%</td>
<td>75.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count (n)</td>
<td>191</td>
<td>55</td>
</tr>
<tr>
<td>%</td>
<td>%</td>
<td>77.6%</td>
<td>22.4%</td>
</tr>
</tbody>
</table>

*Note.* $X^2 (4) = 69.665, p = .000, N = 246,$ Reject $H_{05(a)},$ Effect-size (Cohen’s $d$) = 1.299

Chi-square analysis showed a significant relationship between administrators’ awareness that all students are required to learn about the theory of evolution, regardless of parent or student beliefs, and allowing or not allowing a student to opt out of evolution $[X^2 (4) = 69.665, p = .000]$ so the null hypothesis $H_{05(a)}$ was rejected. There was a statistically significant relationship between administrators’ awareness that all students are required to learn about the theory of evolution, regardless of parent or student beliefs, and use or non-use of opt-out practice. Administrators in this study who disagreed that students are required to learn about evolution also perceived parents have the right to opt out their child from class when the scientific theory of evolution is taught.
Awareness of pressure from parents in the community to avoid teaching evolution concepts. Both the “Yes” subgroup \( (n = 15) \) and the “No” subgroup \( (n = 7) \) were similar in their agreement (less than 15%) that they have felt pressure from parents in their community to avoid teaching evolution concepts in science classes. Table 30 shows the frequency results for participants’ awareness of pressure from parents in the community to avoid teaching evolution concepts in science classes.

### Table 30

*Frequency Results for Awareness of Pressure from Parents in the Community to Avoid Teaching Evolution Concepts in Science Classes [H₀5(b)]*

<table>
<thead>
<tr>
<th>Likert-type Item</th>
<th>Agreement Level</th>
<th>Have or would allow opt out</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I have felt pressure from parents in my community to avoid teaching evolution</td>
<td>Strongly</td>
<td>Count ( (n) )</td>
<td>56</td>
<td>26</td>
<td>82</td>
</tr>
<tr>
<td>concepts in science classes.</td>
<td>Disagree %</td>
<td>68.3%</td>
<td>31.7%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>Count ( (n) )</td>
<td>101</td>
<td>20</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>83.5%</td>
<td>16.5%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Undecided</td>
<td>Count ( (n) )</td>
<td>23</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>92.0%</td>
<td>8.0%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>Count ( (n) )</td>
<td>12</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>63.2%</td>
<td>36.8%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strongly</td>
<td>Count ( (n) )</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>100.0%</td>
<td>.0%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>Count ( (n) )</td>
<td>195</td>
<td>55</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>78.0%</td>
<td>22.0%</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

*Note. \( X^2 (4) = 12.754, p = .013, N = 250, \) Reject \( H₀5(b) \), Effect-size \( \text{Cohen’s } d \) = 0.190*

Chi-square analysis showed a significant relationship between administrators’ awareness of pressure from parents in the community to avoid teaching evolution
concepts and allowing or not allowing a student to opt out of evolution \(X^2(4) = 12.754, \quad p = .013\) so the null hypothesis \(H_{05(a)}\) was rejected. There was a statistically significant relationship between administrators’ awareness of pressure from parents in the community to avoid teaching evolution concepts in science classes and use or non-use of opt-out practice.

**Awareness of whether or not the majority of parents of students who attend the participants’ school support the teaching of evolution.** Less than 25% \((n = 47)\) of the “Yes” subgroup agreed that the majority of parents of students who attend their school support the teaching of evolution, but 45% \((n = 25)\) of the “No” subgroup agreed with this statement. However, 68% \((n = 132)\) of the “Yes” subgroup and 44% \((n = 24)\) of the “No” subgroup were undecided on this statement. Table 31 shows the frequency results for the awareness statement of whether or not the majority of parents of students who attend the participants’ school support the teaching of evolution and the decision to allow or not allow a student to opt out of class when evolution is taught.

Chi-square analysis showed a significant relationship between administrators’ awareness that the majority of parents of students who attend my school support the teaching of evolution and allowing or not allowing a student to opt out of evolution \(X^2(4) = 11.395, \quad p = .022\) so the null hypothesis \(H_{05(a)}\) was rejected. There was a statistically significant relationship between administrators’ awareness that the majority of parents of students who attend my school support the teaching of evolution and use or non-use of opt-out practice. Since such a high percentage (62% overall) of the participants stated they did not know or were undecided whether or not the majority of
parents of students who attend their school support the teaching of evolution, the
significance value for this item may not be accurate.

Table 31

Frequency Results for Awareness that the Majority of Parents of Students who Attend
my School Support the Teaching of Evolution [H05(c)]

<table>
<thead>
<tr>
<th>Likert-type Item</th>
<th>Agreement Level</th>
<th>Have or would allow opt out</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>The majority of parents of students who attend my school support the teaching of evolution.</td>
<td>Strongly</td>
<td>Count (n)</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>%</td>
<td>66.7%</td>
<td>33.3%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>Count (n)</td>
<td>12</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>75.0%</td>
<td>25.0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Undecided</td>
<td>Count (n)</td>
<td>132</td>
<td>24</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>84.6%</td>
<td>15.4%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>Count (n)</td>
<td>37</td>
<td>19</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>66.1%</td>
<td>33.9%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Strongly</td>
<td>Count (n)</td>
<td>10</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>%</td>
<td>62.5%</td>
<td>37.5%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Count (n)</td>
<td>195</td>
<td>55</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>78.0%</td>
<td>22.0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note. $X^2 (4) = 11.395, p = .022, N = 250, Reject H05(c), Effect-size (Cohen’s $d$) = 0.280

In summary, there is a statistically significant relationship between
administrators’ awareness of pressure from parents in the community to avoid teaching
evolution concepts, awareness that all students are required to learn about the theory of
evolution, and awareness that the majority of parents of students who attend my school
support the teaching of evolution, and use or non-use of opt-out practice.
Hypotheses Validation

Chi-square statistics were used to determine if a significant relationship existed between administrators who allow opt out and administrators who do not allow opt out, and variables specified in five null hypotheses (see Appendix L for hypotheses verification). The table for upper critical values was used to reject or fail to reject the null hypothesis if the test statistic was greater than the tabled value for alpha = 0.05.

The null hypothesis ($H_0^1$) was that there was no statistically significant relationship between community and school demographics and use or non-use of opt-out practice. The null hypotheses for Florida region ($H_0^{1a}$), urbanization ($H_0^{1b}$), size of school ($H_0^{1c}$), type of school ($H_0^{1f}$), and use or non-use of opt-out practice, were not rejected because there were no statistically significant relationships. The null hypotheses for F/RL population (Reject $H_0^{1d}$), grade levels served (Reject $H_0^{1e}$), and use or non-use of opt-out practice were rejected. There were statistically significant relationships ($p < .05$) between percentage of students receiving free-and-reduced lunch, and grade levels served, and use or non-use of opt-out practice.

The null hypothesis ($H_0^2$) was that there was no statistically significant relationship between individual participant characteristics and use or non-use of opt-out practice. The null hypotheses for tenure in education ($H_0^{2a}$), experience as a school administrator ($H_0^{2b}$), highest degree attained ($H_0^{2d}$), and use or non-use of opt-out practice were not rejected because there was no statistically significant relationship. The null hypothesis for certification subject areas and use or non-use of opt-out practice was rejected (Reject $H_0^{2c}$).
The null hypothesis ($H_{03}$) was that there was no statistically significant relationship between secondary school administrators’ actions and use or non-use of opt-out practice. There was a statistically significant relationship between administrator support of the teaching of evolution, support of teacher’s academic freedom to teach alternative theories to evolution in science classes, allowing a student to be assigned an alternate assignment when evolution is taught, and use or non-use of opt-out practice (Reject $H_{03}$). Administrators who support teacher academic freedom to teach alternate theories to evolution also support the teaching of evolution.

The null hypothesis ($H_{04}$) was that there is no statistically significant difference in secondary school administrators’ attitudes and perceptions about evolution and use or non-use of opt-out practice. There was a statistically significant relationship between administrators’ perception that parents should have the right to opt out their child from class when evolution is taught, awareness of opt-out policies, required standards, and perceived parent rights, and use or non-use of opt-out practice (Reject $H_{05}$).

**Trends in Participant Comments from Open-Ended Questions**

Participant comments from the two open-ended items were analyzed for trends that supported the significant relationships between variables and the decision to allow or not allow a student to opt out of class when evolution is taught. Item 15 asked participants to elaborate on why they would make the decision to allow or not allow a student to opt out of class when evolution is taught. Item 30 asked the participants to share any concerns or issues that had in regards to the opt-out practices and the teaching of evolution in their school or district. In this study, 239 participants provided comments for at least one open-ended question. Sixteen participant comments could not be clearly
placed into themes, and the remaining 223 comments were placed into one of eight themes that justified the decision to allow or not allow opt out (see Appendix M for a detailed list of comments from participants). Open-ended comments from both items were organized into the following themes: (a) parent rights, (b) alternative assignment, (c) pro-ID language, (d) conflict avoidance, (e) district policy, (f) transference of current opt-out policies, (g) required state standards and curriculum, and (h) freedom of religion. Table 32 lists the themes found through analysis of the open-ended comments and the total number of participant comments that were categorized within each theme and by subgroup.

Table 32

*Open-ended Comments from Participants Categorized by Theme*

<table>
<thead>
<tr>
<th># of Comments / Theme (N = 223)</th>
<th>Description of Theme</th>
<th>“Yes” Subgroup Count (n) / Theme</th>
<th>“No” Subgroup Count (n) / Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 (4.5%)</td>
<td>Action of assigning an alternative assignment</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>13 (5.8%)</td>
<td>Action of avoiding conflict/confrontation with parents/community members</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>24 (10.7%)</td>
<td>Action of using pro-ID language such as <em>other theories and both sides of the issue</em></td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>8 (3.6%)</td>
<td>Action of applying current opt-out policies (human sexuality / health screenings) to controversial topics</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>48 (21.5%)</td>
<td>Awareness that teaching the scientific theory of evolution is required by state standards</td>
<td>5</td>
<td>43</td>
</tr>
<tr>
<td>9 (4.0%)</td>
<td>Perception of freedom of religion</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>100 (44.8%)</td>
<td>Perception of parent rights to determine the curriculum for their child</td>
<td>98</td>
<td>2</td>
</tr>
<tr>
<td>11 (4.9%)</td>
<td>Perception opt out is required by the district</td>
<td>9</td>
<td>2</td>
</tr>
</tbody>
</table>
Open-ended comments supported that most of the participants in this study who have or would allow a student to opt out of class when evolution is taught, stated that parent rights as the predominant reason for to allow opt out. Avoiding conflict, district required opt-out policies, and freedom of religion were also given as reasons by participants in the “Yes” subgroup for allowing a student to opt out of class when evolution is taught. Some comments revealed that the current State opt-out policies are being applied to topics outside of the approved opt-out exemptions and pro-ID language was used frequently to justify the decision to allow opt out. Almost 65% ($n = 43$) of the “No” subgroup participants ($n = 68$) referred to state required curriculum and graduation requirements as the basis for their decision to not allow opt out.

**Perception of parent rights to opt-out of required curriculum.** Open-ended comments supported participant perception that parent rights should supersede the state requirement that all students must learn about the scientific theory of evolution. Forty-five percent ($n = 100$) of the participants stated parent rights as the reason for allowing opt-out. Almost all ($n = 98$) of the participants who used parent rights as a basis for opt out also have or would allow a student to opt out of class when evolution is taught. Four percent ($n = 9$) of the participants perceived freedom of religion as a reason for opt out, and most ($n = 8$) were in the “Yes” subgroup.

Comments from the open-ended responses from middle school administrators in this study revealed that parent involvement and perceived parental rights to opt out their child from class was a predominant reason they allowed students to opt out. Some examples of comments that supported participant perception of rights to opt-out of required curriculum are listed below.
• We want parents to be involved, and then dictate what level of involvement.

• If a middle school parent had strong feelings about their … child learning the theories of evolution then I feel obligated to honor that request.

• I believe that it is a parent’s right to choose for their student at the middle school level.

• In middle school, parents are still an integral part of the educational team.

• If the parent is strong in their conviction and they do not want their child to be a part of this [evolution] then that will be the decision.

The responses from middle school administrators regarding parent requests to opt out their child from class, including state-mandated curriculum, appeared to be associated with the age-level of the child.

Most of the open-ended comments from participants in the “Yes” subgroup supported the decision to allow opt out because their perception was parent beliefs and rights superseded the state requirement that all students must learn about the scientific theory of evolution.

• It's the parents’ choice on whether or not they want the school to be responsible for giving their child this information.

• The decision should be the parents, not the school.

• We have a policy in our District that allows parents to opt out of any lesson they deem unfit for their child.

• I believe you still have to allow parents to choose what view they would like to assist their child in developing.

• If there is no parental approval, I would not allow it to be taught.
Many participants who perceived parent rights superseded state curriculum requirements also disagreed that students are required to learn about the scientific theory of evolution.

**Avoiding conflict with parents and community members.** There were a significant number of “undecided” responses about awareness of parent and community support of evolution. Because of this, open-ended statements were examined to determine if school administrator awareness of parent and community support for teaching evolution had any impact on allowing or not allowing opt out. Open-ended statements confirmed that avoiding confrontation with the community did play a role in participants’ decisions to allow opt out of evolution. About 6% (n = 13) of the participants stated their reason for allowing opt out was to avoid conflict or confrontation with parents and/or community members. All participants who used this rationale for opt out were in the “Yes” subgroup. Several statements revealed that some administrators in this study would allow opt out because the decision to *not* allow opt out may result in a confrontation with parents or possibly a lawsuit.

- I won't be the one telling a parent/student they have to take part. That is a lawsuit waiting to happen.
- When you get into the legalities of religion in the public schools, it can draw unwanted attention.

Appeasing the community they serve was another reason given from participants who have or would allow opt out.

- Evolution, in our community has the potential to be a controversial subject.
- The PR for the decision will have better results than the other choice.
In our community, parents are very vocal. Like any other request to opt out, we respect their request unless mandated.

Administrators in this study may be overlooking the state statutes and required curriculum because of their perception of parent rights, avoiding confrontation, and the politics within the school district and the community superseding these requirements, therefore influencing their decision to allow or not allow opt out.

**Applying current opt-out policies to topics not listed in statute.** Some comments revealed that the current State opt-out policies are being applied to topics outside of the approved opt-out exemptions and pro-ID language was used frequently to justify the decision to allow opt out. Less than 5% (n = 11) of the participant comments claimed the district required administrators to allow a parent to opt out their child from any topic the parent deemed controversial, and less than 4% (n = 8) of the participant comments confirmed the application of current opt-out policies, for human sexuality and health screenings, to controversial topics. With the exception of one participant, all participants who used district requirement or applied health/HIV opt-out policy to evolution were in the “Yes” subgroup and stated they have or would allow opt out. Several open-ended statements indicated that Florida statutes that allow opt out of human sexuality and health screenings may have been misinterpreted or expanded to include other controversial topics.

- If we have to let students opt out of vision and hearing screenings… and certain health subjects, why shouldn't we allow parents to opt out their students from the subject of evolution?
• It [allowing opt out of evolution] is the same practice used when parents opt out of other state/district adopted curriculum. The most common unit parents remove their child from is Human Growth and Development.

• We allow parents to opt out of sex education, the President's speeches, grief presentations, etc.

• School board rule dictates that you have to allow [a] student to get out because of some type of belief.

Use of language from Academic Freedom bills. Some statements from the participants’ open-ended responses were consistent with language in the pro-ID literature and may be impacting secondary administrators’ decisions to allow opt out. About 11% \( (n = 24) \) of the open-ended comments included pro-ID language, and were fairly equally distributed among the “Yes” \( (n = 14) \) and “No” \( (n = 10) \) subgroup participants who used pro-ID language in the open-ended comments. One high school administrator stated, “Evolution and creationism are both discussed in our county… Both are taught as theories, not laws. Students are expected to know about these theories.” Other comments from the open-ended questions indicated that participants perceived there to be two sides to the scientific theory of evolution, and teachers should present both sides and different views about the issue. Statements also included the language of critical analysis, which has appeared in most Academic Freedom bills (see Appendix D for sample Academic Freedom bills from various States).

• All ideas and viewpoints [italics added] must be considered when thinking critically [italics added].

• I think both evolution and its alternative [italics added] should be taught.
• If we are to be fair and balanced [italics added] . . . we should present all sides of an issue [italics added].

• Students need to learn to think and evaluate the evidence [italics added] . . . so the student can analyze, synthesize and critical analysis [italics added].

• Evolution is a theory [italics added] . . . our job is to present evolution and other theories or beliefs [italics added] so that the student can have the information to arrive at his own conclusion.

Language from highly publicized Academic Freedom bills designed by pro-ID interest groups, appeared in many of the participant comments.

**Awareness of state curriculum requirements.** Some participants in this study who stated they have not or would not allow opt out clarified through the open-ended responses their awareness that learning evolution is a state mandate for graduation and opt out is not a school decision. Almost 65\% (n = 43) of the “No” subgroup participants (n = 68) referred to state required curriculum and graduation requirements as the justification for their decision to not allow opt out. Twenty-two percent (n = 48) of the comments cited the NGSSS as the required curriculum and stated they were aware that teaching the scientific theory of evolution is required by state statute. Almost all (n = 43) of the participants who confirmed they were aware of the state requirement were in the “No” subgroup, and have not or would not allow a student to opt out of class when evolution is taught. Comments from several “No” subgroup participants were specific about graduation requirements and state assessments.
• Evolution makes up an entire standard of the Next Generation Sunshine State Standards. End of year assessments that determine high school graduation will include questions about evolution.

• Students will be tested on material that includes knowledge of the theory of evolution, whether they believe in it personally or not.

• If there are standards that are tied to the curriculum that involves evolution then it is impossible to master those skills if the student opts out.

Participants in this subgroup also stated they would not assign an alternative assignment to a student when evolution is taught. Participants in this subgroup who were certified in science stated they recognized evolution as an important component of the biological sciences and learning about evolution does not compromise personal or religious beliefs.

Summary

This chapter discussed the results from the survey and presented the findings for each research question. The population consisted of 297 Florida public secondary school administrators, amounting to about 9% of the sample population. Participants were divided into two groups: administrators who have allowed or would allow students to opt out of evolution, and administrators who did not allow or would not allow students to opt out of evolution. Descriptive statistics were used to determine relationships between participants’ perceptions, awareness, actions, community characteristics and school demographics and the application of opt-out practices involving the scientific theory of evolution.

With the exception of F/RL population and grade level served, community and school demographics did not show any significant correlation. The significance values
(<0.05) for grade level and percent F/RL suggests that the two variables are related to an administrators decision to allow or not allow opt out. Although most of the participants (about 75%) support the teaching of evolution and agreed that all students should have the opportunity to learn about evolution, they also support for the teachers’ academic freedom to teach alternative theories, such as ID, in conjunction with the theory of evolution. Those administrators who have or would allow opt out also answered affirmatively to the action question that they would allow a student to be assigned an alternative assignment when evolution is taught. Very few of the participants in the “Yes” subgroup (less than 15%) agreed that all students are required to learn about the theory of evolution, regardless of parent or student beliefs, which was in contrast to the “No” subgroup where almost 60% of the participants agreed that learning about evolution was a state requirement. Participant comments from the open-ended questions supported the perception that parent rights supersede required curriculum.

The next chapter discusses the findings for the five research questions, limitations, and implications for practice, policy, and further research.
Chapter 5: Discussion

The purpose of this study was to determine if secondary administrators have allowed or would allow parents to opt out their child from areas of the curriculum not identified by Florida statute, specifically the scientific theory evolution. This study analyzed the data collected from a survey that focused on community and school demographics, individual characteristics, action statements, perception statements, and awareness statements. Two open-ended items were used to determine trends within responses and to validate subgroup identification. This study represents a contribution to the existing literature on opt-out practices by administrators in Florida public secondary schools. This chapter presents a summary and discussion of the findings, summary of the hypotheses, conclusions, implications, limitations, and recommendations for further study and practice.

Summary of Findings

Survey data were analyzed to determine if certain factors played a role in public secondary school-based administrators’ opt-out practices in regards to the scientific theory of evolution. The factors examined were: community and school demographics; individual characteristics; actions; perception; and awareness. In Florida K-12 public schools, teachers are required to teach the scientific theory of evolution. Because Florida statutes have identified the academic exceptions for opting out, applying opt-out practice to the scientific theory of evolution is in conflict with Florida law. This study found that
75% \((n = 213)\) of the participants in this study stated that they have or would allow a student to opt out of class when the scientific theory of evolution is taught.

Data supported a correlation between grade levels served, percent of students receiving F/RL, perceived parent involvement, and the participant’s decision to allow students to opt out of class when the scientific theory of evolution is taught. Certification area, experience in education, and highest degree earned did not have a significant correlation with participant’s decision to allow opt out.

School-based administrators in this study perceived that teachers have the academic freedom to teach alternative theories, such as ID, even though the Florida standards specifically identify religious questions as outside of the boundaries of scientific investigation (SC.912.N.2.2). Participants also perceived that parents have the right to opt out their child from academics involving controversial topics such as the teaching of the scientific theory of evolution. Allowing students to opt out of the scientific theory of evolution may be a result of the participants not being aware that learning evolution is a state mandate, as per section 1003.42(2) of the Florida Statutes, or they may be misinterpreting the current opt-out policies for human sexuality and animal dissection to include other controversial topics.

**Research Questions**

Five research questions guided the analysis of secondary school administrators’ responses to survey items on personal attitudes and perceptions, awareness, and actions as they relate to their choice to allow or not allow opt out of academics, specifically the scientific theory of evolution.
1. Is there a correlation between community and school demographics and secondary school administrators’ choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

2. Is there a correlation between background knowledge and experience and secondary school administrators’ choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

3. How do secondary school administrators’ actions relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

4. How do secondary school administrators’ personal attitudes and perceptions relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

5. How do secondary school administrators’ awareness of opt-out policies and required standards relate to their choice to allow or not allow students to opt out of academics involving the scientific theory of evolution?

Previous research on the teaching of evolution addressed primarily teachers’ knowledge of evolution (Fowler & Meisels, 2010; Moore & Cotner, 2009; Moore et al., 2006; Nadelson & Sinatra, 2009; Rutledge & Sadler, 2007; Rutledge & Warden, 2000) and teachers’ support of evolution being taught (Moore et al., 2006; Moore & Kraemer, 2005). This study expanded the survey research to include secondary school administrators who may ultimately make the decision to allow students to opt out of academics that include controversial issues, specifically the theory of evolution. The data from this study may assist in identifying potential policy and language misconceptions.
and misinterpretations that prevent students from learning science concepts assessed on state science tests.

**Context of the Study**

Florida state science standards clearly identify the scientific theory of evolution as the fundamental concept of the biological sciences. The purpose of this standard is not to change beliefs; it is to ensure students understand the processes of science through thoughtful analysis of physical evidence, which applies to all scientific theories. It is important for Florida educational leaders to be knowledgeable on what characterizes good science, the legal history and basis of the evolution debates, identify conflicting policies, and adopt valid opt-out practices to meet the needs of the students, parents, teachers, district, and community.

The significance of this study was: (a) to contribute to the literature on the application and interpretation of opt-out policies as they apply to evolution; (b) to review current policy and legislation as it applies opt-out practices and the scientific theory of evolution; and (c) to provide recommendations to policy-makers at the state and local level in identifying conflicting policies and practices in allowing or not allowing students to opt out of instruction on the scientific theory of evolution.

Section 1003.41 of the Florida Statutes states that public educational instruction is based on state adopted standards that establish the core content of the curricula to be taught and that K-12 public school students are expected to learn. This statute requires Florida public school teachers to teach the NGSSS as identified by state-approved course descriptions. The Principles of Professional Conduct, section 6B-1.006(3), states that teachers "shall not intentionally suppress or distort subject matter relevant to a student’s
academic program” so it may be reasoned that public school teachers can not deliberately exclude the scientific theory of evolution from the high school science curriculum.

Currently, Florida has two statutes that specify the curricular topics students may be opted out and given alternative assignments: human sexuality education, section 1003.42(3), and animal dissection, section 1003.47(1), of the Florida Statutes. Opt-out policies are typically used by parents to excuse their child from content or activities to which they may have religious objections (Scott & Branch, 2008). Recent litigation in California ruled that parents cannot override the determinations of public schools as to the concepts taught in the classroom (Fields v. Palmdale School District, 2005).

Participants

The sample for this study consisted of 281 participants who were grouped into two sub-groups: (a) participants who have allowed or would allow students to opt out of evolution (“Yes” subgroup); and, (b) participants who did not allow or would not allow students to opt out of evolution (“No” subgroup). The “Yes” subgroup consisted of 213 participants and the “No” subgroup consisted of 68 participants. Middle and high school administrators were equally represented among the participants.

Study Instrumentation

The survey contained three sections: (a) demographics of community, school characteristics (urbanization, student population, free and reduced lunch, grade levels, type of school, and parent involvement), and individual participant information (highest degree earned, certification area, and years in education); (b) perception and awareness statements based on a Likert-type scale; and (c) two open-ended questions to allow the participants to express concerns and viewpoints not addressed in the survey. Action
questions identified the participants in this study: administrators that have or would allow a student to opt out of class when the scientific theory of evolution is taught, and administrators that have not or would not allow opt out.

Discussion of Findings

Demographics, individual characteristics and opt-out practices. Middle school administrators in this study serving a student population greater than 50% receiving F/RL with little parent involvement were more likely to allow opt out when the scientific theory of evolution is taught. Further statistical analysis did not support a relationship between parental involvement and higher rates of allowing opt out. However, comments from the open-ended responses from middle school administrators in this study revealed that parent involvement and perceived parental rights to opt out their child from class was a predominant reason they allowed students to opt out. This may be important because the science content in the middle grades lays the foundation for the expansion of science concepts in the high school grades. If parent requests for opt out are greater at the middle school level and the middle school administrators are allowing opt out because of parent requests, the students who are opting out may manifest scientific misconceptions that continue through high school. The Florida Biology End-of-Course (EOC) exam determines if students receive credit in Biology, which is a graduation requirement. Without a foundation in the life sciences, students may be at a disadvantage for this state assessment, which may negatively impact graduation rate and school grades.

The percentage of students receiving F/RL may also be related to a participant’s decision to allow or not allow opt out of evolution. In this study, administrators in
schools with a poverty rate greater than 50% were more likely to allow students to opt out of the scientific theory of evolution upon parent request than administrators in schools that served less than 50% poverty level.

According to the FDOE, Education Information and Accountability Services’ data report on free/reduced-price lunch eligibility (2009), Black and Hispanic populations had the largest percentages of students eligible for free/reduced-price lunch, 66% combined in 2008-09. Parents of Hispanic and black students are less likely than white parents to attend school events or volunteer their time (Child Trends Databank, 2011). It may be possible that the data from this study supported a relationship between percentage of students on F/RL and allowing opt out is also related to minority populations. Data from state and national assessments (FCAT and NAEP) indicate that minority groups are already at a disadvantage on these standardized tests as demonstrated by a plethora of research documenting the probably reasons for the achievement gap. If administrators in this study are allowing students on F/RL to opt out of important science concepts, it may put these minority groups at more of a disadvantage on state tests, and may have a negative impact on a school meeting the Adequate Yearly Progress (AYP) requirements within the subgroup populations.

Although, in this study the data did not show a significant relationship with parent involvement and allowing opt out, the level of F/RL in a school and parent involvement have been found to be related (Mulhall, Flowers, & Mertens, 2002). The survey did not request a breakdown by race at the participants’ schools so data were not available to confirm or deny that race had an impact on allowing opt out. However, the data in this
study supported that school-based administrators may be influenced by the community they serve when applying opt-out practices.

Previous research did not support that educators with a strong background in science resulted in a teacher or administrator being more likely to support the teaching of evolution and not allowing opt out (Moore & Kraemer, 2005; Rutledge & Mitchell, 2002; Sanders & Ngxola, 2009). The data collected for this study supports the literature. Of the total population completing the survey ($N = 281$), 15% ($n = 10$) of those administrators with a science certification would not allow a student to opt out of the scientific theory of evolution.

Several open-ended comments from secondary administrators who were certified in science and would not allow opt out stated they recognized evolution is an important component of the biological sciences and learning about evolution does not compromise personal or religious beliefs. Some of these administrators also recognized that opt out could result in a lower score for students on content that is covered on high stake tests.

Most middle school administrators in this study, including those with a science-certification, stated they would allow students to opt out of the scientific theory of evolution because it was the parent’s rights to determine what their child should learn and to avoid confrontation. Some comments from participants indicated that the perception of parental rights influence opt-out practices at the middle school level, regardless of participant certification area and school demographics. Certification area at the middle school level did not appear to be a factor in the decision to allow opt out.

Conversely, the data also revealed that participants serving grades 9-12 with a science subject area certification ($n = 18$) were less likely to allow students to opt out of
the scientific theory of evolution than participants serving grades 9-12 with other
certifications. Further exploration of the data through crosstab analysis did not reveal if
the participants serving grades 9-12 were less likely to allow opt out because of their
certification area or because of the age level of the students at the school they served.

Actions, awareness, perceptions and opt-out practices. There was a strong
correlation ($p = .012$) between secondary school administrators support for teacher
academic freedom to teach alternative theories in conjunction with the scientific theory of
evolution. Since academic freedom was not defined, the researcher could not determine if
participants were associating the term academic freedom with content, pedagogy, or both.
More than 50% ($n = 105$) of the participants agreed there are other theories, such as ID,
that should be taught in conjunction with the scientific theory of evolution. Participants
may or may not have associated academic freedom with the scientific theory of evolution
or all content areas.

The assimilation by principals’ use of language in the Academic Freedom bills
regarding alternative theories may have been a factor in their agreement that they support
alternative theories and teachers’ academic freedom. Language from highly publicized
past court cases, Academic Freedom bills, and pro-ID groups, appeared in the “Yes”
subgroup participants’ comments, such as only a theory, both sides, critical analysis, and
scientific views. Some statements from the participants’ open-ended responses were
consistent with language in the pro-ID literature and may be impacting secondary
administrators’ decisions to allow opt out.

Many people in the United States have made known they would choose to
eliminate the teaching of evolution in public schools as they believe it interferes with
their at-home religious principles and worldviews (Gallup, 2008). Many advocates for teaching creationism in public schools maintain that evolution is only a theory and not a fact. In a study conducted by Lac et al. (2010), a lack of educational attainment (less than a high school degree) served as the strongest predictor for participants that support creationism-only education, which may also be related to an educational background in the sciences.

A possible reason accounting for why participants with a high level of education were found to be less supportive of creationism may stem from their better understanding of evolutionary processes, whereas their less educated counterparts fail to appreciate how empirical evidence bears on evolutionary claims. (Lombrozo, Shtulman, & Weisberg, 2006 as cited in Lac, et al., 2010, p. 260)

Administrators in this study may be allowing personal perceptions that challenge the teaching of evolution as the only scientific theory and support teacher academic freedom to teach alternative theories as reasons for allowing students to opt out of class when the scientific theory of evolution is taught. Some of the open-ended statements from a few participants in this study revealed they perceived opting out of Bible classes the same as opting out of evolution, and that not teaching both sides is an injustice because learning about evolution is a faith-based decision. Appendix M lists some of the open-ended statements from participants in this study.

There was a correlation between administrators allowing opt out and their perception that parents have the right to opt out their child from classes when the scientific theory of evolution is taught. This is in contrast to the court ruling in the *Fields
v. Palmdale School District (2005) that parents do not have the right to override the determinations of public schools as to the information their children will be exposed to while enrolled as students. Since this court case was tried in California the Florida courts are not bound by this ruling. However, it does set a precedent for future cases involving parent rights in determining what their child learns in public schools. By allowing parents to opt out their child from controversial topics, administrators in this study are extending opt-out policies beyond the limitations of the Florida statutes that allow opt out of human sexuality and animal dissections, sections 1003.42(3) and 1003.47(1) of the Florida Statutes. Eighty-five (85) percent of the participants who would allow opt out also disagreed or were undecided that learning evolution is required regardless of parent beliefs and requests for opt out.

In a recent study, it was found that parents supporting creationism-only education were more likely than parents with the opposite view to report that their children experienced problems at school regarding the topic of evolution, but their children seldom reported such problems (Lac, et al., 2010). Lac, et al. (2010) found the majority of respondents who supported the teaching of creationism also supported a compromise allowing for the joint teaching of evolution and creationism in public schools. This may mean that parents who support creationism-only education hold views that are in contrast with their children’s classroom experiences and possibly their beliefs about evolution and religion. Based on the open-ended comments, secondary public school administrators in this study may perceive parental rights as a valid reason for allowing students to opt out of class when evolution is taught.
Most of the participants stated they were undecided or did not know whether the majority of parents supported the teaching of evolution and very few indicated they had felt pressure from parents to avoid teaching evolution. Although data analysis revealed there was a strong relationship between awareness statements and the decision to allow or not allow opt out, most of the participants stated they did not know whether or not the majority of parents of students who attend their school support the teaching of evolution. There were a significant number of “undecided” responses about awareness of parent and community support of evolution.

Implementing agents ignore, either intentionally or selectively, policies that are inconsistent with their interests (Firestone, 1989) and policies that fit their agendas are more likely to be implemented. The open-ended statements supported that some secondary school administrators who participated in this study were aware that all students are required to learn about the theory of evolution, regardless of parent or student beliefs, and would not allow a student to opt out of learning the scientific theory of evolution.

**Limitations**

**Participation.** The researcher attempted to survey all secondary administrators in the state of Florida and had the university IRB approval to do the survey through email addresses provided by the FDOE. However, several school districts did not allow their principals to participate because the researcher did not have specific district IRB approval. Those districts that declined to participate because District approval was not given prior to the request for participation were some of the largest school districts in the state of Florida (Alachua, Brevard, Broward, Dade, Hillsborough, and Lake Counties),
and may be the reason for a response rate of less than 10 percent. The refusal of participation from large counties may also have resulted in selection bias within the study population. The lack of District support and mandate from some District Office staff to their administrators to ignore the request to participate in the survey, may have deterred many willing participants from more urban areas with different perceptions about the topic of evolution. In the future, the state university system should explore the possibility of putting an IRB approval and request reciprocation in place to satisfy and eliminate the need for additional District IRB approvals. This may have significantly impacted the number of participants who responded to the survey request and may have a negative impact on future state-wide research within the public school system.

**Self-selection bias.** Self-selection bias arises when people have control over whether to participate in a study or survey, and may occur due to purposeful intent on the part of respondents (Bifulco, 2002; Heckman, 1979). The decision to participate in this study may have correlated with strong, personal beliefs that affected the study, possibly resulting in a non-representative sample. People who have extreme opinions about creationism and evolution, or parent rights as they pertain to opting out of class when controversial topics are taught, may have been overrepresented in the survey data. School-based administrators with strong feelings about controversial topics may have been more willing to spend time answering a survey about evolution and the decision to allow opt out. Conversely, administrators who were indifferent about the topic of evolution and opt out, may have been less likely to respond. This may have resulted in a polarization of responses with extreme perspectives and a disproportion in the data.
analysis. Due to the voluntary nature of the survey, non-response bias and self-selection bias may have influenced the results.

**Time commitment.** Approximate time to complete survey may have been estimated too high at 15-20 minutes, which may have discouraged secondary school administrators from participating. It was reported by one participant that it took less than ten minutes to complete the survey and the initial estimation of 15-20 minutes may have deterred other administrators from participating in the survey. In addition, the survey may have come at a time in the school year when participants did not feel they had additional time due to administrative demands.

**Definition of alternative assignment and academic freedom.** Allowing an alternative assignment during the teaching of evolution was considered by the researcher to be the same as allowing opt out but that may not have been the interpretation of the participants. In addition, academic freedom could have been interpreted multiple ways: freedom to determine content (the “what”); freedom to determine pedagogy (the “how”); both the content and the pedagogy; or freedom to include alternative theories, such as intelligent design.

**Survey instrument.** As with any new instrument, once it is given and analyzed, areas of improvement become clear. The researcher recommends the items for certification areas, highest degree earned, parent involvement, and clarification of alternative assignments and alternative theories be addressed.

The survey instrument used in this study should be modified to include a K-6 or K-5 certification component, since it was assumed that secondary administrators were certified in specific disciplines. Middle school administrators may have teaching
experience only in elementary education instead of a specific content area and this may have an impact on the decision to allow or not allow opt out of the scientific theory of evolution, possibly because they have more interaction with parents and believe that parents have a right to determine what their child learns in school.

The item concerning the highest degree earned should be modified to include the date earned and university. Some degree programs may include courses on current education policy and some may include courses on past education policy and law. If an administrator earned an educational leadership degree from a university outside of Florida they may not have participated in a Florida school law class, and therefore, may be unfamiliar with state statutes in K-12 public school education.

Alternative assignments and alternate theories also need to be defined either by the researcher or by participants, possibly through the use of an additional open-ended response item to give participants the opportunity to clarify their definition of alternative. The survey could include an item with a drop-down menu on which alternative theories the participant supports being taught in conjunction with evolution.

The item focusing on parent rights could be split into a perception item and an awareness item. Secondary school-based administrators may think parents should have the right to opt out their child from class when evolution is taught but know they do not have the right to dictate content taught in the public schools.

An item identifying the number of opt out requests for human sexuality and animal dissection could also be included in the survey instrument to determine the prevalence of opt out requests by parents compared to perceived parent involvement.
Subjectivity. The researcher’s personal experiences and perspectives may have had an impact of the analysis and interpretation of the data. The researcher has a background in science education and is familiar with the Florida state standards and assessments. As a post-positivist that relies on scientific and common sense reasoning, the researcher had to consider variables such as conflicting statute language and possible conflicting interpretation of terms on the survey. Relying on statistical analyses of the data and multiple readings of the open-ended comments allowed the data to speak to the researcher and helped minimize bias reporting of the data.

Assumptions

It was assumed that there were only two allowable opt-out policies in the state of Florida: human sexuality and animal dissections. Florida statute requires K-12 public school teachers to teach the Next Generation Sunshine State Standards as identified by state-approved course descriptions. It was also assumed that there were no opt-out policies that allow students to opt out of controversial topics that may be inconsistent with their religion and faith. However, this was not necessarily the case.

Florida statute 761.03(1), the Florida Religious Freedom Restoration Act (FRFRA), prohibits state government from substantially burdening acts that are “sincerely motivated by a religious belief,” absent a compelling governmental interest. The researcher made an inquiry to the FDOE Bureau of Curriculum and Instruction for clarification on the definition of sincere religious belief. The response stated that General Counsel advised that the FDOE does not give legal opinions outside of the agency, so would not be able to provide further assistance (Sweet, personal communication April 6, 2011). The FRFRA statute was not considered prior to conducting this study. The
FRFRA may convolute the application of existing Florida opt-out policies and required state curriculum, as well as impacted participants’ practice of allowing students to opt out of class when evolution, a controversial issue, was taught. It is unknown if this act is well known among Florida public school administrators, and was beyond the scope of this study to determine how many districts many have policies allowing opt out based on *sincerely motivated religious beliefs* as interpreted in the opinion of the Florida General Counsel.

**Implications for Practice**

**Student population demographics.** It appeared from the data collected in this study that participants were influenced by the student population they serve, specifically the percentage of students receiving Free-and-Reduced Lunch (F/RL) and grade level served. Those participants who served grades 6-8 were more apt to allow opt out of the teaching of the scientific theory of evolution. The higher percentage of administrators allowing opt out at the middle grades may be due to more parental involvement in the middle grades.

The middle school years correspond with changes in adolescent development, social development, and renegotiations of family relationships (Hill & Tyson, 2009). Research has demonstrated that the relation between parental involvement and achievement declines between elementary and middle schools (e.g., Singh et al., 1995; Hill & Tyson, 2009; Child Trends Database, 2011). Parents of primary school children are most likely to participate in their child’s school and parental involvement decreases as the student progresses through secondary school, grades 6 through 12.
One may have expected that schools with poverty levels below 50% would have had more parent involvement and therefore more parent requests to opt out and more administrators willing to allow students to opt out of learning the scientific theory of evolution. According to a study conducted by the National Center for Education Statistics (NCES) survey conducted in 2003, the data indicated that parent involvement can vary by poverty concentration and minority enrollment in the school (Vaden-Kiernan, & McManus, 2005). Parents of students living in a household above the poverty level are more likely to be involved in school activities than parents of children living in a household at or below the poverty line (Child Trends Databank, 2011). As grade level increased, fewer parents reported that schools sent home notes or emails. The NCES survey data showed that the parents who agreed that the school made it easier for the family to be involved was higher for students in households above the poverty level than for students in households at or below the poverty level. However, the relationship between administrators in this study who serve schools with a high poverty rate and allow opt out contradicts current literature (Desimone, 1999; Lee & Bowen, 2006).

Participants’ certification subject area may have played a role in the decision to allow opt out for grades 9-12 but certification area did not show a relationship at the middle school levels. The grade level served and level of parent involvement may play a more important role than participant background knowledge on the decision to allow or not allow students to opt out of class when the scientific theory of evolution.

**Alternative assignments and alternative theories.** Participants in this study who would allow opt out and who supported the teaching of evolution also supported teachers’ academic freedom to teach alternative theories to evolution. In addition,
administrators who supported the teaching of alternative theories also support assigning alternative assignments. Knowledge of basic scientific facts and concepts is necessary for a literate society. Allowing students to be assigned alternative assignments in lieu of learning about the scientific theory of evolution, or allowing alternative theories such as ID to be taught in science classes, may perpetuate misconceptions about how science works. In 2006, the National Science Board concluded that “the public’s lack of knowledge about basic scientific facts and the scientific process can have far reaching implications” and the understanding of evolutionary biology is poor among Americans (National Science Board, 2006, chapter 7, p. 3). Knowing how scientific hypotheses are investigated and either accepted or rejected can assist people in evaluating the validity of claims they encounter every day. Scientific literacy starts in the classroom. If teachers are allowed or encouraged to teach ideas as alternatives to scientific theories, or allow alternative assignments, the lack of the public’s understanding of evolutionary biology may put students farther behind in a competitive global economy.

**Influence of Academic Freedom bills.** Wording in recent Academic Freedom bills may be influencing opt-out practices in secondary public schools in the state of Florida. Phrases such as *both sides, presenting different views, evaluate the evidence, only a theory, one-sided presentation; various points of view, and other theories or beliefs* appeared in many of the open-ended comments and the justification by secondary administrators for allowing students to opt out of the scientific theory of evolution.

The Louisiana *Science Education Act*, which became law in 2008, allows teachers to use supplemental material to teach alternative ideas contrary to
scientific theories on grounds that it promotes critical thinking (Guarino, 2011). The law’s supporters claimed the law provided teachers the opportunity to *teach both sides* of the equation regarding certain scientific theories. This is the same claim made by supporters of the Academic Freedom bills.

Although most of the 2008 and 2009 Academic Freedom bills died on the floor, the language from the bills has appeared in some state standards, and continues to be discussed at various state education board meetings. To make informed decisions about public school practices regarding opt out, administrators and teachers need to know how to interpret policy language, especially those policies that impact student learning, as well as be informed about which bills pass legislative sessions.

Academic Freedom bills continue to be introduced into State legislatures (Florida SB1854, 2011; Kentucky HB169, 2011; New Mexico HB302, 2011; Oklahoma HB1551 and SB554, 2011; Tennessee HB368 and SB893, 2011). These recent Academic Freedom bills continue to use the same, seemingly ambiguous language, including “protection for teachers,” “differing views and opinions,” and “develop critical thinking skills” in regards to controversial topics. These recent versions of Academic Freedom bills also include biological evolution, chemical origins of life, global warming, and human cloning as “controversial” topics.

**Parent beliefs and rights.** It appeared from the open-ended comments that some administrators in this study perceived that parents have unlimited rights to determine what their child should or should not learn in public education. At the very least, public
school educators owe it to parents and community members to be well-versed in public school policy to minimize conflicting messages regarding required curriculum, instruction, and assessment in K-12 public schools. This could be achieved through district-wide professional development for secondary school administrators on new state education policies that may directly impact student learning and on how to deal with parent requests for opt out. It is critical that administrators understand which bills passed during legislative sessions as well as high-profile bills that did not pass, such as Academic Freedom bills, but still have an impact on decision-making at the school level.

**Statutes and required curriculum.** Some administrators in this study extended Florida’s opt out statute for human sexuality and animal dissection to include controversial topics such as the scientific theory of evolution. Allowing students to opt out of learning about evolution may be a result of the participants not being aware that learning evolution is a state mandate, section 1003.42(2), Florida Statutes. This is in contrast to the participants who acknowledged in the open-ended responses that evolution was a required topic and also indicated they would not allow a student to opt out of class when evolution is taught.

Based on the data from this study, it appeared that some school-based administrators may not be familiar with the state statute requiring all teachers to teach the state standards and that state standards require students to learn about the scientific theory of evolution. New information is always interpreted in light of what is already understood (Fowler, 2009). The leaders of a reform or policy must acknowledge that implementers or intermediaries, which include school-based administrators, must have the knowledge and skills to successfully implement policy, which requires significant time, training, and
resources (Spillane, 2000). This includes implementation and interpretation of new curriculum standards that have been adopted by State Boards of Education and state statutes passed during legislative sessions. Post-secondary institutions and/or districts may not be preparing new principals to recognize the big ideas in the state science curriculum and assessment requirements, which may contribute to the ambivalence of allowing opt out. School-based administrators may not know that 25% of the Biology End-of-Course (EOC) exam assesses biological evolution.

With the increased demand for accountability through state-imposed mandates, education leaders need to be well-versed in Florida statutes that impact the how and what of public school education. If classroom teachers are aware of opt-out policies and to which content these opt-out policies can be applied, they can assist school-based administrators in determining appropriate opt-out practices for controversial subjects. Although being familiar with the state standards is important, it is unrealistic to expect administrators to be familiar with all the content in all subject areas. The focus for administrators should be to understand the implications of new state statutes and bills that have seemingly important prominence through interest group influence over the perceptions of general public.

Overall, most public secondary school administrators that participated in the survey have or would allow a student to opt out of the scientific theory of evolution. The high percentage of administrators allowing opt out may be a result of several factors: population demographics, such as percentage of students receiving free-and-reduced lunch and grade levels served; perceptions about alternative assignment and alternative theories; highly publicized wording in Academic Freedom bills; perceived parental
rights; and awareness of state mandates on required curriculum. Whether the high percentage of administrators allowing opt out is a result of not understanding the state statute that requires all students learn the state approved curriculum as per section 1003.41(1) of the Florida Statutes, or believing parent rights supersede state curriculum requirements warrants further investigation.

**Implications for Policy**

The history of the evolution debate has played out in the courts and in state legislatures in many ways, leaving a barrage of conflicting and convoluted messages from the court system, the education system, and policy-makers to contend with. Recently, religious advocacy groups have become more prominent in influencing educational policy decisions, whether the issue involves evolution, creationism, ID, or school prayer, and have played major roles in shaping the debates and litigation in public schools (Apple, 2001; Lugg, 2004, 2009; Superfine, 2009). The goal of advocacy groups is to transform their shared beliefs and values into public policy (Lugg, 2009). If a policy proposal, such as an Academic Freedom bill, is coupled to a problem as its solution it is more likely to move forward in legislation (Brown, 2007; Kingdon, 1995; 2003). Both of the 2010 and 2011 Florida Academic Freedom bills (SB 2396 and SB 1854) are good examples of “coupling” with civics and character education. If passed, the bill would have “required instructional staff of a public school to teach a thorough presentation and critical analysis of the scientific theory of evolution and certain governmental, legal, and civic-related principles” (SB 2396, 2011, lines 3-7).

**Establishment Clause and the separation of church and state.** Policies involving the teaching about religion in public schools may conflict with the
Establishment Clause of the First Amendment of the U.S. Constitution. Courses about religion must include the teaching of all religions and cannot endorse one religion over another. The Supreme Court has applied the *Lemon* test to determine if there is a conflict with the Establishment Clause and policies enacted by state-level entities and local school boards (*Epperson v. Board of Education*, 1947). The first prong of the *Lemon* test is to determine if there is no secular purpose and that the primary purpose for a statute is to advance one religion (*Lemon v. Kurtzman*, 1971). Through the use of the *Lemon* test, intent can be proven by the promotion of religion in general (*Wallace v. Jaffree*, 1985), by advancing one particular religious belief (*Epperson v. Arkansas*, 1968; *Kitzmiller v. Dover*, 2005), or establishing that there is no clear secular purpose for the Louisiana Act (*Edwards v. Aguillard*, 1987). These past court cases have determined that policies requiring the teaching of creation science, balanced treatment, or intelligent design are unconstitutional.

Premeditated policy implementation involves behavior that is deliberately aimed at preventing implementation from occurring (Theodoulou, 1995). In the *Epperson* case (1947), the Arkansas statute made it unlawful for a teacher in any public school "to teach the theory or doctrine that mankind ascended or descended from a lower order of animals," and violation of the law was grounds for dismissal from the teaching position. Although states have a right to stipulate the curriculum for its public schools, it does not have the right to prohibit the teaching of a scientific theory. The judge stated that the “fundamentalist sectarian conviction was and is the law’s reason for existence” (*Epperson v. Arkansas*, 1968). The Arkansas anti-evolution law was ruled unconstitutional because the scientific theory of evolution was contrary to the religious
belief found in the Book of Genesis. The court ruled that the Act was either designed to promote the religious hypothesis of creation science or designed to prohibit the teaching of the scientific theory of evolution because it was in conflict with the Biblical interpretation of the origin of man (Lugg, 2009).

In the Edwards case (1987), the court ruled that the primary purpose of the Louisiana Creationism Act was to advance the belief of one religion and was in violation of the First Amendment. The judge stated:

Even if “academic freedom” is read to mean “teaching all of the evidence” with respect to the origin of human beings, the Act does not further this purpose. The goal of providing a more comprehensive science curriculum is not furthered either by outlawing the teaching of evolution or by requiring the teaching of creation science. (Edwards v. Aguillard, 1987)

Teaching a variety of scientific theories about human origins can be done through a secular intent of enhancing the effectiveness of science instruction. If the Louisiana Legislature’s intent was to promote good science, it would have encouraged the teaching of all scientific theories in all subject areas. Justice Brennan rejected the purpose of Louisiana’s Creationism Act, to protect academic freedom, as a “sham” because the purpose was only to discredit the theory of evolution, and therefore had no sincere secular purpose.

Since the Edwards ruling that Louisiana’s Creationism Act requiring balanced treatment of creation science and evolution science was unconstitutional, intelligent design has become more prominent in the general public (Superfine, 2009). Critics of
evolution hoped that ID, which was not specific about who or what created life, would survive a court challenge (Lugg, 2009). Special interest groups have provided economic, political, legal, and academic resources to support the ID movement, through the production of textbooks, articles, and draft legislation (Newman, 2007; Superfine, 2009). ID interest groups, specifically the Discovery Institute, have promised legal defense for potential lawsuits that may arise if a school board adopts an antievolution curricular policy, including the addition of required teaching of alternative critical views of evolution in science classes (Bowman, 2006; Newman, 2007).

In this study, the majority of the participants agreed that students should have the opportunity to learn about evolution, but they also supported the teaching of alternative theories, such as ID. Intelligent design has been linked repeatedly to evolution as an alternative view (Kitzmiller v Dover, 2005). Since 1971, the courts have used tests to determine if policies violate the establishment clause: the Lemon test, the endorsement test, the coercion test, and the neutrality test (First Amendment Center, 2011). The Lemon test (Lemon v. Kurtzman, 1971) determines if a policy has a secular purpose, does not advance or inhibit any religion, and does not entangle religion and government. The Coercion test, established in the Allegheny County v. ACLU (1989) court case, to determine if the government has provided direct aid to a religious organization or of it coerces people to support or participate in religion against their will. However, the coercion test has resulted in varying interpretations by judges (Lee v. Weisman, 1992; Allegheny County v. ACLU, 1989). The Endorsement test, (Lynch v. Donnelly, 1984), asks if the government act/policy has the purpose or effect of advancing or endorsing religion, but this test has been integrated into the Lemon test (First Amendment Center,
The Neutrality test (Mitchell v. Helms, 2000; Zelman v. Simmons-Harris, 2002) determines if the government is favoring one religion over another, not favoring religion over non-religion and vice versa, and has been used in court cases involving vouchers for religious schools. The neutrality test does not allow direct aid to religious institutions, but may allow indirect aid to a religious group through a parent or third party, as long as it is part of a neutrally applied program (First Amendment Center, 2011). The Lemon test continues to be the standard for judicial review in cases involving the establishment clause of the First Amendment (Lemon v. Kurtzman, 1971).

The Kitzmiller case (2005) determined the constitutionality of the local school board’s ID policy. The court ruled that ID failed to be determined a science based on all three prongs of the Lemon test: (a) ID relies on supernatural causation, (b) the argument of irreducible complexity, central to ID, employs a contrived dualism mimicking creation science in the 1980’s, and (c) ID’s negative attacks on evolution have been refuted by the scientific community (Kitzmiller v. Dover Area School District, 2005; Lugg, 2009).

Former President George W. Bush has stated publicly that ID should be taught in conjunction with evolution (Washington Post, 2005). Bush told newspaper reporters that he believed that intelligent design should be taught alongside evolution as a competing theory. “Both sides ought to be properly taught . . . so people can understand what the debate is about” (Baker & Slevin, 2005, para. 3). If people are influenced to believe there are alternative theories to evolution, then people may interpret policy, or language, that allow them to support teachers’ academic freedom to teach alternative ideas that are not scientifically valid.
**First Amendment and freedom of speech.** The concept of academic freedom originated in universities and has gradually filtered into the K-12 public school system. However, in the K-12 public school system, the State Board of Education has the right to define the curriculum, as well as determine the restrictions and policies as they pertain to the approved curriculum. The First Amendment protects academic freedom and freedom of speech, but past and recent court cases have ruled that teachers do not have the right to determine public school curriculum regarding what is taught and the materials and resources used to teach it. In this study, approximately 78% (n = 165) percent of the “Yes” subgroup (n = 213) supported the teaching of evolution as well as the science teachers’ academic freedom to teach alternative theories to evolution. In Florida, the Principles of Professional Conduct (6B-1.006)(3)(d) state that teachers “shall not intentionally suppress or distort subject matter relevant to a student’s academic program..” Teachers must follow the prescribed curriculum and are not entitled to First Amendment protection as a public school employee because classroom assignments and curricular choices are official, job-duty speech.

In *Pickering v. Board of Education* (1968), the court ruled that a public school teacher is entitled to First Amendment protection since their letter to the editor in the local newspaper was conducted as a citizen, not a public school employee. In 1983, the Supreme Court upheld the dismissal of Sheila Myers because she had spoken out about company policy and was terminated for insubordination (*Connick v. Myers*, 1983). The courts have used the *Pickering/Connick* analysis to determine if public school employee comments are matters of public concern and protected by academic freedom.
In 2005, a public high school teacher sued the board of education, high school principal, and school district superintendent for wrongfully terminating her employment, in retaliation for her exercise of her First Amendment right to make curricular choices (Evans-Marshall v. Board of Education). The U.S. Court of Appeals overturned the decision of the 6th Circuit Court, and ruled against the plaintiff. It was determined that a public school teacher’s choice of classroom assignments and curricular choices are official, job-duty speech and are not entitled to First Amendment protection. These court cases have set the precedent for the limits of academic freedom in the K-12 public school system. A public school teacher is entitled to First Amendment protection as a citizen but not as a public school employee. Classroom assignments and curricular choices are considered official, job-duty speech and are not entitled to First Amendment protection.

Florida state statutes. The Constitution of the State of Florida was revised in 1968 and consists of an organized system of fundamental principles for the government of the state, which originates from the people rather than from the Legislature. The Florida statutes consist of a compilation of all the laws, resolutions, and memorials passed during a legislative session (On-line Sunshine, Statutes & Constitution, 2011). The FDOE requires public school administrators to be certified in Educational Leadership, or the equivalent. Certifications require a passing score on the Florida Educational Leadership Exam (FELE) which consist of competencies and skills in leadership for the following areas: instructional, operational, and leadership. Knowledge assessed on the FELE includes federal and state law in education and schooling, student and parent rights, ethical conduct, and curriculum development. Graduate level law courses include historical perspectives in law and education with in-depth reviews of case
law showing the evolution of courts as educational policy makers. Courses may or may not include Title XLIV, Civil Rights, consisting of chapters 760 through 765, and/or Title XLVIII, the K-20 Education Code, consisting of chapters 1000 through 1013.

Very few (15%) of the participants in this study who would allow opt out agreed that all students are required to learn about the theory of evolution, regardless of parent or student beliefs. Sections 1003.41(1) and 1003.42(1) of the Florida Statutes are specific as to the required instruction for K-12 public education. Public K-12 educational instruction in Florida is based on the NGSSS that establish the core content of the curricula to be taught in this state and specify the core content knowledge and skills that K-12 public school students are expected to acquire and require appropriate instruction designed to ensure that students meet state adopted standards.

Data analysis showed there was a statistically significant relationship between participants’ awareness that all students are required to learn about the theory of evolution, regardless of parent or student beliefs, and use or non-use of opt-out practice. Administrators in this study who disagreed that students are required to learn about evolution also perceived parents have the right to opt out their child from class when the scientific theory of evolution is taught. The perception that parent rights supersede state required curriculum and the lack of awareness of the required state curriculum that is annually assessed on state tests, may be a detrimental combination for poor performance on the upcoming Biology End-of-Course exam and negative impact on AYP requirements resulting in decreased federal and state funding for public schools.

The state NGSSS for science, adopted by the SBOE in 2008, include instruction that the “strength or usefulness of a scientific claim, which is evaluated through scientific
argumentation, depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented” (SC.912.N.1.3). Each district school board must provide “appropriate instruction designed to ensure that students meet SBOE adopted standards” in the core subject areas, as per section 1003.42(1) of the Florida Statutes. Science benchmarks for students in grades 9-12 require students to explain how the scientific theory of evolution is supported by physical evidence (NGSSS Benchmark SC.912.L.15.1). It can be inferred that since the state statute requiring K-12 educational instruction in Florida is based upon the NGSSS, science instruction includes the teaching of the scientific theory of evolution and evaluating the strength of a scientific theory through critical and logical analysis and consideration of alternative scientific explanations. All students in public high schools are required to learn and be assessed on this benchmark.

Florida law is also explicit about what public school teachers cannot do in the classrooms. SBOE Rule for Principles of Professional Conduct (6B-1.006)(3)(d) states that teachers “shall not intentionally suppress or distort subject matter relevant to a student's academic program;” therefore, it may be reasoned that public school teachers can not deliberately exclude the scientific theory of evolution, or include ID, from the high school science curriculum.

The scientific theory of evolution is infused into the life science benchmarks in the NGSSS (2008), and is assessed on the Florida Comprehensive Assessment Test (FCAT) for Science and on the Biology End-of-Course exam, which will be implemented in the spring of 2012. The state assessments are administered to all public middle and high school students in Florida public schools are required to learn and be assessed on
what is science, what clearly is not science and what superficially resembles science and fails to meet the criteria for science (SC.912.N.2.1). From the data in this study, more than 75% of the participants stated they have or would allow a student to opt out of class when the scientific theory of evolution is taught and assign a student an alternative assignment. Future litigation may consider this a violation of Florida statutes, sections 1003.41(1) and 1003.42(1), on required instruction for K-12 public education

**Academic freedom.** In the *Edwards case* (1987), Justice Brennan declared the Louisiana’s *Creationism Act* violated the Establishment Clause because it had no sincere purpose except to discredit the theory of evolution, and to advance one religion. The statute was not necessary to enable the teaching of any scientific concept that is based on established fact, and does not grant teachers a flexibility that they did not already possess to supplant the present science curriculum with the presentation of theories, besides evolution, about the origin of life. Any scientific concept that is based on established fact could already be included in the curriculum, and no legislation protecting teachers’ academic freedom was necessary. This same ruling was applied to the *Wallace v. Jaffree* (1985) court case. Alabama Code § 16-1-20.1 was designed to provide a 1-minute period for meditation in public schools, but the code was rejected because the court ruled that the purpose was insufficient because a previously adopted Alabama law already provided for such a 1-minute period. No secular purpose was served by the enactment of the new statute. These court cases may set a precedent for Academic Freedom bills if they are passed by legislatures and challenged in the court system.

**Florida Academic Freedom bills.** Academic freedom as described in the Principles of Professional Conduct (6B-1.006)(4)(a)(b) is not the same as the academic
freedom described in the Academic Freedom bills introduced in state legislatures. These bills, if passed, may open the door to the teaching of alternative theories, such as ID, in addition to the scientific theory of evolution.

Academic Freedom bills are the most recent attempt to insert religion into the public school system. In Florida in 2008, the senate and the house proposed legislation to protect teachers’ academic freedom weeks after the State Board of Education adopted the NGSSS for science. Sponsors of the Academic Freedom bills have stated the use of language such as alternative views and alternative scientific theories do not refer to religious views, however, these phrases and others, critical analysis; strengths and weaknesses; alternative theories; teach the controversy; and different viewpoints are typically found in Academic Freedom bills (Appendix D).

Conservative ideology is conceived to be a key factor underlying the movement for creationism or ID to be taught in public schools (Deckman, 2002; Lac, et al., 2010). The results of the study conducted by Lac et al. (2010) found political ideology was associated with participants’ position on creationism, and the data confirmed that conservative respondents were more supportive of a creation-only policy compared to those who identified themselves as very liberal.

Sponsors of the 2008 Florida Academic Freedom bills, Storms and Hays, are both members of the First Baptist Church (Smith, 2008). According to the Florida Baptist Witness webpage, Florida Baptists have “taken the lead in opposing proposed science standards that require evolution-only teaching in the Sunshine State’s public schools” (Smith, 2007, para. 1). Senator Storms, sponsor of the 2008 Florida Academic Freedom
bill (SB 2692), has publicly stated that the bill does not authorize the teaching of creationism or ID.

The bill is needed because the new science standards [NGSSS, 2008] present the theory of evolution in a dogmatic way and assume its validity without critical thought or examination. The bill does not require any change to current science curriculum and evolution still will be taught as a matter of law when this bill passes. (Smith, 2008, para. 3)

House Bill 1483 (2008), the companion bill to SB 2692 was modeled after the Discovery Institute’s Academic Freedom Act, and sponsored by Senator Hays and titled The Evolution Academic Freedom Act. The bill, had it passed, would have required critical analysis of the scientific theory of evolution. When a newspaper reporter asked him about the bill, Senator Hays replied, “thanks to the Supreme Court’s distortion of the First Amendment, too many people are afraid to even mention the theory of intelligent design….and the bill wouldn't allow creationism to be taught as science” (Deslatte, 2008, para. 6).

If the same logic used in the Edwards (1987) and Wallace (1985) were applied to the Storms and Hays proposed Academic Freedom bills, it may stand to reason that SB 2692 and HB 1483 had no sincere purpose because the statute was not necessary to enable the teaching of any scientific concept that is based on established fact. Neither bill grants teachers a flexibility that they did not already possess through the adoption of the NGSSS in 2008. Any scientific concept that is based on established fact is included in the current science standards, and no legislation protecting teachers’ academic freedom is
necessary, since teachers are required to teach the state adopted standards as per section 1003.42 of the Florida Statutes.

In 2009 and 2011, the Florida legislature introduced two different Academic Freedom bills that were almost verbatim language.

An act relating to educational [italics added] instruction; amending s. 1003.42, F.S.; requiring [italics added] instructional staff of a public school teach a thorough presentation and critical analysis of the scientific theory of evolution. (SB 2396, 2009, lines 1-6)

An act relating to required [italics added] instruction; amending s. 1003.42, F.S.; that would require [italics added] instructional staff of a public school teach a thorough presentation and critical analysis of the scientific theory of evolution. (SB 1854, 2011, lines 1-6)

As with previous proposed bills, neither of the Academic Freedom bills grants teachers a flexibility that they do not already possess to present science curriculum, including the scientific theory of evolution and the origin of life (SC.912.N.1.3 and SC.912.L.15.1). Any scientific concept that is based on established fact can be included in the current curriculum, and no additional legislation allowing this is necessary.

Senator Wise sponsored the 2009 Florida Academic Freedom Bill, SB 2396 publicly stated on WMNF Evening News (Kinane, 2009), “Do we not want to have some ability for the young people to see both sides of any issue?” Since there is no alternative
scientifically valid theory for evolution, the phrase “both sides” could be interpreted to have a non-secular intent. Past court cases have ruled against the teaching of alternative, non-scientific theories in conjunction with the scientific theory of evolution (Edwards v. Aguillard, 1987; Kitzmiller v. Dover, 2005). Senator Wise was also quoted, “Why do we still have apes if we came from them? There’s more than one theory on this thing. And the theory is evolution; the other one is intelligent design” (Kinane, 2009). These statements give the appearance that Senator Wise was proposing legislation that is anti-evolution and promoting one specific religion. Through the use of the Lemon test, intent can be proven by the promotion of religion in general (Wallace v. Jaffree, 1985), by advancing one particular religious belief (Epperson v. Arkansas, 1968; Kitzmiller v. Dover, 2005), or establishing that there is no clear secular purpose for SB 2396 (2009) and SB 1854 (2011) (Edwards v. Aguillard, 1987).

According to Kingdon (1995; 2003), legislative sessions allow special interest groups, like the Discovery Institute, the opportunity to bring attention to their issue. Through Academic Freedom bills, unsubstantiated problems, such as discrimination against teachers when they present controversial topics are linked to proposed solutions, protection from discrimination through academic freedom (SB 2692, 2008). The general public is led to believe that teachers need protection to present controversial information and protection for students from being penalized for subscribing to a particular position on evolution.

Since the Florida NGSSS for science include critical and logical analysis and currently grant teachers the freedom to teach all scientific theories, no additional legislation through Academic Freedom bills is necessary. If challenged, the Academic
Freedom bills could be interpreted by the courts to be a “sham” because the purpose is only to discredit the theory of evolution, and therefore has no sincere secular purpose (Kitcher, 2006). The Academic Freedom bills, including the Florida SB 1854 introduced in the 2011 Florida Legislative session, do not grant teachers a flexibility that they did not already possess to “teach a thorough presentation and critical analysis of the scientific theory of evolution” nor do they enhance the effectiveness of science instruction. However, because the language in the Academic Freedom bills was vague, school-based administrators, and teachers, unfamiliar with the NGSSS, may believe the teaching of alternative theories is required and/or allowed.

**Curriculum frameworks.** Section 1003.41 of the Florida Statutes states that public educational instruction is based on state adopted standards (NGSSS). One benchmark states that students must “Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented” (SC.912.N.1.3). A second benchmark requires students to “explain how the scientific theory of evolution is supported by physical evidence” (SC.912.L.15.1). A theory is a comprehensive explanation of some aspect of nature that is supported by a vast body of physical evidence (NAS, 2008). Historical theories were based on philosophy or religion, such as Flat-Earth, and have been proven incorrect due to a lack of scientific evidence.

The courts have consistently upheld states’ rights to determine educational curricular standards and school board rights to determine instructional materials used to teach the approved standards in K-12 public schools (*Kitzmiller vs. Dover*, 2005; *LaVake*
Academic freedom includes the right of K-12 public school teachers to speak freely about their content area and to select materials and methods relevant to the subject that are appropriate for the age and maturity of the students. In 2005, the Editorial Projects in Education Research Center in conjunction with Education Week conducted a study on the science education standards in 41 states and determined that 15 states’ curriculum frameworks included very little on evolutionary concepts and only 20 states had curriculum frameworks that included common ancestry. Public school teachers do not have the academic freedom to not teach the standards approved by the state even if the content is against their personal beliefs (LaVake v. Independent School District 656, 2000). If state curriculum frameworks do not include the scientific theory of evolution, then it stands to reason that teachers may choose to exclude it from the curriculum altogether to avoid controversy in the classroom and confrontation with parents.

Several states, including Florida, have adopted science standards that include catch-phrases from the Academic Freedom bills. The Florida NGSSS for Science (2008) include a high school Nature of Science benchmark that requires students to “recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented (SC.912.N.1.3).

As public secondary school administrators struggle with new curriculum standards and their own understandings of state requirements, there may be a failure of implementation with fidelity of the state science standards because of
different interpretations of state requirements (Spillane & Callahan, 2000). Individual interpretations of state policy are central in standards-based reform efforts (Hill, 2001). School-based administrators make sense of state standards based on their own perceptions, which may contribute to how the standards are implemented. This may explain why secondary school administrators, in this study, agree that alternative views and ID should be taught in conjunction with the scientific theory of evolution.

**Florida Religious Freedom Restoration Act.** The data from this study found a relationship between secondary school-based administrators’ perception of parental rights and allowing or not allowing a student to opt out of class when the scientific theory of evolution is taught. Opt-out policies are typically invoked to excuse students from activities to which they or their parents may have moral and/or religious objections (Scott & Branch, 2008).

Florida statute 761.03(1), the *Florida Religious Freedom Restoration Act* (FRFRA), prohibits the Government from substantially burdening acts that are “sincerely motivated by a religious belief,” absent a compelling governmental interest. A memorandum dated January 13, 2006 from the General Counsel for the FDOE, in response to an inquiry from the General Counsel for the School District of Hernando County, offered a legal opinion on requests for excusal from certain instruction in Florida public schools (Appendix O). The inquiry was whether a student in a Florida public school should be excused from the teaching of controversial topics at the parent request. According to the legal opinion, if the request is based upon a sincere religious belief, the school should allow the student to opt out. However, the school may deny excusal
requests for other reasons (Woodring, 2006). The memorandum implied that schools
could use the current Florida opt-out policies in the decision-making process for
instruction on controversial topics, specifically evolution and human origins.

The Florida legislature has not provided an explicit opt-out right as
[sic] regards origins instruction in science class or for most other
instructional topics. If a statute provides for such an opt out, for
instance, like statutes allowing students to be excused from certain
health/sex/disease and science instruction when there is
experimentation or dissection of animals, then schools could
address this issue as they do in those contexts. (Woodring, 2006,
p. 2)

The memorandum cited Florida statutes on parent rights as they applied to contraceptive
services, section 1002(3), human sexuality, section 1003.42(3), animal dissections,
section 1003.47, removal from school for religious instruction and holidays, section
1002.20(2), reciting the pledge, section 1003.44(1), and reciting the Declaration of
Independence, section 1003.421(4). The memorandum cited a court case involving the
FRFRA, Warner v. City of Boca Raton (2004), where the Florida Supreme Court
established a test for bringing a claim under the FRFRA.

Once a sincere religious belief is established, a court will scrutinize
the government’s action to determine whether it constitutes a
substantial burden on the adherent’s practice, and if these two tests
are met, the burden shifts to the government to establish that its
regulation furthers a compelling interest and is the least restrictive means to further its interest. (Woodring, 2006, p. 3)

The FRFRA and the tests to determine sincere religious belief and compelling government interest have not been tested in the court system as they apply to evolution or human origins in K-12 public school curriculum. But Woodring did state that a sincere religious belief in creationism might motivate a student to request excusal from public school instruction and discussion of alternative theories for evolution. He continued to explain that a student who requested a curriculum change, or a broader curriculum opt out, including excusal from test-taking requirements, would not likely be considered an acceptable request. The FRFRA requires a school to demonstrate that a student’s participation in the instruction is necessary to advance a compelling governmental interest in the least restrictive manner, but “the FRFRA may be the only state statute that may require a school to grant the student’s opt out request in the context of origins instruction” (Woodring, 2006, p. 2). It should be noted that this legal opinion was given prior to the adoption of the NGSSS and End-of-Course exams required by statute.

Policy language. Policy language can be ambiguous and have no relevant meaning until someone interprets it (McCool, 1995). Analysis of policies is a human activity and involves human perception and interpretation, and is open to interpretation by legislators and other stakeholders (Yanow, 1996). Interpretations of policy language can be more powerful than facts. Special interest groups, such as Discovery Institute, capitalize on the lack of awareness of the general public about policy issues and use that lack of awareness to interpret policy language, and publicize their interpretations to advance their causes. Blocking policies is relatively easy if the interest group is powerful.
enough to persuade the general public (Moe, 2001). Through the use of the media, special
interest groups may have had an impact on the implementation and interpretation of the
new science standards. Although Florida teachers are required to teach the scientific
theory of evolution, there may be some uncertainty about how the topic is taught to
students and what constitutes a scientific theory.

According to the Wedge document, the Discovery Institute’s Center for Science
and Culture seeks nothing less than the overthrow of materialism and the “Darwinist
theory that supports it in the sciences” (The Wedge Strategy, Five Year Plan, para. 5).
Even prominent politicians, including Rick Santorum (R-PA) and President G. W. Bush,
have voiced their support of teaching alternative theories to evolution so both sides of the
debate are properly taught (Baker & Slevin, 2005, para. 2; Superfine, 2009). “We
[Discovery Institute] are building on this momentum…[through] significant coverage in
national media… to see intelligent design theory as an accepted alternative in the
sciences…which has come to be called the theory of intelligent design” (The Wedge
Strategy, Five Year Strategic Plan, para. 1).

When the Academic Freedom bills were introduced in 2008 and 2009, newspaper
articles appeared in districts throughout the state of Florida. Senator Wise, sponsor of the
2009 Academic Freedom bill, stated that if evolution is taught, then both sides should be
taught through critical analysis (Soergel, 2009). Similarly, Representative Hays, who co-
sponsored the 2008 Academic Freedom bill with Senator Storms, has also been quoted as
saying that the theory of evolution is only a theory and has never been scientifically
proven (Cavanagh, 2008; Deslatte, 2008; Soergel, 2009). It is possible that the language
used during highly publicized and controversial legislative sessions has filtered to the
school level and being used for opt out requests from parents even though the bills did not pass both houses of the Florida legislature.

Statements in open-ended responses in this study may be an indication that the language from the well-publicized Academic Freedom bills and pro-ID groups have filtered down to the school level and are impacting school-based administrators’ decisions on opt-out practices. With the exception of “critical analysis” as a scientific process, the use of language such as “other theories”, “all sides”, “both sides”, and “only a theory” never appear in the Florida NGSSS for science. These phrases do, however, consistently appear in the various Academic Freedom bills. Language from these bills appeared in many open-ended responses from participants in this study indicating the language from the Academic Freedom bill may have an impact on the decisions and practices by secondary school administrators in this study to allow students to opt out of class when evolution is taught.

More emphasis is being placed on the scientific theory of evolution through required curriculum and state assessments. Not only may the practice of opt out put the student at a significant disadvantage on state assessments and for college readiness, it may also impact classroom instruction. Since evolution is a unifying theme of the biological sciences, administrators who accommodate opt out requests may inadvertently create class disruption and absenteeism multiple times during the course and may inadvertently affect other core subjects if the student opts to miss the entire school day instead of just science class.

**Summary of policy implications.** The state of Florida requires educational instruction be based on the NGSSS and include the teaching of the scientific theory of
evolution. NGSSS for science require students to evaluate the strength of a scientific theory through critical and logical analysis and consideration of alternative scientific explanations. This requirement does not include non-scientific theories. In this study, the majority of the participants agreed that students should have the opportunity to learn about evolution, but they also supported the teaching of alternative theories, such as ID. In the Kitzmiller case (2005), the court ruled ID was not science because it relied on supernatural causation and utilized a contrived impersonation of creation science.

The high response rate for “undecided” in regard to parent rights and state required content for all students may be contributing factors for the high rate of administrators in this study allowing students to opt out. Ambiguous language in various statutes and bills may also be confusing to administrators who must interpret the language when parents request opt out for their students. In Florida, any scientific concept that is based on empirical evidence is included in the state-mandated curriculum. If administrators are influenced to believe teachers have the academic freedom to teach alternative ideas that are not scientifically valid, they may be intentionally or unintentionally allowing subject matter relevant to a student’s academic success to be suppressed or distorted, which possibly violates the Florida Principles of Professional Conduct (6B-1.006)(3)(d) for both the teachers and the administrators. Eighty-five percent of the participants in this study who would allow a student to opt out of class when evolution is taught also disagreed that all students are required to learn about the theory of evolution, regardless of parent or student beliefs.

The Florida NGSSS include critical and logical analysis of scientific theories, which grants teachers the freedom to teach all scientific theories, and no additional
legislation through Academic Freedom bills is necessary. However, the FRFRA does allow parents to opt out their child from instruction if their objection to the content is sincerely motivated by a religious belief. These two contradicting statutes may also open the door for school-based administrators to allow a student to opt out of any topic in any content area. Opt Out practices based on parent beliefs and parent rights should be thoughtfully considered in the K-12 public school setting in light of state and federal requirements that impact graduation rates and schools’ attainment of AYP.

**Implications for Further Research**

**Prevalence of opt-out practices.** Raising student achievement in math and science is a priority for the FDOE, especially in the Science, Technology, Engineering, and Mathematics (STEM) subjects (Partnership to Rejuvenate and Optimize Mathematics and Science Education in Florida [PROMiSE], 2011). One of the goals for the Florida PROMiSE program is to prepare Florida’s educators to make changes in mathematics and science instruction that are aligned with the NGSSS (PROMiSE, 2011). Twelve percent of participants in this study reported they received requests from parents to opt out their child from class when evolution is taught. Further research is needed to determine the pervasiveness of opt-out practices in secondary schools and ascertain how districts can assist secondary school administrators to make opt out decisions that may have a positive impact on student success, school grades, and funding.

**Misconceptions about academic freedom and alternative theories.** A recommendation for future research is to explore how school-based administrators are interpreting academic freedom for K-12 public school teachers. Further study of school-based administrators should be conducted to determine any misconceptions about the
scientific theory of evolution and the content included and not included in the NGSSS. Almost 80% of the “Yes” subgroup in this study supported the teaching of evolution as well as the science teachers’ academic freedom to teach alternative theories, such as ID, in conjunction with evolution. Less than 5% of the administrators in this study supported the teaching of evolution and did not support the teachers’ academic freedom to teach alternative theories.

How are administrators interpreting academic freedom, and in what areas and to what extent do they support teachers, especially as it pertains to alternative theories to the scientific theory of evolution? The high percentage of participants who perceive that there are alternatives to the scientific theory of evolution that should be taught in science classes is cause for concern. This study did not ask for clarification on what participants considered to be an alternative assignment, and whether the assignment would include learning about Creationism and ID, or selecting a different topic, or simply an independent study of the scientific theory of evolution.

One focus for professional development should be increasing administrator subject matter knowledge about scientific theories and how to respond to parent requests to opt out their child from controversial topics. Administrators need knowledge of the definition of a scientific theory and appropriate alternative assignments for controversial topics.

**Impact on school grades and funding.** Since school grades and funding in Florida public schools will rely on students obtaining a clear understanding of scientific theories, specifically evolution, one must question whether participants would be willing to sacrifice state funding for their personal beliefs, bias and/or preference to allow opt
out. Do administrators in this study, who stated they have or would allow a student to opt out of class when evolution is taught, comprehend the consequences that opt out may have on public perception of their success as a school leader when school grades could drop as a result of a lack of student understanding about evolution? Are students still held accountable for understanding the scientific theory of evolution because it is assessed on the State test or are they allowing students to opt out of learning the concept of evolution altogether? Whether or not administrators allow opt out because they know that ID cannot be taught in conjunction with the scientific theory of evolution, or because they allow alternative theories to be taught in conjunction with evolution, was not part of this study but may warrant further investigation. What concepts do school-based administrators consider an alternative to evolution? Administrators need knowledge of required curriculum standards and the relation to state assessments when considering opt out and appropriate alternative assignments for controversial topics.

**Court cases and state statutes.** Most of the administrators who participated in this study who would allow a student be assigned an alternative assignment disagreed or were undecided that evolution is the unifying them in biology. This may be an indication of not believing in or misunderstanding of the scientific theory of evolution and what can legally be taught in public school science classrooms. Past court cases have upheld that alternative theories, such as Creationism and ID, are religious beliefs and cannot be taught in public schools as an alternative theory to evolution. Future research could also examine the possible conflicts within state statutes. Does the *Florida Religious Freedom Restoration Act* (FRFRA) (section 761.03 of the Florida Statutes) supersede state statutes on required instruction? Does not allowing opt out of evolution because of state
assessments and funding justify a compelling governmental interest since 25% of the Biology EOC will assess the concepts of evolutionary theory? School administrators need knowledge of past court cases that have impacted current school policies and statutes.

None of the Florida Academic Freedom bills have passed the State legislature, yet the majority of administrators in this study believe teachers have academic freedom in regards to the content taught in their classroom, including alternative ideas such as ID. School-based administrators may be non-compliant with the current opt out policy in an effort to avoid confrontations with parents or community members, or they may not understand that teachers’ academic freedom does not include what concepts are taught in public schools. Future research may be needed to clarify these issues and/or perceptions of practicing administrators.

**Florida educational leadership programs.** The possibility may exist that Florida Educational Leadership programs may not be adequately preparing school-based administrators to make decisions in regards to parent rights, academic freedom, sincere religious beliefs, and required instruction. Educational Leadership programs could also assist new education leaders in understanding how academic freedom applies to K-12 public school teachers as determined by policy and court cases. Of the participants that answered affirmatively to allow opt out and alternative assignments to evolution, less than 15% agreed that all students are required to learn about the scientific theory of evolution. Of those participants that answered that they would not allow a student to be assigned an alternative assignment and would not allow opt out most agreed that all students are required to learn about evolution regardless of parent beliefs. Less than one-third of the participants in this study agreed that learning evolution is required by Florida
state statute, but this study did not distinguish whether or not administrators are following the policy as dictated by the required statute that all students in Florida public schools must learn the scientific theory of evolution (section 1003.41 of the Florida Statutes) or if they are guiding decisions based on their understanding of FDFRA.

Another topic that may warrant more instructional time in Educational Leadership programs are the Principles of Professional Conduct (6B-1.006) (3)(d). The Principles of Professional Conduct states teachers may not intentionally suppress or distort subject matter. This includes the scientific theory of evolution. Since teaching scientific theories in Florida public schools is required and assessed on the state exams, not teaching evolution concepts may put students at a disadvantage, which may also have a negative impact on a school’s grade, and therefore result in decreased funding. School-based administrators must be given the tools to make decisions on opt out requests in order to meet the needs of the students, the school, and the community.

**Opt out and grade level.** Another recommendation for future researchers to study is to determine why opt out requests decrease as students get older and if there is a relationship with parent involvement and percentage of students receiving F/RL. Previous research conducted by Hill & Tyson (2009) demonstrated that the relation between parental involvement and achievement declines between elementary and middle schools (Child Trends Database, 2011). Parents of primary school children are most likely to participate in their child’s school and parental involvement decreases as the student progresses through secondary school. The results of this study found that participants who served students in grades 9-12 were less likely to allow a student to opt out of class
when evolution is taught, but the data did not reveal whether this was due to less opt out requests because of less parental involvement in the upper grades.

**Relationship between variables.** This study did not address relationships between variables, so further research could be conducted to determine the relationship between parent involvement and the percentage of students receiving F/RL, both factors may play a role in administrators’ decisions to allow opt out. More than 75% of the participants in “Yes” subgroup whose school had more than 50% of the students receiving F/RL, also reported parent involvement as minimal or sometimes (less than 50%) (Appendix N). Participants in urban or rural communities serving a student population with more than 50% receiving F/RL with little parent involvement were also more likely to allow opt out when evolution is taught.

**Summary**

The purpose of this study was to describe and explain selected secondary school principals’ and assistant principals’ actions, perceptions, and awareness of opt-out practices and applying them to the scientific theory of evolution. This data analysis supported a correlation between the decision to allow a student to opt out of class when evolution is taught and grade levels served. There was also a correlation between the decision to allow opt out and the percent of students receiving F/RL. Many participants agreed that they perceived teachers have academic freedom to teach theories not considered scientific, and that parents have the right to remove their child from science instruction if it conflicts with their religious beliefs. Very few participants agreed that learning evolution is a state mandate. Allowing or not allowing opt out of the teaching of the scientific theory of evolution appeared to have little to do with community
demographics, certification, background knowledge, and experience in education and as a
school-based administrator.

Although participants in this study agreed that teachers should have the academic
freedom to teach alternative theories in conjunction with the scientific theory of
evolution, the data should not be misinterpreted to allow or endorse pseudoscientific
ideas and religious beliefs to be taught in K-12 public schools. The Florida NGSSS for
science make clear what is expected to be taught and do not leave any margin of error
that would allow a public school teacher the academic freedom to determine or modify
the topics and content of the state science standards. NGSSS science standards are tested
on the state mandated assessments and teachers are required to teach those standards.
Whether the participants in this study allow opt out of controversial topics because of
personal beliefs, or whether they are not aware of the specificity of required science
content identified in the NGSSS for science, does not justify the inclusion of alternative
ideas or views in K-12 public schools that are not supported through rigorous scientific
processes and not recognized by the scientific community as an accepted scientific
theory.

According to the NAS, critical thinking must be based on the rules of reason and
evidence. All scientific theories must be based on careful and rational examination of
physical evidence collected through empirical observations. ID and other religious ideas
are not scientifically valid because they cannot be tested through the scientific process.
Science educators are responsible for teaching scientifically valid concepts in all fields of
science, through the incorporation of best practices, and to identify and correct student
misconceptions (NAS, 2008). International assessments that compare student
achievement and progress, including the TIMSS and the PISA, report that American high school students have been lagging behind students in other countries in science and math achievement (NCES, 2009). Over the last 15 years, U.S. students have shown no measurable change in average science scores in fourth grade, and seven countries moved their fourth graders from scoring below the U.S. in 1997 to scoring higher than the U.S. in 2007 (NCES, 2009). If students do not have the opportunity to learn key concepts about the nature of science because they are being allowed to opt out of academics, they may be led to believe that a scientific theory is tentative and open to debate.

The language in the Academic Freedom bills received a great deal of attention in local papers and may have resulted in administrators making assumptions that alternative assignments and the teaching of ID is allowable. More than 70% of the participants supported both the teaching of evolution and teachers’ academic freedom to teach alternative theories. This indicated possible misconceptions at the administrative level about the scientific theory of evolution and the requirements of state statute to teach the standards. The scientific community does not accept or recognize any alternative theory to the scientific theory to evolution, and allowing an alternative assignment might be considered the same as allowing opt out.

State standards and course descriptions are prescribed by the State Board of Education to identify the “what” of teaching. Science research organizations, such as AAAS, McREL, NRC, and NSTA, have identified the “how” of effective science teaching pedagogy. The Florida state standards clearly list the content that all students must know and understand and they are specific about evolution being a unifying them in the biological sciences. Evolution is infused into the biological sciences, and this is
evident in Florida’s NGSSS (2008) for science. It is assessed on the Florida Comprehensive Assessment Test (FCAT) for Science administered to all public middle school students and assessed on the Biology End-of-Course exam for high school students. Allowing students to opt out of class when evolution is taught may have a negative impact on student success on state mandated assessments. It is also important for students to acquire the skills necessary for scientific thinking and to gain the understanding of important scientific concepts to be competitive in a global economy after high school. Opt-out practices in regards to required curriculum may have an impact on student career and college readiness.

Results of this study found that over 70% of the administrators who completed the survey have allowed or would allow opt out request when controversial topics such as the scientific theory of evolution is taught. This may indicate they the administrators in this study possibly do not understand the state policy on required curriculum or perhaps are choosing to ignore policy in regards to evolution concepts, to avoid possible conflicts with parents, community members, or based on their personal beliefs. Since opt out is allowed for human sexuality and animal dissections, there may be some transference of this policy from controversial sex education topics to other controversial topics. The implications from this study indicated that many of the participants would allow a student to opt out of class when evolution is taught, including assigning an alternative assignment, despite the fact that this interpretation of opt out extends beyond the scope allowed for in Florida statutes. If school-based administrators allow a student to opt out of class when the scientific theory of evolution is taught, this may open the door for opting out of the other topics, such as the Holocaust, the Civil War, Presidential speeches,
global warming, reading the *Adventures of Huckleberry Finn* and *Catcher in the Rye*, and any other topic deemed “offensive” by parents. One example of the pervasiveness of opt-out practices is recent Presidential speeches. In September 2009, several Florida school districts, including Hillsborough, Hernando, Monroe, Pasco, and Pinellas, made news headlines for sending home permission slips to allow students to opt out of President Obama’s *Back to School* speech (Guerra, 2009; Mattas, 2009). If parents are continually allowed to opt out their child from any topic that may contradict their political and/or religious points of view, it may influence state approved curriculum.

Precedent has been set concerning parent rights to determine the care, custody, and control of their children (*Fields v. Palmdale School District*, 2005; *Wisconsin v. Yoder*, 1972). One question that remains unanswered is whether or not state assessments and school grades, which are tied to federal and state funding as determined by Adequate Yearly Progress (AYP) in the No Child Left Behind Act (2001), would be considered a compelling governmental interest and support the decision by school administrators to refuse parent request for their child to opt out of class when the scientific theory of evolution is taught. It is through the practice of opt out that the teaching and learning of the scientific theory of evolution will continue to be challenged within the public schools.
References


Appendices
Appendix A: Florida NGSSS on Evolution

<table>
<thead>
<tr>
<th>Standard 15 Diversity and Evolution of Living Organisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC.912.L.15.1 - Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change. Also assesses SC.912.N.1.3, SC.912.N.1.4, SC.912.N.1.6, SC.912.N.2.1, SC.912.N.3.1, SC.912.N.3.4, and SC.912.L.15.10.</td>
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<tr>
<td><strong>SC.912.N.1.3</strong> Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.</td>
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<tr>
<td><strong>SC.912.N.1.4</strong> Identify sources of information and assess their reliability according to the strict standards of scientific investigation.</td>
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<tr>
<td><strong>SC.912.N.1.6</strong> Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.</td>
</tr>
<tr>
<td><strong>SC.912.N.2.1</strong> Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).</td>
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<tr>
<td><strong>SC.912.N.3.1</strong> Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.</td>
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<tr>
<td><strong>SC.912.N.3.4</strong> Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.</td>
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<tr>
<td><strong>SC.912.L.15.10</strong> Identify basic trends in hominid evolution from early ancestors six million years ago to modern humans, including brain size, jaw size, language, and manufacture of tools.</td>
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<tr>
<td>SC.912.L.15.8 - Describe the scientific explanations of the origin of life on Earth. Also assesses SC.912.N.1.3, SC.912.N.1.4, and SC.912.N.2.1.</td>
</tr>
<tr>
<td><strong>SC.912.N.1.3</strong> Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.</td>
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<tr>
<td><strong>SC.912.N.1.4</strong> Identify sources of information and assess their reliability according to the strict standards of scientific investigation.</td>
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<tr>
<td><strong>SC.912.N.2.1</strong> Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).</td>
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<tr>
<td>SC.912.L.15.13 – Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success. Also assesses SC.912.N.1.3, SC.912.L.15.14, and SC.912.L.15.5.</td>
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<tr>
<td><strong>SC.912.N.1.3</strong> Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.</td>
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<tr>
<td><strong>SC.912.L.15.14</strong> Discuss mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow.</td>
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<tr>
<td><strong>SC.912.L.15.15</strong> Describe how mutation and genetic recombination increase genetic variation.</td>
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### Appendix B: Survey Instrument

#### Research Question #1 Community and School Demographics

1. In which Florida Region is the school where you work located?  
   (drop down menu with regions/districts listed)

2. Which of the following best describes your school’s community?  
   *Choices:* Rural: areas of low population density; Suburban: residential area outside city limits; Urban: areas of high population density

3. What is the student population at your school?  
   *Choices:* 100 – 500; 501 – 700; 701 – 1000; 1001 – 1500; More than 1500

4. Describe you school.  
   *Choices:* Public school for grades K-8; Public middle school for grades 6-8; Public secondary school for grades 6-12; Public high school for grades 9-12

5. Is your school considered a charter school, magnet school, virtual school or academy?  
   If yes, which one?

6. Which of the following best describes the involvement and participation of the parents in school events and school-sponsored activities?  
   *Choices:* Minimal: less than 20% parent involvement; Sometimes: between 21-50% parent involvement; Often: between 51-75% parent involvement; Very often: more than 75% parent involvement

7. What percentage of students at your school qualify and/or receive free-and-reduced lunch?  
   *Choices:* Less than 20%; 20-50%; 50-70%; More than 70%.

#### Research Question #2 Individual Characteristics

8. How many years have you been working in the field of education?  
   *Choices:* Less than 1 year; 1-5 years; 6-10 years; 11-15 years; 16-20 years; 21-25 years; 26+ years

9. How many years have you been a school administrator?  
   *Choices:* Less than 1 year; 1-5 years; 6-10 years; 11-15 years; 16-20 years; 21-25 years; 26+ years

10. What is the highest degree you have earned?  
    *Choices:* Bachelor’s degree; Master’s degree; Master’s degree plus post-graduate hours; Specialist degree; Doctoral degree

11. In what subject(s) are/were you certified to teach?  
    *Choices:* Science; Math; English and/or Reading; Social Studies; Health and/or Physical Education; Fine Arts (Music, Art, Drama, etc.); Other

#### Group Identification Questions

12. Have you received requests from parents to opt out their child from class when evolution is taught?  
    Yes (Q13)  
    No (Q14)

13. If you HAVE received requests from parents to opt out their child from class when evolution is taught, did you allow it?  
    Yes (Q15)  
    No (Q15)

14. If you HAVE NOT received requests from parents to opt out their child from class when evolution is taught, would you allow it?  
    Yes  
    No

15. Open Ended: Please elaborate why you would make the decision to allow or not allow a student to opt out of class when evolution is taught.
Appendix B: Survey Instrument (Continued)

<table>
<thead>
<tr>
<th>Research Question #3 Action Statements</th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>16. In your role as the school-based administrator, do you support the teaching of evolution at your school?</td>
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<tr>
<td>17. In your role as the school-based administrator, do you support the science teachers’ academic freedom to teach alternative theories to evolution in science classes?</td>
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<td>18. Have you met and/or discussed with the science teachers that they are required to teach evolution concepts?</td>
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<td>19. Have you asked the science teachers to de-emphasize the teaching of evolution in their classes?</td>
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<tr>
<td>20. Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</td>
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<tr>
<th>Research Question #4 Perception Statements</th>
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<th>D</th>
<th>U</th>
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<th>SA</th>
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<tr>
<td>21. Statements of belief cannot be proved or disproved through scientific investigation.</td>
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<td>22. There are other theories, such as Intelligent Design, that should be taught in conjunction with the theory of evolution.</td>
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<td>23. Evolution is a central and unifying theme in biology.</td>
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<td>24. The world is too complex to have come about without the active and repeated intervention of a higher power.</td>
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<td>25. All students should have the opportunity to learn about evolution.</td>
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<td>26. I think parents should have the right to opt out their child from class when evolution is taught.</td>
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<tr>
<th>Research Question #5 Awareness Statements</th>
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<tr>
<td>27. All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</td>
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<tr>
<td>28. I have felt pressure from parents in my community to avoid teaching evolution concepts in science classes.</td>
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<td>29. The majority of parents of students who attend my school support the teaching of evolution.</td>
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<tr>
<td>30. As the school administrator, please share any concerns or issues you have in regards to the opt-out practices and the teaching of evolution in your school or district.</td>
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Appendix C: Discovery Institute’s Model Academic Freedom Bill

In September 2007, the Discovery Institute’s Office of Public Policy and Legal Affairs posted a model academic freedom statute on evolution. The model bill states:

This bill would expressly provide rights and protection for teachers concerning scientific presentations on views regarding biological and chemical evolution [italics added] and students concerning their positions on views regarding biological and chemical evolution. This law shall be known as the "Academic Freedom Act."

The Legislature finds that existing law does not expressly protect the right of teachers …to present scientific critiques of prevailing scientific theories [italics added]. The Legislature further finds that the topic of evolution has generated intense controversy, lawsuits and threats of lawsuits [that] have created confusion about the rights of teachers and students to hold differing views about scientific controversies and express those views [italics added] without fear of adverse employment or academic consequences…. Every K-12 public school teacher … in the State of ____________, shall have the affirmative right and freedom to present scientific information pertaining to the full range of scientific views regarding biological and chemical evolution [italics added] …. no student in any public school … shall be penalized in any way because he or she may subscribe to a particular position on any views regarding biological or chemical evolution [italics added].
Appendix D: Sections of Selected Academic Freedom Bills

In 2008, several states had Academic Freedom bills that were presented during the legislative sessions in spring 2008: Alabama, Florida, Michigan, Missouri, and South Carolina. Louisiana and Arkansas had similar bills in 2003 and 2001 respectively.

- Alabama House Bill 923 (April 2008) states, “The Legislature finds that existing law does not expressly protect the right of teachers . . . to present scientific critiques [italics added] of prevailing scientific theories…” (§ 2). “Every K-12 public school teacher . . .in the State of Alabama, shall have the affirmative right and freedom to present scientific information pertaining to the full range of scientific views [italics added] in any curricula or course of learning” (§ 3).

- Florida House Bill 1483 (April 2008) states, “The Legislature finds that current law does not expressly protect the right of teachers to objectively present scientific information relevant to the full range of scientific views [italics added] regarding chemical and biological evolution” (p. 1, lines 19-26). “Every public school teacher in the state's K-12 school system shall have the affirmative right and freedom to objectively present scientific information relevant to the full range of scientific views [italics added] regarding biological and chemical evolution” (p. 2, lines 35-40). Florida’s Senate Bill 2692 (April 2008) was similarly written.

- Louisiana Senate Bill 733 (2008) states the bill is “to promote students' critical thinking skills [italics added] and open discussion of scientific theories…and create . . . an environment within public … schools that promotes critical thinking skills [italics added], logical analysis, and open and objective discussion of scientific theories being studied including, but not limited to, evolution” (p. 1, lines 15-17; p. 2, line 1) …and support . . . teachers regarding effective ways to help students understand, analyze, critique, and objectively review scientific theories [italics added] (p. 2, lines 3-5).

- Michigan Senate Bill 1361 (June 2008) states, “An important purpose of science education is to inform students about scientific evidence and to help students develop critical thinking skills [italics added] they need in order to become intelligent, productive, and scientifically informed citizens (§ 1292, p. 1, lines 1-5). The district should “create an environment that encourages pupils to explore scientific questions, learn about scientific evidence, develop critical thinking skills, and respond appropriately and respectfully to differences of opinion about controversial issues [italics added], and… to assist teachers to find more effective ways to present the science curriculum in instances where that curriculum addresses scientific controversies . . . to help pupils understand, analyze, critique, and review in an objective manner the scientific strengths and scientific weaknesses of existing scientific theories” [italics added] (§ 1292, p. 2, lines 7-17).
Appendix D: Sections of Selected Academic Freedom Bills (Continued)

- Missouri House Bill 2554 (April 2008) states that the district shall “create an environment … that encourages students to explore scientific questions, learn about scientific evidence, develop critical thinking skills, and respond appropriately and respectfully to differences of opinion about controversial issues [italics added], and …to assist teachers to find more effective ways to present the science curriculum where it addresses scientific controversies…to help students understand, analyze, critique, and review in an objective manner the scientific strengths and scientific weaknesses of theories of biological and chemical evolution [italics added] (§ A. Chapter 170.335.1).

- South Carolina Senate Bill 1386 states, “An important purpose of science education is to inform students about scientific evidence and to help students develop critical thinking skills [italics added] they need in order to become intelligent, productive, and scientifically informed citizens…It is important to create an environment … that encourages students to explore scientific questions, learn about scientific evidence, develop critical thinking skills [italics added], and respond appropriately and respectfully to differences of opinion [italics added] about controversial issues, and…public school educators must be supported in finding effective ways to present controversial science curriculum … to help students understand, analyze, critique, and review the scientific strengths and weaknesses [italics added] of theories of biological and chemical evolution in an objective manner (p. 1, lines 23-40).
Appendix E: The Wedge Strategy

INTRODUCTION
The proposition that human beings are created in the image of God is one of the bedrock principles on which Western civilization was built. Its influence can be detected in most, if not all, of the West’s greatest achievements, including representative democracy, human rights, free enterprise, and progress in the arts and sciences.

Yet a little over a century ago, this cardinal idea came under wholesale attack by intellectuals drawing on the discoveries of modern science. Debunking the traditional conceptions of both God and man, thinkers such as Charles Darwin, Karl Marx, and Sigmund Freud portrayed humans not as moral and spiritual beings, but as animals or machines who inhabited a universe ruled by purely impersonal forces and whose behavior and very thoughts were dictated by the unbending forces of biology, chemistry, and environment. This materialistic conception of reality eventually infected virtually every area of our culture, from politics and economics to literature and art.

The cultural consequences of this triumph of materialism were devastating. Materialists denied the existence of objective moral standards, claiming that environment dictates our behavior and beliefs. Such moral relativism was uncritically adopted by much of the social sciences, and it still undergirds much of modern economics, political science, psychology and sociology.

Materialists also undermined personal responsibility by asserting that human thoughts and behaviors are dictated by our biology and environment. The results can be seen in modern approaches to criminal justice, product liability, and welfare. In the materialist scheme of things, everyone is a victim and no one can be held accountable for his or her actions.

Finally, materialism spawned a virulent strain of utopianism. Thinking they could engineer the perfect society through the application of scientific knowledge, materialist reformers advocated coercive government programs that falsely promised to create heaven on earth.

Discovery Institute’s Center for the Renewal of Science and Culture seeks nothing less than the overthrow of materialism and its cultural legacies. Bringing together leading scholars from the natural sciences and those from the humanities and social sciences, the Center explores how new developments in biology, physics and cognitive science raise serious doubts about scientific materialism and have re-opened the case for a broadly theistic understanding of nature. The Center awards fellowships for original research, holds conferences, and briefs policymakers about the opportunities for life after materialism.
Appendix E: The Wedge Strategy (Continued)

THE WEDGE STRATEGY
PHASE I  Scientific Research, Writing & Publicity
PHASE II  Publicity & Opinion-making
PHASE III  Cultural Confrontation & Renewal

THE WEDGE PROJECTS
PHASE I.  Scientific Research, Writing & Publication
   Individual Research Fellowship Program
   Paleontology Research program (Dr. Paul Chien et al.)
   Molecular Biology Research Program (Dr. Douglas Axe et al.)
PHASE II. Publicity & Opinion-making
   Book Publicity
   Opinion-Maker Conferences
   Apologetics Seminars
   Teacher Training Program
   Op-ed Fellow
   PBS (or other TV) Co-production
   Publicity Materials / Publications

PHASE III.  Cultural Confrontation & Renewal
   Academic and Scientific Challenge Conferences
   Potential Legal Action for Teacher Training
   Research Fellowship Program: shift to social sciences and humanities

FIVE YEAR STRATEGIC PLAN SUMMARY
The social consequences of materialism have been devastating. As symptoms, those consequences are certainly worth treating. However, we are convinced that in order to defeat materialism, we must cut it off at its source. That source is scientific materialism. This is precisely our strategy. If we view the predominant materialistic science as a giant tree, our strategy is intended to function as a wedge that, while relatively small, can split the trunk when applied at its weakest points. The very beginning of this strategy, the thin edge of the wedge, was Phillip Johnson’s critique of Darwinism begun in 1991 in Darwinism on Trial, and continued in Reason in the Balance and Defeating Darwinism by Opening Minds. Michael Behe’s highly successful Darwin’s Black Box followed Johnson’s work. We are building on this momentum, broadening the wedge with a positive scientific alternative to materialistic scientific theories, which has come to be called the theory of intelligent design (ID). Design theory promises to reverse the stifling dominance of the materialist worldview, and to replace it with a science consonant with Christian and theistic convictions.

Five Year Objectives/Activities).
PHASE I (Research, Writing and Publication) is the essential component of everything that comes afterward. Without solid scholarship, research and argument, the project
Appendix E: The Wedge Strategy (Continued)

would be just another attempt to indoctrinate instead of persuade. A lesson we have learned from the history of science is that it is unnecessary to outnumber the opposing establishment. Scientific revolutions are usually staged by an initially small and relatively young group of scientists who are not blinded by the prevailing prejudices and who are able to do creative work at the pressure points, that is, on those critical issues upon which whole systems of thought hinge. So, in Phase I we are supporting vital writing and research at the sites most likely to crack the materialist edifice.

PHASE II. (Publicity and Opinion-making) The primary purpose of Phase II is to prepare the popular reception of our ideas. The best and truest research can languish unread and unused unless it is properly publicized. For this reason we seek to cultivate and convince influential individuals in print and broadcast media, as well as think tank leaders, scientists and academics, congressional staff, talk show hosts, college and seminary presidents and faculty, future talent and potential academic allies. Because of his long tenure in politics, journalism and public policy, Discovery President Bruce Chapman brings to the project rare knowledge and acquaintance of key op-ed writers, journalists, and political leaders. This combination of scientific and scholarly expertise and media and political connections makes the Wedge unique, and also prevents it from being “merely academic. Other activities include production of a PBS documentary on intelligent design and its implications, and popular op-ed publishing.

Alongside a focus on influential opinion-makers, we also seek to build up a popular base of support among our natural constituency, namely, Christians. We will do this primarily through apologetics seminars. We intend these to encourage and equip believers with new scientific evidences that support the faith, as well as to popularize our ideas in the broader culture.

PHASE III. (Cultural Confrontation and Renewal) Once our research and writing have had time to mature, and the public prepared for the reception of design theory, we will move toward direct confrontation with the advocates of materialist science through challenge conferences in significant academic settings. We will also pursue possible legal assistance in response to resistance to the integration of design theory into public school science curricula. The attention, publicity, and influence of design theory should draw scientific materialists into open debate with design theorists, and we will be ready. With an added emphasis to the social sciences and humanities, we will begin to address the specific social consequences of materialism and the Darwinist theory that supports it in the sciences.

GOALS
Governing Goals
To defeat scientific materialism and its destructive moral, cultural and political legacies.
To replace materialistic explanations with the theistic understanding that nature and human beings are created by God.
Appendix E: The Wedge Strategy (Continued)

Five Year Goals
To see intelligent design theory as an accepted alternative in the sciences and scientific research being done from the perspective of design theory.
To see the beginning of the influence of design theory in spheres other than natural science.
To see major new debates in education, life issues, legal and personal responsibility pushed to the front of the national agenda.

Twenty Year Goals
To see intelligent design theory as the dominant perspective in science.
To see design theory application in specific fields, including molecular biology, biochemistry, paleontology, physics and cosmology in the natural sciences, psychology, ethics, politics, theology and philosophy in the humanities; to see its influence in the fine arts.
To see design theory permeate our religious, cultural, moral and political life.

FIVE YEAR OBJECTIVES
1. A major public debate between design theorists and Darwinists (by 2003)
2. Thirty published books on design and its cultural implications (sex, gender issues, medicine, law, and religion)
3. One hundred scientific, academic and technical articles by our fellows
4. Significant coverage in national media:
   - Cover story on major news magazine such as Time or Newsweek
   - PBS show such as Nova treating design theory fairly
   - Regular press coverage on developments in design theory
   - Favorable op-ed pieces and columns on the design movement by 3rd party media
5. Spiritual & cultural renewal:
   - Mainline renewal movements begin to appropriate insights from design theory, and to repudiate theologies influenced by materialism
   - Major Christian denomination(s) defend(s) traditional doctrine of creation & repudiate(s)
   - Darwinism Seminaries increasingly recognize & repudiate naturalistic presuppositions
   - Positive uptake in public opinion polls on issues such as sexuality, abortion and belief in God
6. Ten states begin to rectify ideological imbalance in their science curricula & include design theory
7. Scientific achievements:
   - An active design movement in Israel, the UK and other influential countries outside the US
   - Ten CRSC Fellows teaching at major universities
   - Two universities where design theory has become the dominant view
   - Design becomes a key concept in the social sciences Legal reform movements base legislative proposals on design theory
## Appendix F: Sources for Survey Items

<table>
<thead>
<tr>
<th>Item#</th>
<th>Modified Item in Study</th>
<th>Original Item and Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Have you received requests from parents to opt out their child from class when evolution is taught?</td>
<td>Designed by researcher</td>
</tr>
<tr>
<td>13</td>
<td>If you HAVE received requests from parents to opt out their child from class when evolution is taught, did you allow it?</td>
<td>Designed by researcher</td>
</tr>
<tr>
<td>14</td>
<td>If you HAVE NOT received requests from parents to opt out their child from class when evolution is taught, would you allow it?</td>
<td>Designed by researcher</td>
</tr>
<tr>
<td>15</td>
<td>Open Ended: Please elaborate why you would make the decision to allow or not allow a student to opt out of class when evolution is taught.</td>
<td>Designed by researcher</td>
</tr>
<tr>
<td>16</td>
<td>As the school-based administrator, do you support the teaching of evolution at your school?</td>
<td>As the school principal or district administrator, I support the teaching of evolution at my school (Bilica, 2001).</td>
</tr>
<tr>
<td>17</td>
<td>As the school-based administrator, do you support the science teachers’ academic freedom to teach alternative theories to evolution?</td>
<td>Designed by researcher</td>
</tr>
<tr>
<td>18</td>
<td>Have you met or discussed with the science teachers that they are required to teach evolution concepts?</td>
<td>Designed by researcher</td>
</tr>
<tr>
<td>19</td>
<td>Have you asked the science teachers to de-emphasize the teaching of evolution in their classes?</td>
<td>As the principal/administrator, I have asked the science teachers to de-emphasize the teaching of evolution in their classes (Bilica, 2001).</td>
</tr>
<tr>
<td>20</td>
<td>Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</td>
<td>Designed by researcher</td>
</tr>
<tr>
<td>21</td>
<td>Statements of belief cannot be proved or disproved through scientific investigation.</td>
<td>Statements of belief cannot be proved or disproved (Hermann, 2007).</td>
</tr>
<tr>
<td>22</td>
<td>There are other theories, such as Intelligent Design, that should be taught in conjunction with the theory of evolution.</td>
<td>There are other theories (besides evolution) that should be taught in conjunction with evolution (Bilica, 2001).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Appendix F: Sources for Survey Items (Continued)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Evolution is a central and unifying theme in biology.</td>
<td>Evolution is a central and unifying theme in biology (Bilica, 2001). Agree that evolution is a central principle in biology (Fowler &amp; Meisels, 2010).</td>
</tr>
<tr>
<td>24</td>
<td>The world is too complex to have come about without the active and repeated intervention of a higher power.</td>
<td>The world is too complex and subtle to have come about without the active and repeated intervention of God (Hermann, 2007).</td>
</tr>
<tr>
<td>25</td>
<td>All students should have the opportunity to learn about evolution.</td>
<td>All students should learn about evolution (Bilica, 2001).</td>
</tr>
<tr>
<td>26</td>
<td>I think parents should have the right to opt out their child from class when evolution is taught.</td>
<td>Designed by researcher</td>
</tr>
<tr>
<td>27</td>
<td>All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>I have felt pressure from parents in my community to avoid teaching evolution concepts in science classes.</td>
<td>I have felt pressure from parents in my community to avoid teaching evolution concepts (Bilica, 2001).</td>
</tr>
<tr>
<td>29</td>
<td>The majority of parents of students who attend my school support the teaching of evolution</td>
<td>The parents of students who attend my school agree that students should learn about evolution (Bilica, 2001).</td>
</tr>
<tr>
<td>30</td>
<td>As the school administrator, please share any concerns or issues you have in regards to the opt-out practices and the teaching of evolution in your school or district.</td>
<td>Designed by researcher</td>
</tr>
</tbody>
</table>
Appendix G: Email Request for Participation and Informed Consent

There is limited research in the area of opt-out practice at the school level as it applies to controversial topics, specifically evolution. Your participation in a 20-minute survey will add to the literature. Please be a part of this ground breaking research. The research and data analysis is only meaningful if many administrators are willing to be a part of it. This survey is voluntary and ANONYMOUS. Demographic information will be used for data analysis purposes only and can not be used for compilation of any personal information. Your time and forthrightness is appreciated.

Administrators,
Thank you for your time and consideration to participate in the survey. My name is Jackie Speake and I am a doctoral student at the University of South Florida in the Department of Educational Leadership and Policy Studies. I have been an educator for 13 years and I am excited for the opportunity to conduct this study.

The purpose of this study is to collect survey data on secondary school administrators' perceptions on practices as they apply to opting out of controversial topics, specifically evolution. There is limited research in the area of opt-out practices as they apply to controversial topics, therefore this study will add to the literature and your participation and contribution is vital. Your forthrightness and time is greatly appreciated.

The survey consists of 30 items and takes about 15 minutes to complete. It is divided into three sections: information about your school's community characteristics and individual demographic information; Section two consists of perception statements; and an open-ended question to allow the participant to speak to issues, concerns, and viewpoints not addressed in the survey.

Participation in this study is voluntary and anonymous. Participation will not result in penalty or loss of benefits and there is no cost to participate in the study. There are no foreseeable risks to participate and you may exit the survey at any time. Survey data will be collected and downloaded by a password-protected electronic database and deleted from the SurveyMonkey website.

The survey will be available from for 30 calendar days. Your candid responses and time is greatly appreciated.

The University of South Florida Institutional Review Board, IRB, may be contacted at: 12901 Bruce B. Downs Blvd. MDC 035, Tampa, Florida 33612, (ph) 813-974-5638. This IRB may request to see my research records from the study. For questions about the research, please contact me at speake@mail.usf.edu. By answering the survey items, you are giving your consent for participation. Thank you for your time.
Appendix H: CITI Human Research Curriculum Completion Report

CITI Collaborative Institutional Training Initiative

Human Research Curriculum Completion Report
Printed on

Learner: Jackie Speake (username: speakej)
Institution: University of South Florida
Contact: Department: Educational Leadership and Policy Studies
Information: Phone: 941-255-0808
Email: jackie_speake@ccps.k12.fl.us

Social / Behavioral Investigators and Key Personnel:

Stage 1. Basic Course Passed on 08/27/09 (Ref # 3423599)

<table>
<thead>
<tr>
<th>Required Modules</th>
<th>Date Completed</th>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>08/25/09</td>
<td>no quiz</td>
</tr>
<tr>
<td>History and Ethical Principles - SBR</td>
<td>08/25/09</td>
<td>3/4 (75%)</td>
</tr>
<tr>
<td>Defining Research with Human Subjects - SBR</td>
<td>08/25/09</td>
<td>4/5 (80%)</td>
</tr>
<tr>
<td>The Regulations and The Social and Behavioral Sciences - SBR</td>
<td>08/25/09</td>
<td>4/5 (80%)</td>
</tr>
<tr>
<td>Assessing Risk in Social and Behavioral Sciences - SBR</td>
<td>08/25/09</td>
<td>4/5 (80%)</td>
</tr>
<tr>
<td>Informed Consent - SBR</td>
<td>08/25/09</td>
<td>3/4 (75%)</td>
</tr>
<tr>
<td>Privacy and Confidentiality - SBR</td>
<td>08/25/09</td>
<td>3/3 (100%)</td>
</tr>
<tr>
<td>Research with Prisoners - SBR</td>
<td>08/25/09</td>
<td>2/4 (50%)</td>
</tr>
<tr>
<td>Research with Children - SBR</td>
<td>08/26/09</td>
<td>4/4 (100%)</td>
</tr>
<tr>
<td>Research in Public Elementary and Secondary Schools - SBR</td>
<td>08/26/09</td>
<td>3/3 (75%)</td>
</tr>
<tr>
<td>International Research - SBR</td>
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<td>3/3 (100%)</td>
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<td>Internet Research - SBR</td>
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<td>5/5 (100%)</td>
</tr>
<tr>
<td>University of South Florida</td>
<td>08/27/09</td>
<td>5/6 (83%)</td>
</tr>
</tbody>
</table>

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator

Return

Appendix H: CITI Human Research Curriculum Completion Report (Continued)

CITI Collaborative Institutional Training Initiative

Human Research Curriculum Completion Report
Printed on 7/5/2010

Learner: Jackie Speake (username: speakej)
Institution: University of South Florida
Contact: Department: Educational Leadership and Policy Studies
Information: Phone: 941-255-0808
Email: jackie_speake@ccps.k12.fl.us

Social / Behavioral Investigators and Key Personnel:

<table>
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<tr>
<th>Required Modules</th>
<th>Date Completed</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refresher Course 101 Introduction</td>
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<td>no quiz</td>
</tr>
<tr>
<td>SBR 101 REFRESHER MODULE 1. History and Ethics</td>
<td>07/05/10</td>
<td>4/5 (80%)</td>
</tr>
<tr>
<td>SBR 101 REFRESHER MODULE 2. Regulatory Overview</td>
<td>07/05/10</td>
<td>5/5 (100%)</td>
</tr>
<tr>
<td>SBR 101 REFRESHER MODULE 3. Fundamental Issues</td>
<td>07/05/10</td>
<td>3/5 (60%)</td>
</tr>
<tr>
<td>SBR 101 REFRESHER MODULE 4. Vulnerable Subjects</td>
<td>07/05/10</td>
<td>4/4 (100%)</td>
</tr>
<tr>
<td>SBR 101 REFRESHER MODULE 5. Additional Topics</td>
<td>07/05/10</td>
<td>4/5 (80%)</td>
</tr>
<tr>
<td>How to Complete The CITI Refresher Course and</td>
<td>07/05/10</td>
<td>no quiz</td>
</tr>
<tr>
<td>Receive the Completion Report</td>
<td></td>
<td></td>
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</tbody>
</table>

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator

https://www.citiprogram.org/members/learnersII/crbystage.asp?strKeyId=E23354BE-7F45-... 7/5/2010
Appendix I: SurveyMonkey Privacy Policy

TRUSTe Privacy Program
SurveyMonkey.com is a licensee of the TRUSTe Privacy Program. TRUSTe is an independent, non-profit organization whose mission is to build user’s trust and confidence in the Internet by promoting the use of fair information practices. This privacy statement covers the Web site http://www.surveymonkey.com. Because this Web site wants to demonstrate its commitment to your privacy, it has agreed to disclose its information practices and have its privacy practices reviewed for compliance by TRUSTe. If you have questions or concerns regarding this statement, you should first contact Chris Finley at support@surveymonkey.com. If you do not receive acknowledgement of your inquiry or your inquiry has not been satisfactorily addressed, you should contact TRUSTe at http://www.truste.org/consumers/watchdog_complaint.php TRUSTe will then serve as a liaison with us to resolve your concerns. SurveyMonkey.com complies with the EU Safe Harbor framework as set forth by the Department of Commerce regarding the collection, use, and retention of data from the European Union. This list can be found at: http://web.ita.doc.gov/safeharbor/SHList.nsf/WebPages/Oregon.

1. Information Collection
You may view some areas of our site for free and register for a free account. We collect information such as your name, address, email. We use this information to contact you about the services on our site in which you have expressed interest.

You have the option to provide demographic information (such as income level and gender) to us; we encourage you to submit this information so we can provide you a more personalized experience on our site.

If you purchase a product or service from us, we request certain personally identifiable information from you on our order form. You must provide contact information (such as name, email, and shipping address) and financial information (such as credit card number, expiration date).

We use this information for billing purposes and to fill your orders. If we have trouble processing an order, we will use this information to contact you.

When you register for SurveyMonkey.com, you will receive a short welcome email. If you opt to receive newsletters from us, you will receive a monthly email. As a paid subscriber, you will receive emails regarding your account status and billing.

We will not use the information collected from your surveys in any way, shape, or form. In addition, any other material you provide us (including images, email addresses, etc.) will be held in the strictest confidence.
Appendix I: SurveyMonkey Privacy Policy (Continued)

In addition, we do not collect personally identifiable information about you except when you specifically provide this information on a voluntary basis. We will make every effort to ensure that whatever information you provide will be maintained in a secure environment.

Log Files
As is true of most Web sites, we gather certain information automatically and store it in log files. This information includes internet protocol (IP) addresses, browser type, internet service provider (ISP), referring/exit pages, operating system, date/time stamp, and clickstream data.
We use this information, which does not identify individual users, to analyze trends, to administer the site, to track users’ movements around the site and to gather demographic information about our user base as a whole.

We do not link this automatically-collected data to personally identifiable information.

Cookies
"Cookies" are small text files a website can use to recognize repeat users. SurveyMonkey.com uses cookies to recognize visitors and more quickly provide personalized content or grant you unimpeded access to the website. With cookies enabled, you will not need to fill in password or contact information.

Information gathered through cookies also helps us measure use of our website. Cookie data allow us to track usage behavior and compile data that we can use to improve the site. This data will be used in aggregate form; no specific users will be tracked.

Generally, cookies work by assigning a unique number to the user that has no meaning outside of the Web site that he or she is visiting. You can easily turn off cookies. Most browsers have a feature that allows the user to refuse cookies or issues a warning when cookies are being sent. However, our site will not function properly without cookies. Enabling cookies ensures a smooth, efficient visit to our website.

We use a third-party tracking service that uses cookies to track non-personally identifiable information about visitors to our site in the aggregate to capture usage and volume statistics to help us improve our site. We have no access or control over these cookies.

This privacy statement covers the use of cookies by www.surveymonkey.com only and does not cover the use of cookies by any third party.
Appendix I: SurveyMonkey Privacy Policy (Continued)

2. Information Use
SurveyMonkey.com reserves the right to perform statistical analyses of user behavior and characteristics. We do this in order to measure interest in and use of the various areas of the website.

SurveyMonkey.com collects IP addresses for system administration and record keeping. Your IP address is automatically assigned to your computer when you use the World Wide Web. Our servers record incoming IP addresses. The IP addresses are analyzed only in aggregate; no connection is made between you and your computer's IP address. By tracking IP addresses, we can determine which sites refer the most people to SurveyMonkey.com. (Think of an IP address like your zip code; it tells us in general terms where you're from.)

Communications from the Site

Service-related Announcements
We will send you strictly service-related announcements on rare occasions when it is necessary to do so. For instance, if our service is temporarily suspended for maintenance, we might send you an email. Generally, you may not opt out of these communications, which are not promotional in nature. If you do not wish to receive them, you have the option to deactivate your account.

Customer Service
Based upon the personally identifiable information you provide us, we will send you a welcoming email to verify your username and password. We will also communicate with you in response to your inquiries, to provide the services you request, and to manage your account. We will communicate with you by email or telephone, in accordance with your wishes.

Newsletters
If you wish to subscribe to our newsletter(s), we will use your name and email address to send the newsletter to you. Out of respect for your privacy, we provide you a way to unsubscribe. Please see the “Opting out” section.

Sending Emails on User’s Behalf
We also send survey invitation emails on behalf of our customers. The customer's email list is stored on our system, but is not used by SurveyMonkey.com in any other way. The emails sent on our customer's behalf appear to come from the customer's email address.
Appendix I: SurveyMonkey Privacy Policy (Continued)

Surveys or Contests
From time-to-time we may provide you the opportunity to participate in contests or surveys on our site. If you participate, we will request certain personally identifiable information from you. Participation in these surveys or contests is completely voluntary and you therefore have a choice whether or not to disclose this information. The requested information typically includes contact information (such as name and shipping address), and demographic information (such as zip code).

We use this information to notify contest winners and to monitor site traffic or personalize the site (in the case of anonymous information collected in surveys).

Testimonials
We post testimonials from time to time. We always receive permission to post prior to posting.

Sharing Information

Service Providers
We use other third parties to provide billing services on our site. When you purchase a service from us, we will share contact and credit card information as necessary for the third party to provide that service.

These third parties are prohibited from using your personally identifiable information for any other purpose including their own marketing purposes.

Opting Out
Upon request, SurveyMonkey.com will allow any user to opt out of our monthly newsletter. You can contact us through our Help Center or follow the unsubscribe instructions included in each promotional email sent to you including the newsletter.

For more information regarding opting out of any mailing from SurveyMonkey.com, please visit our Help Center.

Links to Other Sites
This Web site contains links to other sites that are not owned or controlled by SurveyMonkey.com. Please be aware that we, SurveyMonkey.com, are not responsible for the privacy practices of such other sites.

We encourage you to be aware when you leave our site and to read the privacy statements of each and every Web site that collects personally identifiable information. This privacy statement applies only to information collected by this Web site.
Appendix I: SurveyMonkey Privacy Policy (Continued)

Access to Personally Identifiable Information
If your personally identifiable information changes, or if you no longer desire our service, you may correct, update, delete or deactivate it by making the change on our My Account page or by emailing our Customer Support at support@surveymonkey.com or by contacting us by telephone or postal mail at the contact information listed below. We will respond to any request for access within 30 days.

Legal Disclaimer
We reserve the right to disclose your personally identifiable information as required by law and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our Web site.

General Security Policy
SurveyMonkey.com is aware of your privacy concerns and strives to collect only as much data as is required to make your SurveyMonkey experience as efficient and satisfying as possible, in the most unobtrusive manner as possible.

The security of your personal information is important to us. When you enter sensitive information (such as credit card number and/or social security number) on our registration or order forms, we encrypt that information using secure socket layer technology (SSL).

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

If you have any questions about security on our Web site, you can send email us at support@surveymonkey.com

Changes in this Privacy Statement
If we decide to change our privacy policy, we will post those changes to this privacy statement, the home page, and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

We reserve the right to modify this privacy statement at any time, so please review it frequently. If we make material changes to this policy, we will notify you here, by email, or by means of a prominent notice on our home page.

Last updated: May 2, 2008
Appendix J: SurveyMonkey Security Statement

SurveyMonkey is aware of our users’ privacy concerns and strives to collect only as much data as is required to make our users’ experience with SurveyMonkey as efficient and satisfying as possible. We also aim to collect data in the most unobtrusive manner possible.

SurveyMonkey utilizes some of the most advanced technology for Internet security commercially available today. When a user accesses secured areas of our site, Secure Sockets Layer (SSL) technology protects user information using both server authentication and data encryption, ensuring that user data is safe, secure, and available only to authorized persons.

SurveyMonkey requires users to create a unique user name and password that must be entered each time a user logs on. SurveyMonkey issues a session "cookie" only to record encrypted authentication information for the duration of a specific session. The session cookie does not include either the username or password of the user.

In addition, SurveyMonkey is hosted in a secure data center environment that uses a firewall, intrusion detection systems, and other advanced technology to prevent interference or access from outside intruders. The data center is a highly protected environment with several levels of physical access security and 24-hour surveillance.

However, no method of transmission over the Internet, or method of electronic storage, is perfectly secure. Therefore, we cannot guarantee absolute security. If SurveyMonkey learns of a security systems breach that affects certain users, then we will attempt to notify those users electronically so that they can take appropriate protective steps. SurveyMonkey may also post a notice on our website if a security breach occurs.

If you have any questions about security on the SurveyMonkey website, please email us at support@surveymonkey.com.

Last updated: May 24, 2010
Appendix K: SurveyMonkey Terms of Use

Any person or entity ("User") accessing the SurveyMonkey.com web site (the "Site" or "Service") or any of the information contained herein agrees to and is bound by the following terms and conditions of this SurveyMonkey.com web site terms of use ("Agreement"): 

This Agreement is a legal agreement between the User and SurveyMonkey.com Corporation for the SurveyMonkey.com Software Application Services you subscribe to. These Software Application Services include computer software, data storage mechanisms, databases and related designs, printed materials, and online or electronic documentation (Software Application Services, Application Services, or Software). By using the Software Application Services, you agree to be bound by the terms of this Customer Agreement. If you do not agree to the terms of this Customer Agreement, you are not authorized to use the Software Application Services.

1. PAYMENT

You agree to pay all applicable charges under this Agreement, including any applicable taxes or charges imposed by any government entity, and that SurveyMonkey.com may change its minimum pricing at any time. User must supply SurveyMonkey.com with correct credit card information, and any changes in credit card validity or expiration date must be updated. SurveyMonkey.com will automatically renew and charge User's account every month, quarter, or year for subscriptions. The renewal charge will be equal to the original subscription price, unless SurveyMonkey.com notifies User otherwise in advance. If the credit card cannot be processed for any reason, SurveyMonkey.com reserves the right to cancel the Service.

2. MEMBER ACCOUNT, PASSWORD AND SECURITY

You will receive a password and account designation upon completing the Service's registration process. You are responsible for maintaining the confidentiality of the password and account, and are fully responsible for all activities that occur under your password or account. You agree to (a) immediately notify SurveyMonkey.com of any unauthorized use of your password or account or any other breach of security, and (b) ensure that you exit from your account at the end of each session. SurveyMonkey.com cannot and will not be liable for any loss or damage arising from your failure to comply with this Section.

3. MEMBER CONDUCT

You understand that all information, data, text, software, music, sound, photographs, graphics, video, messages or other materials ("Content"), whether publicly posted or privately transmitted, are the sole responsibility of the person from which such Content originated. This means that you, and not SurveyMonkey.com, are entirely responsible for all Content that you upload, post, email, transmit or otherwise make available via the
Appendix J: SurveyMonkey Security Statement (Continued)

Service. SurveyMonkey.com does not control the Content posted via the Service and, as such, does not guarantee the accuracy, integrity or quality of such Content. You understand that by using the Service, you may be exposed to Content that is offensive, indecent or objectionable. Under no circumstances will SurveyMonkey.com be liable in any way for any Content, including, but not limited to, for any errors or omissions in any Content, or for any loss or damage of any kind incurred as a result of the use of any Content posted, emailed, transmitted or otherwise made available via the Service.

User agrees not to attempt to damage, deny service to, hack, crack, reverse-engineer, or otherwise interfere (collectively, "Interfere") with SurveyMonkey.com's web site in any manner. If User in any way Interferes with SurveyMonkey.com's web site, User agrees to pay all damages incurred by SurveyMonkey.com, including any consequential damages, and agrees that the measure of hard to determine damages will be the highest estimate of damages as provided by SurveyMonkey.com. User's Interference with SurveyMonkey.com's web site relieves SurveyMonkey.com of any of its contractual or other legal obligations to User, including SurveyMonkey.com's obligations under its Privacy Policy. SurveyMonkey.com will cooperate with the authorities in prosecuting any User who Interferes with SurveyMonkey.com's web site, attempts to defraud SurveyMonkey.com, or attempts to defraud credit card companies or any other parties through User's use of SurveyMonkey.com's web site or services.

You agree to not use the Service to:

- upload, post, email, transmit or otherwise make available any Content that is unlawful, harmful, threatening, abusive, harassing, tortuous, defamatory, vulgar, obscene, libelous, invasive of another's privacy, hateful, or racially, ethnically or otherwise objectionable;
- harm minors in any way;
- impersonate any person or entity, including, but not limited to, a SurveyMonkey.com official, forum leader, guide or host, or falsely state or otherwise misrepresent your affiliation with a person or entity;
- upload, post, email, transmit or otherwise make available any Content that you do not have a right to make available under any law or under contractual or fiduciary relationships (such as inside information, proprietary and confidential information learned or disclosed as part of employment relationships or under nondisclosure agreements);
- upload, post, email, transmit or otherwise make available any Content that infringes any patent, trademark, trade secret, copyright or other proprietary rights ("Rights") of any party;
- upload, post, email, transmit or otherwise make available any unsolicited or unauthorized advertising, promotional materials, "junk mail," "spam," "chain letters," "pyramid schemes," or any other form of solicitation;
- interfere with or disrupt the Service or servers or networks connected to the Service, or disobey any requirements, procedures, policies or regulations of networks connected to the Service;
Appendix J: SurveyMonkey Security Statement (Continued)

- intentionally or unintentionally violate any applicable local, state, national or international law, including, but not limited to, regulations promulgated by the U.S. Securities and Exchange Commission, any rules of any national or other securities exchange, including, without limitation, the New York Stock Exchange, the American Stock Exchange or the NASDAQ, and any regulations having the force of law;

Violation of any of the items in this Section relieves SurveyMonkey.com of any of its contractual or other legal obligations to User, including SurveyMonkey.com's obligations under its Privacy Policy.

SurveyMonkey.com reserves the right to refuse any or all service to any User for any reason, at any time, at SurveyMonkey.com's sole discretion. User agrees that SurveyMonkey.com may block its IP address or addresses at any time, and at SurveyMonkey.com's sole discretion, thereby disallowing User's continued use of SurveyMonkey.com's web site.

4. COMPLIANCE WITH AGREEMENT AND LAWS

You shall use the survey tool only in compliance with this Terms of Use, the FTC's CAN-SPAM Law, and all other applicable U.S., state, local, and international laws (including, but not limited to, policies and laws related to spamming, copyright and trademark infringement, defamation, privacy, obscenity, and child protective email address registry laws).

You also agree not to intentionally or unintentionally violate any applicable local, state, national, or international law, including, but not limited to, regulations promulgated by the U.S. Securities and Exchange Commission, any rules of any national or other securities exchange, including, without limitation, the New York Stock Exchange, the American Stock Exchange, or the NASDAQ, and any regulations having the force of law.

Although SurveyMonkey has no obligation to review the content provided by you or your use of the Survey Tool, SurveyMonkey may do so and may block any email messages and or terminate any use of the Survey Tool that SurveyMonkey believes may be (or is alleged to be) in violation of the foregoing.

You also agree not to upload survey links to message boards or newsgroups without express permission.

5. ANTI-SPAM

Email and Prohibited Content
Email messages sent in connection with the Survey Tool must contain an "unsubscribe" link that allows subscribers to remove themselves from your email messages. You
Appendix J: *SurveyMonkey* Security Statement (Continued)

acknowledge and agree that you will not hide, disable, or remove or attempt to hide, disable, or remove the opt out link from the email invitation. You will actively manage and process unsubscribe requests received by you directly within ten days of submission, and update your email lists and address books to reflect the unsubscribe requests. You are responsible for ensuring that during use of the Survey Tool your email messages do not generate a number of spam complaints in excess of industry standards. If *SurveyMonkey* determines that your level of spam complaints is higher than industry standards, *SurveyMonkey*, at its sole discretion, has the right to terminate your use of its Survey Tool.

Permission Lists Only

*SurveyMonkey* has a zero-tolerance spam policy. Subscriber accounts will be terminated for sending unsolicited email messages. This means that all recipients sent to must have opted in to receiving communications from you, the sender.

- You can only use *SurveyMonkey* to send emails to lists of people that gave you permission to email them. If you don't have proof that each recipient on your list opted in for your emails, don't import them into *SurveyMonkey*.
- We prohibit the use of third-party, purchased, rented, or harvested mailing lists. *SurveyMonkey* will terminate accounts violating the foregoing.
- You cannot mail to newsgroups, message boards, distribution lists, or unsolicited email addresses.
- You agree that you shall not utilize the Survey Tool to send any commercial electronic mail messages (as defined in the Act of 2003) to any recipient who has opted out, unsubscribed, or otherwise objected to receiving such messages from you or another party on whose behalf you may be commissioned. The CAN-SPAM Act outlines requirements for sending out commercial emails. These rules govern the Internet by United States law. A brief description of the CAN-SPAM Act follows:
  1. **Bans false or misleading header information.** Requires valid "reply" and "from" addresses. These must be accurate and identify the person who initiated the email.
  2. **Prohibits deceptive subject lines.** The subject line cannot mislead the recipient about the contents or subject matter of the message.
  3. **Requires the email to provide recipients with a valid opt out method.** You must provide a return email address or another Internet-based response mechanism that allows a recipient to ask you not to send future email messages to that email address, and you must honor the requests. You may create a "menu" of choices to allow a recipient to opt out of certain types of messages, but you must include the option to end any commercial messages from the sender. Any opt out mechanism you offer must be able to process opt out requests for at least thirty days after you send your commercial email. When you receive an opt out request, the law gives you ten business days to stop sending email to the requestor's email address. You cannot help another entity...
Appendix J: SurveyMonkey Security Statement (Continued)

send email to that address, or have another entity send email on your behalf to that address. Finally, it's illegal for you to sell or transfer the email addresses of people who choose not to receive your email, even in the form of a mailing list, unless you transfer the addresses so another entity can comply with the law.

4. **Include physical mailing address.** You message must contain clear and conspicuous notice that the message is an advertisement or solicitation and that the recipient can opt out of receiving more commercial email from you. It also must include your valid physical postal address.

**Reporting Spam**
If you suspect that SurveyMonkey.com has been used to send spam, please contact us immediately at abuse@surveymonkey.com and we will investigate accordingly.

**6. MODIFICATIONS TO SERVICE**

SurveyMonkey.com reserves the right at any time and from time to time to modify or discontinue, temporarily or permanently, the Service (or any part thereof) with or without notice. You agree that SurveyMonkey.com shall not be liable to you or to any third party for any modification, suspension or discontinuance of the Service.

You agree that SurveyMonkey.com has no responsibility or liability for the deletion or failure to store any survey data or other Content maintained or transmitted by the Service. You acknowledge that SurveyMonkey.com reserves the right to delete accounts that are inactive for an extended period of time. You further acknowledge that SurveyMonkey.com reserves the right to change these general practices and limits at any time, in its sole discretion, with or without notice.

**7. COPYRIGHTS**

The Software Application Services are protected by copyright laws and international copyright treaties, as well as other intellectual property laws and treaties. The Software Application Services are licensed, not sold.

All title and copyrights in and to the Software are owned by SurveyMonkey.com or its suppliers.

All title and intellectual property rights in and to the content which may be accessed through use of the Software Application Services is the property of the respective content owner and also may be protected by applicable copyright or other intellectual property laws and treaties.
Appendix J: SurveyMonkey Security Statement (Continued)

8. LINKS TO THIRD PARTIES

SurveyMonkey.com makes no claims or representations about any Web Site not under SurveyMonkey's control that a User may access from SurveyMonkey.com's web site—by link, frame, or any other means ("Linked Site"). Any link, frame, or any other means to access any Linked Site provided by SurveyMonkey.com or otherwise on SurveyMonkey.com's web site does not constitute SurveyMonkey.com's endorsement, recommendation, or acceptance of any responsibility for the content of that Linked Site or the operators of that Linked Site.

9. LIABILITY DISCLAIMER

The information, software, products, and services included in or available through the SurveyMonkey.com sites/services may include inaccuracies or typographical errors. Changes are periodically made to the SurveyMonkey.com sites/services and to the information therein. SurveyMonkey.com and/or its respective suppliers may make improvements and/or changes in SurveyMonkey.com sites/services at any time.

SurveyMonkey.com corporation and/or its respective suppliers make no representations about the suitability, reliability, availability, timeliness, lack of viruses or other harmful components and accuracy of the information, software, products, services and related graphics contained within the SurveyMonkey.com sites/services for any purpose. All such information, software, products, services and related graphics are provided "as is" without warranty of any kind. SurveyMonkey.com and/or its respective suppliers hereby disclaim all warranties and conditions with regard to this information, software, products, services and related graphics, including all implied warranties and conditions of merchantability, fitness for a particular purpose, workmanlike effort, title and non-infringement.

You specifically agree that SurveyMonkey.com shall not be responsible for unauthorized access to or alteration of your transmissions or data, any material or data sent or received or not sent or received, or any transactions entered into through a SurveyMonkey.com site/service. You specifically agree that SurveyMonkey.com is not responsible or liable for any threatening, defamatory, obscene, offensive or illegal content or conduct of any other party or any infringement of another's rights, including intellectual property rights. You specifically agree that SurveyMonkey.com is not responsible for any content sent using and/or included in a SurveyMonkey.com site/service by any third party.

In no event shall SurveyMonkey.com and/or its suppliers be liable for any direct, indirect, punitive, incidental, special, consequential damages or any damages whatsoever including, without limitation, damages for loss of use, data or profits, arising out of or in any way connected with the use or performance of the SurveyMonkey.com sites/services, with the delay or inability to use the SurveyMonkey.com sites/services or related services, the provision of or failure to provide services, or for any information, software,
Appendix J: SurveyMonkey Security Statement (Continued)

products, services and related graphics obtained through the SurveyMonkey.com sites/services, or otherwise arising out of the use of the SurveyMonkey.com sites/services, whether based on contract, tort, negligence, strict liability or otherwise, even if SurveyMonkey.com or any of its suppliers has been advised of the possibility of damages. Because some states/jurisdictions do not allow the exclusion or limitation of liability for consequential or incidental damages, the above limitation may not apply to you. If you are dissatisfied with any portion of the SurveyMonkey.com sites/services, or with any of these terms of use, your sole and exclusive remedy is to discontinue using the SurveyMonkey.com sites/services.

If for any reason a court of competent jurisdiction finds any provision or portion of the Terms of Use to be unenforceable, the remainder of the Terms of Use will continue in full force and effect.

These Terms of Use constitute the entire agreement between the parties with respect to the subject matter hereof and supersedes and replaces all prior or contemporaneous understandings or agreements, written or oral, regarding such subject matter. Any waiver of any provision of the Terms of Use will be effective only if in writing and signed by SurveyMonkey.com Corporation.
Appendix L: Hypotheses Verification

Table L1

Hypothesis Verification for $H_0$1

$H_0$1: There is no statistically significant difference in community and school demographics (Region, urbanization, size of school, free and reduced lunch population, grade levels, type of school, and perceived parent involvement) and use or non-use of opt-out practice.

$H_a$1: There is a statistically significant difference in community and school demographics (Region, urbanization, size of school, free and reduced lunch population, grade levels, type of school, and perceived parent involvement) and use or non-use of opt-out practice.

<table>
<thead>
<tr>
<th>$H_0$1(a)</th>
<th>In which Florida Region is the school where you work located?</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$ (5) = 7.252 and $p &lt; .05$. Because $r$ was below the accepted significance level of 0.05 with five degrees of freedom, the null hypothesis $H_0$1(a) was not rejected.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$H_0$1(b)</th>
<th>Which of the following best describes your school’s community?</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$ (5) = 4.865 and $p &lt; .05$. Because $r$ did not exceed the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis $H_0$1(b) was not rejected.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$H_0$1(c)</th>
<th>Which of the following best describes the involvement and participation of the parents in school events and school-sponsored activities?</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$ (3) = 1.397 and $p &lt; .05$. Because $r$ was below the accepted significance level of 0.05 or 5% with three degrees of freedom, the null hypothesis $H_0$1(c) was not rejected.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$H_0$1(d)</th>
<th>What is the student population at your school?</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$ (4) = 6.645 and $p &lt; .05$. Because $r$ did not exceed the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis $H_0$1(d) was not rejected.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$H_0$1(e)</th>
<th>Describe your school (grade levels).</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$ (4) = 12.593 and $p &lt; .05$. Because $r$ exceeded the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis $H_0$1(e) was rejected.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$H_0$1(f)</th>
<th>Is your school considered charter, magnet, virtual or academy?</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$ (4) = 4.333 and $p &lt; .05$. Because $r$ did not exceed the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis $H_0$1(f) was not rejected.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$H_0$1(g)</th>
<th>What percentage of students at your school qualify and/or receive F/RL?</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$ (3) = 8.492 and $p &lt; .05$. Because $r$ exceeded the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis $H_0$1(g) was rejected.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix L: Hypotheses Verification (Continued)

Table L2

_Hypothesis Verification for H_02_

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Description</th>
<th>Test Statistic</th>
<th>p-value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>H_02(a)</td>
<td>How many years have you been working in the field of education?</td>
<td>( X^2 (6) = 2.452 ) and ( p &lt; .05 ). Because ( r ) was below the accepted significance level of 0.05 or 5% for six degrees of freedom, the null hypothesis H_02(a) was not rejected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H_02(b)</td>
<td>How many years have you been a school administrator?</td>
<td>( X^2 (6) = 3.303 ) and ( p &lt; .05 ). Because ( r ) was below the accepted significance level of 0.05 or 5% for six degrees of freedom, the null hypothesis H_02(b) was not rejected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H_02(c)</td>
<td>What is the highest degree that you currently hold?</td>
<td>( X^2 (4) = 3.716 ) and ( p &lt; .05 ). Because ( r ) was below the accepted significance level of 0.05 or 5% for four degrees of freedom, the null hypothesis H_02(c) was not rejected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H_02(d)</td>
<td>In what subject(s) are/were you certified to teach?</td>
<td>( X^2 (7) = 15.868 ) and ( p &lt; 0.05 ). Because ( r ) was above the accepted significance level of 0.05 or 5% for seven degrees of freedom, the null hypothesis H_02(d) was rejected.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix L: Hypotheses Verification (Continued)

Table L3

*Hypothesis Verification for \( H_0^{3} \)*

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Description</th>
<th>Test Statistic</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>( H_0^{3(a)} )</td>
<td>In your role as the school-based administrator, do you support the teaching of evolution at your school?</td>
<td>( X^2 (1) = 7.109 ) and ( p &lt; .05 ). Because ( r ) exceeded the upper critical value of 3.81 for a 0.05 probability level with one degree of freedom, the null hypothesis ( H_0^{3(a)} ) was rejected.</td>
<td></td>
</tr>
<tr>
<td>( H_0^{3(b)} )</td>
<td>In your role as the school-based administrator, do you support the science teachers’ academic freedom to teach alternative theories to evolution in science classes?</td>
<td>( X^2 (1) = 6.321 ) and ( p &lt; .05 ). Because ( r ) exceeded the upper critical value of 3.81 for a 0.05 probability level with one degree of freedom, the null hypothesis ( H_0^{3(b)} ) was rejected.</td>
<td></td>
</tr>
<tr>
<td>( H_0^{3(c)} )</td>
<td>Have you met and/or discussed with the science teachers that they are required to teach evolution concepts?</td>
<td>( X^2 (1) = 3.217 ) and ( p &lt; 0.05 ). Because ( r ) did not exceed the upper critical value of 3.81 for a 0.05 probability level with one degree of freedom, the null hypothesis ( H_0^{3(c)} ) was not rejected.</td>
<td></td>
</tr>
<tr>
<td>( H_0^{3(d)} )</td>
<td>Have you asked the science teachers to de-emphasize the teaching of evolution in their classes?</td>
<td>( X^2 (1) = 0.290 ) and ( p &lt; .05 ). Because ( r ) did not exceed the upper critical value of 3.81 for a 0.05 probability level with one degree of freedom, the null hypothesis ( H_0^{3(d)} ) was not rejected.</td>
<td></td>
</tr>
<tr>
<td>( H_0^{3(e)} )</td>
<td>Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</td>
<td>( X^2 (1) = 91.162 ) and ( p &lt; .05 ). Because ( r ) exceeded the upper critical value of 3.81 for a 0.05 probability level with one degree of freedom, the null hypothesis ( H_0^{3(e)} ) was rejected.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix L: Hypotheses Verification (Continued)

Table L4

<table>
<thead>
<tr>
<th>Hypothesis Verification for H₀₄</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>H₀₄: There is no statistically significant difference in secondary school administrators’ attitudes and perceptions about evolution and use or non-use of opt-out practice.</td>
<td></td>
</tr>
<tr>
<td>H₄: There is a statistically significant difference in secondary school administrators’ attitudes and perceptions about evolution and use or non-use of opt-out practice.</td>
<td></td>
</tr>
</tbody>
</table>
| H₀₄(a) | *Statements of belief cannot be proved or disproved through scientific investigation.*  
X² (4) = 2.306 and p < .05. Because r did not exceed the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis H₀₄(a) was not rejected. |
| H₀₄(b) | *There are other theories, such as ID, that should be taught in conjunction with the theory of evolution.*  
X² (4) = 0.897 and p < .05. Because r did not exceed the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis H₀₄(b) was not rejected. |
| H₀₄(c) | *Evolution is a central and unifying theme in biology.*  
X² (4) = 7.848 and p < .05. Because r did not exceed the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis H₀₄(c) was not rejected. |
| H₀₄(d) | *The world is too complex to have come about without the active and repeated intervention of a higher power.*  
X² (4) = 2.982 and p < .05. Because r did not exceed the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis H₀₄(d) was not rejected. |
| H₀₄(e) | *All students should have the opportunity to learn about evolution.*  
X² (4) = 8.534 and p < .05. Because r did not exceed the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis H₀₄(e) was not rejected. |
| H₀₄(f) | *I think parents should have the right to opt out their child from class when evolution is taught.*  
X² (4) = 102.326 and p < 0.05. Because r exceeded the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis H₀₄(f) was rejected. |
Appendix L: Hypotheses Verification (Continued)

Table L5

_Hypothesis Verification for H₀5_

<table>
<thead>
<tr>
<th>H₀5:</th>
<th>There is no statistically significant difference in secondary school administrators’ awareness of policies and required standards and use or non-use of opt-out practice.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H₁₅:</td>
<td>There is a statistically significant difference in secondary school administrators’ awareness of opt-out policies and required standards and use or non-use of opt-out practice.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H₀₅(a)</th>
<th><em>All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X² (4) = 69.665 and p &lt; .05. Because r exceeded the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis H₀₅(a) was rejected.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H₀₅(b)</th>
<th><em>I have felt pressure from parents in my community to avoid teaching evolution concepts in science classes.</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X² (4) = 12.754 and p &lt; .05. Because r exceeded the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis H₀₅(b) was rejected.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H₀₅(c)</th>
<th><em>The majority of parents of students who attend my school support the teaching of evolution.</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X² (4) = 11.395 and p &lt; .05. Because r exceeded the upper critical value of 9.488 for a 0.05 probability level with four degrees of freedom, the null hypothesis H₀₅(c) was rejected.</td>
</tr>
</tbody>
</table>
Appendix M: Comments from Subgroup Participants

<table>
<thead>
<tr>
<th>Comments that Confirm Perception of Parental Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>• First, I would talk with the parents and explain to them the objectives/curriculum and how the theory is taught. Then, if they are still against it I would allow them to opt that child out.</td>
</tr>
<tr>
<td>• Parents have a right to decide whether or not their child should receive this form of education based on their religious beliefs.</td>
</tr>
<tr>
<td>• I respect the beliefs of families and I'm willing to support the option to have an alternative assignment.</td>
</tr>
<tr>
<td>• Whenever we are discussing a controversial topic, I believe the parents should have the right to decide whether or not they wish for their children to participate.</td>
</tr>
<tr>
<td>• Parents have the right to opt out.</td>
</tr>
<tr>
<td>• Would conference w/parent and determine case-by-case.</td>
</tr>
<tr>
<td>• In the few cases of parents coming in [to request opt out] all have agreed to this [students . . . develop their own opinions and philosophies] and allowed students to receive the evolution information from this standpoint . . . if a parent still insisted after our discussion I would make alternative arrangements.</td>
</tr>
<tr>
<td>• I feel that parents should be able to opt out during the teaching of evolution if they want to do so [and the] student could be given a project to do.</td>
</tr>
<tr>
<td>• I feel that parents should be able to opt out during the teaching of evolution.</td>
</tr>
<tr>
<td>• If a parent still insisted after our discussion I would make alternative arrangements.</td>
</tr>
<tr>
<td>• It's the parents’ choice on whether or not they want the school to be responsible for giving their child this information.</td>
</tr>
<tr>
<td>• The decision should be the parents, not the school.</td>
</tr>
<tr>
<td>• We have a policy in our District that allows parents to opt out of any lesson they deem unfit for their child.</td>
</tr>
<tr>
<td>• Parents' requests must be met.</td>
</tr>
<tr>
<td>• I would honor a parent’s religious belief and [assign] an alternative assignment.</td>
</tr>
<tr>
<td>• I believe you still have to allow parents to choose what view they would like to assist their child in developing.</td>
</tr>
<tr>
<td>• If a subject/lesson is not in accordance with the principles/values of a parent the parent should have the right to opt out their child.</td>
</tr>
<tr>
<td>• It's [opt out] part of the educational process.</td>
</tr>
<tr>
<td>• If there is no parental approval, I would not allow it to be taught.</td>
</tr>
<tr>
<td>• In the past, students have been given permission to opt out of classes where the Bible was explored as part of a study in the creating of the universe. Therefore, I would respect the same request from parents who express the same emotions concerning evolution.</td>
</tr>
<tr>
<td>• It's a faith based decision that I would understand and support.</td>
</tr>
</tbody>
</table>
Appendix M: Comments from Subgroup Participants (Continued)

<table>
<thead>
<tr>
<th>Comments that Confirm Awareness of State Statutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• If we have to let students opt out of vision and hearing screenings . . . and certain health subjects, why shouldn't we allow parents to opt out their students from the subject of evolution?</td>
</tr>
<tr>
<td>• It [allowing opt out of evolution] is the same practice used when parents opt out of other state/district adopted curriculum. The most common unit parents remove their child from is Human Growth and Development.</td>
</tr>
<tr>
<td>• We allow parents to opt out of sex education, the President's speeches, grief presentations, etc.</td>
</tr>
<tr>
<td>• School board rule dictates that you have to allow [a] student to get out because of some type of belief.</td>
</tr>
<tr>
<td>• Evolution makes up an entire standard of the NGSSS. End of year assessments that determine high school graduation will include questions about evolution.</td>
</tr>
<tr>
<td>• Students will be tested on material that includes knowledge of the theory of evolution, whether they believe in it personally or not.</td>
</tr>
<tr>
<td>• If there are standards that are tied to the curriculum that involves evolution then it is impossible to master those skills if the student opts out.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comments Confirming Awareness of Community/Parent Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Evolution, in our community has the potential to be a controversial subject.</td>
</tr>
<tr>
<td>• The PR for the decision will have better results than the other choice.</td>
</tr>
<tr>
<td>• In our community, parents are very vocal. Like any other request to opt out, we respect their request unless mandated.</td>
</tr>
<tr>
<td>• I won't be the one telling a parent/student they have to take part. That is a lawsuit waiting to happen.</td>
</tr>
<tr>
<td>• When you get into the legalities of religion in the public schools, it can draw unwanted attention.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comments from Participants with Pro-ID Verbiage</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Students … must be able to see both sides of the coin. Like politics.</td>
</tr>
<tr>
<td>• As educators it is our responsibility to present both sides of any issue.</td>
</tr>
<tr>
<td>• We also show scientific evidence that does not support this theory.</td>
</tr>
<tr>
<td>• Teachers would present the different views about the issue. Censorship is dangerous. Students need to learn to think and evaluate the evidence.</td>
</tr>
<tr>
<td>• Students need to be exposed to all theories so they are able to make educated decisions as they progress through life.</td>
</tr>
<tr>
<td>• I would encourage the parent [that] the goal of public education is to present all sides of the issue, it is for the parent . . . to tell a student what he/she is allowed to believe.</td>
</tr>
<tr>
<td>• As educators it is our responsibility to present both sides of any issue and let the student take this information and turn it into knowledge for them based on the learning process.</td>
</tr>
<tr>
<td>• Ultimately, we teach evolution as a theory.</td>
</tr>
</tbody>
</table>
Appendix M: Comments from Subgroup Participants (Continued)

- *Evolution is a theory*. If presented along with creationism, it would be fine. Since that is not the case, parents should have the right to avoid a *one-sided* presentation.

- Students must *be exposed to various points of views regardless it [is] scientific or not*. Educators should allow the students [to] *question the validity* of the teachings.

- I have always explained to parents that the purpose of education ... is not to support or deny the *validity of evolution* but to make the student aware of what it is so the student can *analyze, synthesize and evaluate concepts* to develop their own opinions and philosophies.

- I would provide them [parents] with the basis for understanding that it is only a theory and ... present it as a strategy for critical thinking and awareness.

- It is ... our job is to present evolution and *other theories or beliefs* so that the student can have the information to arrive at his own conclusion.

- It is a complete injustice that BOTH evolution and creationism are not taught. Neither can be "proven" as one is a matter of faith and the other is a theory, but yet we are FORCED to only teach one. If we taught just creationism but not evolution, it would never be tolerated. It is just another example of the hypocrisy of our government-run schools.

**Comments from “No” Subgroup that Support Not Allowing Opt Out**

- It's like opening up the flood gates. Once we begin letting parents decide what their child's curriculum looks like - then we are in trouble.

- District requirement to have Biology class and benchmarks taught are state and district mandated/adopted.

- The science standards include evolution and it is not an option to opt out of curriculum. They may opt out from attending class ... but are still responsible for the content as expected in the standards. They can opt out of discussions ... during class time and may be placed in an alternate location [but] they would still be required to learn the content.

- If it is a required subject it would be difficult to opt out unless an alternate subject is offered.

- I feel they need to be exposed to it, to be able to make their own educated decision.

- Evolution should be taught as a theory to be considered.

- Students need to be exposed to all theories so they are able to make educated decisions as they progress through life.

- Tests such as EOC, SAT, ACT and other high stake testing in the field of science could result in a lower score for students that opt out of a content that is covered.

- Alternate non-scientific "theories" have a place in public school curriculum, but not taught as science in a science classroom.

- [Teacher] training [to] provide teachers with the knowledge that they need to present an understanding of evolution through an inquiry approach.

- I can only advise that teachers should teach evolution, but only objectively, and not in a way that a student might feel influenced to believe.

- The learning experience should not be driven by personal beliefs.
Appendix N: Additional Data Tables and Figures

Research Question 1

Table N1

*Community Characteristics and School Demographics of the Participants in Subgroups*

<table>
<thead>
<tr>
<th>Community and School Demographics</th>
<th>“Yes” Subgroup Have or would allow opt out. (n = 213)</th>
<th>“No” Subgroup Have not or would not allow opt out. (n = 68)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>50%</td>
<td>35%</td>
</tr>
<tr>
<td>Suburban</td>
<td>34%</td>
<td>47%</td>
</tr>
<tr>
<td>Rural</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>School serves more than 1000 students</td>
<td>64% (n=136)</td>
<td>78% (n= 53)</td>
</tr>
<tr>
<td>Public High School for Grades 9-12</td>
<td>44% (n= 93)</td>
<td>62% (n= 42)</td>
</tr>
<tr>
<td>Public Middle School for Grades 6-8</td>
<td>42% (n= 90)</td>
<td>22% (n= 15)</td>
</tr>
<tr>
<td>Parent Involvement Minimal or Sometimes</td>
<td>78% (n=165)</td>
<td>70% (n= 48)</td>
</tr>
<tr>
<td>50% or more Students on FRL</td>
<td>60% (n=128)</td>
<td>41% (n= 28)</td>
</tr>
</tbody>
</table>

Figure N1. Graph showing relationship between percentage of student population receiving F/RL and level of parent involvement.
Appendix N: Additional Data Tables and Figures (Continued)

Research Question 2

Table N2
Summary of the Percentages for Subgroups for Individual Characteristics

<table>
<thead>
<tr>
<th>Individual Characteristics</th>
<th>“Yes” Subgroup n = 213</th>
<th>“No” Subgroup n = 67</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤15 yrs</td>
<td>16+ yrs</td>
</tr>
<tr>
<td>How many years have you been working in the field of education?</td>
<td>35% (n=73)</td>
<td>65% (n=138)</td>
</tr>
<tr>
<td>How many years have you been a school administrator?</td>
<td>85% (n=182)</td>
<td>15% (n=31)</td>
</tr>
<tr>
<td>What is the highest degree that you currently hold?</td>
<td>Master’s+ 72% (n=153)</td>
<td>Spec/Doc 28% (n=60)</td>
</tr>
</tbody>
</table>

Figure N2. Graph comparing years in education and years in administration.

Years in Education and Administration

- Less than 1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- 26+ years

- Years in Education
- Years in Administration
### Appendix N: Additional Data Tables and Figures (Continued)

#### Table N3

*Grade Level Served, Certification Area, and Allowing Opt Out*

<table>
<thead>
<tr>
<th>Have or would allow</th>
<th>Yes</th>
<th>%Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grades 9-12</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English/Reading</td>
<td>1</td>
<td>20%</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Math</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Health/PE</td>
<td>1</td>
<td>20%</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>20%</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Multiple areas</td>
<td>1</td>
<td>20%</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Grades 9-12</strong></td>
<td>16</td>
<td>15%</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>English/Reading</td>
<td>13</td>
<td>12%</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Math</td>
<td>9</td>
<td>9%</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>1</td>
<td>1%</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>20</td>
<td>19%</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Multiple areas</td>
<td>11</td>
<td>10%</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td><strong>Grades 9-12</strong></td>
<td>2</td>
<td>11%</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>English/Reading</td>
<td>2</td>
<td>11%</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Science</td>
<td>2</td>
<td>11%</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Social Studies</td>
<td>3</td>
<td>16%</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>21%</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Multiple areas</td>
<td>3</td>
<td>16%</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Grades 9-12</strong></td>
<td>15</td>
<td>11%</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>English/Reading</td>
<td>15</td>
<td>11%</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>Science</td>
<td>8</td>
<td>6%</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Social Studies</td>
<td>15</td>
<td>11%</td>
<td>9</td>
<td>24</td>
</tr>
<tr>
<td>Health/PE</td>
<td>2</td>
<td>1%</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>2</td>
<td>1%</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>25</td>
<td>19%</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Multiple areas</td>
<td>11</td>
<td>8%</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English/Reading</td>
<td>0</td>
<td>0%</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Math</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Science</td>
<td>2</td>
<td>12%</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Social Studies</td>
<td>3</td>
<td>18%</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Health/PE</td>
<td>0</td>
<td>0%</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>12%</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Multiple areas</td>
<td>3</td>
<td>18%</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix N: Additional Data Tables and Figures (Continued)

Figure N3. Comparison of certification area, grade level served, and allowing opt out.

Table N4
Crosstab Analysis for Highest Degree Earned and Allowing or Not Allowing a Student to be Assigned an Alternative Assignment

<table>
<thead>
<tr>
<th>Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</th>
<th>Have or would allow opt out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were you to assign an alternate activity in the science classes?</td>
<td>Yes</td>
</tr>
<tr>
<td>What is the highest degree that you currently hold?</td>
<td>Masters</td>
</tr>
<tr>
<td></td>
<td>Masters Plus</td>
</tr>
<tr>
<td></td>
<td>Specialist</td>
</tr>
<tr>
<td></td>
<td>Doctorate</td>
</tr>
<tr>
<td>Total</td>
<td>195</td>
</tr>
</tbody>
</table>
Appendix N: Additional Data Tables and Figures (Continued)

![Graph comparing subgroups and highest degree earned.]

Figure N4. Graph comparing subgroups and highest degree earned.

Research Question 3

Table N5
Summary of the Percentages for Subgroups for Actions and Opt-Out Practices

<table>
<thead>
<tr>
<th>Action Statements</th>
<th>“Yes” Subgroup n = 213</th>
<th>“No” Subgroup n = 68</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>As the school-based administrator, do you support the teaching of evolution at your school?</td>
<td>16%</td>
<td>78%</td>
</tr>
<tr>
<td>As the school-based administrator, do you support the science teachers’ academic freedom to teach alternative theories to evolution in science classes?</td>
<td>17%</td>
<td>77%</td>
</tr>
<tr>
<td>Have you met and/or discussed with the science teachers that they are required to teach evolution concepts?</td>
<td>76%</td>
<td>18%</td>
</tr>
<tr>
<td>Have you asked the science teachers to de-emphasize the teaching of evolution in their classes?</td>
<td>94%</td>
<td>&lt; 1%</td>
</tr>
<tr>
<td>Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</td>
<td>3%</td>
<td>92%</td>
</tr>
</tbody>
</table>
Appendix N: Additional Data Tables and Figures (Continued)

Table N6
_Crosstab Analysis for Subgroups and Agreement Level that Other Theories should be Taught in Conjunction with the Scientific Theory of Evolution_

<table>
<thead>
<tr>
<th>Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</th>
<th>Have or would allow opt out</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>There are other theories, such as Intelligent Design, that should be taught in conjunction with the theory of evolution.</td>
<td>Strongly disagree</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disagree</td>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IDK/U</td>
<td>55</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>189</td>
<td>25</td>
<td>214</td>
</tr>
<tr>
<td>No</td>
<td>There are other theories, such as Intelligent Design, that should be taught in conjunction with the theory of evolution.</td>
<td>Strongly disagree</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disagree</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IDK/U</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6</td>
<td>29</td>
<td>35</td>
</tr>
</tbody>
</table>

Table N7
_Crosstab Analysis for Allowing Opt Out with Action of Supporting the Teaching of Evolution and Teacher Academic Freedom to Teach Alternative Theories_

| In your role as the school administrator, do you support the science teachers’ academic freedom to teach alternative theories to evolution in science classes? | Have or would allow opt out |
|---|---|---|---|
| Yes | In your role as the school administrator, do you support the teaching of evolution at your school? | Yes | 136 | 38 | 174 |
| | | No | 27 | 1 | 28 |
| | Total | 163 | 39 | 202 |
| No | In your role as the school administrator, do you support the teaching of evolution at your school? | Yes | 29 | 19 | 48 |
| | | No | 7 | 1 | 8 |
| | Total | 36 | 20 | 56 |
Appendix N: Additional Data Tables and Figures (Continued)

Table N8: *Crosstab Analysis for Allowing Opt Out and Alternative Assignments with the Action of Supporting the Teaching of the Scientific Theory of Evolution*

<table>
<thead>
<tr>
<th>Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</th>
<th>Have or would allow opt out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Yes In your role as the school administrator, do you support the teaching of evolution at your school?</td>
<td>Yes 158</td>
</tr>
<tr>
<td></td>
<td>No 34</td>
</tr>
<tr>
<td></td>
<td>Total 192</td>
</tr>
<tr>
<td>No In your role as the school administrator, do you support the teaching of evolution at your school?</td>
<td>Yes 6</td>
</tr>
<tr>
<td></td>
<td>Total 6</td>
</tr>
</tbody>
</table>

**Research Question 4**

Table N9

*Summary of the Percentages for Subgroups for Perceptions and Opt-Out Practices*

<table>
<thead>
<tr>
<th>Perception Statements</th>
<th>“Yes” Subgroup</th>
<th>“No” Subgroup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statements of belief cannot be proved or disproved through scientific investigation.</td>
<td>44% A</td>
<td>17% U</td>
</tr>
<tr>
<td>There are other theories, such as Intelligent Design, that should be taught in conjunction with the theory of evolution.</td>
<td>44% A</td>
<td>30% U</td>
</tr>
<tr>
<td>Evolution is a central and unifying theme in biology.</td>
<td>49% A</td>
<td>27% U</td>
</tr>
<tr>
<td>The world is too complex to have come about without the active and repeated intervention of a higher power.</td>
<td>48% A</td>
<td>27% U</td>
</tr>
<tr>
<td>All students should have the opportunity to learn about evolution.</td>
<td>81% A</td>
<td>10% U</td>
</tr>
<tr>
<td>I think parents should have the right to opt out their child from class when evolution is taught.</td>
<td>86% A</td>
<td>7% U</td>
</tr>
</tbody>
</table>

*Note.* A=Agree, U=Undecided, D=Disagree
### Table N10
*Crosstab Analysis for Allowing Opt Out and Alternative Assignments with Perception that Parents have the Right to Opt Out*

<table>
<thead>
<tr>
<th>Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</th>
<th>Have or would allow opt out</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>I think parents should have the right to opt out their child from class when evolution is taught. (p=.000)</td>
<td>Strongly Disagree</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disagree</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Undecided</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
<td>112</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strongly Agree</td>
<td>52</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>187</td>
<td>25</td>
<td>212</td>
</tr>
<tr>
<td>No</td>
<td>I think parents should have the right to opt out their child from class when evolution is taught. (p=.004)</td>
<td>Strongly Disagree</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disagree</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Undecided</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6</td>
<td>28</td>
<td>34</td>
</tr>
</tbody>
</table>

### Table N11
*Crosstab Analysis for the Action of Supporting Teacher Academic Freedom and Perception there are Other Theories that should be Taught in Conjunction with the Scientific Theory of Evolution*

<table>
<thead>
<tr>
<th>As the school administrator, do you support the science teachers’ academic freedom to teach alternative theories to evolution in science classes?</th>
<th>Have or would allow opt out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>There are other theories, such as Intelligent Design, that should be taught in conjunction with the theory of evolution.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>No</td>
<td>There are other theories, such as ID, that should be taught in conjunction with the theory of evolution.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>
Appendix N: Additional Data Tables and Figures (Continued)

Table N12
Crosstab Analysis for Administrators Who Would Assign an Alternative Assignment and Agreement that all Students Should have the Opportunity to Learn About Evolution

<table>
<thead>
<tr>
<th>Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</th>
<th>Have or would allow opt out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes <em>(p=.530)</em> All students should have the opportunity to learn about evolution.</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>Disagree</td>
<td>11</td>
</tr>
<tr>
<td>Undecided</td>
<td>20</td>
</tr>
<tr>
<td>Agree</td>
<td>112</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>188</td>
</tr>
<tr>
<td>No <em>(p=.047)</em> All students should have the opportunity to learn about evolution.</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
</tr>
<tr>
<td>Undecided</td>
<td>1</td>
</tr>
<tr>
<td>Agree</td>
<td>3</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
</tr>
</tbody>
</table>

Research Question 5

Table N13
Summary of Agreement Level for Subgroups for Awareness and Opt-Out Practices

<table>
<thead>
<tr>
<th>Awareness Statements</th>
<th>“Yes” Subgroup</th>
<th>“No” Subgroup</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>U</td>
<td>D</td>
</tr>
<tr>
<td>All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</td>
<td>16%</td>
<td>14%</td>
</tr>
<tr>
<td>n=30</td>
<td>n=26</td>
<td>n=135</td>
</tr>
<tr>
<td>I have felt pressure from parents in my community to avoid teaching evolution concepts in science classes.</td>
<td>8%</td>
<td>12%</td>
</tr>
<tr>
<td>n=15</td>
<td>n=23</td>
<td>n=157</td>
</tr>
<tr>
<td>The majority of parents of students who attend my school support the teaching of evolution.</td>
<td>25%</td>
<td>69%</td>
</tr>
<tr>
<td>n=47</td>
<td>n=132</td>
<td>n=16</td>
</tr>
</tbody>
</table>

Note. A=Strongly Agree & Agree; U=Undecided; D=Strongly Disagree & Disagree
### Table N14

*Crosstab Analysis for Allowing Opt Out and Alternative Assignments with Awareness that All Students are Required to Learn the Scientific Theory of Evolution*

<table>
<thead>
<tr>
<th>Would you allow a student to be assigned an alternate assignment when evolution is taught in the science classes?</th>
<th>Have or would allow opt out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Yes*</td>
<td></td>
</tr>
<tr>
<td>All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>Disagree</td>
<td>97</td>
</tr>
<tr>
<td>Undecided</td>
<td>23</td>
</tr>
<tr>
<td>Agree</td>
<td>24*</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>3*</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>184</td>
</tr>
<tr>
<td>No</td>
<td></td>
</tr>
<tr>
<td>All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
</tr>
<tr>
<td>Undecided</td>
<td>2</td>
</tr>
<tr>
<td>Agree</td>
<td>2</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6</td>
</tr>
</tbody>
</table>

### Table N15

*Crosstab Analysis for Perception that Parents Have the Right to Opt Out their Child and Awareness that all Students are Required to Learn the Scientific Theory of Evolution*

<table>
<thead>
<tr>
<th>I think parents should have the right to opt out their child from class when evolution is taught.</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</td>
<td>D 7</td>
<td>U 4</td>
<td>A 39</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</td>
<td>D 4</td>
<td>U 9</td>
<td>A 8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>All students are required to learn about the theory of evolution, regardless of parent or student beliefs.</td>
<td>D 134</td>
<td>U 17</td>
<td>A 21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>172</td>
</tr>
</tbody>
</table>
Appendix O: Memorandum Opinion from FDOE General Counsel

Date: January 13, 2006
PREPARED BY: Timothy D. Osterhaus
PHONE: 850-245-0442
SUNCOM: 205-0442
OPINION NO.: 06-01
STAFF CONTACT: none

MEMORANDUM OPINION

TO: J. Paul Carland, II, General Counsel, The School District of Hernando County, FL
FROM: Daniel Woodring, Esquire
      General Counsel
DATE: January 13, 2006
SUBJECT: Student Requests to be Excused from Certain Instruction in Florida Public Schools

QUESTION PRESENTED:

Upon the request of a parent or student, should a Florida public school excuse a student from the teaching of particular subject material?

SHORT ANSWER:

Yes, if the request is based upon a specific statutory opt-out or a sincere religious belief.

Public schools have a duty to carry out their statutory mandate to teach students in accordance with the Sunshine State Standards and to require student attendance, except as directed by other state law or court decisions. While state law provides only a few express rights for parents or students to opt-out of particular curriculum material, the Florida Religious Freedom Restoration Act, §761.03(1), Florida Statutes, likely requires a school to excuse a student from the instruction of particular subject material if that request is based upon a sincerely held religious belief. However, a school may deny excusal requests for other reasons.

DISCUSSION:

The instant question asks for general guidance that arises from a student’s request to be excused from a science class during instruction related to the origin of the universe, Earth, and living organisms (hereinafter referred to as “origins instruction”). We do not know the motivation for the student’s request.
Origins instruction recently has stirred a national debate and is an inherently sensitive topic for religious adherents, civil rights advocates, and school personnel alike. Our advice aims not to be drawn into that policy debate, but to give practical advice to schools based upon a strictly legal analysis.

The Sunshine State Standards require schools to instruct students regarding “various scientific theories on how the universe was formed” and “that Earth’s systems and organisms are the result of a long, continuous change over time.” Sunshine State Standards, Science, Grades 9-12. Florida law clearly expects school districts to educate students in accordance with the Sunshine State Standards, §1003.41, Florida Statutes (2005), except as otherwise defined or limited by the legislature or authoritative common law. The analysis is the same for any student request to be excused from the teaching of particular subject material in the public schools, in science or other contexts.

The Florida legislature has not provided an explicit opt-out right as regards origins instruction in science class or for most other instructional topics. If a statute provides for such an opt-out, for instance, like statutes allowing students to be excused from certain health/sex/disease and science instruction when there is experimentation or dissection of animals, then schools could address this issue as they do in those contexts.

The statutory analysis does not end here, however, as another provision—the Florida Religious Freedom Restoration Act (“FRFRA”), §761.03(1), Florida Statutes1—may be implicated by an excusal request. The FRFRA prohibits government from substantially burdening acts (or refusals to act) that are “substantially motivated by a religious belief,” absent a compelling governmental interest. If a student or parent requests to be excused claiming a religious objection to particular instruction, then the FRFRA’s application will most likely determine whether a school must grant the request. Though again, we do not know the basis for the specific opt-out request at issue here, we find the FRFRA to be the only state statute that may require a school to grant the student’s opt-out request in the context of origins instruction.2 A school is, therefore, free to deny a request to be excused

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1 The FRFRA provides that “the government shall not substantially burden a person’s exercise of religion, even if the burden results from a rule of general applicability, except . . . [if the] application of the burden to the person: (a) is in furtherance of a compelling governmental interest; and (b) is the least restrictive means of furthering that compelling governmental interest.” “Exercise of religion” is defined as “an act or refusal to act that is substantially motivated by a religious belief, whether or not the religious exercise is compulsory or central to a larger system of religious belief.” §761.02(3), Florida Statutes.

2 Though not determinative of the instant issue, we note that Florida law grants certain parental rights and expects significant parental involvement and collaboration in the public school education of children. See e.g., Florida Statutes at §1003.94(3) (requirement for parents to be involved with schooling), §1002.20(4) (parental right to receive, review, buy education materials), §1003.24 (parental responsibility for child’s school attendance), §1002.33(3) (parental consent required before a student is referred to or offered school contraceptive services), §§1003.42(3) & 1003.47 (parental right for child to opt-out of certain science and health classes), §1002.20(2) (parental right to remove child for religious instruction and holidays), §1003.44(1) (parental right to excuse child from citing the pledge), §1003.421(4) (parental right to excuse child from reciting the Declaration of Independence).
Appendix O: Memorandum Opinion from FDOE General Counsel (Continued)

from origins instruction, unless that request is specifically motivated by a sincere religious belief.

The FRFRA Likely Requires Deference to Parent or Student Opt-out Requests

The FRFRA was enacted to counter a decision by the U.S. Supreme Court that appeared to change the standard for evaluating First Amendment, Free Exercise claims. In Employment Division, Department of Human Resources of Oregon v. Smith, 494 U.S. 872 (1990), the Court held that government may enforce neutral, generally applicable laws that infringe religious free exercise rights, without showing a compelling governmental interest. This decision departed from previous rulings that government must show a compelling interest in balancing the Free Exercise Clause against generally applicable laws. See e.g., Sherbert v. Verner, 374 U.S. 398, 407-08 (1963); Hobbie v. Unemployment Appeals Comm’n, 480 U.S. 136 (1987).

The Smith decision sparked an uproar among advocates of religious liberties. In response, Florida, the U.S. Congress, and several other states enacted religious freedom restoration acts to restore the pre-Smith test, effectively preventing government from substantially burdening religious belief or actions without a compelling governmental reason. In Florida’s case, it enacted a provision with religious exercise protection that is broader than that afforded by the [free exercise] decisions of the United States Supreme Court for two interrelated reasons. First, the FRFRA expands the free exercise right . . . because it reinstates . . . [the compelling interest test]. Second, under the FRFRA, the definition of protected “exercise of religion” subject to the state compelling interest test includes any act or refusal to act whether or not compelled by or central to a system of religious belief.


In Warner, the seminal case construing the FRFRA, the Florida Supreme Court established a test for bringing a claim under the FRFRA. A religious adherent must first show that a sincere religious belief has been implicated. Id. at 1032; see also Freeman v. Dep’t of Highway Safety and Motor Vehicles, 2005 WL 2108094 (Fla. App. 5 Dist.) at 6 (Sept. 2, 2005). Once a sincere religious belief is established, a court will scrutinize the government’s action to determine whether it constitutes a substantial burden on the adherent’s practice. Id. at 1035. If these two tests are met, the burden shifts to the government to establish that its regulation furthers a compelling interest and is the least restrictive means to further its interest.

3 The Smith case addressed whether employees fired for using peyote using during religious services had a right to collect unemployment benefits. The two discharged employees were fired and denied unemployment compensation, because they ingested peyote as part of sacramental services, which was deemed work related “misconduct.” The employees sued, arguing that the decision violated their right to freely exercise their religion under the First Amendment. Ultimately, the U.S. Supreme Court disagreed with their argument for the above-discussed reason.
Appendix O: Memorandum Opinion from FDOE General Counsel (Continued)

The Florida Supreme Court in *Warner* considered whether the FRFRA protected the rights of grave plot owners to erect vertical, religiously-decorated, cemetery plot markers in a city cemetery. The city’s policy allowed only horizontal markers and not vertical ones for the most part. The Court found the plaintiffs’ decisions to erect vertical religious decorations on grave markers (e.g., crosses and stars of David) to be the sort of sincere religiously-motivated acts given protection by the FRFRA. However, it concluded that the City’s regulation “merely inconvenience[d],” but did not substantially burden plaintiffs’ religious exercise. *Id.*

In reaching this result, the Court closely considered the City’s manner of regulating the plot owners’ religious exercise. Adopting the trial court’s reasoning, the Court explained that the plot owners’ religious exercise had been merely inconvenienced because (1) the City did not altogether prohibit marking graves or decorating them with religious symbols—horizontal markers and decorations were always allowed, (2) the City regulated merely the form of decoration—only vertical markers were prevented, and (3) the City regularly allowed vertical markers for limited periods of time, e.g., immediately after the date of burial and after certain holidays. *Id.*

Reaching a similar result, Florida’s Fifth District Court of Appeal in *Freeman* recently considered the claim of a Muslim motorist who had her driver’s license cancelled after she refused to have her identification picture taken without her veil. *Freeman v. Dep’t of Highway Safety and Motor Vehicles*, 2005 WL 2108094 (Fla.App. 5 Dist.) at 6 (Sept. 2, 2005). Ms. Freeman brought action under the FRFRA seeking permission to wear a veil in the picture. The trial court denied her FRFRA claim. The appeals court affirmed, concluding that her free exercise right had been merely inconvenienced. Similar to the *Warner* court’s analysis, the appeals court closely evaluated whether the DHSMV’s rule and practice altogether foreclosed Ms. Freeman’s religiously-motivated practice:

Freeman’s deposition testimony [stated that] she must be veiled only in the presence of men unrelated to her. Importantly, she agreed that her veiling belief did not mean that she could never be photographed without her veil. The Department’s existing procedure would accommodate Freeman’s veiling beliefs by using a female photographer with no other person present. Thus, the burden to accommodate Freeman’s religious beliefs would be placed upon the Department.

*Id.* Because the DHSMV policy’s accommodative posture as to the prohibitions of Ms. Freeman’s religion, the appeals court ruled that her religious practice was not substantially burdened. *Id.*

**FRFRA Applied in the Instant Fact Scenario**

If the opt-out request in the instant factual scenario is motivated by a sincere religious belief, we believe a court would affirm the existence of a legitimate religiously-motivated practice, threshold issue #1, just as it did in *Warner* and *Freeman*. It seems completely believable that a sincere religious belief in
Appendix O: Memorandum Opinion from FDOE General Counsel (Continued)

creationism might motive an adherent, for example of Christianity or Judaism, to excuse oneself or to request excusal from government-sponsored instruction and discussion of a contrary theory of origins.\(^4\)

Different from \textit{Warner} and \textit{Freeman}, however, we think a Florida court is unlikely to find a “mere inconvenience” (threshold issue #2), where a student is barred altogether from leaving a religiously offensive class, or parents’ requests for excusals are summarily denied by a school. Both the \textit{Warner} and \textit{Freeman} precedents are instructive here. In both, plaintiffs’ religious exercise was not altogether suppressed. Each court made much of the government’s explicitly accommodative policies that differed from plaintiffs’ desired result only as to the degree of accommodation requested (\textit{i.e.}, religiously decorative gravemarkers were allowed in \textit{Warner}, and a non-offensive mode of picture-taking was provided in \textit{Freeman}). That the plaintiffs desired even more accommodation of their convictions, was deemed to be merely an inconvenience to their religious exercise. Presumably, these courts would have ruled differently if plaintiffs’ religious expressions were altogether suppressed by government actions, for example, if the City of Boca Raton had mandated that all crosses and/or stars of David be removed from gravemarkers, or if the DHSMV had made no effort to accommodate Ms. Freeman’s religious prohibition against unveiling in the presence of men.

Where a student requests to opt out from instruction on a particular topic for religious reasons, there appears to be no reasonable accommodation short of excusing the student. Because of the FRFRA’s explicitly broad protection of religiously-motivated exercise and Florida courts’ concern for protecting religious liberties thereunder, a court is likely to strictly scrutinize any school’s decision to compel classroom attendance or participation in the face of a student’s or parent’s religious objection.\(^5\)

It is important to note that this analysis does not involve a student’s request for wholesale curriculum change, a broader curriculum opt-out for a student, or request to be excused from test-taking requirements, but, rather, is limited to a narrower content objection scenario, \textit{e.g.}, opt-out of a particular class lesson(s), school program, or reading assignment. In fact, Florida courts are likely to take a dim view of a student’s request for a broader degree of accommodation, as in the above FRFRA cases, \textit{e.g.}, if a student requests to be excused not only from a particular class lesson, but from an entire course or testing requirement, or if a student’s request involves being given credit for work not completed or requirements not satisfied.

\(^4\) The Christian and Jewish Scriptures address a God-ordained origin of life in their very first words. 

\(^5\) \textit{See also Lee v. Weisman}, 505 U.S. 577, 592-93 (1992), in which the U.S. Supreme Court recognized peer pressure in the school environment to be a viable threat to student’s freedom of conscience: “we think the State may not, consistent with the Establishment Clause, place primary and secondary school children [in the dilemma of participating, with all that implies, or protesting]. Research in psychology supports the common assumption that adolescents are often susceptible to pressure from their peers towards conformity, and that the influence is strongest in matters of social convention.”
Appendix O: Memorandum Opinion from FDOE General Counsel (Continued)

Schools may craft individual solutions that may be workable both to accommodate a student’s religious exercise and a school’s educational requirements. For instance, a school could require a student that requests to opt-out of particular instruction to complete a different or additional assignment such that the learning requirement could be satisfied, e.g., in place of a religiously-offensive book in a literature course, assign an alternate one for a student to read and write a report.

A court’s application of strict scrutiny to a policy requiring a student’s participation in particular instruction is certain to be fatal to the policy. Under a strict scrutiny analysis, the RFRA would require a school to demonstrate that a student’s participation in the instruction is necessary to advance a compelling governmental interest in the least restrictive manner—a virtually impossible test. Courts have noted that strict scrutiny is the most stringent legal test. See e.g., Wisconsin v. Yoder, 406 U.S. 205 (1972), (a state’s interest in requiring schooling through age 16 was not sufficiently compelling to overcome Amish religious objections to educating children over age 13); Sherbert v. Verner, 374 U.S. 398 (1963) (state interest in making availability for Saturday work a prerequisite for receiving unemployment benefits ruled not compelling where a Seventh Day Adventist’s belief did not permit Saturday work); but see Bob Jones Univ. v. U.S., 461 U.S. 574 (1983) (preventing racial discrimination is a compelling interest, such that government may forbid such discrimination even where it conflicts with religious beliefs). Even if the school’s interest was determined to be compelling, it would be required to implement its policy in the least restrictive manner. See e.g., Grotz v. Bollinger, 539 U.S. 244 (2003) (a university’s policy of distributing admission credits to every single “underrepresented minority” applicant solely because of race, was not narrowly tailored to the state’s compelling interest of achieving educational diversity).

Florida law already explicitly allows excused opt-outs from science lessons dealing with animal experiments and dissection with a parent’s request. § 1003.47, Florida Statutes. If the school districts can fulfill their objectives while granting excused absences from science class animal experiments and dissections for indeterminate reasons, it would be difficult to successfully argue that schools have a compelling interest in forcing students to participate in every other science class lesson. Likewise, it might be difficult for a court to accept that a forced attendance policy is implemented in the “least restrictive” manner, so long as some science class opt-outs are allowed, just not religiously-based ones.

Federal First Amendment, Free Exercise Considerations Support an Opt-out

Federal Constitutional analysis appears to support permitting student opt-outs in this scenario. The legal interpretation of two fundamental rights—religious free exercise and parental rights—are implicated here. State and federal law provide broad (but not limitless) rights for their citizens to believe and practice religion free of government interference—rights that are not “checked at the door” of public schools. Also, parents have significant rights to direct their child’s schooling. See e.g., Wisconsin v. Yoder, 406 U.S. 205 (1972) (parental “liberty” to direct the education of their children is “fundamental”); Lofton v. Department of Children and
Appendix O: Memorandum Opinion from FDOE General Counsel (Continued)

Family Services, (11th Cir. 2004) (quoting Troxel v. Granville, 530 U.S. 57, 65 (2000), “Supreme Court precedent has long recognized . . . ‘the fundamental right of parents to make decisions concerning the care, custody, and control of their children’“).

As earlier discussed, the U.S. Supreme Court in Employment Division v. Smith, 494 U.S. 872 (1990), appeared to curtail historic, FRFRA-like free exercise protections where the government enforces a neutral or generally applicable rule. The Court in Smith distinguished two exceptions based on past precedents, however, where the rule would remain subject to heightened scrutiny: (1) a “hybrid rights” exception—when a free exercise claim is coupled with some other constitutional claim, and (2) an “individualized exemption” exception—if a state’s facially neutral rule contains a system of individualized exemptions, then a state may not refuse to extend that system to cases of religious hardship without a compelling reason. Id. at 881-84 (citing past Court decisions that involved hybrid-rights and individualized exemption exception claims). Our facts appear to implicate both Smith exceptions.

Hybrid Rights Exception

In Smith, the Court explained that when a parent’s fundamental interest in directing their child’s education was combined with a First Amendment free exercise of religion claim, the burden of the state was heightened to show a FRFRA-like compelling reason for any policy infringing those rights. Id. at 881 (citing its ruling in Wisconsin v. Yoder). While the Court has not exhaustively defined the application or limits of hybrid-rights claims, Florida and other courts have recognized hybrid rights claims, especially in the context of claims involving parental and First Amendment free exercise rights combinations. Johnson v. Dade County Public Schools, 1992 WL 466902 (S.D.Fla., 1992) (recognizing a hybrid claim to exist where First Amendment parental and free exercise rights were intermingled in a challenge to a school’s telephone counseling services); see also, Brown v. Hot, Sexy and Safer Productions, 58 F.3d 525 (1st Cir. 1995), cert. denied, 116 S.Ct. 1044 (1996); Cornerstone Bible Church v. City of Hastings, 948 F.2d 464, 473 (8th Cir. 1991); American Friends Service Comm. v. Thornburgh, 961 F.2d 1405, 1407-08 (9th Cir. 1991), but see Kissing v. Board of Trustees, 5 F.3d 177 (6th Cir. 1993) (refusing the recognize hybrid-rights claims until further clarification of the issue by the Supreme Court).

Under the Fourteenth Amendment, the U.S. Supreme Court has held that, “the custody, care and nurture of the child must reside first in the parents,” Prince v. Massachusetts, 321 U.S. 158, 166 (1944), and declared this right to be fundamental, Troxel v. Granville, 530 U.S. 57, 66 (2000). See also, Meyer v. Nebraska, 262 U.S. 390, 401 (1923) (first recognizing right of parents “to control the education of their own” children). While some federal appeals courts have narrowly defined parental rights in the public school education context, the instant facts concern a lesser expression of parental rights than at issue in those cases. For instance, the Ninth

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6 Various federal appeals court rulings (not from the 1st Circuit) have ruled there to be relatively narrow parental rights vis-à-vis public schools. See e.g., Swanson v. Guthrie Indep. Sch.
Appendix O: Memorandum Opinion from FDOE General Counsel (Continued)

Circuit in Grone v. Mead School Dist. No. 354, 753 F.2d 1528, 1535 (9th Cir.1985), would not enjoin the use of a book that parents found offensive to their religious beliefs, but noted that the student was not forced to read the book or be present or participate during classroom discussions relating to the book.

The Individualized Exemption Exception

The Smith Court ruled that where a state’s facially neutral rule contains a system of individualized exemptions, a state may not refuse to extend that system to cases of religious hardship without a compelling reason. Id. at 881-84 (citing past decisions that involving individualized exemption exception claims); see also Church of Lukumi Babalu Aye, Inc. v. City of Hialeah, 508 U.S. 520, 532, 542 (1993). The Court's concern is the prospect of the government's deciding that secular motivations are more important than religious motivations. See Lukumi, at 542 (“All laws are selective to some extent, but categories of selection are of paramount concern when a law has the incidental effect of burdening religious practice.”). The Court has not yet explained what constitutes a “system” of individualized exceptions, and like the hybrid rights exception, courts and commentators are split on the question. Perhaps the best example of such a system is the one in which this exception originated—an unemployment benefits system which required claimants to show “good cause” as to why they were unable to find work. In Sherbert v. Verner, 374 U.S. 398 (1963), a Seventh Day Adventist was fired because she refused to work on Saturdays, which her faith did not permit. Sherbert applied for unemployment benefits, but was denied for failing to demonstrate “good cause” for her unemployment. The Court held that the denial of benefits violated the Free Exercise Clause, because it forced Sherbert “to choose between following the precepts of her religion and forfeiting benefits, on the one hand, and abandoning one of the precepts of her religion in order to accept work, on the other hand.” Id. at 404.

Another court recently applied a free exercise, individualized exemptions-based claim in the context of education. In Axson-Flynn v. Johnson, 356 F.3d 1277 (10th Cir. 2004), the Tenth Circuit considered the case of a woman admitted to an actor training program at the University of Utah. During her first semester, she refused to say the word “f***” or take God’s name in vain during class assignments. Her professors ultimately refused to allow her to alter or change assigned scripts, demanding that she read assigned scripts as written. The court concluded there to be a genuine issue of material fact as to whether the University had a system of individualized exemptions because a Jewish student was exempted from a curricular requirement because of a religious holiday and, at times, Axson-Flynn herself was exempted from curricular requirements. The court concluded that if there was an

Dist.No. I-L, 135 F.3d 694 (10th Cir. 1998) (parents have no right to pick and choose which curriculum-required classes their children will attend), Brown v. Hot, Sexy and 11 Safer Prods., Inc., 68 F.3d 525 (1st Cir. 1995) (a parent may not preclude a school from teaching subjects or putting on programs that they find offensive because of the sexually explicit material presented), Mozart v. Hawkins County Bd. of Educ., 827 F.2d 1058 (6th Cir. 1987) (a parent may not for religious reasons exclude a child from participating in a school district’s multi-level reading program). Notably, none of these precedents involved the application of a post-Smith state religious freedom act.
exemption system, the system must be extended to cases of religious hardship. *Id.* at 1299.

The instant scenario raises similar issues, insofar as Florida statutorily allows excused opt-outs from particular classroom instruction, including from its science curriculum.7 As earlier discussed, Florida law excuses students from biology instruction in which animal experiments or dissection takes place. See § 1003.47, Florida Statutes. Because Florida schools have a practice of allowing science lesson opt-outs for students for indeterminate reasons, they may be required to demonstrate a compelling interest to deny religiously-motivated requests to be excused from different lessons in those same classes.

**CONCLUSION:**

Under Florida law, where a student or parent requests to be excused from instruction, a program, or other teaching on a particular subject, a school should determine:

1. whether Florida law or district policies allow an explicit right to opt out of that instruction (e.g., animal dissection/experimentation, reproductive health or HIV/AIDS instruction), with which the school must comply; or

2. whether the request is substantially motivated by a student’s sincere religious belief, in which case the school is on firmest legal ground if it grants the opt-out request.

If neither (1) nor (2) is applicable, then a school has broad authority to refuse the request and to require a student to attend.

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7 Additionally, individual school districts in Florida have discretion and may have policies that allow students to opt out of additional subjects of classroom instruction.
ABOUT THE AUTHOR

Jacquelyn Hoffmann Speake was raised in Annapolis, Maryland and earned a Bachelor’s of Science degree from the University of Maryland, College Park, and a Master’s of Education degree from the University of South Florida, Tampa. She was a marine biologist for eight years before becoming a high school Biology and Marine Science teacher in 1997. Jackie has a Post-Master’s Certificate in Educational Leadership and is currently the Curriculum and Instruction Specialist for K-12 Science/Health for Charlotte County Public Schools.