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Differences of Mean Scores on the Preliminary Scholastic Aptitude Test (PSAT) for Classical Christian Schools Compared to Non-Classical Christian Schools

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ABSTRACT

This causal-comparative quantitative study compares mean scores on the Preliminary Scholastic Aptitude Test (PSAT) between Classical Christian schools and non-Classical Christian schools using data randomly selected from survey responses. The sample consisted of 4,486 mean scores from the 2003–2004 school year through 2012–2013. Welch's *t*-tests for unequal variances was used with an alpha set at 0.05 and 0.017 for Bonferroni correction and returned statistically significant results for all three academic areas: reading, math, and writing. Effect size measured by Cohen's d and eta squared indicated Classical Christian methodology should have a large, positive effect on PSAT scores. Demographic and between school comparison limitations noted. Future research and associated correlational studies are recommended.

Introduction

While the Classical Christian education movement has appeared recently in both Christian and secular media as an instructional method new to the scene, it really is a look back at what the Essentialists of the 1920s saw as a tried and true method in Western culture for inculcating youth while preparing them for participatory citizenship. This article will provide background information regarding Classical Christian education, the problem, purpose and significance of the study, the research questions guiding the study, and finally, definitions pertinent to the study. See Supplementary Appendix A for definitions of key terms in this study.

Background

Recently, the Gospel Coalition published an article touting amazing academic progress made in an inner city school (where most had not

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Supplemental data for this article can be accessed on the publisher's website.

graduated high school and the ones who did read at an eighth-grade level) utilizing the Classical Christian education method which had been "sprouting up" all across America in the past 25 years (Zylstra, 2017).

The first Evangelical Protestant Classical and Christian school which became the model for others in the Association of Classical and Christian Schools (ACCS) was started in Moscow, Idaho in 1981 (Logos School, 2014) by Pastor Douglas Wilson, Shirley Quist, and Larry Lucas. The ACCS has grown to an organization of more than 236 member schools with more than 40,000 student enrollment, including international schools from The Bahamas to Indonesia, South Korea, and Africa (Association of Classical and Christian Schools, 2017). There also are Christian schools following the Classical method within the Association of Christian Schools International or ACSI.

While the Classical Christian education movement looks back to the Trivium method of Greco-Roman education, it also incorporates more modern understandings of child development as espoused by Piaget (1976). The ACCS' Classical Christian philosophy is based in part on a definition of "Classical" drawn from Sayers' (1947) essay titled "The Lost Tools of Learning" and Wilson's (1991) book, *Recovering the Lost Tools of Learning*. The Classical Christian methodology assumes students move through developmental stages in three broadly defined categories correlated to the Trivium, which were renamed by way of illustration in Sayers' essay (1947).

The purpose of education from the Classical Christian theoretical framework encompasses how to learn, when and what content is to be learned, as well as the worldview from which to interpret and apply all knowledge (Association of Classical and Christian Schools, 2012c). According to 1 Thessalonians 5:23, human beings are body-soul-spirit, and as such, require a theoretical framework to understand the three-fold nature of mankind (Fausset, 1871). "The 'spirit' links man with the higher intelligence of heaven, and is that highest part of man which is receptive of the quickening Holy Spirit" (Fausset, 1871, para 4). The Bible also teaches that there are maturational stages in the process of learning, as Henry (1706b) pointed out in his commentary on 1 Corinthians 3:1–2 and 13:11: The Apostle Paul tells the conceited, immature Corinthian believers that he has not deemed them adult and ready for the weightier or meatier matters of doctrine because they have only limited knowledge of the things of God and are not mature enough in their understanding. Henry (1706b) further explained the Apostle's message in terms of the instructional method, "It is the duty of a faithful minister of Christ to consult the capacities of his hearers and teach them as they can bear" (lines 15–16). Henry (1706b) noted that the Apostle compared the Corinthians to children in speech and

actions, since a child's capacity to learn more difficult concepts grows as he grows and develops into a man, so spiritual understanding in younger Christians should grow, in knowledge and understanding, as they develop more spiritual maturity. In his commentary on Hebrews 5:12–14, Henry (1706c) confirmed the central metaphor Paul used to compare the learning of children—first the simple, plain truths to be learned, understood and exercised before the more sublime and mysterious concepts were to be tackled and grasped—to the state of Christian doctrinal teaching and learning within the church.

Such maturational stages of learning and development in children need more investigation and analysis. While areas such as cognitive and moral development as well as public/private test score comparisons have been studied and theorized, there is a lack of research and analysis in this area of acquiring a knowledge base prior to introducing more abstract concepts, as promoted by Essentialists, compared to Progressive pedagogical methods which are more child-centered and student directed in curriculum choices (Kessinger, 2011). According to Nehemiah Institute's Smithwick (2014), "Many, if not most teachers in Christian schools receive their education degree from state universities," and are "often humanist in mind" due to the worldview inherent at institutions granting state teaching certificates (p. 9). This causes a heart/mind worldview disconnect, Smithwick (2014) stated, between humanistic or man-centered educational philosophies, coupled with child-centered pedagogical practices being placed into what educators had intended to be a God-centered education.

Decades-long studies performed by the Nehemiah Institute (Smithwick, 2013) show that fewer than 10% of students from Christian homes graduate with a biblical worldview, regardless of whether or not they attend Christian private school or public school. The exception to this trend, stated Smithwick (2013), or students retaining a Christian worldview, are those who attended Classical Christian schools such as those accredited by the ACCS, or those who used The Principle Approach home school curriculum. Recent research by Brickhill (2010) supports Smithwick's findings among middle school-aged students.

Another component of Classical Christian education, reminiscent of Comenius' thorough list of subjects (Sovocol, 1932), is the idea of a topically integrated curriculum, including an emphasis on reasoning, poetry, literature, and presentation skills. Littlejohn and Evans (2006) claimed such an emphasis on both thinking and learning content corresponds well to Plato's pedagogical hierarchy of sensory, intellectual and intuitive learning. The difference from the much maligned "rote learning" is contextual and developmental applications (Littlejohn & Evans, 2006, p. 164). On this point, Bagley and the Essentialists agreed with the Progressives that simply

repeating back information is not enough – rote learning without connecting "prior knowledge to current lessons" was just "stupid, parrot-like learning" (Null, 2001, p. 46).

The Essentialist movement, which started in about 1940 and reemerged in the 1980s was founded by teacher trainer and educational theorist Bagley (Kessinger, 2011). Bagley "believed that there were essentials for all to learn" in formal instruction governed by "tried and true" methods (Ediger, 2012, p. 176). The Essentialists emerged in response to a call for universal student-centered education by Progressives such as Dewey (1938) and Kilpatrick who favored child-directed or purely vocational curriculum choices "instead of advocating for a … liberal arts curriculum for all" (Null, 2007, p. 1015). Kohlberg and Mayer's (1972) emphasis on cognitive-psychological development of the self as the driving force in education and the Progressive educators' emphasis on "child-centered" social reformism (Gutek, 1995, p. 488; Ediger, 2012, p. 176) stand in contrast to Essentialist thinking, according to Null (2008). The Essentialists, led by Bagley, argued for education's end outside the realization of the self; that the moral purpose of molding children's lives is inseparable from academic instruction (Null, 2008). Bagley valued the "fundamental and thoroughgoing" approach with a "penetrating program" of study having "virtues" (Bagley, 1917, p. 624). Biblical scholars agreed: In arguing against removing the Bible from public classrooms, Rankin (1876) stated the Bible is "the standard by which we determine the character of our civilization" (para. 22). Henry (1706a) argued that Christians should utilize reason as a tool under the subjection and direction of the scriptures in his commentary on Acts 17:1–9.

The present study sought to isolate and identify any difference in results of such an Essentialist philosophy of education of molding children's character while including rigorous academic instruction aimed at learning how to learn, which is evident today in the resurgence of the Classical Christian method of instruction, in terms of academic achievement based on the standardized PSAT.

Problem statement

Within the faith-based education field, others have studied spiritual formation (Dernlan, 2018), the effects of educator worldview on students (Brickhill, 2010; Fyock, 2007; Smithwick, 2014; Wood, 2008), and even headmaster job satisfaction (Dietrich, 2010) as differences between the Classical and non-Classical Christian schools, but no study has looked at pedagogical differences between Classical Christian schools and non-Classical Christian schools as far as performance on standardized tests measures.

Whether students attend private or public schools, charter, college prep, or religious schools, the standardized tests for college admission are considered a reflection of academic achievement (The College Board, 2011, 2014, 2014c, 2015). Jeynes' (2012a) extensive meta-analysis of 90 studies found that while charter school students performed no better than their public school counterparts, private Christian school students outperformed public school students on standardized tests.

Jeynes (2008) found that Evangelical Protestant schools make up an increasing percentage of all religious schools in America. Additionally, Jeynes (2003, 2008, 2014) found that private school students perform better on standardized tests than public school students even when social and economic variables were accounted for. Jeynes (2008) also compared Catholic and Protestant schools within the private school realm and found that Protestant students scored higher on several measures in the National Educational and Longitudinal Survey or NELS than Catholic school peers. Researcher Jeynes has not published a direct comparison, however, between Classical Christian schools and non-Classical Christian school student scores on standardized assessments. Such standardized tests instituted under the impetus of the No Child Left Behind Act of 2001 (2002) were intended to ensure higher academic achievement and are Essentialist in design, according to Kessinger (2011).

The problem is there are no current studies comparing academic achievement of students in Classical Christian schools and non-Classical Christian schools. The purpose of this quantitative causal-comparative study was to address this gap in research by comparing academic achievement mean scores on the standardized PSAT from students educated through the Classical Christian method to mean scores from non-Classical Christian schools to see if there were any significant differences. Schools associated with the ACCS (2001) and the ACSI (2012a), by virtue of specific standards and rigorous accrediting protocols, made up the comparison groups in the present study from which random samples were drawn and then statistically analyzed.

Literature review

The following brief review of literature is focused on certain themes or tenets of the Classical Christian model that have quantitative study results. [The entire literature review from my dissertation is available through Liberty University https://digitalcommons.liberty.edu/doctoral/1670/].

With developmental and quantitative cognitive differences in mind, reviewers Cervetti and Hiebert (2015) stated that current implementation of the new CCSS (National Governors Association Center for Best

Practices, Council of Chief State School Officers, 2010) misses the mark in that informational texts are emphasized as a genre starting in kindergarten but it is not recognized that the standards were designed to help students acquire an extensive knowledge base necessary for later organization and synthesis as they mature. According to Cervetti and Hiebert (2015), Building a sound knowledge base in all study disciplines or topics is closely linked with reading and writing skills. Cervetti and Hiebert (2015) stated, "the aim is not simply to teach students to read for the sake of having reading proficiency and remembering content faithfully, but also reading to acquire and expand upon ideas" (p. 257). Moreover, having a good knowledge base, including topical and real world knowledge, has been shown to help students in the third grade and older develop inferential reasoning as well as higher order thinking skills (Cervetti & Hiebert, 2015). According to Cervetti and Hiebert (2015), "the finding that knowledge supports inference is important to bear in mind in light of perspectives on close reading" (p. 258) that are included as part of best practices under CCSS (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010), suggesting that readers stay "'within the four corners of the text' rather than relying on background knowledge" (Cervetti & Hiebert, 2015, p. 258). Textbook writers, added Cervetti and Hiebert (2015), "especially writers of complex texts, assume that their readers will be able to fill in gaps and make connections" utilizing prior knowledge (p. 258). Acquiring a knowledge base can aid struggling readers, as well as help students, understand "complex and ambiguous texts—the kinds of texts that they increasingly encounter in content area learning" (Cervetti & Hiebert, 2015, p. 259). According to Cervetti and Hiebert (2015), "this emphasis on comprehension as a process of uncovering meaning in the text is inconsistent with current understandings about the role of a reader's knowledge" (p. 262) as well as the context of meaning and being "inconsistent with the representation of comprehension within the Standards themselves" (p. 262). Implications of this misapplication of the standards has resulted in classroom confusion and a lack of background knowledge delivery by instructors; Cervetti and Hiebert (2015) gave the example of texts referring to historical cultural settings in foreign lands that 21st-century students would have no real world knowledge of without developing such a knowledge base in that particular historical and cultural context prior to the reading. Cervetti and Hiebert (2015) pointed out that in reaction to the new emphasis on reading competency brought about by the CCSS (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010) and the No Child Left Behind Act, "the biggest injury to knowledge enhancement would be the further expansion" (p. 263) of language arts reading instruction time "at the

expense of content area learning" (p. 263). While learning to decode, pronounce, and use grammar is important, Cervetti and Hiebert (2015) stressed that "content instruction can also be a supportive context for literacy development" (p. 263). Just as developing a solid knowledge base aids in reading and literacy, argued Cervetti and Hiebert (2015), so too does reading subject area texts to gain content knowledge help develop higher order thinking and organizational skills. According to Cervetti and Hiebert (2015), "there is compelling evidence that growth in reading engagement and reading comprehension is accelerated" (p. 263) when students read in order to prepare an argument, develop a concept or investigate a phenomenon. Students need to be able to learn content from reading and not just what is assessed on the state and federal standards. Cervetti and Hiebert (2015) stressed that "knowledge is the commodity of the digital–global age" (p. 264) and that in order for students to utilize prior knowledge, they must have built up a foundational base of knowledge through reading a variety of texts and not just texts used as an "an exercise to ensure the designated distributions of informational–narrative texts at different grade bands" (p. 265).

Ritchie, Sala, and McIntosh (2013) found in two elementary school experiments in the United Kingdom of primary school children ages eight to 12 that traditional study techniques including rehearsing facts, note-taking, self-quizzing, and low stakes instructor quizzing produced superior recall of facts over time than visual organizers such as mind-mapping. In the first experiment of 109 student volunteers with parental permission, 59 of whom were female, from primary school grades five and seven pulled from two classes each, from Towerbank Primary School in Edinburgh, had a median age of 10.29 years with a standard deviation of 1.07 years and were randomly assigned to either the retrieval or mapping group (Ritchie et al., 2013, para. 11). According to Gall, Gall, and Borg (2007), random assignment is "the best technique available for assuring initial equivalence between different treatment groups" (p. 397). Children "in the retrieval practice condition" (Ritchie et al., 2013, para. 1) group were able to recall "significantly more facts four days later" (Ritchie et al., 2013, para. 1). In the second and subsequent experiment, participants were 209 children, 99 of whom were female, ranging in age from eight to 12 years-old with a median age of 10.15 years and a standard deviation of 1.19, from primary grades four, five, six, and seven, utilizing two classes from each grade from Bruntsfield Primary School in Edinburgh (Ritchie et al., 2013, para. 27). Researchers "increased the difficulty of the tasks" (Ritchie et al., 2013, para. 26) in the second experiment by increasing the number of facts to be learned, reducing the learning times, and "extending the interval between the learning and testing phases to one week for a first test, and five weeks

for a second" (Ritchie et al., 2013, para. 26) to assess longer term outcomes. Results, according to Ritchie et al. (2013) were that "children in the retrieval practice condition recalled significantly more facts at the one- and five-week tests, albeit with a smaller effect size than for the four-day test administered in Experiment 1" (para. 42). No effect of the mind mapping technique was found when results were measured. Ritchie et al. (2013) stated, The popular technique of mind mapping may be an interesting and enjoyable way for children to visually represent their learning, but teachers should not expect it to boost fact learning-at least of the type studied here-in the short- or long-term. (2013, para. 50) The results "underline the effectiveness of retrieval practice for fact learning in young children" (Ritchie et al., 2013, para. 1).

Edicer (2012), in an article on careful listening, expounded on many of the tenets of Classical Christian education in a journal on improving students' reading. The article championed metacognitive exercises to teach children to think about their thinking and making lessons that relate to other knowledge and lessons (integrating and coordinating the curriculum) so that material is presented in deeper context—not broadly/shallowly covered—while insisting that teachers and students take time to master concepts and knowledge before moving on to new horizons (Edicer, 2012). Nasrollahi-Mouziraji and Nasrollahi-Mouziraji (2015) found in their review that mastery of fundamental knowledge by memorization at younger ages is normal and should be utilized. Nasrollahi-Mouziraji and Nasrollahi-Mouziraji (2015) stated, "young children will naturally memorize language patterns from their environment … rather than considering rote memorization as a direct opposition to understanding, it can be viewed in a complementary role" (p. 871). From a neurological standpoint, "memorization develops the brain in a way nothing else can" (Nasrollahi-Mouziraji & Nasrollahi-Mouziraji, 2015, p. 271), while from an information processing perspective it is important to rehearse new information and not to "bombard the learners with too much information" (Nasrollahi-Mouziraji & Nasrollahi-Mouziraji, 2015, p. 271). "If the new information is not transferred to the long term memory through rehearsal activities, it will be easily decayed and lost" (Nasrollahi-Mouziraji & Nasrollahi-Mouziraji, 2015, p. 272). Memorization, according to Nasrollahi-Mouziraji and Nasrollahi-Mouziraji (2015), "can be considered as the way through which controlled processes are changed into automatic ones, and hence available for easy retrieval" (p. 873)

In Classical pedagogy, the study of Latin is central to language acquisition and reasoning. While writing to advocate Latin instruction for "precocious students" (VanTassel-Baska, 2004, p. 56), VanTassel-Baska (2004) argued that Latin has intrinsic value for all serious students of

literature and Western culture. According to VanTassel-Baska, 2004), the mastery of Latin carries with it an "enduring personal relevance" (p. 56) and "educational value" (p. 56) attributed to a study of the classics, according to Van Tassel-Baska. VanTassel-Baska (2004) cited The College Board, reporting a more than 90% increase in students taking the Latin exam for college credit. Latin instruction promotes higher order thinking, an integration of history, language, philosophy, literature, and art (VanTassel-Baska, 2004). Moreover, it allows those who master it the joy of performing plays, reading manuscripts, and participating in modern dialogs in the language of the original authors of the Roman classics (VanTassel-Baska, 2004).

Wagner and Perels (2012) chose Latin instruction to study self-regulation and which interventions and processes might promote translation skills precisely because the study of Latin is thought of as old and outdated by many non-Classical modern scholars. Wagner and Perels (2012) saw the beauty and transferability of Latin skills, however, and wrote interventions to help students self-regulate studies in Latin and then use these new competencies to improve study skills in other endeavors toward "lifelong learning" (p. 1). Latin translation skills, argued Wagner and Perels (2012), closely resemble the complex analytical and synthesis competencies involved in problem solving, a much sought after tool in the 21st-century skill set toolbox. Accordingly, Wagner and Perels (2012) advocated for a "refocus" (p. 2) in Latin instruction to stress the value of the learning process in mastering Latin translation skills over the debatable utility of the language itself and its transferability to acquiring other languages.

Significance of the study

While public education reached near-universal expression in the 1960s, that decade also marked when the Bible and prayer were removed from public schools and public school test scores fell dramatically (Jeynes, 2012a). Researchers such as Jeynes, as well as authors in the field of Christian education, see a need to identify and publicize educational methods that are proving fruitful: "In my view it is important not only to distinguish between traditional public schools, charter schools, and Christian schools but the various kinds of Christian schools as well" (W. Jeynes, personal communication, June 2015). In a meta-analysis, Jeynes (2012a) found that students attending private religious schools achieved the highest academic results compared to public, charter and other private educational institutions. Jeynes also noted in another article that attending a private Christian religious school decreased the achievement gap for minority Hispanic and African-American students compared to their majority white counterparts by more than 25% (Jeynes, 2014).

There are several reasons why educators should be interested in how a Classical Christian education may affect students' PSAT scores, not the least of which is the awarding of National Merit Scholarship Corporation (2014) based on these scores. Admittance to the college of choice would be another reason to consider the type of K-12 school students attend.

The Association of Christian Schools International or ACSI (2012a), like the ACCS (2001), stated that its mission is to promote, establish, and equip schools (including homeschools and co-ops) committed to education from an Evangelical Protestant Christian worldview. Both the ACCS (2012b) and ACSI (2012b) support instruction grounded in the Old and New Testament Scriptures. The ACCS (2012a, 2012b) added its Classical philosophy of teaching to both its mission statement and accrediting standards as a distinction from other Christian school methods.

Dietrich (2010) observed that Classical Christian methodology "differs significantly from postmodern American education" in that "children are taught how to think and learn rather than viewed as great silos that need to be filled to capacity with information" (pp. 28–29). Based on the groundwork laid by cognitive-developmental theorists and current researchers such as Jeynes (2012a), the current study sought to examine any differences in achievement from students in Classical Christian schools and non-Classical Christian schools in order to help determine if this method of instruction is still effective and worthy of implementation today.

Methods

The researcher utilized preexisting groups from private Protestant Evangelical Christian schools that collected PSAT scores in order to compare mean scores between those that teach classically and those that do not. Collecting mean test scores from self-selecting, preexisting groups is one way to overcome obstacles to preserving confidentiality (Gall et al., 2007).

Design

This study was a quantitative, non-experimental, causal-comparative design, which is appropriate for preexisting groups in which the independent variable is not manipulated (Gall et al., 2007). This design is appropriate for measuring the possible relationship between preexisting educational methods chosen by families in an analysis of standardized test score means by school. In this study, the dependent variable was school mean scores on PSAT verbal, mathematic and writing assessments. Composite/overall scores were not analyzed due to a low response rate from schools. The

PSAT is recognized by college scholarship awarding agencies as a good predictor of academic success measured by college readiness (The College Board, 2011). The independent variable was the type of educational philosophy, either Classical Christian or non-Classical Christian private school education. According to Pyrczak (2008), since students are not usually randomly assigned to groups, it is normal and a best practice to assign another equal class as the control group – one which does not receive the treatment. The present study compares two preexisting groups of Evangelical Protestant Christian private school students; one group had an added distinction in educational philosophy, the Classical method, whereas the other did not.

Research questions and hypotheses

The following research questions were proposed:

RQ1: Is there a difference in academic performance on PSAT composite scores for Classical Christian private schools compared to non-Classical Christian private schools?

RQ2: Is there a difference in academic performance on PSAT mean math scores for Classical Christian private schools compared to non-Classical Christian private schools?

RQ3: Is there a difference in academic performance on PSAT mean reading scores for Classical Christian private schools compared to non-Classical Christian private schools?

RQ4: Is there a difference in academic performance on PSAT mean writing scores for Classical Christian private schools compared to non-Classical Christian private schools?

The following null hypotheses were proposed:

$H_0$1: There is no significant difference in academic performance on PSAT composite scores for Classical Christian private schools compared to non-Classical Christian private schools.

$H_0$2: There is no significant difference in academic performance on PSAT mean math scores for Classical Christian private schools compared to non-Classical Christian private schools.

$H_0$3: There is no significant difference in academic performance on PSAT mean reading scores for Classical Christian private schools compared to non-Classical Christian private schools.

$H_0$4: There is no significant difference in academic performance on PSAT mean writing scores for Classical Christian private schools compared to non-Classical Christian private schools.

Participants and setting

The participants for the study consisted of a random sample from all ACCS (Classical Christian) and accredited ACSI (Classical and non-Classical Evangelical Protestant Christian private schools) member schools in the United States and abroad that answered the study survey. While the researcher had intended to compare mean scores year by year, too few responses were provided for longitudinal analysis. Mean school scores were designated either Classical or non-Classical, regardless of year. The sample size was drawn from a randomized list in an Excel spreadsheet of all schools answering the survey: 152 Classical Christian schools generated 718 weighted mean scores (in essence, giving each test-taking student from the school the same score as the school mean score) from the 10-year period 2003–2013 and 196 Non-Classical Christian schools generated 3,768 weighted mean scores (in essence, giving each student from the school the same score as the school mean score) from the same 10-year period. One hundred fifty-five is an appropriate sample size for a medium effect size at .7 statistical power with an alpha of 0.05 for an independent samples *t*-test (Gall et al. 2007, p. 145); sampling far exceeding this measure once all weighted mean scores for all 10 years were combined and not evaluated year-by-year.

About half of the schools that provided scores also provided some demographic information that was incomplete from year to year; demographic data was not statistically analyzed due to insufficient number of responses. Of the half that did include demographic data, the Classical Christian schools in general (from the 2012–2013 school year) consisted of students who were 75% white, 1.17% black or African American, 9.6% Asian, 0.08% American Indian or Alaska Native, 1.25% Native Hawaiian or other Pacific Islander, 1.67% Hispanic or Latino, 22.5% other race; 57% male and 43% female. The Classical Christian schools had an average student age of 16 years old; 14% of schools were in the Midwest, 13% in the south, 17% in the Northeast, 33% percent in the Northwest, and 22% in the Southwest. Classical Christian schools that responded to the survey averaged 21 years in operation with all of the schools being in operation for 10 years or more. The non-Classical schools in general (from the 2012–2013 school year) consisted of students who were 71% white, 5.2% black or African American, 15.8% Asian, 0.62% American Indian or Alaska Native, 0.12% Native Hawaiian or other Pacific Islander, 3.2% Hispanic or Latino, 0.96% other race; 50% male and 50% female. The non-Classical Christian schools had an average student age of 16 years old; three percent of schools were in the Midwest, 22% in the south, 13% in the Northeast, nine percent in the Northwest, 38% in the west, and nine percent international. Non-Classical

Christian schools responding to the survey averaged 41 years in operation with 100% of the schools having been in operation for 10 years.

Instrumentation

The instrument used in this study was the Preliminary Scholastic Aptitude Test (PSAT, The College Board, 2014b). The variables the instrument was used to measure in the study were: critical reading skills (called reading in this study), math problem-solving (called math in this study), and writing skills (called writing in this study).

While the National Merit Scholarship Program started in 1955, the National Merit Scholarship Corporation adopted the College Board's Preliminary SAT exam (PSAT) as the qualifying test for its consideration in 1971 (College Compass, 2011). The PSAT/NMSQT includes five sections: two 25-minute critical reading sections, two 25-minute math sections, and one 30-minute writing skills section. The entire test takes two hours and 10 minutes (The College Board, 2014b). According to Proctor, Wyatt and Wiley (2010), The College Board's PSAT/NMSQT standardized tests are recognized as valid and reliable measures for college readiness among high school juniors. According to The College Board (2014b), validity studies show a strong correlation of .50 between its assessments and first-year college grade point averages (Shaw, 2015).

Procedures

After receiving permission from Liberty University and IRB approval, this study utilized a causal-comparative design. The procedures included receiving permission from both the ACCS and ACSI boards to request data from member schools through a mailed survey (see Supplementary Appendix B).

A professional cover letter was sent with the survey to all 247 member schools in the ACCS as well as all named Classical Christian schools among the 3,000 in the ACSI accredited schools list and all accredited ACSI schools with an upper school. Once a response was received, anonymity was assured through coding of respondents in Excel spreadsheets by numbering envelopes as received; school names were not used for any further identification.

Respondent questionnaires have several advantages (Gall et al., 2007) including low cost of sampling across large geographic areas and a relatively quick response time compared to personal interviews which, while time consuming, have more adaptability (Gall et al., 2007, p. 228).

Results

Data analysis

In this study, the null hypotheses indicated a comparison of weighted mean scores taken from schools within the ACCS and ASCI. Descriptive statistics for each comparison group were compiled before weighting of mean scores by school in reading, math, and writing. In reading, Classical Christian schools were $M = 56.52$, $SD = 6.03$, and $n = 152$. Non-Classical Christian schools were $M = 48.87$, $SD = 3.92$, and $n = 196$. In math, Classical Christian schools were $M = 54.43$, $SD = 5.86$, and $n = 152$. Non-Classical Christian schools were $M = 49.31$, $SD = 4.08$, $n = 196$. In writing, Classical Christian schools were $M = 56.54$, $SD = 7.10$, and $n = 144$. Non-Classical Christian schools were $M = 48.82$, $SD = 4.74$, and $n = 196$. Boxplots indicated one or two outliers but these could be reasonably explained by naturally occurring variation in student scores.

The independent variable was the method of instruction, Classical Christian or non-Classical, and the dependent variables were the PSAT mean scores by school. Mean scores were weighted by the number of students taking the test as reported by schools (in essence, giving each test-taking student from the school the same score as the school mean score). The populations were normally distributed. Since weighing of mean scores was performed to account for large differences in numbers of students (the school score mean comprised by the most students was 332 while the smallest was two), weighted variances also must be used (Delacre, Lakens, and Leys, 2017). Statistical analysis was conducted using SPSS® software except for weighting variances which was done in an Excel spreadsheet. After being entered, the data was coded and screened (school numbers and years were dropped, mean scores without the number of students making up average score or scores with percentiles were eliminated).

Assumptions of normality were tested using histograms and boxplots to make sure there were no extreme outliers and variance homogeneity was assessed using Levene's test (Gall et al., 2007). Originally, the researcher planned to conduct a *t*-test for independent samples, but when Levene's test returned non-tenable results ($p = .001$) in all tested hypothesis topics indicating that homogeneity of variances could not be assumed, a Welch's *t*-test for unequal variances was performed instead. According to Satterthwaite (1946), issues with homogeneity of variance can be avoided by utilizing a linear function of mean squares to estimate variance. Delacre, Lakens, and Leys (2017) suggested that the Welch's *t*-test for unequal variances is appropriate under these circumstances and will return results that are less likely to result in a Type 1 error of rejecting a null hypothesis when it is true if the study data assumption of homogeneity is not met.

Table 1. Descriptive statistics of PSAT classical Christian school mean scores.

	N	*M*	*SD*	SE mean
Reading				
Non-classical Christian	196	48.870	3.920	0.280
Classical Christian	152	56.521	6.025	0.489
Math				
Non-classical Christian	196	49.305	4.082	0.292
Classical Christian	152	54.426	5.860	0.475
Writing				
Non-classical Christian	196	48.825	4.741	0.339
Classical Christian	144	56.542	7.105	0.592

Table 2. Levene's test results.

		F	Sig.
Reading	Equal variances not assumed	24.181	0.001
Math	Equal variances not assumed	18.366	0.001
Writing	Equal variances not assumed	19.000	0.001

A two-tailed Welch's *t*-test was used. After analysis, a one-tailed Welch's *t*-test was added to identify the greater of the two weighted, mean score categories. This design was appropriate for preexisting groups (Gall et al., 2007). The significance level of $p < .05$ was used as a measure indicating rejection of the null hypotheses which is the conventional and standard level (Gall et al., 2007). Due to multiple dependent variables, a Bonferroni correction was made and the alpha level was set at $p < .0125$ to help avoid a Type I error. Effect size, or "estimate of the magnitude of the difference" (Gall et al. 2007, pp. 143–146) was measured using eta squared and Cohen's *d* (Gall et al. 2007) (Tables 1 and 2).

Findings by hypotheses

$H_0$1: Due to a lack of scores returned, Null Hypothesis One, there is no significant difference in academic performance on PSAT composite scores for Classical Christian private schools compared to non-Classical Christian private schools, was not analyzed.

$H_0$2: Null Hypothesis Two stated there is no significant difference in academic performance on PSAT mean reading scores for Classical Christian private schools compared to non-Classical Christian private schools. For $H_0$2, the histogram returned a reasonably normal bell-shaped curve indicating assumption of normality is tenable but homogeneity of variance was not met when applying Levene's test in SPSS® returning a significance level of .000 (Szapkiw, 2010). The two-tailed test results were Welch's $t(\text{df}) = 36.36$ (3768), $p < .001$. Thus, the null hypothesis was rejected, both at the alpha level .05 and .017 with Bonferroni correction. The one-tailed test to determine the higher test score mean returned $p < .001$. In mean reading scores, Classical Christian schools ($M = 55.23$, $SD = 21.59$, $n = 718$) scored significantly higher than non-Classical Christian schools ($M = 48.56$, $SD = 3.68$, $n = 3{,}768$). The effect size was high ($d = 1.73$). Eta squared returned $\eta^2 = 0.428$, indicating that 43% of variation in dependent variable was explained by independent variable.

$H_0$3: Null Hypothesis Three stated, there is no significant difference in academic performance on PSAT mean math scores for Classical Christian private schools compared to non-Classical Christian private schools. For $H_0$3, the histogram returned a reasonably normal bell-shaped curve indicating assumption of normality is tenable but homogeneity of variance was not met when applying Levene's test in SPSS® returning a significance level of .000 (Szapkiw, 2010). The two-tailed test results were Welch's t(df) =21.04 (858), $p < .001$. Thus, the null hypothesis was rejected, both at the alpha level 0.05 and 0.017 with Bonferroni correction. The one-tailed test to determine the higher test score mean returned $p < .001$. In mean math scores, Classical Christian schools ($M = 53.77$, $SD = 4.88$, $n = 718$) scored significantly higher than non-Classical Christian schools ($M = 49.76$, $SD = 3.45$, $n = 3{,}768$). The effect size was high ($d = 1.08$). Eta squared returned η^2=0.225, indicating that 23% of variation in dependent variable was explained by independent variable.

$H_0$4: Null Hypothesis Four stated, there is no significant difference in academic performance on PSAT mean writing scores for Classical Christian private schools compared to non-Classical Christian private schools. For $H_0$4, the histogram returned a reasonably normal bell-shaped curve indicating assumption of normality is tenable but homogeneity of variance was not met when applying Levene's test in SPSS® returning a significance level of .000 (Szapkiw, 2010). The two tailed test results were Welch's t(df) =29.73 (897), $p < .001$. Thus, the null hypothesis was rejected, both at the alpha level 0.05 and 0.017 with Bonferroni correction. One-tailed test to determine the higher test score mean returned $p < .001$. In mean writing scores, Classical Christian schools ($M = 55.11$, $SD = 5.74$, $n = 701$) scored significantly higher than non-Classical Christian schools ($M = 48.24$, $SD = 4.88$, $n = 3{,}768$). The effect size was high ($d = 1.37$). Eta squared returned η^2=0.318, indicating that 32% of variation in dependent variable was explained by independent variable.

Discussion

The purpose of this quantitative study was to compare mean scores on the PSAT between Classical Christian schools and non-Classical Christian schools to see if there was any difference in academic performance. A statistically significant difference was found after analyzing the data, indicating both a positive effect of the independent variable of instructional method on the dependent variable of PSAT mean score as well as a need for further research to determine which variables correlate to the significant difference found.

As Ritchie et al. (2013) found, traditional methods for memorization of facts indicated superior recall results, which agree with the developmental design of the Trivium. Edicer (2012) promoted metacognitive exercises (thinking about thinking) as well as integrated and cross-curricular lessons to deepen context. Edicer (2012) also argued that students should master the base knowledge of topics before moving to higher levels of analysis. Nasrollahi-Mouziraji and Nasrollahi-Mouziraji (2015) agreed, stating that younger students should master a base of core knowledge by memorization.

These methods are included in the developmental design of the Greco-Roman Trivium practiced by Classical Christian instructors.

The statistically significant difference found in academic performance on PSAT mean reading, math and writing scores for Classical Christian private schools compared to non-Classical Christian private schools attributed to instructional method (eta squared results) supports what Yuksel (2014) posited about both prior knowledge and reading ability contributing to substantial gains in mathematics knowledge. Additionally, higher levels of both reading and writing skills combine with a sufficient base of knowledge to aid in development of inferential and critical thinking/higher-level cognitive skills (Cervetti and Hiebert, 2015). Wagner and Perels (2012) agreed, arguing that translation skills acquired in Latin instruction transfer to cross-curricular problem solving skills including analysis and synthesis. Acquiring a sufficient base of knowledge prior to developing analytical skills as well as instruction in Latin are hallmarks of the Classical Christian method.

Specifically, the study results of statistically significant higher PSAT mean reading scores for Classical Christian private schools compared to non-Classical Christian private schools supports the findings of Cervetti and Hiebert (2015) that reading skills underlie both inferential reasoning and assessment competencies as well as Edicer's (2012) call for deeper context across disciplines in reading instruction.

Similarly, the statistically significant higher PSAT mean math scores for Classical Christian private schools compared to non-Classical Christian private schools supports the findings of Yuksel (2014) in both prior knowledge base and reading ability contributing to higher performance in mathematics as well as Purnomo et al., (2014) findings that math is best taught to children in procedural order, that is the ordering of instruction from concrete to abstract.

In writing, the statistically significant higher PSAT mean scores for Classical Christian private schools compared to non-Classical Christian private schools supports the findings of Cervetti and Hiebert (2015) and Coker and Erwin (2011) who found that direct instruction in writing logical arguments improved both cognitive and written language skills. Bandini et al., (2013) argued that reading and writing skills are interdependent in nature, as supported by similar findings in the present study of statistically significant higher mean scores in both of these academic areas for Classical Christian schools.

Results of the statistical analysis of PSAT mean scores also support Henry's (1706b) explanation of the Apostle Paul's instructional method "to consult the capacities of his hearers and teach them as they can bear" (lines 15-16). Henry (1706c) stated that Paul used the illustration of how children learn, first simple precepts and then more difficult concepts as he grows

and develops, in his commentary on Hebrews 5:12-14. Bagley's (1911) Essentialist theory posited that a command of essential basic knowledge frees one's mind for higher-level thinking and analysis; results of this study seem to support that theory with significantly higher mean scores on the PSAT college entrance exam as a measure. More investigation is needed into the Essentialist theory of acquiring a core knowledge base prior to introducing more abstract concepts as compared to Progressive pedagogical methods which are more child-centered with student-directed curriculum choices (Kessinger, 2011).

Implications

The implications of this study reach beyond the classroom to include improved teacher training, more institutions training classroom teachers in the Classical Christian methods and philosophy, and more research to identify which variables may hold the most promise as correlated to standardized test performance. Secular teacher training programs should also take note and investigate where techniques, methodologies, and philosophies might be incorporated into current thought or replace current paradigms completely.

Jeynes (2012a, 2012b) found that students scored higher when attending Christian private schools, these associated academic benefits were stable over time, and these associated academic benefits improved minority student scores, closing the perceived gap between majority race counterparts. Classical Christian schools are a subset of Christian private schools and scored significantly higher on the PSAT standardized test in this study. In light of these qualities, it would be important for education policymakers, parents and educators to consider or reconsider the merits of the Essentialist-based developmental approach of the Trivium practiced in Classical Christian schools.

Limitations

Limitations this study included both internal and external validity as well as researcher bias. Internal threats to validity included the maturity, state of mind, health, and attentiveness of each student taking the PSAT as well as the common practice of taking the PSAT more than once in preparation for the SAT (Testmasters, 2017). The present study received averaged scores from school headmasters to allow for the utmost in privacy (no student names can be attributed to any reported score) with scores covering a 10-year period. The researcher had no way of identifying how many times each student took the tests that made up the averaged scores. While teacher

preparation was controlled to some extent due to the use of only accredited member schools polled in the ACSI where a minimum of a bachelor's degree is required, the ACCS schools had no such requirement. Also, due to low response rates in some areas of the survey, observed differences in mean scores could be partly attributed to differences in school resources, staff preparation, and student demographics. Similarly, the schools polled for data included all accredited ACSI schools internationally while the only ACCS schools with students old enough and offering the PSAT were located in the United States. While this study utilized real, classroom-generated scores, generalizing the results of the present study to all grade 11 students or another defined population would be an overgeneralization, or a limitation of external validity, according to Gall et al., (2007, p. 389). The researcher in this study has used rigorous statistical measures (existing mean scores provided by schools, coding for confidentiality, Bonferroni adjustment) to ensure bias would not affect the outcome or reporting. The researcher disclosed that she serves as treasurer in a public charity that aids homeschools and parent groups starting schools who wish to investigate and possibly implement the Classical Christian method.

Recommendations for future research

Since Jeynes' (2012a) meta-analysis of 90 studies found that charter school and public school students fell behind their private Christian school counterparts on standardized tests, and this study suggests that the Classical Christian method shows promise in raising standardized test scores; more research should include other standardized test measures to corroborate findings. While Jeynes' (2003, 2008) accounted for social and economic variables, this study did not receive enough returned data to analyze demographic information (16 out of 32 non-Classical and 12 out of 23 Classical Christian schools returned limited demographic data). Most schools reported they did not have such data on hand since private schools are not required to report demographics to the federal government. Field work in a future study could reveal such data from school files. A correlational study would be appropriate at that time to try to identify which variables within the Classical Christian method may hold the most promise for future classroom implementation.

Conclusions

This study indicated that students who are educated utilizing the Essentialist philosophy of acquiring a base of knowledge before moving to higher cognitive levels of analysis, synthesis, and application as illustrated by the

developmental model of the Greco-Roman Trivium utilized in Classical Christian schools scored significantly higher on the PSAT than students who were educated utilizing non-Classical methods in Christian schools.

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