Galileo: The Conflict and Compromise Between Science and Catholicism

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Research Paper

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Imagine a world with no clocks, thermometers, or telescopes. Now imagine a world where everyone believes Earth is still. With the sun revolving around the earth, Earth being the center of the universe. This place existed in the world of 1564, the year of Galileo Galilei's birth.[1] Most people thought the earth was the center of the universe for hundreds of years. People did not doubt or wonder if this was true, except for very few. And very few of those who did not follow tradition, argued upon it.[2] Look through those people's eyes. Whose side would you take? This was the world in which there were only theories of what today we call basic universal laws. Theories, or simply put, strong beliefs, caused riots, devastation, and tension.[3] Galileo affects us not just intellectually, but also passionately because, though he was tried as a heretic and was in house arrest demanded by the Roman Catholic Inquisition, he still argued his rights, was on his own side of all the riots, and stood up for what he believed in through writing down his works and lecturing, and through historical memoirs, novels, picture books, and websites, this material was gathered into one to tell the story of the ways we missed the bravery of Galileo and how he deserves more respect.

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We have become less keen to define the term 'Renaissance' as a cultural movement when it comes to the visual arts of the early modern Europe. This specific word has a very accurate meaning and should remain the title of this time in Europe. It was a new start and a rebirth.[4]

The Renaissance spread to England, France, Germany, the Netherlands, Spain, and other countries in the late 1400's, yet the Renaissance ended in about 1600, due to the discovery of America, resulting in an economic decline in Italy. The Renaissance represented a rebirth; many European scholars and artists, specifically in Italy, studied the learning and art of ancient Greece

[1] Christensen, Bonnie. *I, Galileo*. New York, NY: Knopf Publishing, 2012.
[2] Sis, Peter. *Starry Messenger: Galileo Galilei*. Book Wholesalers, 2000.
[3] *Ibid.*
[4] Gowing, Lawrence. Facts on File Encyclopedia of Art. Facts on File, 2007.

and Rome. It is therefore also known as the revival of antiquity due to the representation of rebirth of the cultures. The Middle Ages was overlapped by the Renaissance at the end of its time. Rejections were made by the leaders of the Renaissance about many attitudes and ideas of the Middle Ages. Religious authorities in the Middle Ages thought that this revolution would distract people from the important task of saving their souls by following rules they thought would get them into heaven.[5] Yet, the Renaissance thinkers often saw this revolution as positive places where people could send devotion to the common good, build courage, and teach self-sacrifice. During the Middle Ages, the most important branch of learning was theology. Renaissance thinkers would study humanity, rather than theology. They would examine the accomplishments of different cultures, particularly those of ancient Greece and Rome. Renaissance artists stressed the beauty of the human body, rather than painting unrealistic people like the Greeks and Romans did. Their artwork often was used to instruct, or it might've served symbolic purposes. [6]

The most significant intellectual movement of the Renaissance was Humanism. It blended concern for the history and actions of human beings with religious concerns. Humanists wanted to study subjects they thought would help them better understand the problems of humanity. Greece and Rome had great success about subjects, such as sciences, and thus could serve as models to the humanists.[7]

The Holy Roman Empire was supposedly controlling much of Italy at the dawn of the Renaissance. The Popes, during the time, ruled central Italy but could not extend political control

[5] "A Brief Overview; Examples; Causes." Overview: Where Science and Religion Conflict, www.religioustolerance.org/scirel_ov1.htm.
[6] *Ibid.*
[7] Thompson, Stephen P. *Renaissance Literature*. Greenhaven Press, 2001

to the rest of Italy, and the emperors lived in Germany with little power over their Italian lands. No central authority was then established in Italy to unify all states of about 250.[8]

Before the Renaissance, the strongest powers in Europe were the Pope and the Catholic Church. They either ruled or influenced other rulers in Italy and other countries. But during the Renaissance some people began to question the authority of the Church. Men such as Martin Luther and Galileo Galilei challenged the Pope on political and religious matters.[9]

Martin Luther (1483-1546) was an extraordinary man who translated the entire Bible into the German language (1534). He also had a very instrumental impact in Galileo's life. Luther's method of going directly to the original sources for inspiration and authority was directly related to the humanist scholarly agenda. However, several humanists, such as Erasmus and more, rejected Luther's reforms when Luther's teaching diverged from traditional Catholicism and threatened to divide Christendom. Luther's reform movement became known as the Protestant Reformation, and it changed the religious outlook of many Europeans as well as the political formation of several European states. The Reformation is deeply entwined with the values and transformations of the Renaissance. The spread of ideas in the Reformation was made possible by the printing press, a Renaissance invention.[10] Renaissance thinkers were extraordinary people because of the way they created this new world which included building a new perspective on the people.

Galileo Galilei had the best way of constructing a new perspective of how the world should go and how the world should reshape its people. He gave us modern science. It took almost two centuries for the change of thought to become established in western Europe. This

[8] *World Book 2007 (Q-R: 16)*. World Book, Inc, 2007.
[9] Hightower, Paul. *Galileo: Astronomer and Physicist*. Enslow Publishers, 2008.
[10] Halvorson, Michael. *The Renaissance*. McGraw-Hill, 2014.

prolonged crisis is now referred to as the scientific revolution. Galileo is the culmination of the Italian Renaissance.

Galileo was born on February 15th, 1564. He was born two months before Shakespeare to Vincenzo, his father, whom intended Galileo to be a doctor. Vincenzo was a musician, and when Galileo returned to Florence without his degree as a doctor, his father was skeptical about his decision. Galileo then began to take a serious interest in mathematics. He began to study with Ostilio Ricci, who taught at the court of the Grand Duke of Tuscany.

The success of Galileo caused suspicion and jealousy in the Church. Sermons were preached against "Galileists" in Florence. There were even complaints that he "defiles the dwelling place of the angels by seeing spots on the sun and moon and lessens our hope of heaven." [11]

Galileo turned less combative as he grew up, yet he was still very often arguing his point of view. In fact, he was so into defending his beliefs that he wrote a three-hundred-line poem making fun of the academic black toga he was supposed to wear when he was a professor.[12] The poem helped indicate that uniforms hid the true nature of an individual, which is the type of attitude the Renaissance thinkers would display.

Galileo was the first modern scientist to consistently use experiments and measurement.[13] He spent years asking questions. Galileo is known as one of history's most controversial figures, surrounded by defenders and an equal number of enemies. Galileo Galilei had one thing everybody should strive for, curiosity. None of these things had created tension between him and the Catholic Church, but what lead to his collision with the powerful Church was when he turned

[11] Meadows, A. J. *The Great Scientists*. Oxford University Press, 2000.
[12] Krull, Kathleen, and Kathryn Hewitt. *Lives of the Scientists: Experiments, Explosions (and What the Neighbors Thought)*. Harcourt Children's Books/Houghton Mifflin Harcourt, 2013.
[13] Newman, Simon. "Science in the Middle Ages." *Science in the Middle Ages | Middle Ages*, www.thefinertimes.com/Middle-Ages/science-in-the-middle-ages.html

his attention to the heavens. He spoke for Copernicus by becoming convinced that at the center of the universe lies the sun, not the earth. He became so controversial over this topic that he was eventually tried as a heretic. Galileo refused to stay in his laboratory and hide from controversy.[14] Although his attitude got him into trouble, it also insured that long after he was gone his work would remain part of the public discourse.[15]

There were changes within the Catholic Church during the early modern era that influenced the Renaissance. Humanists, new thinkers of the era, were questioning Catholic theology, bringing the potential of humans a greater concept rather than their sinfulness. To these new philosophers, humans were more than sinners, and life was more than being in hopes of one day reaching paradise in heaven. These new attitudes drew artists into different subjects and themes. Donatello, for example, mixed religious and secular themes in his art and Greek mythology was incorporated into Botticelli's paintings.

Ostilio Ricci introduced Galileo to the idea of quantification, or measurement, and that it should be used along with observation and logic as the preferred method of verifying scientific discoveries. He liked mathematics much more and neglected his medical classes, resulting in no degree in that field. Ostilio Ricci persuaded Vincenzo to allow Galileo to continue his study of mathematics. He was yet to be a professor when in fact, as a student, would question his professors aggressively. But what would've happened if Galileo gave up? Personally, I think most of the theories following Galileo's studies wouldn't have happened at all.

Aristotle (384-322 BC) attempted to organize the physical world into a coherent system by believing the earth was the center of our universe. Aristotle was before Galileo's time, and

[14] Boerst, William J. *Galileo Galilei and the Science of Motion*. Morgan Reynolds Pub., 2004.
[15] 2015, Randall Smith Wednesday April 29. "A 'War' between Science and Religion?" *The Catholic Thing*, 29 Apr. 2015, www.thecatholicthing.org/2015/04/29/a-war-between-science-and-religion/.

he had very strong beliefs, much in common with Galileo except the conflict with the Church. Aristotle believed earth was much more complicated and chaotic than the heavens.

Galileo furthermore his conflict by wanting to defend Copernicus's book, *On the Revolutions of the Heavenly Spheres*, from the Catholic's suspension of reading it. Galileo had failed to convince the leaders of the Church that there was no inherent conflict between Copernicus and Catholic theology. He had not been condemned but he had been ordered to stop speaking and writing about heliocentrism as more than a hypothesis.

Cardinal Barberini, Galileo's old friend, was Pope Urban VIII after Pope XV died. When this happened, the title page of The Assayer was changed to include a dedication to the new Pope. Several people that were friendly to Galileo were appointed by Urban to high positions.

Urban wanted to be the one who brought The Thirty Years' War (1618) to a victorious end. If he could restore Catholicism as the dominant religion in Europe, he would be the greatest Pope since St. Peter. Allowing Galileo to write a book comparing the Ptolemaic and Copernican systems was a way to begin this process.

Galileo continued his works and succeeded in making his *Dialogue* impartial on the surface. No one clearly "wins" the arguments. Superficially, Galileo stayed within the dictates of the 1616 public decree. Yet, through the course of his works, it becomes clear which position the author supports.[16] *Dialogue* consisted of 3 characters, Simplicio, whom represented the ideas of Aristotle and Ptolemy, Salviati, who defended Copernicus' theory, and Sagredo, who asked questions so the two could debate. *Dialogue* was, at one time, referred to as a literary and scientific masterpiece.[17] In Galileo's time, everybody knew *Dialogue* was a very opinionated work. Simplicio, for example, consistently justifies his position by referring to ancient texts.

[16] *Ibid.*
[17] *Ibid.*

Anyone familiar with Galileo knew what he thought of this sort of reasoning.[18] Although *Dialogue* was referred to positively,[19] it was banned in Italy for two hundred years.[20]

To protect both the author and himself from retribution, Riccardi (Father Niccolo Riccardi), convinced Galileo to write a preface in which it stated clearly the discussion within the book was hypothetical. In the meantime, Prince Cesi died suddenly. This left the Lincean Academy in chaos, and Galileo would have to find a different publisher. He had further delays. Then the Bubonic Plague returned, and for months the roadways were barricaded.

By August, Galileo was hearing almost daily reports about efforts to suppress the book. There was also a dangerous, non-scientific subtext to the controversy. The work had to be published between the Pope and the Medici family over the Pope's direction for the Vatican's foreign policy concerning the Thirty Years' War. Urban had recently signed a secret agreement with Protestant King Gustavus Adolphus of Sweden, the de facto leader of France, and Cardinal Richelieu, to join forces against the Hapsburg rulers of the Holy Roman Empire. Urban was prompted to make the Seurat accord with France and Protestant Sweden. Early in the war, the Hapsburgs had been militarily successful against the Protestants in Bohemia and other parts of Germany. Urban was concerned that the conflict would make them too powerful particularly in northern Italy. It was these geopolitical concerns that led Urban to form an alliance with a Protestant ruler to fight a Catholic empire.[21]

Galileo was tried by the Inquisition in 1633, when just a year before his works of *Dialogue* appeared.[22] He plead guilty for a lighter sentence in April of that same year, when he officially faced the Roman Inquisition. Pope Urban VIII put Galileo under house arrest and

[18] *Ibid.*
[19] *Ibid.*
[20] *Ibid.*
[21] *Ibid.*
[22] *Ibid.*

Galileo lived at his villa in Arcetri, which is near Florence, until his death on January 8th, 1642. Galileo Galilei's defense over his own beliefs almost cost him his life, yet he stuck with it because he knew what was right despite his own religious authority figures punishing him for advocating Copernican theory.[23]

Galileo and Copernicus weren't the only ones who defended the theory of heliocentrism. Johann Kepler (1571-1630) had a basic conjunction that God had created the universe according to mathematical laws. He argued that the planets keep themselves in orbital motion due to the magnetic attractions between the sun and the planets. That approach was rejected by most seventeenth-century mechanistic scientists as being too "magical". It in fact paved the way for the law of universal gravitation (formulated by Isaac Newton) at the end of the seventeenth century.[24]

The Renaissance had many significances including technological advances, the rise of Individualism, a cultural revolution, and Humanism. There are only a handful of historical figures who are referred to by first name, and Galileo is one of them. This indicates that he was a very important player in the development of modern science. Though, Galileo's influence extends beyond the scientific method. The archetypal stories of the modern world are often misunderstood in its detail, as the story of Galileo's conflict with religious authority and the intellectual institutions of Italy has become one of them. With Galileo arrested, tried, and convicted due to advocating a scientific idea considered conflicting to the Christian religion, the situation brought many to the conclusion that there is an unavoidable conflict between science and religion.

[23] Webghighi per POSITIVAmente A.C. - www.webghighi.com - www.positivamente.org. "Accademia Nazionale Dei Lincei." *Accademia Nazionale Dei Lincei*, www.lincei.it/.
[24] Obstfeld, Raymond, and Loretta Obstfeld. *The Renaissance*. Greenhaven Press, 2002.

A very popular assumption, yet Galileo argued that the conflict between the two was neither inherent nor unavoidable, which is often lost in the story. In which he asserted, not God's mind and imagination was the problem in the failure of man. Many scientists before and after Galileo managed to have avoided open conflict with the Church, but Galileo obviously did not. Instead, he chose to maintain a high-profile. While it can be argued that he got himself into the conflict, it is also true that he announced that a new era had begun. Pope John Paul II issued a formal apology, and the Catholic Church officially admitted that condemning Galileo had been wrong, in 1992.[25] The compromise was heard and therefore, it is now safe to say, Galileo Galilei had not only moved into a great position in human life, but also human consciousness - a position that still survives today.

[25] *Ibid.*

Appendix A

Appendix B

Appendix C

Bibliography

Primary Sources

Altdorfer, Erhard. "Adam and Eve in Paradise." *Digital Collections University of Wisconsin-Madison Libraries*, Madison, 1952, uwdc.library.wisc.edu/. This primary source is a photo of an original image from a Bible issued in 1533 by Ludwig Dietz at Lubeck. I think this picture is a good source because of its relation to religion and the way it was drawn is very close to the descriptions of how the Renaissance thinkers created their new type of art by showing more realistic details to the human body and their surroundings. I think this piece stresses those things and shows what kind of mood artists of that time were in. The description of the piece was stated as "Adam and Eve watching a group of monkeys pick fruit from the forbidden tree" by the Digital Collections University of Wisconsin-Madison Libraries. To use this picture an email regarding the whereabouts was recommended, yet not required, which has been done. The best thing to love about the photograph is that the Renaissance can still positively affect religion today through art. This relates to the conflict between the Church and Galileo because the detail that is shown provides an example of how the Renaissance thinkers and their belief of Catholicism didn't cause conflict within themselves, as it did with the Roman Catholic Church. An example of this painting is shown in the Appendix A.

Greene, Nathaniel, and Catherine Bonesho. "Tomb Sculptures from Palmyra." *Digital Collections University of Wisconsin-Madison Libraries*, Madison, 17 June 2013. This primary source is a photograph of a sculpture in which is based at the University Museum

in Philadelphia, Pennsylvania. The sculpture shows detail and shows what beautiful pieces of art came before and during the Renaissance era. This piece has etchings around the focal point of the art and you can also see how it is not very realistic in the terms of the human body. The Greeks and Romans before the Renaissance thinkers thought these types of pieces would better educate the people who would view them. Yet the Renaissance thinkers stressed the human body and put many details resulting in more lively pieces of art. There is no date to be found for the creation of this sculpture, yet the lack of realistic detail and ancient Greek etchings point towards before the Renaissance rose to be a great period of rebirth. This sculpture relates to the conflict between Galileo and the Church due to the period it was created in, showing the dramatic change in stressing the human body during the Renaissance. An example of this photograph is shown in the Appendix B.

"Palazzo Vecchio: Tickets and Tours." *Visit Palazzo Vecchio on Guided Tour or with Tablet*, www.uffizi.org/florence-museums/palazzo-vecchio/. This website is a primary source. It gives plenty of information on the Palazzo Vecchio, which is placed right next to the Uffizi Gallery in Florence, Italy. It provides many pictures of the artwork and activities inside the building including the Monumental Quarters, the Secret Passages, and the building itself which was in fact enlarged by Giorgio Vasari in the middle of the 1500s. The museum is still home to the mayor and to city government and is referred to as a very splendid museum.

Sobel, Dava. *Galileo's Daughter*. Random House Audio, 1999. This historical memoir is a primary source. It shows the story of Galileo and his daughter, Maria Celeste, and their relationship during the Renaissance era. It shows the remarkable letters between the two that have survived, and how Galileo, a scientist, and Maria Celeste, a nun, get along through the rough stigmatization of the time that they were living through.

Vinci, Leonardo da. *The Last Supper*. 1498, Milan Museum, Milan, Italy. This painting is a primary source by Leonardo da Vinci. The Last Supper was a big deal in Europe during the Renaissance era and remains to be very popular. To view this painting in the Milan Museum, you must be in a group of a maximum of 25 people for only 15 minutes. It is also one of the most famous works of art in the entire world. The painting took over 3 years to complete, yet the actual date of commencement is unknown because of lost and unreliable record-keeping. The medium that Leonardo da Vinci used in his painting is fresco, yet it is not true fresco because it was painted on dry wall instead of wet plaster. The painting started to deteriorate soon after but is recognizable to many people today. This painting relates to the conflict with Galileo and the Church because of its relation between the artistic abilities of the Renaissance thinkers and their religious beliefs, showing that both personality traits can be present in somebody with conflict. An example of this painting is shown in the Appendix C.

Secondary Sources

"A Brief Overview; Examples; Causes." Overview: Where Science and Religion Conflict, www.religioustolerance.org/scirel_ov1.htm. This website is a secondary source by Religious Tolerance. Hence the articles title, I liked that this website gave a very clear overview of Galileo's time in trial, and the way it was written was helpful for creating an opinionated thesis.

Bauer, Susan Wise. *The History of the Renaissance World: from the Rediscovery of Aristotle to the Conquest of Constantinople*. W.W. Norton & Company, 2013. This book is a secondary source. It tells the background information about what was happening before the Renaissance, people's opinions, and maps of the Holy Roman Empire. I liked how it showed a clearer picture of how life was like in the Renaissance world.

Boerst, William J. *Galileo Galilei and the Science of Motion*. Morgan Reynolds Pub., 2004. Galileo Galilei and the Science of Motion is a secondary source written by William J. Boerst, who did a fantastic job of explaining every aspect of Galileo's life. I appreciate the justification of the events before, during, and after Galileo's life. Within the book, there was many examples of Galileo's works as primary sources.

Christensen, Bonnie. *I, Galileo*. Alfred A. Knopf, 2012. I, Galileo is a secondary source written by Bonnie Christensen. It gave a simple story to give you background knowledge about Galileo's life. I greatly admired the bibliography, which then lead me to more compelling books and websites.

Cloutier, David. "The Catholic Church Is Not an Enemy of Science." New Republic, 12 June 2015, newrepublic.com/article/122016/catholic-church-not-enemy-science. This website is a secondary source by New Republic. I enjoyed this website because of the different opinion that was being shared. It brought in a new perspective into the topic of Galileo and I got to see what other people think of him and his time.

Demuth, Patricia Brennan, and John O'Brien. *Who Was Galileo?* Grosset & Dunlap, an Imprint of Penguin Group (USA) LLC, 2015. This book is a secondary source. I really enjoyed this book because of the fun facts about Galileo's daughter, the Apollo 15 astronauts who tested his theory, and the ancient letters written by Galileo's daughter.

"Dictionary.com." *Dictionary.com*, Dictionary.com, www.dictionary.com/. This website is a secondary source and it helped me a lot during my essay when I didn't know what a word meant or when I couldn't find the right word. This website was the most helpful in my essay when I was researching some of the Renaissance art of Galileo's time.

"Explore Encyclopedia Britannica." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., www.britannica.com/. This online encyclopedia is a secondary source by Encyclopedia Britannica. I like this source because it was helpful with the vocabulary of the older times.

"Front Page | Origins: Current Events in Historical Perspective." *Front Page | Origins: Current Events in Historical Perspective*, origins.osu.edu/. This website is a secondary source by Origins. It doesn't hurt to get a little more background knowledge about history and how it may have impacted the era your researching. I liked how the website gave me more background knowledge about not just Galileo's time, but the times that were impacted by Galileo.

"Galileo Galilei 1564-1642." *Galileo Galilei*, muse.tau.ac.il/museum/galileo/galileo.html. This website is a secondary source by Andrea. I like how this source gives the information needed to know the basic facts of Galileo's time. It gave me the background knowledge I needed to get started with the research.

"Galileo in Rome for Inquisition." History.com, A&E Television Networks, www.history.com/this-day-in-history/galileo-in-rome-for-inquisition. This secondary source was very helpful for me when I needed more background knowledge about the Inquisition and the Roman Catholic Church. It gives a very brief overview of Galileo's life during and after his encounter with the Roman Inquisition, and it also told some

about how Galileo, when he stuck to his beliefs, affected the scientists who came after him for example, Sir Isaac Newton and his works of gravitation.

"Galileo: Timeline of His Life." *PBS LearningMedia*, wpt.pbslearningmedia.org/resource/phy03.sci.phys.mfw.galileolife/galileo-timeline-of-his-life/. This secondary source was a very helpful website, the PBS LearningMedia, and it explains the important events in chronological order. The timeline helped me organize my information, and it was the base of the essay. Knowing what came before, during, and after Galileo's time helped me understand some of the more complicating factors of these kind of time periods.

Gowing, Lawrence. Facts on File Encyclopedia of Art. Vol. 4, Facts on File, 2007. This encyclopedia of art is a secondary source giving plenty of noteworthy documentations about Romanesque Art. It gave information about the artistic timeline of Galileo's time, and gave examples of the beautifully done artwork. I like how it captures the use of archaic words so that the readers will get a feel for the beginning stages of the artistic side of the Renaissance.

Halvorson, Michael. *The Renaissance*. McGraw-Hill, 2014. This book is a secondary source. I liked all the helpful information and facts about Martin Luther and the Protestant Reformation. I used those facts in my essay when I wanted to explain the impact of Martin Luther and how he corresponds with Galileo's beliefs.

Helden, Albert Van. "The Galileo Project." *The Galileo Project | Chronology | Galileo Timeline*, 1995, galileo.rice.edu/chron/galileo.html. This website is a secondary source by The Galileo Project. I like how this website gives a timeline section, a biography section, a family life section, and many more. This website had very much information on almost every aspect of Galileo's life.

Hightower, Paul. *Galileo: Astronomer and Physicist*. Enslow Publishers, 2008. This book is a secondary source written by Paul Hightower. I think this book gives excellent insight into the characters of Galileo's Dialogue. This also explains the background of the conflict between Galileo and the Church. I used this in my essay to explain the characters of Dialogue and to give a theory about why Galileo might've created and used the characters in the way he did.

Hinds, Kathryn. *Everyday Life in the Renaissance*. Marshall Cavendish Benchmark, 2010. This book is a secondary source. I liked how this book tells about the political background of Italy, the Holy Roman Empire, and Inquisitions. The book also had many random facts that I thought were very interesting.

"History." *PBS*, Public Broadcasting Service, www.pbs.org/faithandreason/intro/histo-frame.html. This website is a secondary source by the PBS Public Broadcasting Service. I

enjoyed the many topics that were introduced during the Renaissance, including physics, neuroscience, and cosmology. It helped me understand these concepts and gain more knowledge about interesting topics.

Johnson, Paul. *The Renaissance: A Short History*. Distributed by Paw Prints/Baker & Taylor, 2008. This book is a secondary source. The book shares the historical and economic background of the Renaissance, and I like that it tells how the spread and decline of the Renaissance affected the rest of the world.

Krull, Kathleen, and Kathryn Hewitt. *Lives of the Scientists: Experiments, Explosions (and What the Neighbors Thought)*. Harcourt Children's Books/Houghton Mifflin Harcourt, 2013. This book is a secondary source. I like how this book shows us the many ways Galileo affects us today, including pop culture like the load repetition of his name in Queen's song, "Bohemian Rhapsody." It was very helpful, and I used it in the essay to explain Galileo's personality, as he was aggressively defending his theories at times, yet grew less obnoxious as he grew old. The book had many interesting facts that I wished to include in my essay but didn't quite fit to the theme and my main argument.

Lewis, Tanya. "Science and the Catholic Church: A Turbulent History." *LiveScience*, Purch, 11 Mar. 2013, www.livescience.com/27790-catholic-church-and-science-history.html. This website is a secondary source by Live Science. Although it does not have the information I was looking for, it helped me understand the Pope's role in the world to this day. It

brought me information about what kind of things the Pope does now, so that I could relate it to what the Pope's expectations were back in the Renaissance era.

Manchester, William. *A World Lit Only by Fire: The Medieval Mind and the Renaissance-Portrait of an Age*. Sterling Publishing Co., Inc., 2014. This book is a secondary source. The book has a good description of the Renaissance, and I like how the book gives the readers a feel for what it was like living in the era.

Meadows, A. J. *The Great Scientists*. Oxford University Press, 2000. The Great Scientists is a secondary source written by Jack Meadows. I liked that the book had information about, not just Galileo, but also other important figures that contributed to the Renaissance era including Aristotle, Newton, and Darwin. This book has an excellent description of Galileo before the Renaissance, giving plenty of background knowledge to the readers. The way that Jack Meadows has written it gives a very well explanation to the Inquisition, to better understand the perplexing components of Galileo's life.

Newman, Simon. "Science in the Middle Ages." *Science in the Middle Ages | Middle Ages*, www.thefinertimes.com/Middle-Ages/science-in-the-middle-ages.html. This website is a secondary source by The Finer Times. I used this website because it gave information regarding the Middle Ages where I could not find anywhere else. It was very helpful getting more information on the middle ages because then I could understand the events before and after and understand what the people did in those times.

O'Connor, Barbara. *Leonardo Da Vinci: Renaissance Genius*. Carolrhoda Books, 2003.

Leonardo Da Vinci Renaissance Genius is a secondary source written by Barbara O'Connor. Although the book does not directly relate to the focal point, it gives an explanation to what the Renaissance thinkers were like, giving me a better understanding

"Search UWDC." *UW Digital Collections*, uwdc.library.wisc.edu/collections/classicalstudies/.

This secondary source was helpful in the terms of knowing what kind of art was created before and during the Renaissance period. There were essays, poems, photographs of sculptures, and paintings. It gives a better understanding of classical and ancient art and history and it takes up a lot of time to read through the types of art and their historical background in which is probably the most interesting aspect of the Digital Collections. This website also has many resources on the history of Wisconsin, which their based off of the University of Madison, and it is interesting to find the many facts and cultures of Wisconsin's history and how it relates to the Italian Renaissance all the way over in Europe.

"Should Catholics Get an F in Science?" *USCatholic.org*, 1 Mar. 2016, www.uscatholic.org/articles/201603/do-catholics-get-f-science-30575. This secondary source is a website by the organization US Catholic. It brings the opinion of the other side of the spectrum to life. I like how the article shares a lot about how the conflict still affects us today, and how any conflict never completely goes away.

Sis, Peter. Starry Messenger: *Galileo Galilei*. Book Wholesalers, 2000. Starry Messenger is a secondary source written by Peter Sis. The book has many examples of Galileo's writings in The Starry Messenger. I appreciate the book also giving wonderful insight into how Galileo thought.

"THE COPERNICAN MODEL OF THE PLANETARY SYSTEM - THE HELIOCENTRIC MODEL." *THE HELIOCENTRIC MODEL*, muse.tau.ac.il/museum/galileo/heliocentric.html. This website is a secondary source by Andrea. I liked the explanation of the theory of heliocentrism, it was a detailed yet understandable description. It also gave a plentiful explanation towards the Greek and Roman point of views before the Renaissance, and how it sparked the Renaissance thinkers to think the way they did.

Thompson, Stephen P. *Renaissance Literature*. Greenhaven Press, 2001. This book is a secondary source, consisting of 19 essays exploring the historical context of Renaissance literature. I like the information on the significance of the Renaissance, and the introduction to the new character Johann Kepler, which I did not hear about him until I read this book. I used him to explain that it wasn't just Galileo and Copernican, and that there were others who supported their theories. This book also talks about the changing perspectives happening during the Renaissance era, and how it affects the world today. It also includes a timeline in chronological order which was very helpful.

Tyson, Peter. “Galileo's Big Mistake.” *PBS*, Public Broadcasting Service, 29 Oct. 2002, www.pbs.org/wgbh/nova/earth/galileo-big-mistake.html. This website is a secondary source, the PBS Public Broadcasting Service. It gives a lot of information about the Catholic Church, and more specifically, Galileo’s conflict with the Church. It tells about Galileo’s theory of the tides and how it triggered the Catholic Church to turn against Galileo a whole lot more. The website tells how some of Galileo’s mistakes he made through his time affected him a lot more than if he was somebody else. It also tells us how the Church would pay special attention to Galileo Galilei, because of his personality of arguing strongly, and sometimes aggressively, about his beliefs.

Ucla. “Newsroom.” *UCLA Newsroom*, newsroom.ucla.edu/. This website is a secondary source by the UCLA Newsroom. I liked how this website gave me the background information I needed so I understood the complicated parts of the Renaissance era.

“Visit the Medici Chapels in Florence: Buy Your Tickets Online Now.” *In Florence: Buy Your Tickets Online Now*, www.uffizi.org/florence-museums/medici-chapels/. This website is a secondary source. Being part of the monumental complex of San Lorenzo, the Medici Chapels are the final burial ground of the Medici family which is mentioned in the essay. While visiting you can find the grand dukes of Tuscany with their wives as you enter the museum and first walk into the crypt. There is the Chapel of Princes and the New Sacristy designed by Michelangelo and built in the start of the 16th century. Since

Michelangelo left Florence without finishing his job, Lorenzo the Magnificent, one of the most famous members of the family, was buried under the altar without a grand monumental tomb.

Webghighi per POSITIVAmente A.C. - www.webghighi.com - www.positivamente.org. "Accademia Nazionale Dei Lincei." *Accademia Nazionale Dei Lincei*, www.lincei.it/. This website is a secondary source by the Accademia Nazionale Dei Lincei. This website includes many topics to explore about the history of Italy, Galileo, and the famous works of art in Italy. It tells the story about Prince Cesi and the Academy of Lincean. The website is in Italian, so it might be difficult to read, yet the information was very helpful.

World Book 2007 (Q-R: 16). *World Book*, Inc, 2007. This reference book is a secondary source. The book had a great deal of material, which I would recall as the best part, there were also pictures of the artwork that was done during the era.

2015, Randall Smith Wednesday April 29. "A 'War' between Science and Religion?" *The Catholic Thing*, 29 Apr. 2015, www.thecatholicthing.org/2015/04/29/a-war-between-science-and-religion/. This secondary source is a website by The Catholic Thing. It is one of the few opinionated pieces I have read about Galileo throughout the essay process, although there is not much out there. The bias of this article is very clear, yet I like how this brings new ideas into the readers perspective.