



LUCERNA

UNDERGRADUATE RESEARCH JOURNAL
VOLUME 14

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LETTER FROM THE EDITOR

Welcome to *Lucerna*, an interdisciplinary journal of undergraduate research brought to you by the UMKC Honors College.

Since its founding in 2005, *Lucerna* has devoted itself to publishing papers from students across the university with the purpose of cultivating and showcasing the original research and scholarship of undergraduate students at UMKC. After over a year of hard yet rewarding work, I am excited, humbled, and honored to introduce the fourteenth volume of *Lucerna*. With a new year comes beginnings, fresh initiatives, and bright expectations. It seems only appropriate to announce the projects and recognize the work that the *Lucerna* staff has undertaken during the last few years.

More than two years ago, Anthony Gilyard (*Lucerna* Editor-in-Chief, 2018) and I spent several hours talking on the phone and, unbeknownst to us at the time, we worked out a plan to update, restructure, and bring revitalizing ideas to the journal as well as to the organization that supports its production. Our passion and support for the mission of *Lucerna*, along with a desire to see that mission realized, motivated us to look at all aspects of the journal's production with fresh and critical eyes. In 2018, we began to set our plans in motion. There were many times it was challenging, as we knew the results of what we were working on would not be evident for some time. As the production of the fourteenth volume began, the changes we had initiated and implemented began to come to light. With the incredible work, support, and talent of Katelyn Fisher (*Lucerna* Managing Editor, 2019), Dr. Henrietta Rix Wood (*Lucerna* Faculty Advisor), and the Editorial staff, *Lucerna* started to shine.

There is still much work underway and still more to be done, yet I am excited to have the opportunity to see the journal rise to a new level, humbled to have played a small part in it, and honored to have worked alongside such extraordinary students, faculty and staff. Let me close by saying that I believe the value of *Lucerna* resides not in such innovations but rather in the quality of the material that it publishes. Our journal is produced by and for undergraduate students at UMKC, and our primary mission is to present the best papers from students across the university. That has always been our primary mission, and my hope is that the new year will bring greater things for *Lucerna*.

Joseph Allen
Editor-in-Chief

EDITORIAL BOARD

Editor-in-Chief: Joseph Allen

Joseph Allen is a third-year student at UMKC pursuing a Bachelor of Science in biology with a Biomedical Sciences (BMS) emphasis, a minor in chemistry, and the distinction of Honors Scholar. Joseph is the Editor-in-Chief of *Lucerna*, leads the honors discussion sections for General Chemistry I and II, is on the Pre-Medical Society leadership board, and works in leadership or as an advisor for several other organizations across campus. With respect to undergraduate research, Joseph designs CRISPR systems for the study of multiprotein complexes regulating neural stability at the Ryan Mohan Laboratory, and is engaged in research of the biochemical/biophysical mechanisms behind voltage-gated sodium ion channels at the Shizhen Wang Laboratory. After graduating from UMKC, Joseph plans to attend medical school and pursue a specialty in cardiothoracic or neurosurgery. Joseph enjoys spending his free time hiking, fishing, painting, cooking, playing piano, or sitting down to a good book and a cup of coffee.

Managing Editor: Katelyn Fisher

Katelyn Fisher is a junior at UMKC studying chemistry and French. Katelyn originally joined *Lucerna* at the start of her freshman year, taking on the role of co-treasurer. She is honored to have had the opportunity to watch the evolution of *Lucerna* over these past three years and is excited for the future. After college, Katelyn plans to attend medical school for her MD in cardiology. Apart from *Lucerna*, Katelyn also works as a chemistry TA for Dr. Paul Barron. In her free time, Katelyn enjoys being active, listening to music, reading, and writing.

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“In Our Perfect World”: The Empathetic Rhetoric of Dorothy Roudebush

By Olivia Steely

I should like to say at the outset that none of us advocates abortion. We wish there never any necessity for a woman to feel she needs to have one. In our perfect world - where there is an infallible contraceptive widely available and faithfully employed - there will not be such a thing as an unplanned, unwanted pregnancy.

—Roudebush 1

In this excerpt from a speech on April 16, 1972, at the Manchester Christian Church in St. Louis, Missouri, Dorothy Roudebush expressed to her audience of conservative Christian citizens an idea of a world in which all women have access to family planning education as well as effective birth control. Roudebush saw a society in which women planned their families according to their desires and in which they would have control of their reproductive choices. However, she recognized that increasing women’s rights was a process for which she would have to reason with society and work with the limitations of United States law. Far from pessimistic, Roudebush often expressed her goal of helping women and their families lead happier, healthier lives by providing them with the means to terminate unplanned and unwanted pregnancies. She understood that United States law did not come close to the ideal, especially in her home state of Missouri, so she used her education and passion for advocacy to increase women’s access to family planning services and toward the aim of legalizing abortion.

Issues regarding female birth control, abortion, and other family planning services and health care are still highly debated today. By looking at past women's rhetoric, researchers can learn from their oratory technique and gain insight into how they affected policy and public opinion. Abortion was a crucial topic during second-wave feminism, and women, such as Roudebush, used oral rhetoric to seek common ground between opposing viewpoints.

Roudebush was a St. Louis native who taught in numerous secondary and post-secondary schools while concurrently working with city officials and organizations to provide citizens with greater access to family planning services, such as reproductive education, health screenings, birth control, and abortion. Through these connections, she became an advocate for and a committed member of Planned Parenthood. In 1963, she teamed up with an associate, social worker Julian Hall, to organize the "Citizen's Committee for Family Planning Through Public Health Services" and served as committee chairperson until, less than a decade later, the group disbanded (Roudebush 1). The committee was made up of a group of individuals who were passionate about providing family planning services to St. Louis families through public health institutions in the area. After Roudebush's involvement with the committee, she narrowed her focus to abortion activism. In 1969, Roudebush helped found the Committee for Legal Abortion in Missouri, for which she served as president and through which she became active in politics and law-making (Roudebush 1-2).

Her education, committee work, and nationwide connections led her grassroots movement forward. She delivered speeches relating to birth control and the legalization of abortion since the mid-1960s. Many documents can be found in the Missouri State Historical Society archives that Roudebush donated including correspondence, records associated with numerous organizations in which she was involved, and distributed press releases and brochures from various groups during the time. Among these documents were copies of the oral

speeches she wrote and delivered to audiences around the country.

One such document was the speech she delivered to the Manchester Christian Church. Roudebush addresses her audience who were against abortion with the aim of persuading them to understand the importance of legalizing abortion. She achieved this persuasion by using personal language and empathetic rhetoric that included her audience in the conversation, validated their opinions, and guided them to understanding the common ground between their viewpoints and her ideas. This strategy worked to form a relationship between herself and the audience that surpassed the typical audience-speaker dynamic. In many ways, her speech exemplified how abortion rhetoric can be empathetic. Her work offers us an opportunity to analyze how empathetic rhetoric functions in a debated and often emotional issue, such as abortion. We will examine the context of the birth control movement during the 1960s and 1970s, and how abortion rhetoric is commonly defined. Then, we will define empathetic rhetoric and how researchers have studied the topic thus far, including how Roudebush's work has unprecedentedly built these frameworks. Finally, we will analyze Roudebush's Manchester Christian Church speech as well as some of her other fascinating work.

Bringing Empathetic Rhetoric and Abortion Rhetoric Together

During the birth control movement of the 1960s, many individuals, like Roudebush, formed grassroots movements to enact the change they had waited years to see. At the beginning of the twentieth century, the subject of birth control was not openly discussed. Not only was there a severe social stigma surrounding this topic, but laws, such as the federal Cornstock law and anti-obscenity laws, banned dissemination of contraceptives and family planning information through the mail or across state lines. These laws were not declared unconstitutional until 1972, a year before legalized abortion (Institute of Medicine par. 25). Between the early 20th century and 1972, little

related to the birth control movement occurred. Many women received “back-alley abortions” because access to and public discussion of birth control did not make serious gains until the release of the birth control pill in 1960 (National Abortion Federation par. 10). Margaret Sanger, one of the most well-known abortion advocates of the twentieth century and founder of Planned Parenthood, an organization that was created in response to the Cornstock law, also used a rhetorical strategy of appealing to women and children’s needs and happiness: “At the national level, Sanger viewed contraception as the means of addressing a country’s social ills: she urged citizens to adopt birth control practices as a means of curbing national poverty, unemployment, hunger, child labor, and other troublesome elements of modern life” (Stearns par. 29). A common thread that connects humans is that we all require our basic bodily needs to be met. By acknowledging how abortion helps these “ills” of modern life, both Sanger and Roudebush appealed to the audience’s most primal needs. Roudebush directly used empathetic rhetoric as a strategy to convince her audience of the importance and beneficence of legalizing abortion.

By 1970, President Nixon had established the Title X Family Planning Program, a program that “provides grants for family planning services, training, research, and informational and educational materials” (Institute of Medicine par. 34). While this enactment must have thrilled Roudebush, she realized the program banned national abortion funding, banned the discussion of abortion as a method of family planning, and denied patients the opportunity to access abortion information about or be referred to abortion services. During this period prior to *Roe vs. Wade*, more than thirty states rejected liberal abortion laws. From 1967-1972, seventeen states legalized abortion; however, thirteen of those states were only able to keep the laws for a brief period of time (Cole par. 9). Unwavered by these outcomes, many women joined the movement to advocate for access to family planning services.

During the early 1970s, abortion became a more prevalent topic of discussion compared to previous decades, as shown through the abundant records available from this time. Joseph Dellapenna argues that, during this period, abortion debate was polarized and uncertainty was “produced by the continually changing medical technologies relating to birth processes” (360). In other words, as abortion procedures and reproductive medicines developed, individuals grew wary of trusting those changes. During the time Roudebush spoke, vacuum aspiration procedures replaced dilation and curettage during abortions prior to the twelfth week of pregnancy. Additionally, after the sixteenth week of pregnancy, saline amniocentesis hysterectomies took the place of older treatments. These procedures became widely-used after 1960 as they served to make abortions safer, simpler, and less painful (Dellapenna 413). Advances in birth control treatments initiated the beginning of the medical community treating abortions similar to a minor surgery. Moreover, medicine began to distinguish the health of the fetus from the health of the mother, encouraged by the invention of the field of fetology (Dellapenna 414). New practices along with a change in the perspective of fetal gestation contributed to some physicians opposing abortion. A decade before Roudebush spoke at Manchester Christian Church, women had begun to gain access to the birth control pill, and many American families were beginning to attain agency by questioning and implementing family planning strategies. As these advancements became more prevalent, public discussion of these policies followed, and abortion rhetoric flourished. Currently, abortion policy is being debated in Missouri, as legislation passed that outlaws abortions after detection of a fetal heartbeat. Once again, we see abortion rhetoric in the news.

Abortion rhetoric is rhetoric used to promote arguments related to abortion by following common strategies that engage with the public audiences, yet research relating to abortion rhetoric fails to mention the role that empathetic rhetoric has with making those engagement strategies effective. Eliza-

both Kuechenmeister writes that pro-life rhetoric tends to focus on the act of abortion: "Familiar pro-life arguments use graphic descriptions of the act and images of bloody, mangled fetuses to gain support. These images remind viewers of the act of abortion, in terms of reminding them what is lost when the act is performed" (par. 13). When mentioning the woman who chose to have an abortion procedure, pro-life rhetoric focuses on how the woman relates to the act (i.e., that she is a murderer and selfish) rather than addressing her agency. Pro-life rhetoric often uses direct statements to draw "correlations between fetus and human" (Kuechenmeister par. 14). Examples of these statements could be "the fetus is a human" or "abortion is murder" (par. 14). Randall Lake writes that anti-abortion rhetoric focuses on guilt and aims to viscerally expose that guilt: "Women, anti-abortionists claim, know that the unborn are persons. This intuitive certain knowledge is available to men as well through the widespread anti-abortionist display of fetal photographs" (432). Pro-life rhetoric tends to visually and descriptively showcase the act of abortion and focus on the decision to end a life.

On the other hand, pro-choice rhetoric tends to focus on the politics and purpose underlying abortion. For example, Kuechenmeister writes that "purpose is emphasized above all other pentadic elements, highlighting political injustice and the oppressive conservative social system in order to achieve its mission of keeping abortion legal and providing women a legal right to choose" (par. 6). Larry R. Churchill and José Jorge Simán argue that both pro-life and pro-choice rhetoric focus on individual rights; however, pro-life rhetoric focuses on the rights of the fetus and pro-choice rhetoric centers on the rights of the woman. Churchill and Simán write, "For proponents of abortion, the cardinal right in question is the right of privacy, or self-determination. It is thought to be overriding, either because a fetus is not a person and has no right to life, or because the right to life itself is less basic than freedom of choice" (10). Therefore, pro-choice rhetoric shifts focus from the act of abortion to the mother's right to in choose what happens to her

body. Taking a step back from abortion rhetoric provides view of the broader field of empathetic rhetoric.

Empathetic rhetoric, compendiously named, functions by applying narrative and emotional elements that engage with socially identified differences, build connections, and develop agreements by shifting power dynamics between the audience and rhetor. In other words, empathetic rhetoric effectively relays the message by appealing to and building upon human connections that cross ideologies and reach the audiences' heart. Kenneth Burke writes that theories of identification and connection are central to one's rhetorical argument: "You persuade a man only insofar as you can talk his language by speech, gesture, tonality, order, image, attitude, idea, identifying your ways with his" (Leake 3). Empathetic rhetoric is not only a strategy used by a rhetor to further their argument, but a stratagem that engages the audience through a variety of ways and invites a more personal, humanistic relationship.

In regard to Roudebush's work with rhetorical empathy, little work has been done to analyze her use of empathetic rhetoric in oratory and abortion advocacy during the twentieth century birth control movement, yet many researchers have discussed rhetorical empathy in terms of its significance to pedagogy and education institutions. For example, Eric Leake writes, "Empathy in general seems to bring together many of the so-called 'turns' in the field—the turns 'affective,' 'social,' and 'material'—as ways of more fully understanding persuasion beyond the well-established limitations of appeals to pity and formal logic" (3). Leake is concerned with how to incorporate empathy in to the classroom to teach students rhetoric and how to use empathetic rhetoric as an argumentative tool for research, writing, and conversation.

Many researchers have studied the use of empathetic rhetoric in well-known political figures. Colleen Shogan states the importance of studying this type of rhetoric in politics: "A democratic leader in a large republic cannot understand the hardships of all of the citizens he governs. But the ability

to empathize enables him to acknowledge and consider the problems of others” (860). Shogan contributes to this field significantly by researching numerous genres of rhetorical communication, such as letters, debates, and speeches. Shogan argues that researchers have paid little attention to the use of empathetic rhetoric in politics and the importance of this rhetoric in the skillset of politicians. I would further argue that little attention has been given to empathetic rhetoric in most masculinized fields, such as politics. Research of rhetorical empathy in relation to literature and narratives has also been considered, but further investigation of this rhetoric across all fields and genres is warranted to explore the depths of such a valuable and intersectional framework.

Roudebush is set apart as she utilized empathy in her pro-choice speech to negotiate difficult ground with the strategy of identifying common goals and finding mutual agreement between opposing views, a rhetorical strategy that requires more research. By analyzing Roudebush, we find that pro-choice abortion rhetoric is predicated on the relationship the speaker has with her audience and showing how empathetic relationship can be rhetorically effective. Roudebush fills the gap between abortion rhetoric and empathetic rhetoric, and proves her archived speeches are a valuable resource in analyzing the importance of forming a relationship between rhetor and audience.

Empathetic Engagement

Through the 1960s and 1970s, Roudebush faced an audience with opposing views that were emotionally charged by the federal legalization of abortion. While much of Roudebush’s activism was centered around the advocacy of family planning services and legalization of abortion, once those goals were accomplished, she continued working to build a bridge between people with vehemently different views. Roudebush’s speech to the Manchester Christian Church serves as an example of the empathetic rhetoric she utilized during her career.

Roudebush began her speech by presenting the audience with her credibility as an abortion advocate. Interestingly, she does not start with a question, statistic, or an anecdote, but by simply stating the purpose of her presence along with her thesis. She states, "What permits me to speak on this difficult subject of abortion is that I have worked for a generation in the field of family planning, committed to the ideal that every child should be born wanted, to gleefully expectant parents, ready to provide the physical and emotional nurture essential to his fullest development" (Roudebush 1). Roudebush not only established her experience by informing her audience that she has worked many years in the family planning field, but she also initiates a relationship with her audience by offering that they share similar goals.

Roudebush's effort to connect with her audience's goals is a different approach than common abortion rhetoric used during that decade. As discussed previously, Lake argues that anti-abortion rhetoric appeals to the fetus' innocence. He states that "the nostalgic appeal to innocence is particularly powerful in the abortion context because, according to anti-abortionists, the fetus, completely and utterly innocent, is the 'perfect' child. Therefore, the symbolic state that appeals to the state of the innocent childhood also leads one to identify with the unborn" (438). While Roudebush does not explicitly use the word innocent, there are parallels in her beginning sentence that are illuminated through the lens of 1970s abortion rhetoric. By engaging the audience with words such as "ideal" and "gleefully," Roudebush develops a mutual nostalgia for the birthing process and for wanting a child who can be nurtured and shaped to "his fullest development" (Roudebush 1). The child can be shaped, molded, and formed in its innocence. Through this strategy, Roudebush connects with her audience's empathy by expressing her desire for all children to be born wanted, an ideal that few were likely to counter, and appeals to the anti-abortion rhetoric of the decade by identifying with the unborn fetus. As such,

Roudebush simultaneously establishes her credibility and aligns herself with her audience's emotional position.

Roudebush continues her introduction by specifically addressing the reason she came to speak to this audience of conservative Americans – the desire to speak to their virtue. Her objective is as follows:

My purpose is not now, however, to present to you the legislative and legal processes in which we have been engaged – a process which seemed to have been brought to a brilliant climax with the decision of the U.S. Supreme Court on January 22, in which the court upheld the constitutional right of a woman to seek and obtain a medically safe abortion. Rather, I think we are to discuss the *morality* of a woman's choosing to terminate an undesired pregnancy."

–Roudebush 1

Roudebush used the rhetorical strategy of *paralepsis* by mentioning the political and legal processes she is attempting to change, yet along with informing her audience that she has not come to make those topics the focus of her argument. Use of this tactic indicates that Roudebush may have been aware that for her to be rhetorically effective, she must not use logical argumentation to advocate laws for which the audience do not agree. Instead, speaking to the emotion and morality of the audience would more effectively build a bridge between opposite viewpoints. We are left to ask: What morality is Roudebush trying to engage with her audience? The diction Roudebush used implies that she would like to shift the conversation from identifying with the fetus and the "ideal that every child should be born wanted," to identifying with the woman who must endure the pregnancy or abortion (Roudebush 1). In other words, Roudebush appealed to the audience's rhetoric of empathizing with the fetus, and then used that connection to lead them to empathize with the mother. Rather than saying that she came to

discuss the morality of terminating a fetus, she asked them to consider “the constitutional right of a woman to seek a medically safe abortion” and the morality of a “woman’s choosing”; thereby omitting use of the word “fetus” or “child” from her statement (Roudebush 1).

Later in the speech, Roudebush describes a common ground to her audience and presents a society so idealized that neither side would refute. Roudebush declares, “I should like to say at the outset that none of us advocates abortion. We wish there was never any necessity for a woman to feel she needs to have one. In our perfect world - where there is an infallible contraceptive available and faithfully employed - there will not be such a thing as an unplanned, unwanted pregnancy” (1). Roudebush states that her goal is for all women to have access to effective birth control and family planning education. However, she recognized this objective cannot become reality. By presenting the goal as a common ideal that both parties share, in that abortion ought not be necessary, she solidifies a common ground between them. Additionally, she unites parties by identifying an agreement in their humanity early in her speech, a textbook example of utilizing empathy. Lisa Ede quotes Suzanne Clark regarding alternative discourse, writing of a “dialogic rhetoric,” by which one bases their argument “not on oppositions or conquest but on collaboration, rationality, and mutuality, one that ‘can interrupt the rigidities of language and open it to a subject in process’” (62). She suggests this rhetoric as an alternative to the combative, masculinized rhetoric that is pervasive in modern discourse. Before continuing her speech, Roudebush addressed that the base for both sides’ arguments is formed on common ground and mutual understanding, a technique similar to empathetic rhetoric that “relies upon some recognition of self-other overlap for the possibility of understanding each other” (Leake par. 5).

What also should be considered is her use of pronouns. She uses words like “us” and “we”, and conversationally engages in a “universal” language that we will discuss later. She

said, "We do not see abortion as a method of contraception - obviously it is not. Nor do we see it in the context of population stabilization...We do see it as a fall-back, when there has been a contraceptive or human failure" (Roudebush 2). These statements serve to distance Roudebush from the women who choose to have abortions. By using unifying language, Roudebush is not unifying herself with the women who receive abortions, but with the crowd. She tells the crowd, "We wish there was never any necessity for a woman to feel she needs to have one", including herself alongside the emotions of the audience (Roudebush 1). This type of empathetic engagement was first described as a psychological concept by philosopher Robert Vischer. He fused the subject and object, using art as an example: "Because a work of art can affect muscular and emotional attitudes in a viewing subject, the subject thereby experiences those feelings as qualities of the object" and "'feeling-in' is at the basis of empathy as a concept" (Shogan 861). Roudebush aligns herself with her audience making them the "subject," and the woman who chose to have an abortion as the "object." If this "object" feels a certain way, like if she "feels she needs to have one [abortion]," the subject can empathize and more fully understand the predicament of the object by feeling alongside them. Roudebush clearly advocated for abortion and understood the situations of the woman who may choose to have an abortion. By grouping herself with the audience, she is able to invite them into a space where they can "feel-in" as well.

As mentioned previously, Roudebush used a "universal," pronoun rich language when describing herself, her audience, and women who receive abortions throughout her speech. This language may be considered as a theoretical strategy one can employ when his or her audience is of a different or diverse perspective. The technique aimed to appeal to logic and is not interested in the self (Midiri par. 7). The act of using unifying language that is based in logic can be an effective rhetorical strategy when attempting to mutually empathize with an audience.

A prime example of Roudebush employing this strategy can be seen when she tells her audience, "In such a highly personal matter, we see no place for the state to enact or continue to enforce a law which compels her to continue an unwanted pregnancy. Should not our laws provide the latitude for diverse points of view on this highly personal matter?" (2-3). She assumed that her audience is highly logical and understood that abortion is not only personal but has room to be debated and discussed with an understanding about the point-of-view of the women. Using a rhetorical question only emphasizes her point and draws her audience to the notion that there is a place for more than one view, but logic must prevail. Leake writes that a main aspect of empathy is "maintaining a clear self-other differentiation" (par. 5). By Roudebush acknowledging that diverse points-of-view can exist, she asks her audience to not forfeit their "self" but to see the "other" and allow for coexistence through empathy.

In contrast to the universal audience to which Roudebush speaks, she writes of the women who choose to receive an abortion as "woman" or "a woman." By singling out one woman, Roudebush enables her audience to empathize with one person rather than millions. She claims that "it is only the individual woman who can make the decision to terminate a pregnancy. It is her conscience, her judgement, her moral choice which is the touchstone" (Roudebush 3). By speaking of one woman and her personal decision, Roudebush is asking her audience to engage in "affective empathy", in which a "cognitive recognition of another person's situation must occur" (Shogan 862). Repeating that "it is her conscience, her judgement, her moral choice," Roudebush emphasizes her point that to truly understand abortion and the arguments for legalizing it, one must recognize the other person's situation. And, the personability and rationality of using "woman" instead of "women" allowed the audience to relate the messages to individual women, perhaps those they know and love.

Roudebush also presented statistics to substantiate her claims and assist the audience in understanding the context surrounding abortion. Keeping with her empathetic rhetoric strategy, each statistic presented is precluded with an appeal to pathos. Her first statistic is offered halfway through her speech and she introduces the data by saying, "When a woman seeks an abortion and is denied one of the psychological effects may be much more severe. Not only she, but the child suffers. He then becomes the embodiment of society's punitive posture – what a diabolical use of a child" (Roudebush 3). Again, Roudebush focused the attention upon the subject of the event, the woman.

Roudebush then shifted her focus to how a child suffers from familial and societal structures that do not benefit the child and his or her development. As she presented the data, Roudebush calls attention to the humanity and reality behind the numbers:

A study rather recently in Sweden points up to this truth. A group of 193 women were denied abortions and went on to deliver unwanted children. Those children were followed for roughly 20 years, and matched against a control group. The results showed that those whose mothers would have aborted if permitted were registered more often with psychiatric services; engages in more anti-social and criminal behaviors; were more dependent on public assistance; and were more often rejected for military duty (a certain measure of psychological and physical fitness.

– Roudebush 3

By appealing to her audiences' empathy as well as presenting data, Roudebush worked to have her audience understand the other side of the debate.

Moreover, Roudebush built a bridge between the two sides by appealing to her audience's religious interests. Roudebush

was aware of her audience's view and use of religion to justify anti-abortion means: "I think one of the reasons why the efforts to humanize abortion laws in this country has met such resistance is that we have had inculcated in us over the ages that to procreate is to achieve fulfillment in the eyes of God... It is therefore difficult for us to acknowledge that perhaps this woman at this stage of her life does not want to bear a child" (4). She used this "universal" language of "we" and "us" to include herself in the mindset of religious fulfillment through procreation. With sensitivity to her audience's beliefs and by addressing religion, she not only empathizes with them, she invites them to do the same.

Roudebush's strategic use of religion helped to overcome the defamation of which pro-life supporters and pro-choice supporters sometimes engage. For example, Martha Vanderford wrote an article about the vilification of the abortion rhetoric in the 1970s. She states that "according to the MCCL [Minnesota Citizens Concerned for Life], pro-choicers wanted to destroy justice in America by discriminating against the poor. Allegedly unwilling to foot the bill for increasing numbers of welfare children" (174). While such a claim is beyond the scope of this paper, the importance of the statement lies in how it offers a glimpse of what Roudebush's audience may have thought, showing her awareness of the opposition's context and arguments. Through the use of empathetic rhetoric, Roudebush engaged with her audience and their religious beliefs and drew attention to the individual woman and child, as well as what the lack of abortion accessibility could cause. She invited the audience to empathize with her regardless of their initial beliefs.

Interestingly, Roudebush ended her speech by telling her audience that the legalization of abortion is inevitable and must be accepted regardless. She stated that her hope is for the law to be implemented fairly and responsibly, and asserted, "So, we see, women are making the decision for themselves not to go on with undesired pregnancies. It is really a

question of whether we will make abortion legal in Missouri, available to women at varying income levels and therefore safe" (Roudebush 5). She concluded with, "To liberalize Missouri's law will restore to a woman the right and the responsibility to make this decision, and to effectuate it with dignity" (Roudebush 5). This statement is Roudebush's call to action before she handed responsibility over to her audience and urged them to not only accept the inevitability of abortion, but to liberalize Missouri's abortion law to ensure the safety and dignity of women who make that choice. Her last few lines are not an appeal to rhetorical empathy, however, by basing her speech on empathy she was able to conclude with an effective moral demand. Shogan argues that empathy contributes to one's moral activity. She writes that biologically "empathy can provide the moral motivation for action or judgement. Although it is typically thought of as a stimulus for moral behavior or choice, empathy can also aid in the development of moral principles, such as justice and equality" (862). Roudebush strategically structured her speech to, in various ways, empathize with her audience and request that they empathize with her in return. By developing her argument upon the foundation of empathy, Roudebush could end her speech with a call to action, using built-up empathy as a stimulus for her audience's future moral principles and actions.

Conclusion

The tense discussion surrounding abortion during second-wave feminism did not end with *Roe v. Wade*. Abortion laws were conservative, the act was stigmatized, and access was not granted to many individuals. In the midst of the debate, Dorothy Roudebush, a St. Louis native, took action by addressing numerous crowds and advocating for abortion. Her speech to the Manchester Church in St. Louis, utilized empathetic rhetoric as a strategy to educate, persuade, and build a relationship with her audience. By studying Roudebush, we not only examine an important time in women's history but analyze

a courageous woman who used her knowledge, environment, and skills to affect change. Studying Roudebush's rhetoric of empathy has shown how it can be used as a compelling strategy to persuade an audience with opposing views and build a relationship between the rhetor and audience based upon understanding, consideration, and connection. Almost fifty years later, we do not live in a society that Roudebush described in her speech, yet the United States continues to fight for fair, effective, and affordable access to reproductive health-care and family planning services. By understanding women like Roudebush, perhaps we may get one step closer to "our perfect world."

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The Opioid Crisis: Overview, Pharmacology, and Potential Solutions

By Kelista McGraw

Introduction

Thirteen-years-old, I remember riding to school in my older brother's car. Darrin and I had never been terribly close, often fighting during our childhood, yet a 2011 album by Mac Miller called *Blue Slide Park* gave us a reason to bond. As we knew nobody else in our family was interested in rap of any kind, Darrin and I would frequently send each other videos of the hip hop singer and his latest releases. This artist brought us together through my adolescence and into adulthood. In September of 2018, Mac Miller died in his home after an accidental overdose of fentanyl, cocaine, and alcohol. Fentanyl, an opioid used for pain relief, is one of the many prescription drugs contributing to the opioid crisis through abuse and misuse. I believe Mac Miller's talents as an artist and his contributions to the work of other rap artists were unparalleled. Yet, the artist means more to me because of how his music strengthened the relationship I have with my brother. I cannot help but think of the pain I felt from his death, compared to the pain of those who have lost loved ones, family members, and friends to opioid overdose and addiction. Over the past 30 years, opioid misuse has become a serious public health crisis. In order to fully evaluate the crisis and develop solutions to combat it, the problem of opioid abuse must be considered in its entirety. The opioid crisis has had a devastating impact on the United States population, and extensive efforts to develop awareness through education along with research toward finding solutions are needed to decrease the morbidity and mortality of this epidemic.

The Problem

Every year, deaths due to opioid misuse continues to rise. From July 2016 to September 2017, opioid overdoses increased by 30%. In certain regions, including the Midwest, the increase during this same period was nearly 70% (National Institute on Drug Abuse). With that in mind, the United States prescribes 80% of the world's opioids (Rathmell and Kharasch 866). This problem continues to escalate, affecting more people each year, and reforms need to be made to the current prescribing methods of physicians and toward improving patient education. The crisis has become more severe as the market for prescription opioids grows, and with many physicians feeling pressured to treat pain aggressively with opioids (Cicero 1322). Patients are often overprescribed an opioid to manage pain, leading to dependence. The high potential for dependence is why it is important for physicians to first attempt other effective treatment options to ensure opioids are only prescribed with necessary cases. If a patient's pain can be managed with non-opioid treatment options, it may be safer to utilize those treatments prior to opioid therapy.

Overdose is the leading cause of opioid related death, particularly among Americans. While overdoses can be unintentional, the number of opioid related suicides has increased from 17% in 2000 to 41% in 2017 (University of Michigan). With rates of both unintentional and intentional deaths caused by opioid misuse increasing in the United States, it is clear that many who suffer from opioid-use-disorder are not receiving proper treatment. Some European countries, such as Switzerland, have better treatment rates and provide an example that the United States could model. In the United States, less than 22% of patients suffering from opioid-use-disorder received treatment between 2009 and 2013, while in Switzerland 71% to 88% of the coextensive population received treatment (Vokinger 189). Lack of treatment in the United States may directly correlate to the increasing death rates associated with the opioid crisis. Without a critical analysis of this crisis, the

death toll will continue to rise. Understanding the demographic predictors of opioid addiction and misuse, accessibility of treatment, and the pharmacology of opioids is necessary to evaluate the crisis and suggest proper educational and medical reform.

At-risk Population

Examining the disparities that are characteristic of at-risk populations will allow for the development of more targeted solutions for education, treatment, and prevention efforts. Amy S.B. Bohnert and Mark A. Ilgen from the Department of Psychiatry at the University of Michigan state that more research is needed “to identify who’s most at risk of deliberate or unintentional opioid overdoses, to make sure these individuals get better pain management, mental health care and medication-assisted therapy for opioid addiction.” Identifying at-risk populations could allow for adjustment of health efforts and lead to a decrease in opioid overdose in these populations. In addition, identifying at-risk populations can lead to uncovering trends that will focus future treatment efforts. A 2015 drug use and health survey classified and evaluated prescription opioid use by demographics in the United States. The survey found that prescription opioid overdose deaths have quadrupled between 1999 and 2015 (Han, Compton *et al.* 293). This survey found information about the risk factors associated with prescription opioid misuse in the United States. The general trends indicate that men are more at-risk of opioid misuse than women, the family income of affected individuals generally falls below \$20,000 yearly, and the most impacted individuals are between the ages of 18 to 29 years-old (Han, Compton *et al.* 296). Therefore, poor, young males are disproportionately affected by the opioid crisis. While it is important to identify risk factors for opioid abuse, it is also important to note that any person can experience addiction, and those affected deserve proper treatment.

Risk Factors

Risk factors for opioid addiction have been recognized through several research studies. An article published in *The New England Journal of Medicine* identified additional correlations. The research found that women below the age of 65 are more likely to unintentionally overdose compared to other demographic groups (Bohnert and Ilgen). This may be because women, on average, are physically smaller than men, and smaller body-mass may increase their susceptibility for an opioid related overdose. It was also found that opioid misuse is correlated with age and race. Generally, older black men are more likely to misuse opioids than older white men, while young white men are more likely to misuse opioids than young black men (Bohnert and Ilgen). Knowing these risk factors is important for healthcare providers to develop targeted prevention efforts and overdose treatments for their patients. For example, a physician informing a female opioid addict that she is more likely to overdose than any other demographic could potentially motivate the patient to continue and maintain treatment for the addiction. Although poor, young, males are disproportionately impacted by this crisis, those from all backgrounds may be at-risk as well due to the current over-prescription of opioids in healthcare today.

Pharmacology of Opioids

Development of drugs for treating opioid addiction was made possible by research into the physiology of opioid interactions. Drug developers have identified the central pathways through which opioids work, and the blocking of these pathways allows for multiple effective treatment options. Opioids bind three transmembrane neurotransmitter receptors: μ (Mu), κ (Kappa), and δ (Delta). Mu is the transmembrane receptor that is clinically significant as opioid binding of this receptor modulates neurotransmitter transmission. Opioids inhibit neurotransmission through the nociceptive pathways of pain perception (Strain). Opioids function at both the presynaptic and postsynaptic neurons.

Starting at the pre-synapse, opioids act antagonistically by binding to the Mu G-Coupled Protein Receptors, closing the voltage-gated calcium channels by hyperpolarizing, increasing, the cells membrane potential. When the voltage-gated calcium channels are closed, the calcium concentration inside the cell decreases, reducing the release of neurotransmitter into the synaptic cleft. With fewer nociceptive impulses sent, the patient feels the analgesic effect of the drug (Strain). Antagonistic drugs to treat opioid misuse include Naltrexone (Traynor 254) and Naloxone (National Institute on Drug Abuse). Naltrexone does not have “intrinsic activity,” meaning that when it binds to the opioid receptor it does not induce the same effect as an opioid (Raffa, Taylor, and Pergolizzi 860). Naltrexone acts as a competitor for the opioid binding site, reducing the number of receptors that respond to opioids the opioid initiated pathway (see Figure 1).

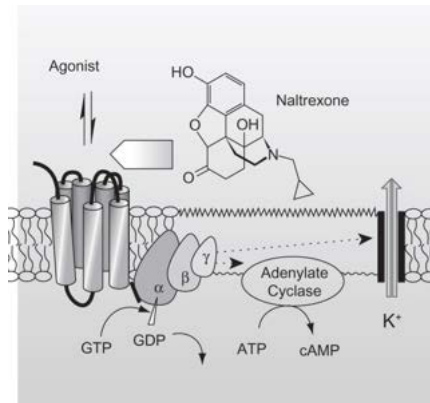


Figure 1: Mechanism of Action of Naltrexone

Naltrexone takes place of an agonist that would create opioid-like effect.

Source: Raffa, Taylor, and Pergolizzi. "Naltrexone Extended-Release Injection: an Option for the Management of Opioid Abuse." *Substance Abuse and Rehabilitation*, 5 Dec. 2011, p. 219., doi:10.2147/sar.s17920.

At the post-synapse, opioids act as agonists by binding to Mu G-Coupled Protein Receptors, stimulating the release of potassium via the opening of voltage-gated potassium channels. This efflux of potassium leads to hyperpolarization, preventing an action potential from being generated, thereby inhibiting transmission of the nociceptor (Strain). Prescription agonists to treat opioid misuse include Methadone and Buprenorphine (Traynor 254). Buprenorphine is a partial agonist of the mu-opioid receptor, with efficient binding but limited effects in terms of receptor activation (see figure 2) (Pillariseti and Khanna 860). This opioid can compete with a stronger opioid like morphine for the binding site, yet provide the analgesic effect that addicts want.

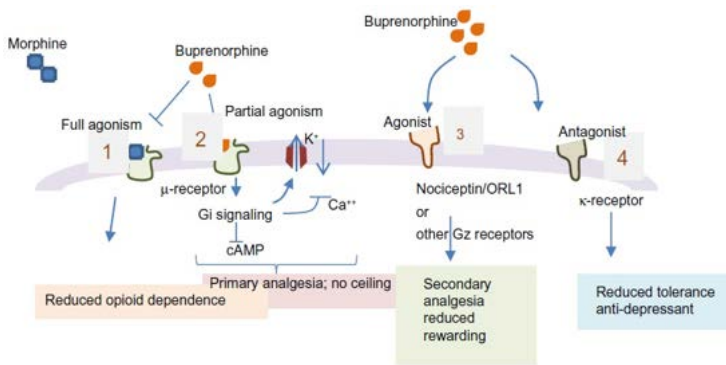


Figure 2: Mechanism of Action of Buprenorphine

Buprenorphine demonstrates a partial agonism responsible for reduced opioid dependence and analgesia.

Source: Pillarisetti, Sivaram, and Ish K Khanna. "Buprenorphine – an Attractive Opioid with Underutilized Potential in Treatment of Chronic Pain." *Journal of Pain Research*, 4 Dec. 2015, doi:<https://doi.org/10.2147/JPR.S85951>.

Pharmacologists use their understanding of the mechanisms behind the of action of opioids to create better pain management drugs. Traditionally, it was thought that all opioids activated the same downstream pathway, but this simplistic view has been replaced by a model of functional selectivity. This model describes how Mu receptors either activate G-Coupled Protein Receptors or receptors in the Beta-Arrestin pathway. The American Society of Anesthesiology states: "Even more exciting is the discovery that various opioids can selectively confer more activity in one pathway than another, called 'biased agonism' or 'functional selectivity'" (Rathmell and Kharasch 866). If the G-Coupled Protein Receptor pathway can be targeted for pain management, the negative effects of the Beta-Arrestin pathway can be mitigated (Rathmell and Kharasch 866). Negative effects associated with the Beta-Arrestin pathway, as well as with opioids in general, include shallow breathing and the development of tolerance. The competitive agonism of opioid pathways can be exploited to mitigate the negative effects of opioids, and further research may lead to more effective treatment for those abusing opioids.

Treatment Access

Despite the wide variety of treatment options, access to effective treatment is often difficult for those within the at-risk population. Treatment access tends to be limited and "those with opioid use disorder are young and more likely to be unemployed, either uninsured or relying on Medicaid, and other public funding mechanisms, than those without substance use disorders" (Becker 210). There are a few widely used treatment options for opioid addiction that help to mitigate the symptoms of addiction or reverse overdose. The first treatment option is buprenorphine, which treats the actual opioid addiction by preventing the undesirable consequences of withdrawal (Traynor 254). Patients are given smaller and smaller doses of buprenorphine, in a controlled manner, to wean them off opioids without sending their body into shock. Methadone is also

prescribed in a similar fashion. However, because these drugs may be abused as well, Hillary Connery writes in the *Harvard Review of Psychiatry* that this option could be “used illicitly, resulting in further opioid misuse and overdoses” (Connery 69). Additionally, naltrexone is used to block “the euphoric effects of opioids to prevent relapse in patients who have completed detoxification and are no longer physically dependent on opioids” (Traynor 254). These drugs increase the options available for practitioners to include in a treatment regimen to reduce the tendency of relapse. Furthermore, Naloxone (generic: Narcan) may be an effective treatment for reversing an acute overdose (Bohnert and Ilgen). Naloxone rapidly eliminates opioids from the body causing potentially aggressive withdrawal symptoms. For this reason, Naloxone is only administered during acute, life-threatening situations. With multiple effective treatment options, there should be greater opportunities for treatment of individuals misusing opioids.

Potential Solutions

Increased treatment of those misusing opioids will require reduced stigmatization of opioid addiction, increased education nationwide, and increased political action to address the problem. Increased treatment rates may lead to better outcomes within the United States population, reducing the opioid crisis. Currently, there is much talk about the opioid crisis in the media and in politics, but more work needs to be done. The United States presidential administration declared the opioid crisis a public health emergency in October of 2017, and this declaration was renewed in October of 2018 (Azar II). Although this statement of a public health emergency was a promising stride toward change, it only served to reallocate funds and offered no tangible solutions. Instead, there must be comprehensive initiatives enacted by political leaders to improve health outcomes of those affected by opioid misuse.

Those that hold the power to make public health initiatives, fund research, and advocate for treatment of those impacted

by opioid misuse should be passionate and informed, or this crisis will only worsen. For example, the *Canada Health Journal* describes the need for novel approaches to data collection to find risk factors and trends, as well as improve treatment rates. The journal explains, "The Office of Drug Research and Surveillance is working with the Canadian Surveillance System for Poison Information on harmonizing call data collected by poison control centers to capture details on drug-related harms, including due to opioid related overdoses (Abdesselam, Dann and Alwis 315)." The collected data has provided Canada with more useful information that could lead to a deeper understanding of opioid use and misuse. Efforts like this should be modelled in the United States to lead to data driven public health initiatives. Political awareness is the responsibility of every citizen of the United States and may lead to better outcomes for those suffering from opioid addiction. Research and public health initiatives happen when citizens vote for officials who are invested in change and will advocate for solutions at a nationwide level.

Education on the opioid crisis can take many different forms, and should be included in medical school curriculums. The education of doctors who prescribe opioids should be comprehensively covered in medical school and continuing-education should be provided for those in practice. Theodore Cicero describes the necessity of a risk-benefit ratio when prescribing opioids, arguing that prescribing fewer opioids is not always beneficial and that opioids are often therapeutically necessary (Cicero 1323). The opioid epidemic cannot be solved by simply reducing the number of prescribed opioids. In a National Survey of Drug Use and Health, Han, Compton, et al. write: "Simply restricting access to opioids without offering alternative pain treatments may have limited efficacy in reducing prescription opioid misuse and could lead people to seek prescription opioids outside the health system or to use nonprescription opioids, such as heroin or illicitly made fentanyl, which could increase health, misuse, and overdose risks" (Han,

Compton, et al 299). Simply put, turning people away from pain treatment is not the right path as many people will turn to illicit opioids for relief, an alternative that could be life threatening. Instead, treatment rates for those suffering from addiction need to increase, access to non-addictive pain medication must increase, and excessive prescribing of opioids that could be misused needs to be reduced (Han, Compton, et al 293). Within pharmacology, there must be an expansion of existing pharmacologic resources to mitigate the cycle of opioid over-prescription and education for healthcare practitioners with respect to opioid treatments (Rathmell and Kharasch 866).

In addition to better training for physicians, the stigma for those seeking opioid addiction treatment needs to be dispelled. In order to change this stigma, there must be nationwide education efforts to reinforce the importance of treatment for opioid misuse. Kerstin Vokinger remarks in *The Journal of Law, Medicine and Ethics* that those addicted to opioids are not weak, lacking morality, or doing it “on-purpose” but this is often how they are treated (Vokinger 189). Those who want treatment would feel less shame and be more likely to take the necessary steps to get help with community support. To reduce the number of individuals affected by the opioid crisis, as well as increase treatment, limit overdoses, and reduce addiction, there must be education and informational campaigns on multiple fronts. Natalia Morone and Debra Weiner advocate for pain education and training in *Clinical Therapeutics*. Morone and Weiner describe the fifth vital sign of pain and how practitioners are trained to respond to pain (Morone and Weiner 1730). Education efforts could use cases of chronic pain management to educate the medical professionals about “a comprehensive, multidimensional approach that also reviews pain theory, the physical examination, and management of the various contributors to pain” (Morone and Weiner 1730). Education efforts, such as those purposed by Morone and Weiner, may possibly reduce over prescribing of opioids and reverse the trend of misuse. With widespread education, awareness, understanding, and funding may follow, eventually leading to change.

Conclusion

With a vast number of opioid overdoses and low treatment rates, it is clear that the opioid crisis is a critical issue in the United States. In 2017, more than 70,200 Americans died from opioid overdoses and within the past decade, there has been a two-fold increase in opioid overdose rates (National Institute on Drug Abuse). Not enough action being taken today to stop the epidemic and a lack of resources dedicated to researching alternate drugs as well as identifying means to target at risk populations hinder this progress. While some populations are at higher risk for opioid addiction and overdose, it is important to note that opioid misuse is a problem for people in all walks of life: young and old, men and women, as well as rich and poor.

An effective treatment for opioid addictions are counter-drugs. Many drugs are known to target different aspects associated with addiction. Naltrexone targets the antagonistic pathway and may help reverse an opioid overdose, preventing relapse. Buprenorphine and methadone are opioid agonists that can wean a patient from opioid dependency. In spite of the availability of these effective treatment methods, few users seek treatment (Becker 210). With low treatment rates across the United States, there is room for improved screening for opioid use, coupled with treatment of those who are found misusing. If a person misusing opioids does not receive treatment for their addiction, their dependency often worsens, eventually resulting in an overdose. Initiatives enacted in other countries have resulted in increased treatment rates. These plans could be used as models to improve treatment rates in America. In healthcare, education for new drugs that could provide pain relief without the negative effects of opioids, treatment options for those who are struggling with misuse, and education for those that are addicted to seek help and remain clean. Furthermore, public-wide education efforts are needed to recognize an overdose, understanding of the dangers of taking opioids

that are not prescribed, and the risk of overdose when misusing opioids. These items will require funding, and start with elected United States officials. Elected leaders must advocate, allocate funding, and have the initiative to enact change in the nation's approach to opioids. Opioid misuse, addiction, and overdose rates are increasing every year. There must be continued education efforts, productive legislation, and funded research to reverse this trend.

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Mental Health in Queer Youth

By Maggie Agee

LGBTQIA+ – for some people this may seem like a random assortment of letters, but to others it is a symbol of solidarity and freedom. The acronym refers to individuals who identify as lesbian, gay, bisexual, transgender, or as other non-heterosexual or non-cisgender identities. But, over time, it has come to represent much more than a set of terms. Now, it describes a community of people who are fighting to live authentically without judgment or harassment. The LGBTQIA+ community, as it is recognized today, dates to June 28th, 1969; in Greenwich Village, New York where a local gay bar, the Stonewall Inn, was raided by police. Raids of gay bars were common occurrence at the time because homosexual relations were deemed illegal in the city, however, during this night the patrons retaliated. Shouting in protest, they began to throw pennies, bottles, and bricks at officers who were arresting their friends and peers. As a crowd gathered around the inn to watch, many joined the fight. The riot would become the event that sparked the beginning of the modern gay rights movement. For the first time, queer people put aside their differences and came together, adopting a shared sense of identity, to combat the unlawful treatment of LGBTQIA+ individuals. Built upon a platform of love and acceptance, this new community would advocate for the equality, security, and validation of millions of people for years to come. As a member of the group, people were given the opportunity to live their lives openly and confidently regardless of who they were, where they came from, or who they loved. This legacy holds true even to this day, and it serves as a beacon of hope for those who feel as though they do not belong (Kelly 4).

Though the LGBTQIA+ community has made progress, many individuals still face stigma and discrimination for having an open identity. Homophobia remains a recurring nightmare. Every morning LGBTQIA+ individuals wake to face a world that treats them as second-class citizens because of characteristics beyond their control. As a result, many people suffer from tremendous psychological distress, especially among younger LGBTQIA+ populations. According to the National Association of Mental Illness, LGBTQIA+ children are four times more likely to commit suicide than non-LGBTQIA+ children, and rates of suicide are even higher in areas that hold to more conservative values. Such areas can often be found in the Midwest. States like Kansas, Nebraska, Missouri, and Indiana are notorious for invalidating LGBTQIA+ identities, and this often can have severe consequences in terms of the mental health of kids who are in the process of coming to terms with their identity (Hasenbush 6). Proper advocacy and support from families and institutions should be prioritized in the Midwest as it is crucial for promoting the healthy development and acceptance of LGBTQIA+ youth.

When addressing the mental health concerns of queer youth, one of the most important things to consider is their relationship with family members. Families are characterized by unconditional love and warmth, yet this is not always the case for children who have come out. Many LGBTQIA+ kids face rejection from their parents, and some families express their disapproval through more extreme measures (Vanderwaal 73). One example of an extreme measure is the practice of conversion therapy. Conversion therapy is a form of treatment, often based on psychodynamic theory or religious ideology, that is meant to rid a child of homosexual thoughts and to “cure their queerness” (Ross 317). The assumption that queerness can be cured may be seen in previous editions of the *Diagnostic and Statistical Manual of Psychological Disorders*, which labeled LGBTQIA+ individuals among the mentally ill, but such claims are outdated as scientific perceptions of LGBTQIA+ individ-

uals has been revised. In 1973, mention of homosexuality was removed from the journal's pages, and transgenderism, diagnosed as gender identity disorder, followed forty years later. This change reflected a shift in perceptions regarding the connection these identities had with psychopathology (CNN). Today, the field of psychology views LGBTQIA+ as merely different expressions of identity and recognizes that there is no scientific basis for conversion therapy (APA).

Though progress has been made, discreditation had little effect on ending conversion practices. In January 2018, the Williams Institute at the UCLA School of Law estimated that nearly 20,000 kids would undergo conversion therapy from medical professionals and another 57,000 would undergo conversion therapy from religious leaders before their eighteenth birthday (Mallory 1). Currently, only 14 out of the 50 states passed laws to protect minors from such practices, and most of those are coastal and often more liberal states. Illinois is the only state in the Midwest with laws that prohibit use of conversion therapies on children (Movement Advancement Project). The remainder of the nation has yet to act upon these concerns.

Not only have conversion practices persisted, some individuals seek to improve the effectiveness of these practices by incorporating elements of severe psychological and physical abuse. According to a 2017 interview with an individual from Iowa who experienced these practices first-hand, Samuel Brinton, modern conversion therapies utilize aversive techniques that are meant to redirect the associations a child makes regarding their sexuality or gender. In Brinton's case, doctors strapped him to a chair while images of people holding hands or kissing were projected onto a screen in front of him. Needles were pressed into his hands and, whenever individuals in the images were homosexual rather than heterosexual, an electrical current would pass through the needles and shock him. The goal was to have him associate pain with same-sex intimacy, and for a while it worked. Months after the conversion

treatments, the touch of a man, even a friend or family member, would cause him to scream. He felt disgusting and hated himself due to his sexuality - until a day came when he found himself standing on the roof of his apartment, leaning over the edge, wanting to end it all. Thankfully, his mother found him before he could jump, yet his near suicide and subsequent rescue did not change the relationship he had with his family. And, though she witnessed her son attempt suicide, Samuel's mom continued to see him as an abomination. To this day, his parents rarely speak with him, and he does not feel welcome in his own home. As a result, he continues to struggle with depression and his sense of identity (Manske).

The psychological effects of conversion therapy are extensive. Recent research in queer studies and psychiatry suggests that individuals who experience conversion therapy tend to develop mental disorders such as PTSD, depression, and anxiety which, as illustrated by Brinton's experience, can influence suicidal ideation. These individuals can also exhibit paranoia, problems in relationships, and trust issues (Ross 318). The effects of these therapies persist for years, and they reveal the inhumanity of these programs.

In addition to conversion therapies, many LGBTQIA+ children suffer from homelessness as a result of parental rejection. Kicking a child out of the house for opening up about their feelings may seem extreme, but it is more common than one might think. The True Colors Fund, an organization designed to aid homeless LGBTQIA+ people, states that of the 50% of queer children who receive negative reactions to their 'coming out', one in four will be thrown out of their home. It comes as no surprise that nationally, 40% of homeless youth identify as LGBTQIA+.

Homeless children on the street face higher rates of malnutrition, substance abuse, and victimization than those who have the comfort and privilege of a home. Due to poor conditions, many homeless children resort to "survival sex," or the act of trading sex for basic necessities. Increase of unprotected sexu-

al activity carries the risk of pregnancy and sexually transmitted diseases and should cause concern for the psychological state of these children (Lambda Legal).

The mental health of homeless children in the LGBTQIA+ community is arguably poorer than other children due to the potential and likely increase of depression and anxiety. Hannah, a young lesbian, is a prime example. In a 2014 interview with *Rolling Stone*, Hannah revealed that, after being disowned by her mother, she frequently asked the universe “if my life’s always been horrible because I like girls” (qtd. in Morris 10). If she had only been straight, she thought, perhaps she would be tucked into a warm bed in a cozy suburban home rather than sleeping on a hard mattress in an underkept shelter where she would wake up to find maggots in her hair. Her life had become cruel, something worthy of hate. She thought the world had cast her out, and now she was “burning in hell” (qtd. in Morris 10). Her thoughts fought against her self-esteem, and she began to question whether her identity was something that society could learn to love, or if she, and so many others, would be set to this life forever. It was a lonely life, and even among the homeless who surrounded her, Hannah felt she did not belong. The streets were filled with people who were just as homophobic as her family, and some violently so. Hannah had heard stories of kids being beaten up and robbed because of their identity, and fear of such rumors led her to sleep with a knife. The restless anxiety she experienced haunted her for years until she found a job and saved enough money to afford a home (Morris 10).

Stories like Hannah’s are heartbreaking. No child should suffer what she went through. Her mother’s actions were cruel and might have cost Hannah her life, but she was one of the lucky ones. She had the strength to fight until she could escape; for her story, a happy ending. Sadly, not all LGBTQIA+ children are as fortunate. Without a proper support network, many homeless children will become self-destructive as a way

of coping with their pain. And, how many will take their lives to escape a world where they feel they are hated?

Along with facing rejection from their families, many queer children suffer bullying from their peers. According to the 2017 National School Climate Survey from the Gay, Lesbian, and Straight Education Network (GLSEN), 59.5% of US students reported feeling unsafe at school because of their sexual orientation, and 44.6% felt unsafe due to their gender expression. These students said they were frequently targeted by bullies who would verbally abuse them. Of these students, 60.3% reported hearing homophobic remarks and 45.6% reported hearing transphobic remarks from classmates on a regular basis (GLSEN 18). Although the scars of verbal abuse may not be visible, their effects can be lasting. Verbal abuse may act as a persistent shadow that envelops a person wherever they go and in everything they do. Calling someone a “fag” or a “dyke” can affect their self-esteem, causing them to develop a negative view of themselves and the world. In other words, they can feel worthless and powerless as they begin to believe bullying and discrimination is an inevitable part of life (Heffernan 2).

It is important to note, however, that not all verbal abuse is intentional. Sometimes what a person says can indirectly hurt someone because the abuser lacks the ability to recognize the effect certain words can have on an LGBTQIA+ individual. For instance, the word “gay” is commonly used to refer to something that is lame or effeminate. Young children and some adults often joke that things are “gay” without considering how their words affect people who identify with that term (Kort 1). Regardless of one’s opinion of the LGBTQIA+ community, using terminology in certain contexts dehumanizes the identity of queer people and turns it into a joke or a reason to bully. Today, GLSEN’s state map shows only two Midwestern states with laws to defend LGBTQIA+ youth against bullying, and the consequences of this lack of protection are devastating. At a crucial time in a child’s social development, children tend to internalize and ruminate on negative views of their self-image. As

a result, negative personal comments can lead to higher levels of depression and feelings of despair (Kort 2). These issues that queer youth have with low self-esteem, depression, and feeling set apart can be compounded by a lack of role-models and understanding of LGBTQIA+ history.

Many LGBTQIA+ youth experience challenges from not having LGBTQIA+ role-models to look up to for encouragement and support. For example, few schools in the Midwest offer a queer-inclusive curriculum. Children sit in class and learn about history, yet they are not taught of Marsha P. Johnson, Christine Jorgenson, Harvey Milk, or other important figures because, regardless of what these historical figures did, they were queer. Many students are not taught about the Homophile movement in the 1950s, the Stonewall riots in the 1960s, or the ACT UP campaign against AIDs in the 1980s - all of which are important events in LGBTQIA+ history as well as U.S. history. These people and movements shaped queer experiences today, and without this information, queer children feel their history and experience is unimportant (Pino 2). LGBTQIA+ identities may be invalidated because nearly all of the famous people they hear about in class are presented as heterosexual, straight. The founders of our country were straight. War heroes are and were straight. Everyone to look up to is a representation of heteronormative society. Without role models, LGBTQIA+ children can believe they are not able to succeed in life, damaging their will to pursue their potential. They may shy away from opportunity and give up their passions because they perceive that they do not have a chance of reaching those goals because of their sexuality. Furthermore, limiting history curriculums prevents straight children from learning the contributions that LGBTQIA+ individuals have made for society. Some people will continue to stereotype and harass queer individuals because of ignorance. Many individuals do not know what it is like to live as LGBTQIA+, and they are unable to understand or empathize with queer youth because they are not given the information needed to challenge heteronormative assumptions (Pino 2).

Despite the obstacles these kids face, they are not without hope. There are a variety of ways people can help to improve the lives of LGBTQIA+ youth, and the responsibility for making those improvements rests with families and institutions.

Beginning in the home, family attitudes play an important role in fostering a healthy self-image for queer youth. The way family members, specifically parents, interact with queer children during the time when they open up about their sexuality can have a profound influence over the child's self-image, so negative interactions can have significant consequences (Harvey 399). That said, if family members consider how they think, speak, and act during the coming out process, they can help build up the self-esteem of queer children and reduce the negativity and emotional strain during a psychologically vulnerable time. The key lies with how the family perceives the situation. The first step toward narrowing the divide between family members and their children is to ensure open, honest, and understanding communication. Upon coming-out, one of the most difficult parts for many families is processing the new information. An ideal situation would be for parents to react calmly while trying to be as understanding as possible. However, many parents, in the midst of anger and confusion, can instead lash out. Negative reactions to coming out can cause a queer child to feel scared and betrayed because the people who they love the most do not accept how they feel. In situations like these, family counseling has been shown to be helpful for families who need some guidance during this crucial and sometimes difficult period (Harvey 416).

According to Rebecca Harvey and Linda Fish, family dynamics can be improved through the completion of three main stages: refuge, tolerance of difficult dialogs, and nurturing of queerness. For stage one, refuge refers to the process of creating a space where clients feel safe enough to be honest about their feelings. In this delicate phase, it is the therapist's job to utilize compassion to encourage families to open up about their concerns regarding a child's sexuality or gender identity.

Here, assumptions are challenged as families consider their own biases and how those biases are shaped by society. The purpose of this self-examination is to bring forward the barriers that are preventing family members from supporting one another (Harvey 402). The next step is “breaking the ice” when it comes to tough conversations. During this stage, children are encouraged to share aspects of themselves that they have kept hidden from their parents. These aspects can range from negative things like body dysmorphia and feelings of inferiority to more positive things like finding friends and developing crushes. Such dialogs can be difficult and even painful for both parties, but the goal is for parents to be able to put themselves in their child’s shoes and empathize with them. In many cases, this can be a wake-up call for parents that have neglected to follow up with how their kids have been feeling (Harvey 402). During the final nurturing phase, a transformation takes place as parents accept their child for who they are. Many parents begin to see the beauty in being different and realize that it does not matter whether someone is gay or straight as long as they are happy (Harvey 403). This third and final step aims to heal any wounds cause by ignorance, and it gives families a chance to mend broken relationships. Those who participate in family therapies walk out with a deeper respect for one another, and this leaves them better equipped to deal with difficult situations down the road. Respect also guarantees a willingness to listen to one another which makes for a stronger bond between parent and child. The stronger the bond, the higher a child’s self-esteem will be, and this helps propel them forward on their journey to self-acceptance (Harvey 416).

Alongside therapy, further family support and development can be gained through involvement with PFLAG organizations. Established in 1973, PFLAG stands for Parents, Families, and Friends of Lesbians and Gays, and its primary focus is to provide parents with guidance and resources during the coming out process. These organizations can help families feel comfortable with being part of their queer child’s new, open

identity. This process generally begins with a form of grief management. K.L. Broad, a professor of sociology and a researcher in gender studies at the University of Florida, noted that many parents will undergo a mourning period when their child comes out because they feel as if the person they knew and loved is gone forever (Broad 405). This sense of grief stems from fear that a child's sexuality or gender identity will change who they are, and that they will become a stranger to their family. Grief can arise from fear of the possible consequences their child may face with a queer identity. Often parents dread the notion that one of their children might identify as LGBTQIA+ because they worry for their child's safety. In the 1990s, following the AIDs epidemic, when PFLAG's activism was at its peak, assaults of LGBTQIA+ people were a significant concern. To this day, queer individuals, especially transgender people, have to be careful to avoid becoming victims of physical violence. With these possible events in mind, it is reasonable for parents to be frightened, however the goal of PFLAG is to provide parents of queer youth with information to overcome those fears so these children can live authentically with the support of their family. Additionally, PFLAG facilitates support groups so these parents can talk with others in similar situations and work through their anxieties together. When parents see they are not alone, it may become easier for them to move past their grief and enter the learning and advocacy stages of their journey. This transition will help families to not only accept their child's identity but to celebrate its expression as well (Broad 407).

PFLAG can be beneficial for parents who are looking to understand that queerness is not something to be feared or hated, but something to be admired - for it takes a lot of courage to be honest about one's identity. Those who join PFLAG often develop a deeper respect for their children, and many may get involved by participating in fundraisers, awareness programs, and protests on their child's behalf. However, the shift from ignorance to acceptance does not happen overnight. It may take time to adjust, which is okay. For example, PFLAG

member Christy Flores, underwent a long and difficult journey before she was able to accept her son's sexuality. A conservative mother from Texas, Flores writes in PFLAG's community blog that, before joining the organization, she dreaded the idea of having a gay son. Like many other parents, she thought that she had done something wrong and that this was God's way of punishing her for bad parenting. For months, she and her husband did everything possible to deny and hide their son's sexuality from their family and community. His identity became a "dirty secret," and it was not until he moved out that Flores realized she had made a huge mistake. Feeling lonely and guilty for pushing away her own son, she joined PFLAG with the hope of establishing a healthier relationship with him. At first, she was skeptical because, no matter how much she loved her son, she could not picture herself marching in a pride parade nor being proud of that fact that her son was gay. It took time, but eventually she had a change of heart. After listening to other parents' stories, she came to see that being gay was not a curse. In fact, it could be a blessing. Inspired by her PFLAG peers, Flores took it upon herself to learn all she could about the LGBTQIA+ community, and with their support, she reconnected with her son. Within a year, their relationship was stronger than it had ever been, because it was honest. Today, Flores has found herself not only marching in pride parades but leading them, and she works to help other parents on their journeys toward acceptance. Her son, Nat, is incredibly proud of the progress she has made, and as a result of her efforts, he is much more confident in himself. The support he received from his mom and PFLAG changed his life, and he is grateful that he is able to live as the person he was always meant to be (Flores).

Along with the positive effects of a strong family support system, LGBTQIA+ children can benefit from institutional support, specifically in the educational system. Schools ought to provide children with an environment that is safe for learning and growth, but such an environment often does not exist

for queer youth in Midwestern schools (Movement Advancement Project). Homophobic victimization is a prevalent issue in many schools, and it is the responsibility of those institutions to provide protection for their students. While most school districts have anti-bullying policies in place, they are generic, and fail to provide explicit protections for those who identify as LGBTQIA+ (Kull 413). I believe school officials should focus on providing a safe space for individuals to go in the midst of bullying. One example of a safe space would be a Gay-Straight Alliance meeting area.

An article in the *Journal of Youth and Adolescence* states that a Gay-Straight Alliance (GSA) is a student organization designed to give queer students a place to be “unapologetically themselves” while also giving them a chance to discuss important issues with other members of the community (Marx 1270). Clubs like these provide students with an opportunity to connect with queer youth so they can work together to help raise awareness for LGBTQIA+ issues. GSAs provide queer students with the opportunity to see that they are not alone, it can give them a sense of validation, and it may have an effect on their experience in school. Studies have shown that the presence of GSAs can help lower homophobic victimization by 30%, fear for safety by 36%, and reports of homophobic remarks by 52%, thus improving the educational environment (Marx 1278). Once a child feels safe and validated, their education would no longer be hindered by negative feelings associated with their self-image. As of today, nearly 4,000 schools across the United State have established such organizations, however, most of them are in coastal cities that have a reputation for supporting LGBTQIA+ rights (Lambda Legal). Rural areas and smaller towns in the Midwest tend to be more conservative, and fewer of those schools have queer organizations and resources available to their students (Movement Advancement Project). In order to reduce victimization and ensure the wellbeing of LGBTQIA+ students, I believe GSAs

should be offered in every school regardless of political or religious affiliation.

Many students also suffer from poor representation in the classroom. Few teachers in the Midwest discuss LGBTQIA+ identity and history, and, as a result, many queer students are left feeling invisible and vulnerable to the ignorance of their peers. A solution to this problem may be to incorporate more queer material into the standard curriculum, but it is not always that simple. According to Tony Fenwick and Sue Sanders, mere exposure is not enough to validate queer experience and promote tolerance. Instead, schools should be focusing on integrating queer themes into existing lesson plans, a process called “actualizing”, so that queerness can not only be recognized but normalized in society (Fenwick 66). For example, if a class were discussing technology, teachers could include information about Alan Turing, the father of computer science, and his struggle with his identity. Likewise, if a class were discussing literature, they could discuss the gay experience of author and poet Oscar Wilde. The possibilities are endless for LGBTQIA+ education and exposure. By acknowledging these historical figures’ sexuality, students can see that these identities are more than their stereotypes. People who are queer have emotions, talents, and goals like the rest of society. They are human, and their sexuality does not change that fact. These types of discussions open eyes to see the world from another perspective, and, once seen, people can begin to challenge the stereotypes they have been socialized to believe (Fenwick 66). With stereotypes challenged, bullying rates are likely to reduce, and schools will be on the way to creating a more inclusive environment for all students (Fenwick 65).

In addition to education, integration and normalization of LGBTQIA+ identities may be needed to improve the self-esteem of students who identify as queer. Open acceptance helps children understand that queerness is not something to be kept hidden but rather something that should be embraced as part of the human experience. Let us strive to love

the beauty of uniqueness and show children that regardless of who they are and no matter how tough life may seem, it can always get better.

If we, as a community, take the necessary steps to better understand, validate, and normalize the queer experience, LGBTQIA+ youth will feel more comfortable with themselves and as a consequence their mental health may improve. I believe that the key is for us to put aside biases and consider what is best for our children. Queer or straight, every life matters. Every child deserves to be loved, appreciated, and accepted no matter who they are or who they love. It is up to us to make the changes necessary to ensure no child feels alone, scared, or neglected because of their identity. The journey to acceptance will be a long one, but we can get there. For the sake of our children, we must be willing to try.

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Please Touch: An Exploration of the Bloch Building as a Post-Museum in the Nelson-Atkins Museum of Art

By Sophie Jess

Introduction

From Emanuel Cleaver II Boulevard, you can view the south side of the nearly 90-year-old original building of the Nelson-Atkins Museum of Art in Kansas City, Missouri (see Figure 1). Its ornate, neoclassical design juxtaposes the whimsical shuttlecocks and silver trees that decorate the south lawn. To the east, you can see the eleven-year-old Bloch Building, designed with marked minimalism in a way that is intended to complement but not mimic the original building (see Figure 2). The duality of this design personifies the duality between the classical and contemporary art the museum houses, as well as the duality between the purposes and concepts of both parts of the museum. The concepts of the modernist museum and the post-museum exist simultaneously within the Nelson-Atkins Museum of Art, and is most apparent when comparing the purpose and concepts of the original Nelson-Atkins building and the museum's recent Bloch addition. In this interdisciplinary study, I will define the post-museum concept and discuss how the Bloch Building blurs the boundaries between the post-museum and modernist museum, then analyze the purposes of the original Nelson-Atkins building and the Bloch Building, arguing that they embody the modernist and post-museum models, respectively.



Figure 1. The Original Nelson-Atkins Building, 1933.

Photograph by author.



Figure 2. The Bloch Building, 2007.

Photograph by author.

The Post-Museum Model

The term “post-museum” is used by Eilean Hooper-Greenhill in her book, *Museums and the Interpretation of Visual Culture*. It is a relative term; it describes post-something, but “post” what? A post-museum is the answer to the problems associated with the museum model that Hooper-Greenhill calls the modernist museum. The modernist museum is “based on the nineteenth century European institutional form which is still very familiar across the world today” (8). According to Hooper-Greenhill, the difference between the two museum models is their pedagogical approaches. The modernist museum is “based on an understanding of communication as transmission” (125). In other words, the goal is exposing the public to high culture and transmitting the knowledge that comes with that culture. The concept of the post-museum is developing, and it “can be analyzed by understanding communication as an integral part of culture as a whole” (125).

The post-museum is less concerned with transferring knowledge and more with educating its guests about the presented culture so that they might contribute to and engage in intellectual conversation. Put simply, the modernist museum is a lecture and the post-museum is a dialogue. The dichotomy continues as Hooper goes on to say that the modernist muse-

um views its visitors as an “undifferentiated mass,” whereas the post-museum is more focused with reaching its visitors on an individual level. The modernist museum seems to expect the audience to rise to the level of the high culture being presented to them, while the post-museum is more focused with how the museum can reach the audience. As Hooper-Greenhill writes, the goal of the post-museum is to be interactive and “embrace their visitors more closely” (1). While the modernist-museum could be characterized by paintings on a wall with a name and date, or maybe occasional interpretive plaque, the post-museum incorporates interactive elements. Given that the structure of the post-museum is largely undefined, these interactive elements could be anything from an educational video to an immersive hands-on activity. Later in this exploration, I will discuss in detail the exact interactive elements the Nelson-Atkins Museum of Art uses in the exhibits in the Bloch Building.

The Original Nelson-Atkins Building

The Nelson-Atkins Museum of Art was originally created as two separate galleries, the William Rockhill Nelson Gallery of Art and the Mary Atkins Museum of Art (Huselton). The stone structure that is now referred to as the Nelson-Atkins building was originally the William Rockhill Nelson Gallery of Art. It was opened to the public in 1933, but the acquisition of the art for the galleries can be traced back to the 1850s (Ehrlich 278). The original purpose of the Nelson-Atkins Museum of Art was similar to that of the modernist museum model. As Kristie Wolferman writes in *The Nelson-Atkins Museum of Art-Culture Comes to Kansas City*, the Nelson-Atkins Museum of Art came to be during a time where urban centers were being developed to be “more aesthetic and hygienic places to live” (1). This movement was called City Beautiful. As the movement swept across the country, one of the main goals of City Beautiful was to make art available to ordinary people (Wolferman 1). This reflects the goal of the modernist museum model to educate the public on high culture. George Ehrlich states that

part of the motivation for building the Nelson-Atkins Museum of Art was pressure from Kansas City development planners to emulate other major urban centers, like St Louis, that had rich cultural resources for its residents. There was also a significant local art scene emerging in Kansas City that helped stimulate the motivation to design and develop a state-of-the-art museum (Ehrlich 277-278). The Nelson-Atkins Museum of Art opened during the prime of the modernist museum model in the United States. Hooper-Greenhill describes museums created during this period as “closed, hermetic and self-referential” with “an elite authoritative social position” (Hooper-Greenhill 135). As a result, “Active provision for visitors was taken less and less seriously as a collection and care of collections began to define the work of curators” (135). She asserts that most of the interpretative work fell on the shoulders of the museum visitors, noting that “the facts may be absorbed by visitors, if they themselves can make connections with the material provided... The collections may be enjoyed if visitors can understand their context or appreciate their aesthetic qualities” (135). It is like the old adage, “You can lead a horse to water but you cannot make it drink” – you can expose the guests to art but you cannot force them to understand or appreciate it. The approach of the original building of the Nelson-Atkins Museum of Art is typical of a modernist museum. In the Nelson-Atkins building, interactive elements that help bridge the interpretative gap between the art and the visitors are few and far between.

The Bloch Building

The Bloch Building of the Nelson-Atkins Museum of Art houses the contemporary art, ticketed exhibitions, and the African Art collection. It additionally utilizes the most interactive educational techniques in the museum. This addition to the Nelson-Atkins Museum of Art opened in 2007. It is primarily composed of steel and glass structures, which its designer Steven Holl calls “lenses.” When the building was being constructed, it met with overwhelming disapproval from the

public (Stephens). I remember my mother, who has a degree in interior design, pitilessly referring to the new addition as “the sheds.” Perhaps it was the overwhelming contrast to the original neoclassical structure that initially put people off, however, that was all part of Holl’s vision. Despite these concerns, after construction was complete and the Bloch Building opened in 2007, its design received more positive reviews. Holl had a common vision for all of the additions that he designed for the museum, including the pavilions and the Bloch addition. His vision was of “complementary contrast” (Masheck & Holl 25). He did not want to abandon or clash with the neoclassical design of the original building nor copy it. This concept is analogous to the purpose and model of the older part of the museum and the Bloch Building. The Bloch Building kept many of the same elements of the modernist museum model, it remains continuous, but it also incorporates new interactive elements that are less prevalent in the older parts of the museum.

As stated previously, the concept of the post-museum is under development. As a result, what can be considered an interactive element is up for debate. In my evaluation of the Bloch Building as a post-museum, I defined an interactive element as anything that serves to bridge the interpretive gap between the art and the visitor. One example of interactive elements in the Bloch Building is *Chromoplastic Mural* by Luis Tomasello (see Figure 3). It is one of the first things you see as you are walking through the corridor from the original building to the Bloch Building. The *Chromoplastic Mural* is made of many white wooden prisms with fluorescent pink bases mounted on a wall. To the left of the mural, is a sample prism with a plaque that reads “Please touch!”, allowing patrons to rotate and experiment with orientations of the prism to see how it affects the light and the way the prism looks against the white surface (see Figure 4). There is an adjacent plaque explaining how the block can be used to explore the ways in which light, color, shape, and shadow can be manipulated by an artist. The plaque also explains that the model has “begun to show wear and tear” to

illustrate that why guests should only touch the sample prism and not those on the mural itself. This is an interesting way that the museum has overcome the hurdle of creating tactile attractions without putting the art at risk.



Figure 3. Wall Mural, Chromoplastic Mural, 2011.
Photograph by author.



Figure 4. Sample Prism.
Photograph by author.

There are interactive stations throughout many of the different collections. For example, in the African Art collection and the Wendell Castle exhibit, there are several tablet stations that are touch-screens about the size of the monitor of a desktop computer that guests can use to complete interactive activities (see Figures 5 and 6). One allows patrons to design their own African-inspired tapestry (see Figure 5). These activities are a good way for patrons to connect with the art on a deeper level compared to simply walking around and looking at it. It is also free advertising, because the museum allows you to email yourself your tapestry and encourages you to post your creation on social media with their special hashtag. Another station in the African Art Collection has a replica of a traditional carved wooden stool that guests are allowed to touch. Along with the replica, there is a video explaining the process that goes into making the stools and their cultural relevance (see Figure 6). This combination of elements allows the guests to

closely interact with the art. The guests can see, listen, touch, and create, all of which serves to offer the guests a better understanding of the art and culture.

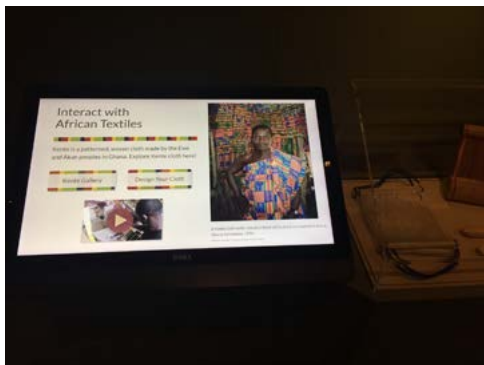


Figure 5. Interacting with African Textiles.
Photograph by author.



Figure 6. Stool Replica with Video.
Photograph by author.

Another example to this combination of interactive elements exists in the Wendell Castle exhibit. Wendell Castle is a furniture designer, so his art explores the boundaries between everyday objects and masterpieces. Castle's art provides an interesting learning opportunity in the line between form and function and to help guests work with and understand these concepts, there is an interactive game. To complete the activity, guests plot Castle's pieces on a spectrum, depending on whether they think the piece is more representative of form or function, and if they consider the piece ordinary or extraordinary (see Figure 7). This activity prompts guests to think more critically about the art in the exhibit, and connect with it on a deeper level. In addition to this hands-on learning tool, another tablet station allows guests to watch a video showing Castle's

process (see Figure 8). Knowing how the art is made may add another layer to the experience guests have while going through the exhibit.



Figure 7. Wendell Castle Game, *Extra or Ordinary?*

Photograph by author.

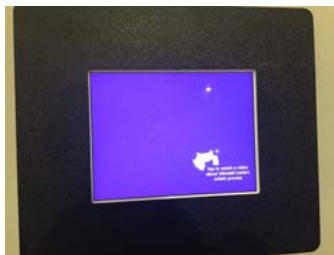


Figure 8. Wendell Castle's Artistic Process Video

Photograph by author.

The more interactive ambiance in the Bloch Building is intentional. According to the museum's website you can "enrich your Bloch Galleries experience with state-of-the-art technology including in-gallery tablets and interactive stations, along with podcast-style audio tours, guided tours, events and talks—free of charge." When the Bloch Building was opened, it presented the museum with a unique opportunity to reimagine itself. This opportunity for new conception allowed the Bloch Building to be created in an image that more closely resembles Hooper-Greenhill's post-museum model, while the original Nelson-Atkins building, which mostly lacks these interactive elements, remained in the modernist museum model. Overall, the Bloch Building and other post-museums are more focused on giving their audience a holistic experience.

Of course, there is always opportunity for growth. For example, the Bloch Building could do a better job of incorporating these elements more consistently throughout their collections. As a visitor, I noticed that some collections have several stations with interactive activities and informational

videos, while others have none at all. It would feel more complete if the elements of the post-museum model were applied more evenly throughout the collections. However, the Bloch Building, like the post-museum model and Hooper-Greenhill suggest, is continuously being developed as it “is a new idea that is not yet born, but whose shape is beginning to be seen” (Hooper-Greenhill 8). Although in some ways the Bloch Museum could do better to reach its audience, there is no museum today that can act as the perfect embodiment of the post-museum model. We do not yet know the best way to execute the concepts of the post-museum model, yet the Bloch Building is experimenting with them with some degree of success.

Conclusion

When the Bloch Building was added to the Nelson-Atkins Museum of Art, it created an opportunity for the museum to address the issues of the modernist museum model. Since the Nelson-Atkins building and the Bloch Building exist simultaneously, they represent a unique view into how traditional museum and post-museum elements can work together in one space. The Bloch Building of the Nelson walks a fine line between the post-museum and traditional museum, containing elements of both. The Nelson-Atkins Museum of Art could be a good study for museums trying to find new ways to create interactive and inviting ways to organize their exhibits. It also shows that the transition from modernist museum to post-museum does not have to be one that happens overnight, rather it can occur in stages, starting one collection at a time.

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Achieving Philosophical Perfection: Omar Khayyam's Successful Replacement of Euclid's Parallel Postulate

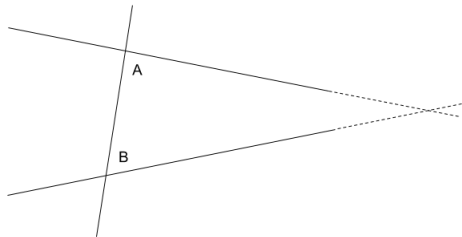
by Amanda Nethington

In the mathematical world, no volume could be considered more studied, more criticized, or more influential than Euclid's *Elements* (Katz, 2009, p. 51). Compiled and organized circa 300 BCE by Greek mathematician Euclid of Alexandria, the *Elements* consists of 13 books, or chapters, and contains the majority of the knowledge of geometry understood at the time. Little is known about Euclid's life, but his work on the *Elements* put him on the map as an influential and distinguished mathematician (Katz, 2009, p. 51). This fame did not come without objections, however. A number of the entries in the *Elements* have been criticized by countless mathematicians since its publishing for small, but crucial, holes in the logic, or for certain statements that should be addressed as postulates. Our discussion will revolve around objections to the fifth postulate of the first book, referred to later as the parallel postulate.

Euclid begins the first book of the *Elements* with five postulates, or accepted statements, which are referenced through the remainder of the *Elements*. Much of the work in ancient Greek mathematics revolved around geometric construction using only a straightedge and a compass (Katz, 2009, p. 40). The Greeks were dedicated to solving geometric problems in the most logical and minimalistic way possible; therefore, creating geometry in its purest form. So, the first three postulates simply encode facts about the use of a straightedge or compass. The fourth postulate addresses the uniqueness of the right angle. The fifth and final postulate of the first book caught

the eye of some mathematicians. The five postulates are as follows: (Katz, 2009, p.53)

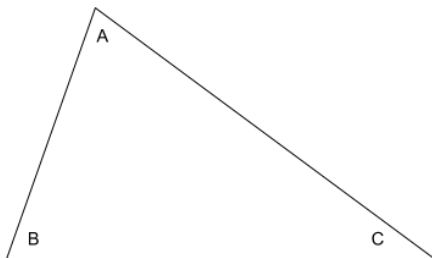
1. To draw a straight line from any point to any point [A straightedge property.]
2. To produce a finite straight line continuously in a straight line. [A straightedge property.]
3. To describe a circle with any center and distance [radius]. [A compass property.]
4. That all right angles are equal to one another. [Meaning that all right angles have the same "standard" magnitude. Euclid wisely understood that it was necessary for him to accept this as a postulate. (Heath, 1956)]
5. That, if a straight line intersecting two straight lines makes the interior angles on the same side less than two right angles [less than 180°], the two straight lines, if produced [extended] indefinitely, meet on that side on which are the angles less than two right angles.



The fifth postulate is illustrated above. If two lines are intersected by a third, and $\angle A + \angle B < 180^\circ$, then the two lines will meet on the side of angles A and B, creating a triangle. This postulate became known as the parallel postulate, since any two lines which did not meet these criteria would be considered parallel. In some ways, this fifth postulate seems acceptable.

However, need this be considered a postulate? Mathematicians contemplated this for centuries.

Among those was Proclus, a first-century Greek writer (Katz, 2009, p. 51). Proclus claimed that the fifth postulate did not fit with the other four due to its complexity. He stated that it was, in fact, a theorem, “and the converse of it is actually proved by Euclid himself as a theorem” as well. (Lamb, 2015, p. 1). A theorem is a statement logically deduced from postulates or previous theorems. The theorem mentioned by Proclus is proposition 17 of the same book, which states that “the sum of two angles of a triangle is less than two right angles” (Lamb, 2015, p. 1). This proposition is illustrated below.



Proposition 17 stated that if any two of the interior angles A, B, and C of the triangle were added together, their sum would be less than 180° . It is clear that this is simply the converse of the parallel postulate, which made that postulate feel even more out of place next to the other four. Proclus presented an excellent point. If Euclid was able to prove I-17, he surely should be able to prove its converse, the parallel postulate (Katz, 2009, p. 1).

For centuries, “courageous souls” examined the parallel postulate, either trying to “prove the postulate, to derive it from other more obvious postulates, or else to replace it by some principles which are less complicated” (Struik, 1958, p. 282). Countless mathematicians tried and failed for one reason or

another to prove the parallel postulate (Rashed & Vahabzadeh, 2000, p. 183). Some tried to prove the parallel postulate by contradiction, others by recruiting the ideas of motion. Some tried instead to replace it all together within Euclid's *Elements* (Kanani, 2000, p. 112).

By the 11th century, this postulate sparked the attention of Persian (current day Nishapur, Iran) mathematician Umar al-Khayyami (1048 - 1131), known in the west as Omar Khayyam. Within mathematics, Khayyam expanded the knowledge of cubic equations, real numbers, the binomial theorem, and the length of a calendar year (O'Connor & Robertson, 1999). In addition to his works as a mathematician, Khayyam was a well-known philosopher, astronomer, and poet. His most famous work in poetry, the *Rubaiyat*, can be found translated and paraphrased into English by Edward Fitzgerald, completed in 1859 (Khayyam, 1937).

Khayyam recognized the failures of other mathematicians from the start, claiming that, "every one of them has postulated something which was not easier to admit than this [the fifth postulate itself]" (Rashed & Vahabzadeh, 2000, p. 219). He also stated that their error was due to "their disregarding the principles taken from the Philosopher [Aristotle], and their relying upon the extent which Euclid had supplied in the beginning of the first Book" (Rashed & Vahabzadeh, 2000, p. 224). Khayyam explains that modern mathematicians had failed to prove the parallel postulate because they were only relying on the original four postulates in Book I of Euclid's *Elements*. However, relying on these four postulates alone is not enough, because "the propositions which are required prior to geometry are numerous" (Rashed & Vahabzadeh, 2000, p. 224). After seeing the countless attempts and failures of other mathematicians, Khayyam did not attempt to prove Euclid's famous parallel postulate from the other four postulates.

Instead, Khayyam believed that Euclid had begun the *Elements* in a manner that was incomplete. He claimed "the reason why Euclid has disregarded the demonstration of this

premise and has postulated it [the fifth postulate], is that he was relying upon the principles taken from the Philosopher [Aristotle] regarding the notion of straight line and of rectilinear angle" (Rashed & Vahabzadeh, 2000, p. 222). It is important to note that Khayyam is not stating that Euclid was wrong for working off of the primary premises of Aristotle to create the fifth postulate. Khayyam understands Euclid's thought process behind the fifth postulate, including a brief sketch and example into his commentary.

Rather, Khayyam is confused why Euclid would choose to begin with such a complicated postulate without including a discussion, asking "how can one allow Euclid to postulate this proposition [...] while he has demonstrated many things much easier than these?" (Rashed & Vahabzadeh, 2000, p. 223). Khayyam, while appearing to get a bit frustrated, presents an excellent point. Euclid was capable of producing far less complicated propositions from the primary premises of Aristotle. Khayyam provides the example of Euclid III-29: "*In equal circles straight lines that cut off equal circumferences are equal*" (Rashed & Vahabzadeh, 2000, p. 223). The proof of III-29 is extremely short and straightforward. Thus, when comparing it with Euclid's parallel postulate, Khayyam exclaims "how much will he stand in need of proving something like that!" (Rashed & Vahabzadeh, 2000, p. 223). Even though Euclid derived the parallel postulate using principles taken from Aristotle, it seems that Khayyam believes that it can be conveyed in a simpler way. Therefore, Khayyam chose to address the parallel postulate by claiming Euclid should have started with more natural and "pure" principles which would be "easier to admit" (Kanani, 2000, p. 112; Rashed & Vahabzadeh, 2000, p. 219). It appears that Khayyam's goal was not to prove the parallel postulate, but rather to rewrite Euclid's *Elements* in a way that was more natural to the mathematician and to the philosopher.

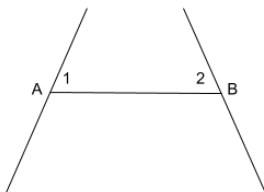
Interestingly enough, it is not until book I, proposition 29 that Euclid even uses the parallel postulate. This became

another common wonder among mathematicians (Katz, 2009, p. 59). Was the fifth postulate an afterthought that was only added for the demonstration of the 29th proposition? Was it written with haste? Nonetheless, Khayyam accepted the first 28 propositions of book 1, which were based on only the first four of Euclid's postulates. He began his rewriting of the *Elements* at proposition 29. Khayyam chose two definitions and three principles to begin his discussion, and eight propositions to ultimately replace the parallel postulate (Kanani, 2000, p. 115).

Modern mathematicians criticize Khayyam's argument, claiming that his "attempts to eliminate this postulate or deduce it from other axioms, that is, to find a simpler substitute, had failed" (Kanani, 2000, p. 122). Others argue that Khayyam's argument was meant to "justify the parallel postulate," and that "the reader can easily find the mistake in the third theorem of part I" that ultimately caused his eight-proposition argument to fail (Amir-Moez, 1959, p. 275). We will examine these claims and Proposition Three closely, and locate if and where a fatal error occurs in his logic. All of the translated material below was compiled and translated from two modern manuscripts of Khayyam's work (Rashed & Vahabzadeh, 2000, p. 215). Moving forward, all notes in square brackets and all illustrations are mine. Notes in angle brackets are provided by the translator.

DEFINITION 1.1:

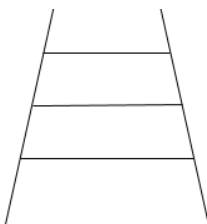
The distance between two straight lines situated in the same plane is the straight line which joins them so that the two internal angles are equal.



[Let two lines be joined by a line segment AB . If $\angle 1 = \angle 2$, then the length of AB between the point A and the remaining line is the distance between the two lines.]

DEFINITION 1.2:

Two straight lines situated in a same plane diverge in one direction when their distance one from another increases in this direction. -And two lines in the same plane converge in one direction when their distance one from another diminishes in this direction.

**PRINCIPLE 1.1:**

Two parallel lines are equidistant.

[This was a common principle asserted by Islamic mathematicians. (Kanani, 2000, p. 115)]

PRINCIPLE 1.2:

If two straight lines in the same plane diverge in one direction, it is impossible that they converge in the same direction. -And if two straight lines in the same plane converge in one direction, it is impossible that they will diverge in the same direction .

[Two straight lines cannot both converge and diverge in the same direction.]

PRINCIPLE 1.3:

If two straight lines intersect at a point, they will diverge indefinitely, away from the point of intersection.

[Khayyam planned to insert Propositions One through Six into Euclid's *Elements* , and use Propositions Seven and Eight to replace part of Euclid's *Elements* . His scheme for doing so is outlined below, where double arrows indicate replacement.

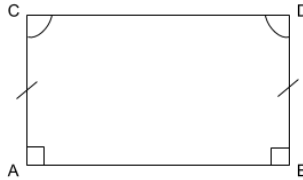
<u>Euclid's <i>Elements</i></u>	<u>Khayyam</u>
Proposition 1	
...	
Proposition 28	
	Proposition One
	Proposition Two
	Proposition Three
	Proposition Four
	Proposition Five
	Proposition Six
Propositions 29, 30	↔ Proposition Seven
Fifth Postulate	↔ Proposition Eight

...And this is where we begin with the true causal demonstration of this notion with the help of God and His good support...

PROPOSITION ONE,

that is the [new] 29th of Book I [of Euclid's *Elements*].

The line [segment] AB is given. And we draw AC perpendicular to AB, and we will set BD perpendicular to AB and equal to the line [segment] AC <they will consequently be parallel, as has been demonstrated by Euclid on proposition 26>, and we will join CD. I say then that the angle ACD is equal to the angle BDC.

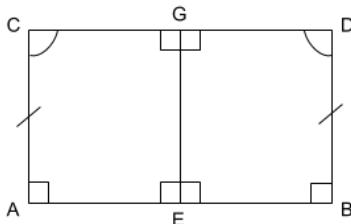


[The proof of Proposition One is straightforward. Khayyam creates two diagonal lines AD and BC and comes to his conclusion using congruent triangles, a standard Euclidean proof.]

PROPOSITION TWO,

that is the [new] 30th of the *Elements*.

We repeat the figure ABCD [from Proposition One], and we divide AB in two in E, and we draw EG perpendicular to AB. I say then that CG is equal to GD, and EG perpendicular to CD.

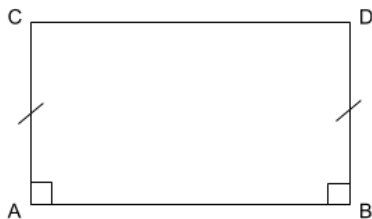


[The proof of Proposition Two is also straightforward. Khayyam creates diagonal lines CE and DE and again comes to his conclusion using congruent triangles.]

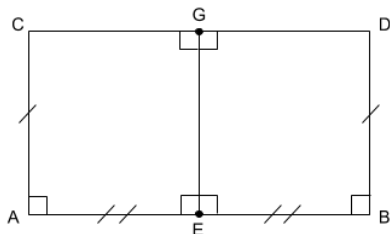
PROPOSITION THREE,

that is the [new] 31st of the *Elements* .

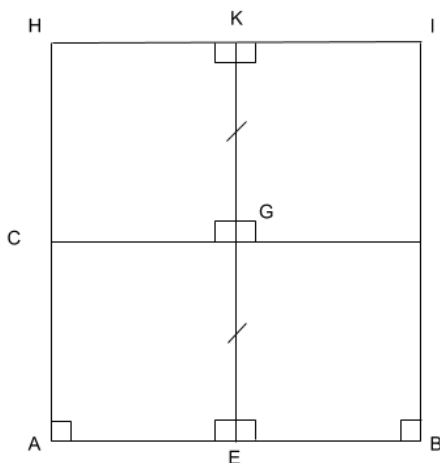
And we repeat the figure $ABCD$ [from Proposition One]. I say then that the angles ACD, BDC are right.



Demonstration. [Proof] We divide [bisect] AB in two halves at E ; and we draw the perpendicular EG [at E . Note that EG is also perpendicular to CD at G by Proposition Two],



and we produce [extend] it; and we set GK equal to GE ; and we draw HKI [H and I defined below] perpendicularly to EK ; and we produce [extend] AC, BD .



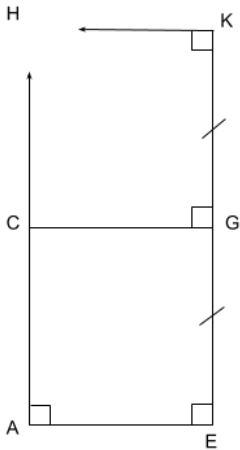
[Claim] Therefore they will cut HKI at H, I .

[Proof of claim] <For AC, EK are parallel;

[Euclid I-27 states: If a straight line $[CG]$ falling on two straight lines $[AC$ and $EK]$ makes the alternate angles $[\angle CGK = \angle EGD,$ both right angles] equal to one another, then the straight lines are parallel to one another. Therefore AC is parallel to EK .]

and HK, GC are also parallel [again, by Euclid I-27]. But whenever there be two parallel lines, the distance between them does not vary. [By Khayyam's Principle 1.1, which states: *Two parallel lines are equidistant.*]

Therefore we produce [extend] to infinity AC parallel to EK [similarly, we extend "to infinity" BD to EK], and we produce [extend] to infinity HK parallel to GC ; and they [the extensions] will inevitably meet these [points H and I].>

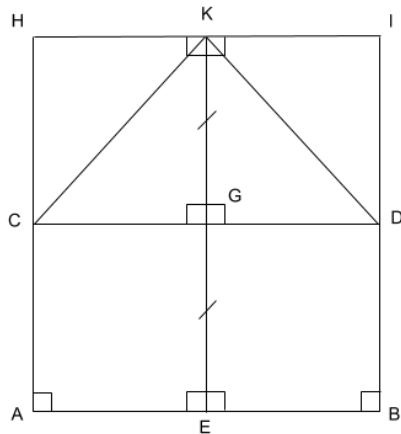


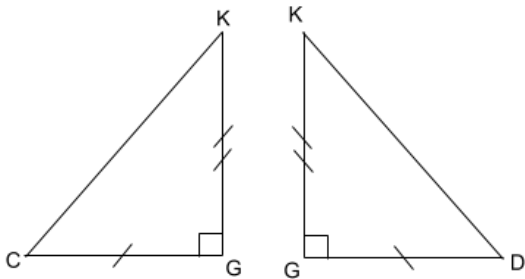
[By Principle 1.1, the distance between GC and HK , and between AH and EK , does not vary. Therefore, these extensions will inevitably meet at a point H . This argument can be replicated for point I . This follows from Khayyam's understanding that Euclid's *Elements* required a continuity axiom of some sort. He mentions this early on in his demonstration, stating "that magnitudes are divisible ad infinitum, and are not composed of indivisible things [...]" the truth is that this proposition is among the premises of geometry, not among its

parts [theorems]. -And notably, that one can produce a straight line to infinity" (Rashed & Vahabzadeh, 2000, p. 224).]

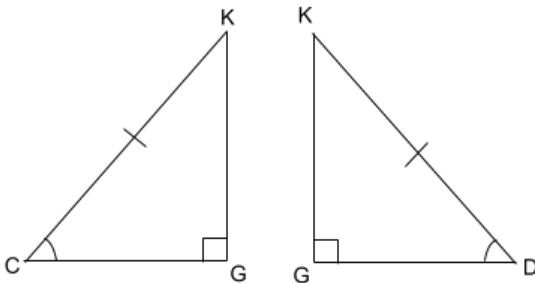
And we join CK , DK .

So [in triangles GCK and GDK] the line CG is equal to GD [by Proposition Two]; and GK is common, and it is a perpendicular [by Proposition Two].

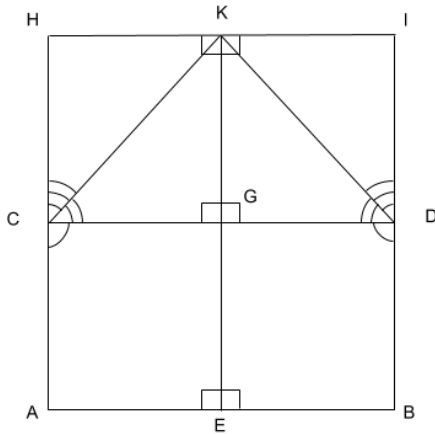




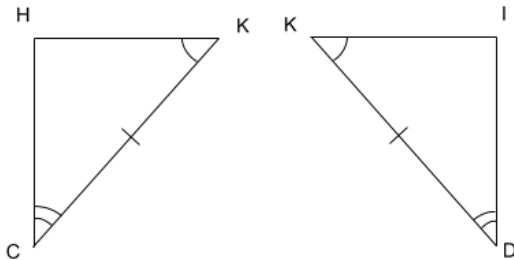
[So by the SAS statement, Euclid I-4, triangles GCK and GDK are congruent.] Therefore the bases CK , KD will be equal, and the angles GCK , GDK will be equal.



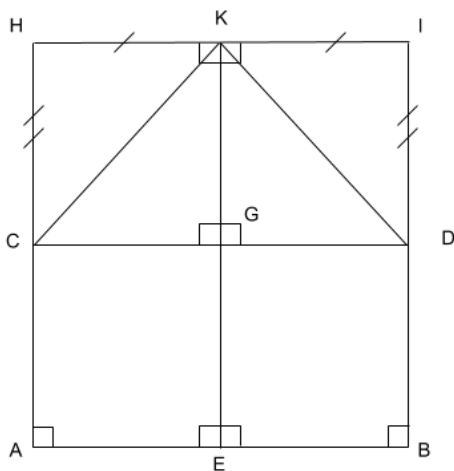
Therefore there will remain the angle HCK equal to KDI . [Note that straight $\angle ACH = \angle ACG + \angle GCK + \angle HCK$ and straight $\angle BDI = \angle BDG + \angle GDK + \angle KDI$. Since $\angle ACH = \angle BDI$, $\angle ACG = \angle BDG$, and $\angle GCK = \angle GDK$, we have $\angle HCK = \angle KDI$.]



But the angles CKG , DKG are equal [by congruent triangles CKG and DKG]. Therefore there will remain the angles CKH , DKI equal to each other [since as right angles $\angle GKH = \angle GKI$ and $\angle CKG = \angle GKD$]. But the line CK is equal to KD [by congruent triangles CKG and DKG].



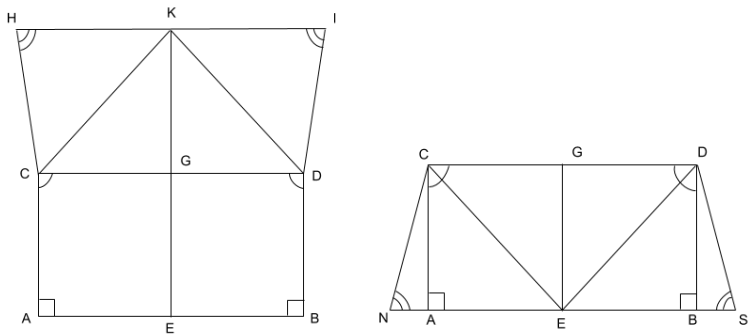
[Thus, by the ASA theorem, Euclid I-26, triangles CKH and DKI are congruent.] Therefore CH will be equal to DI , and HK equal to KI .



[Given these preliminaries, Khayyam returns to prove his original proposition “I say then that the angles ACD, BDC are right”. Recall that by Khayyam’s Proposition One, $\angle ACD = \angle BDC$.]

And if the angles ACD, BDC are right, the statement will be true. But if they are not right, each one of them will either be less than a right <angle>, or greater.

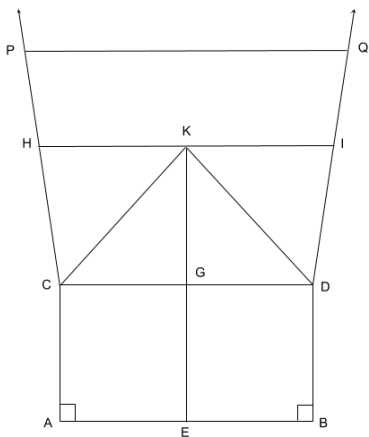
[Case 1: Proof by contradiction] Let it [$\angle ACD = \angle BDC$] first be less than a right <angle>. And we apply the surface [rectangle] HD to the surface [rectangle] CB . [Common notation at the time denoted rectangles by their opposite vertices. Khayyam reflects rectangle HD onto rectangle CB along line segment CD .] GK will therefore apply to [lie on] GE [recall $GK \cong GE$ by construction], and HI to [lie on] AB [since GE is perpendicular to AB and GK is perpendicular to HI].



[Claim] Therefore HI will be equal to the line NS [as shown].

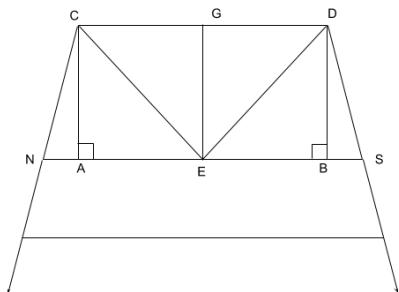
[Proof of claim] <For the angle HCG [\cong reflected angle NCG] being greater than the angle ACG , [Since $\angle ACH = 180^\circ$ and $\angle ACG < 90^\circ$, it follows that $\angle HCG > 90^\circ$.] the line HI will be greater than AB . [Since $\angle ACG < 90^\circ$, and $\angle GCN > 90^\circ$, triangle ACN is formed. Therefore NA exists, and $HI > AB$. This argument is repeated for angle GDI .] > [End of proof of claim]

And likewise, if the two lines [CH and DI] be produced [extended] ad infinitum [to infinity] in this manner, each of the joined line[s] will be greater than the other, and they will follow one another. [Meaning if CH and DI are extended to infinity in the direction of H and I , then the lines connecting them (CD , HI , PQ , ...) will continuously get larger ($CD < HI < PQ < \dots$)]



Therefore the lines AC , BD [AH , BI in the original figure] will diverge [in the direction of H and I by Khayyam's Definition 1.2].

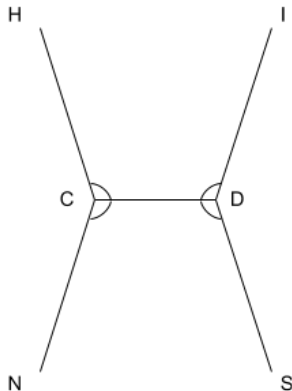
And likewise, if AC , BD be produced [extended] in the other direction [in the direction of N and S], they will diverge by the same demonstration; and the state of the two sides will necessarily be similar when applied [illustrated below].



Therefore two straight lines [AH and BI] will cut a straight <line> [CD] according to two right <angles> [meaning the sum of their angles at C and D will each equal 180°], then the distance between them increases on both sides of that line [CD].

And this is a primary absurdity when straightness be conceived and the distance between the two lines be realized.

[Contradiction. Recall Khayyam's Principle 1.2. Line segments AH and BI are both converging towards CD and then diverging away from CD . Therefore, AH and BI are both converging and diverging in the same direction, which contradicts Principle 1.2.]

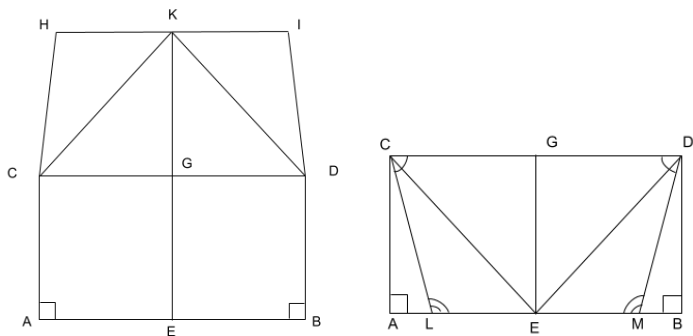


<And that is among the things which have already been undertaken by the Philosopher

[Aristotle. Khayyam produced Principle 1.2 from similar work by Aristotle. (Lamb, 2015, p. 7)].>

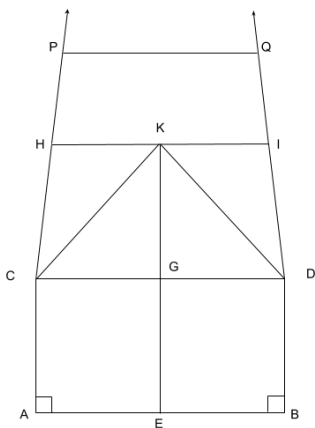
[Case 2: Proof by contradiction] And if each of them [$\angle ACD = \angle BDC$] be greater than a right <angle>, the line HI when applied will be equal to LM ; that is less than AB .

[Again, Khayyam reflects rectangle HD over rectangle CB along line segment CD . Since $\angle ACH = 180^\circ$ and $\angle ACD > 90^\circ$, it follows that $\angle GCH < 90^\circ$. Since $\angle CAE = 90^\circ$, triangle CAL is produced within rectangle CB . This argument is repeated on $\angle BDC$. Therefore, $LM < AB$.]



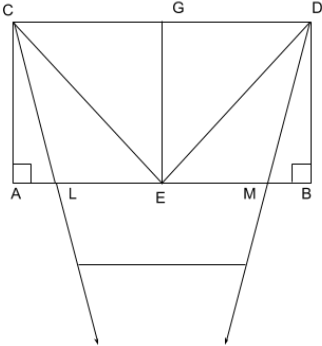
And likewise all the lines which are joined in this manner.

[Khayyam repeats the argument from the acute case. If AH and BI are extended to infinity in the direction of H and I , then the lines connecting them (CD, HI, PQ, \dots) will continuously get smaller ($CD > HI > PQ > \dots$)]

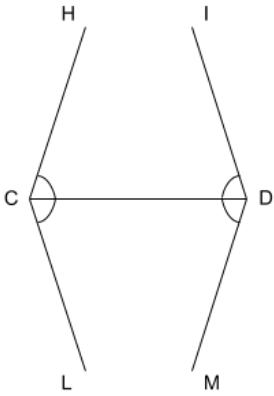


Therefore the two lines [AH and BI] will converge [in the direction of H and I , by definition 1.2].

And if they $[AC, BD]$ be produced $[extended]$ in the other direction $[in the direction of L and M], they $[CL$ and $DM]$ will also converge, for the state of the two sides will be similar when applied $[illustrated below]$. <And that is among the things which you will be able to recognize with a modicum $[small amount]$ of reflection and investigation.>$



And this is also absurd because of what we have mentioned. $[Line segments AH and BI are both diverging towards CD and then converging away from CD . Therefore, AH and BI are both converging and diverging in the same direction, which contradicts Principle 1.2.]$



And as it is impossible for the two lines [HI and AB] to be unequal, they will be equal. And as they are equal, the two angles [$\angle ACD = \angle BDC$] will be equal. Consequently, they [$\angle ACD = \angle BDC$] will in that case be two right <angles>. [End of proof.]

<One will recognize it with a modicum of reflection, we will therefore omit it to avoid prolixity [wordiness]. So whosoever wants in this place to establish that according to the mathematical order, let him do it; we will not stand in the way!>

[With that, Khayyam has completed Proposition Three. Khayyam restates that his predecessors failed because they were simply overcomplicating their arguments. He also adds an additional definition before proceeding.]

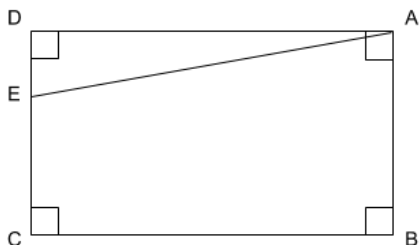
DEFINITION 1.3:

Two straight lines perpendicular to a given straight line are called face-to-face.

PROPOSITION FOUR,

that is the [new] 32nd of the *Elements*.

The surface $ABCD$ [from Proposition Three] is rectangular. I say then that AB is equal to CD , and AD equal to BC .



[Khayyam proves Proposition Four by contradiction. He claims that $AB = CE$ and proves this to be impossible using Euclid's proposition I-16, the exterior angle theorem.]

PROPOSITION FIVE,

that is the [new] 33rd of the *Elements*.

The lines *AB*, *CD* [in rectangle *ABCD* from Proposition Four] are *face-to-face*. I say then that each line which is perpendicular to one of them will then be perpendicular to the other.

[Khayyam proves this proposition by contradiction.]

PROPOSITION SIX,

that is the [new] 34th of the *Elements*.

Whenever there be two parallel lines <as Euclid has defined it, namely those which do not meet, without any other condition>, they will be face-to-face.

[This follows immediately from Khayyam's definition of face-to-face and Proposition Five.]

PROPOSITION SEVEN,

that is the [new] 35th [of the *Elements*].

<This proposition replaces [original] propositions 29, 30 of Book 1 [of Euclid's *Elements*].>

If a straight line falls upon two parallel lines, the alternate angles will be equal to one another, and the exterior angle equal to the interior, and the two interior angles equal to two right <angles>.

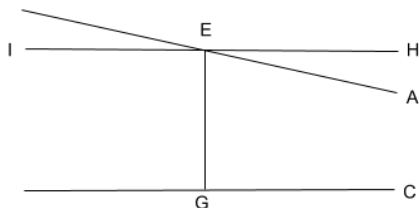
[Proposition Seven is almost word-for-word to Euclid's proposition I-29. The translators also claim that this Proposition should replace Euclid I-30: Straight lines parallel to the same straight line are also parallel to one another. The replacement of I-30 is not explicitly justified. Khayyam proves Proposition Seven by utilizing his previous propositions.]

We have thus demonstrated the laws of parallels without having needed the premise we want to demonstrate [the fifth postulate], and that Euclid has postulated. And this is its demonstration:

PROPOSITION EIGHT,

that is the [new] 36th [of the *Elements*].

The line EG is straight; and the lines EA, GC have been drawn from it in such a way that the angles AEG, CGE are less than two right <angles>. I say then that they will meet in the direction of A.



[Note that this is a version of Euclid's parallel postulate. Khayyam begins by stating that $\angle AEG < \angle CGE$ by construction. He draws a third line HI such that $\angle HEG = \angle CGE$. Using his previous propositions, Khayyam claims that HI and GC must be parallel, proving the parallel postulate.]

...So this is the true demonstration of the laws of parallels and of the notion which was aimed at. And the truth is, that one should add these propositions to the work the *Elements* according to the order which was mentioned; and take away from it what pertains to the principles and belongs by right to [Aristotle's] First Philosophy <and we have only produced it here, although it be foreign to the art itself, for we could not avoid to produce those sections because of the difficulty of the question and the numerous things which people say about it>, and add what we mentioned to the beginning of the principles. For the art requires it in order to be brought to philosophical perfection, so that the one which looks into it will not be disturbed with doubts and uncertainties.

And it is time for us to conclude the first Book praising God the Sublime, and blessing the prophet Muhammad and all his family.

With that, Khayyam believed that he had successfully replaced the parallel postulate with his principles and propositions. He believed that his eight propositions should be written into Euclid's *Elements* according to the order mentioned earlier. Since the parallel postulate continued to be the center of attention among some mathematicians for centuries after Khayyam, we know that Khayyam did not succeed in convincing others that he had replaced the parallel postulate.

On the contrary, Khayyam's work sparked criticism. Recall that some mathematicians claimed that Proposition Three contained a fatal error which caused Khayyam's argument to fail. In particular, Proposition Three was the first time that he used Principle 1.1, stating that two parallel lines are equidistant, and Principle 1.2, stating that two lines couldn't both converge and diverge in the same direction. Propositions One and Two did not require any additional principles.

According to the objecting mathematicians, the fatal error in Khayyam's argument was that Principles 1.1 and 1.2 are actually logically equivalent to the fifth postulate itself (Rashed & Vahabzadeh, 2000, p. 185).

The translators of Khayyam's work commented upon his use of these equivalent principles, stating that "for him this is not so much a matter of logical equivalence, but rather the fact that principles [One & Two] are immediate consequences of the notions of straight line and rectilinear angle, whereas the [fifth] postulate itself is not" (Rashed & Vahabzadeh, 2000, p. 185). It seems that Khayyam believed his two Principles were more natural than the parallel postulate itself, and they should replace it. Since the two Principles are logically equivalent to the fifth postulate, Khayyam had succeeded in creating something "easier to admit" than the fifth postulate without fault.

Nonetheless, for centuries, many mathematicians still criticized Khayyam's work, claiming that by using principles that were equivalent to the parallel postulate, that his replacements and additions to the *Elements* were done "in vain" (Amir-Moez,

1959, p. 275). They claimed that Khayyam's argument failed in the same way that every other mathematician at the time failed to prove the parallel postulate, from, "an error or, more likely, another assumption" (Katz, 2009, p. 59). However, is it appropriate to conflate Khayyam's attempt with the attempts of others? Was Khayyam's argument a failure, or was it a correct proof of the fifth postulate from Euclid I-1 through I-28 using replacement axioms?

At the same time, others claimed that Khayyam's "attempts to eliminate this postulate or deduce it from other axioms, that is, to find a simpler substitute, had failed" (Kanani, 2000, p. 122). This bit of criticism, in itself, is contradictory. Eliminating or deducing the fifth postulate is not the same as finding a simpler substitute. Even so, we've seen that Khayyam was not attempting to eliminate, deduce, or justify the parallel postulate, as claimed. He was attempting to find a simpler substitute that was "easier to admit", and with that he was successful. Therefore, contrary to these criticizing mathematicians, there is no fatal error within Khayyam's argument, just a misunderstanding of his original intent.

It is also interesting to note that in his final comments, Khayyam mentions Aristotle's First Philosophy. Recall that Khayyam also used parts of Aristotle's work to produce Principle 1.2. Since Khayyam was a distinguished philosopher, it makes sense that he would continuously mention the work of Aristotle. Today, the First Philosophy is known as metaphysics, a branch of philosophy centered around understanding objects, space, and time in a natural manner (Wilshire, Walsh & Grayling, 2018). When working under the First Philosophy, the goal is to use only the most natural or basic premises to arrive at the conclusion. In addition, when using the First Philosophy within mathematics, there should be "no unjustified assumptions" (Wilshire, Walsh & Grayling, 2018). When considering this mention of the First Philosophy, it appears that creating more natural statements than the fifth postulate was exactly what Khayyam was attempting to do. Khayyam was able to create

two Principles that were equivalent to the parallel postulate without unjustified assumptions, satisfying the First Philosophy.

Omar Khayyam did not succeed in convincing others to replace the parallel postulate. However, he did succeed in bringing the fifth postulate to “philosophical perfection” (Rashed & Vahabzadeh, 2000, p. 233). Khayyam was able to discover two equivalent principles that were free of “doubts and uncertainties” and indeed easier to admit than the fifth postulate itself (Rashed & Vahabzadeh, 2000, p. 233). Thus, from that point of view, Khayyam’s work is done. Omar Khayyam concludes his argument is complete both from a mathematical and philosophical standpoint, and so will I.

With them the seed of Wisdom did I sow,
And with mine own hand wrought to make it grow;
And this was all the Harvest that I reap’d –
“I came like Water, and like Wind I go.”
– Omar Khayyam (1048-1131),
translated by Edward Fitzgerald (1859)
(Khayyam, 1937, p. 152)

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The Importance of Bond “Girls”

By Hetty Bai

The James Bond franchise has been a staple within cinema for over fifty years. A British cultural icon as well as an emblem of the ideal suave gentlemen, the James Bond franchise has decades of history associated with its books and films. Through the years, some staples have been associated with each film: the “Bond, James Bond” quote, Aston Martins, intricate spy gadgets, and Bond girls. People have criticized Bond girls as only existing to provide sex appeal without substance. After analyzing five scholarly sources about Bond girls, I conclude that they contradict the stereotypical notion that women in media only serve as eye candy, and show these women are competent and important characters. Before analyzing this topic, I provide background about Bond girls and the nature of a Bond film.

James Bond, the main character, is also known as 007 (McNeely). In every film, he must defeat his adversaries to complete his British Secret Service mission. Along the way, he always runs into a young woman who will be known as the Bond Girl. A Bond girl is characterized as the love interest of James Bond. Looking across the Bond franchise, a different Bond girl appears in every film. Honey Ryder was the original Bond girl, being introduced in the first Bond film, *Dr. No* (South). In 1962, Honey Ryder, appearing in a bikini, made headlines as the film was released during a socially conservative era. Since then, there have been Bond girl villains, Bond girl allies, and Bond girls who tread the line between both roles.

Bond Girls have evolved dramatically over time. When Bond girls were introduced, it was obvious one of their key characteristics was sexiness. Whether it was Honey Ryder’s yellow swimsuit or Plenty O’Toole’s revealing dress, Bond girls

attracted the viewer's attention (Nitins). The Bond girls' looks eclipse their characters as many people fail to notice the competence these women possess. This notion refutes the stereotype that Bond girls are just damsels in distress. For example, in the first Bond film, *Dr. No*, Honey Ryder reveals to Bond that she murdered the man who abused her (McNeely). There have also been times where Bond was saved by the Bond girl. In *Goldfinger*, Pussy Galore saves Bond and his mission, during the second half of the film when he is a prisoner of the main villain (McNeely). It is not until the very end of the movie that Pussy Galore shows any sexual interest in Bond, contradicting the notion that Bond girls in the franchise immediately surrender to Bond (McNeely). Additionally, Bond girls are frequently have the same profession as Bond. There have been six Bond girls who, among their other roles, were undercover government agents (McNeely). This detail is important as many people believe that all Bond girls have no knowledge or authority in Bond's field. Critics often focus on these women's looks, disregarding the fact that they have had similar experiences as Bond, and are essentially a female version of Bond.

Though James Bond is often presented as tough, Bond girls offer viewers insight into the emotional vulnerability of Bond. In *On Her Majesty's Secret Service* (1969), James Bond is married to a young woman, Tracy, a detail often glossed over in the history of Bond (Garland). His marriage to Tracy is significant as it shows Bond is willing to commit, trust, and care for a woman for life instead of being with multiple women like in the previous Bond films. This marriage shows the sensitive side of Bond as it debunks the womanizing attitude he is often known for. In the same film, his wife is murdered after their wedding (Garland). This loss is devastating for Bond as he feels responsible for her death (Garland). This marriage is never mentioned in subsequent Bond films so the viewers could never see how this loss affected Bond. Part of the reason we do not witness Bond's emotions following the loss of his wife may be because the actor playing Bond in the film, George Lazenby, left the

franchise after the film's release (Held). Sean Connery would re-launch the franchise with his portrayal of Bond, yet the character's short marriage would be passed over for newer plot lines.

In addition to Bond's relationship with Tracy, a stronger example of Bond's vulnerability is the relationship between him and Vesper Lynd in 2006's *Casino Royale* (Garland). This is the only Bond film where the Bond girl acts as both ally and enemy. Vesper and Bond's chemistry is evident throughout the film, though Vesper continuously refuses to sleep with Bond stating that he must stay focused on the mission (Funnell). This detail of Vesper's refusal of Bond reinforces the fact that Bond girls are socially independent. Near the end of the film, Bond confesses he will give up his "license to kill" to stay with Vesper ("Casino"). This confession is important as it further suggests to the humanity of Bond. He loves Vesper so much that he would leave the life he has led to in order to stay with her. Yet in the end, Vesper Lynd betrays Bond and in the process, is drowned despite Bond's efforts to save and revive her ("Casino"). Despite her betrayal, viewers witness Bond's desperation while he struggled to rescue her. This struggle indicated that he truly loves her and was potentially willing to forgive her. Unlike Tracy's death, the death of Vesper is continuously mentioned in subsequent Bond films. In *Quantum of Solace* (2008), Bond carries Vesper's necklace, this gesture showing that he was reluctant to move on after her death, an emotional element that was never touched on in previous Bond films. This roller-coaster relationship opened up Bond to the viewers, showing that despite the resilient look Bond wears, he is overwhelmed by his true love's death that it even haunts him in future films. Because of Vesper, Bond does not look like an indestructible secret agent, but rather a vulnerable man who, like everyone else, gets devastated over a loss.

Vesper Lynd and Tracy were arguably the only true loves of James Bond in the franchise, due to Bond's commitment to both. The differences of Vesper's relationship with Bond versus Tracy's relationship with Bond shows that in the fifty-five-year

history of James Bond, the films have evolved, and thus so have the Bond girls.

One aspect about Bond girls that has evolved are the names. When Bond girls were introduced, they often had names containing sexual innuendos, such as Pussy Galore. Although earlier Bond girls had sexually suggestive names, there has not been a Bond girl since Xenia Onatopp (1995) with a suggestive name (Garland). In *Casino Royale* (2006) Bond jokes to Vesper that he should call her "Miss Tiffany Broadchest," a reference to the earlier Bond girl names, which she adamantly rejects (Funnell). By having a Bond girl actively reject the usual Bond girl classification, it is obvious that the modern Bond films are trying to distance themselves from the previous objectifying terms. This distancing is significant as it signifies that these modern 2000 Bond films are a newer, rebranded, contemporary era of Bond.

Besides the names, other aspects of Bond girls have also evolved. In the article *I Know Where You Keep Your Gun*, Lisa Funnell, categorizes the Bond girls evolution into three stages: the English Partner in the 60s, the American Side-Kick in the 70s and 80s, and then the American Action Hero in the 90s and early 2000s (Funnell). From just a love interest, to a side kick and then an equal partner, Bond girls have evolved significantly and been given a greater role in the franchise. Instead of being just a standby, the roles of Bond girls have become more active as modern Bond girls are often undercover spies or competent fighters. Modern Bond girls are now physically, intellectually, and sexually equal to 007. The growing importance of Bond girls in the franchise has also been recognized by advertisers as now promotional materials of Bond films don't just focus on James Bond himself, but also the Bond girl. When *Die Another Day* (2002) was released, the car, bikini and lipstick that Bond girl Jinx wore were advertised (Nitins). Promotion for *Tomorrow Never Dies* (1997) featured both Bond and the Bond girl in advertisements for Omega watches (Nitins). In modern Bond films, as the importance and status of Bond girls improve, so do

reviews of the franchise (Held). This growing attention on Bond girls is best described in a Yin Yang analogy by James South and Jacob Held. Held and South state that in earlier films, Bond, aka the masculine Yang, overpowered the feminine Yin of the Bond girls (Held). This led to imbalance as Ian Fleming, the author of James Bond, originally wanted both elements to be equally portrayed in this universe (Held). It was not until later films when the machismo of Bond was complemented by the substantial female characters (Held). This analogy is effective as many viewers think that by increasing the presence and competence of Bond girls, Bond's masculinity is threatened. The yin yang analogy is effective as Bond's masculinity is complimented by the Bond girl's growing character.

Bond girls complicate the notion that women in media exist as sexualized objects because a large portion of the James Bond fan base are women (Nitins). If Bond girls are demeaning to women, shouldn't this turn away half of the Bond demographic? The reason women enjoy the films is because Bond girls are competent characters and despite the exploitation of the Bond girls' sex appeal, the films equally utilize James Bond's sex appeal. All actors who have played Bond were cast, in part, due to their attractive appearance and mannerisms (Nitins). There have been many times throughout the series where Bond was either exposed shirtless or suggestively revealed in another way (Nitins). The most notable example of this is in *Casino Royale* (2006) where Bond himself rises from the ocean wearing only a swimsuit (Nitins). This scene is significant as it was Daniel Craig's first time as Bond and thus introducing a new, modern continuation of the Bond franchise (Held). Arguments have been made that Bond girls are sexualized due to the required *Playboy* promotional photoshoots of past Bond girl actresses, however, this is no longer a requirement (Nitins). Though *Playboy* photoshoots used to be in the Bond Girls contract, sexually suggestive *GQ* photoshoots were required for Bond too (Nitins). although Bond girls are characterized as sexy, so is James Bond himself, but this is often overlooked as critics focus on the women's sexualization.

Both James Bond and Bond girls are sexualized to fulfill one of the movie's main themes: making Bond the ideal man. In all films, Bond is always portrayed as the man every man wants to be, and the man every girl desires. He is capable in combat and suave, thus, appealing to both male and female audiences. The attention the Bond girls give Bond helps develop the mysterious appeal of his character. By making Bond appear to be the interest of beautiful women, Bond is seen as the man every girl wants to date, and every guy wants to emulate. The supporting females are sometimes saved by Bond, but only to reinforce his status as the lead of the franchise.

I conclude that the Bond girl's purpose is often muddled and simplified as the "sex kittens" of the franchise. As I have explained, Bond girls are far more complex and serve a greater purpose for the franchise. Bond girls are attractive, but only because the characters are meant to be attractive, and that does not make them unacceptable female role models. Many overlook their more complex qualities. Though these girls are not the main character of the franchise, they deliver elements like emotional vulnerability and another layer of character and plot complexity that are vital to the success and development of the Bond franchise.

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Overcoming LDR Saturation in a Sun Tracking Solar Panel System

By Grace Reeseaman

Introduction

Dwindling, non-renewable energy sources, including carbon, petroleum, natural gas, and nuclear power, will soon necessitate a viable alternative. Yet, it is argued that renewable energy sources, such as equipping solar energy, are inefficient and expensive. Using solar panels to harness solar energy may provide a promising alternative, eradicating the search for hydrocarbon deposits. However, for solar panels to be commonplace, the process of capturing solar energy must be refined and efficiency increased. Utilization of a sun-tracking solar panel system may provide part of the answer for increasing efficiency. A sun-tracking solar panel not only has the capability of harnessing energy from solar rays, it includes a system that automatically orients the solar panel to the most efficient angle, relative to the sun, throughout the course of the day. A study by Sidek, et al. showed that the average sun-tracking solar panel system can be 26.9% more efficient compared to a fixed, tilted panel system. Yet, complications, such as saturation and effectiveness during low-visibility conditions, remain problematic for traditional sun-tracking system. Saturation occurs when the charge capacity of the photocell, or Light Dependent Resistor (LDR), is reached, making the current constant (York). If the charge capacity is reached, the algorithm that governs movement of the panel will error, returning to the first point of saturation rather than facing the sun. Given that the initial saturation location is often close to the desired position, this problem is typically ignored. Additionally, research has provided means to overcome the issue by utilizing a manual sun-tracking solar

panel system (Bhattacharya *et al.*). However, this requires an individual to manually change the orientation of the panel, which is ineffective and unattainable for large scale, solar panel facilities. The aim of this study is to explore a more efficient solution for saturation.

To combat the saturation problem, a filter was placed over the LDR, causing the flux through the LDR to be proportionally lower in all conditions. By preventing saturation, the filter allows the panel to maintain an efficient angle relative to the sun on clear days. However, Mie scattering effects make efficient angles on cloudy days more difficult to determine. Mie scattering, a solution to Maxwell's equations, occurs when light, in this case from the sun, reflects off a non-homogeneous media with particles that are approximately the size of the wavelength of the light (Xiaoyu *et al.*). This occurs as light passes through clouds, becomes more diffuse, and causes the most efficient angle to be more difficult to determine. Thus, a difference in the most efficient method of light detection on cloudy days versus sunny days was expected.

The flux values with and without the filter were compared in a variety of light intensities in order to determine whether the filter made a difference in the panel's efficiency, or if it would be more effective for the panel to remain parallel-to-the-ground during low-visibility days. Light intensity values (measured with a Luxmeter) and voltage at the LDR, with and without the filter, were recorded. A plot of lux and voltage were formed to directly compare the perceived light intensity by the LDR with and without a filter and a trendline was found for both sets of data using Excel, allowing the effect of the filter to be analyzed.

System Hardware

A servo motor with one degree of freedom controlled the position of the solar panel shown in Figure 1.a. The servo motor interfaced with an Arduino Uno microcontroller, that was instructed by a C++ code that modulated movement of

the LDR. The LDR is a resistor of which resistance is inversely proportional to incident light intensity due to the photoelectric effect. LDRs are also referred to as photocells or photoresistors (see Figure 1.b).

The motor is able to move the panel from zero to one-hundred eighty degrees along its one degree of freedom every fifteen minutes, and voltage values were taken and stored in an array at each degree. The maximum voltage of the array, and the associated position, was found using a program in Arduino (using C++). Once found, the servo motor adjusted the solar panel to the maximum voltage position.

The motor was held at a fifty-one-degree angle, relative to the horizontal, with the panel facing south. The specificity of this position and angle was used because, at the equinox, the sun's altitude was fifty-one-degrees. This angle was obtained by subtracting Kansas City's latitude, which is approximately thirty-nine, from ninety degrees. Given that the ecliptic at equinox is the average altitude of the sun, this will result in the panel being at a more efficient angle throughout the year (Jenkins).

The filter used during the measurement was made of polyethylene, a polymer commonly found in grocery bags. Polyethylene was chosen for its accessibility and efficacy. The filter was created by cutting a portion of plastic bag that would cover the photocell and then secured with a rubber band.

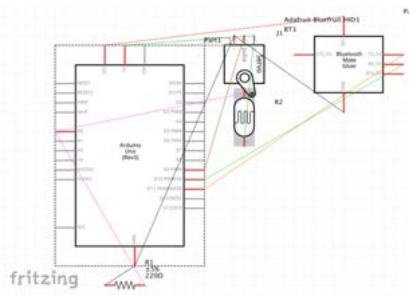
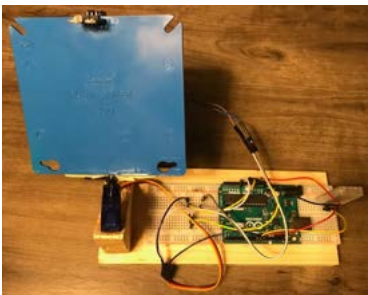


Figure 1.a (Left): Photograph of the sun-tracking solar panel.

Figure 1.b (Right): Circuit diagram of the sun-tracking solar panel. Made via Fritzing.

Application (STSP)

An application called STSP (Sun Tracking Solar Panel) was generated using Blynk to collect user-input data concerning the visibility (sunny versus cloudy) (see Figure 2.a.). The app displayed a graph of maximum light intensity (Lux) values throughout the day by interfacing with the Arduino and recording measurements in the form of virtual pins. The collected data was sent to one of two virtual pins, and the determination of which pin the data was recorded under depended on whether the user selected "SUNNY" or "CLOUDY" in the application. The collected and categorized data was then used to create a graph of light intensity, or flux per unit area, versus time as seen in Figure 2.b.

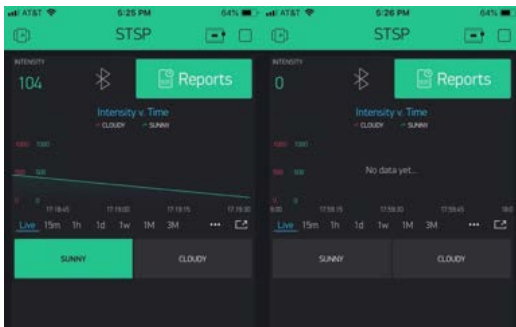


Figure 2.a (Left): A screenshot of the app prior to collecting data.

Figure 2.b (Right): A screenshot of the app while in use. Since "SUNNY" is selected, the data is stored in the corresponding virtual pin and used to create the graph shown.

The other widgets in the app were "Reports" and "Bluetooth." "Reports" created a description of the data stored in the virtual pins. "Bluetooth" provided communication between the Arduino and STSP. The panel would not be able to work unless connected via Bluetooth to STSP. To stop the panel from turning, a feature that is important in terms of efficiency during the night, the Bluetooth connection between the devices was disrupted. Additionally, STSP is capable of exporting data from the graph into Comma Separated Value (CSV) format via email.

Code

A code was written in C++ to instruct the Arduino to interface with the servo motor and record the voltage values detected at each degree in STSP. The code instructed the motor to move the solar panel from zero to one-hundred eighty degrees and store the voltage values, obtained with the attached photocell, in an array. The maximum value in the array, along with the corresponding location, was found using a loop. The servo motor then moved the panel to the location at which the detected voltage was at a maximum. Through use of a delay function, the code instructed the motor to carry out this function every fifteen minutes. At night, the user may disrupt the Bluetooth connection to prevent the panel from continuing the program. Shutting-down operation overnight assisted in maximizing the efficiency of the sun tracking solar panel system.

The data points in the array were sent to and displayed in the Arduino's serial monitor and plotter. The maximum voltage value was converted to a light intensity value and sent to STSP via Bluetooth. Depending on whether "SUNNY" or "CLOUDY" was selected in the application's "Segmented Switch" widget, the code instructed the data to be sent to one of the two virtual pins. The data was then displayed on the graph shown in STSP's user interface (Figure 3.a and 3.b).

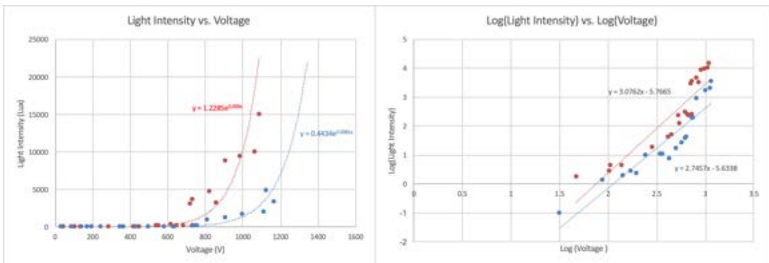


Figure 3.a (Left): The graph depicts light intensity versus voltage for an LDR with (red) and without a filter (blue).

Figure 3.b (Right): The graph depicts the log of light intensity versus the log voltage for an LDR with (red) and without (blue) a filter.

Equations

The values were converted from voltage to light intensity using one of two equations obtained by measuring intensity with a lux-meter that corresponds to a voltage value and then a line of best fit was found. Two equations were required in order to compare the effect of the filter on efficiency of the panel, specifically on cloudy days. These equations were included in the C++ code, and the converted value was sent to the app via Bluetooth. The equations obtained for converting Voltage (V) to Light Intensity (I) were as follows.

Without a filter:

$$I=0.4434*e^{0.0081*v} \quad (1)$$

With a polyethylene filter:

$$I=1.2285*e^{0.009*v} \quad (2)$$

A comparison of equation (1) and equation (2), reveals that the exponentially growing intensity corresponding to increasing voltage values are within a thousandth of each other. This discrepancy arises as the filter provides a larger horizontal shifting effect to the graph of light intensity versus time. It follows that different filters would have different coefficients and, therefore, would provide different horizontal shifting effects. Thus, equations (1) and (2) can be generalized with an approximate exponent as follows:

$$I=A*e^{0.00855*v} \quad (3)$$

where A is a constant dependent on the material of the filter. The constant A can be found by using multiple light sources that have known light intensity, and measuring the voltage produced by each light source. This process is akin to the steps taken to obtain equations (1) and (2).

Results and Discussion

The initial question asked how the filter affected the sun-tracking solar panel's light detection capabilities on cloudy days. This question was later extended to whether the filter would have a non-linear effect on the intensity of the incident light detected by the LDR. The equations show that the exponential relationship between intensity and voltage grows approximately the same amount, with and without a filter.

Additionally, Equation (3) provides a basis for what to expect with and without a filter on cloudy days. From analysis of the graph, it is apparent that the filter will have less effect on cloudy days than on sunny days. However, further investigation is required to determine if this prediction is consistent with experimental results. If the prediction is correct, then the most efficient method of collecting energy on cloudy days is to leave the solar panel in a parallel-to-the-ground position during low visibility days. This conclusion arises from the large uncertainty associated with the location of the light source due to the effects of Mie scattering.

Voltage	Intensity	Voltage	Intensity
<small>(No Filter)</small>	<small>(No Filter)</small>	<small>(Filter)</small>	<small>(Filter)</small>
808	924	825	4796
907	1240	861	3265
998	1709	910	8862
1113	2044	987	9365
1167	3377	1065	10,000
1125	4848	1087	15,000

Table 1: The table illustrates the top 6 values of light intensity versus voltage values used in Figure 3.a and 3.b.

Figure 3.a shows that the point of saturation is significantly higher when using the filter. The higher point of saturation is

because, with a given constant voltage value, the output of equation (3) is a greater intensity while the filter is utilized and, therefore, a higher intensity value is required to saturate the photocell. This effect can be seen in the larger voltage values in Figure 3.a. As seen in Table 1, comparable voltage values output greater intensity values when using equation (2) rather than equation (1). This demonstrates that the LDR will remain sensitive to a larger incident light intensity before reaching saturation with the use of a filter.

Conclusion

As shown in Figure 3.a and Table 1, use of a filter is superior on sunny days as it allows the LDR to remain sensitive to higher incident light intensity and subsequently locate the most efficient position. As expected, the filter did not significantly change efficiency on cloudy days. Possibilities of increasing the effectiveness of the sun-tracking solar panel system on cloudy days include: leaving the panel at a parallel-to-the-ground position throughout the day, allowing the panel to function the same as it does on sunny days, or changing the filter to a material that is more suitable to finding the most efficient angle during low-visibility days. With these possibilities in mind, the best option would depend on the amount of energy required to run the system. For example, on cloudy days with a high-energy requiring sun-tracking solar panel system, the system may use more energy than it collects. In such case, the most efficient solution would be to leave the panel in a parallel-to-the-ground position throughout the day.

From equation (3), one can consider how different filters affect light intensities perceived by the LDR. Therefore, while the method of maximum effectiveness may change based on the system's power requirements, the material of the filter, or visibility conditions, a prediction of what is most efficient can be made with equation (3). The data acquired using STSP, along with equation (3), may assist in the development of a more efficient procedure in harnessing energy on cloudy days.

Ultimately, this procedure may assist in making solar panels more efficient, and thus eradicating the search and need for hydrocarbon deposits.

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The Portu-guise: Influences on the Portuguese National Identity Post-Carnation Revolution

By Chase Ford

Cabo da Roca, a cape in Portugal, is known for its beauty, historical significance, and geographical importance. The cape is at the western-most point of continental Europe and is known as a former gateway for Portuguese explorers embarking toward the West. It is a symbol of Portuguese strength, past and present. However, if people were to walk Cabo da Roca on April 24, 1974, they may stand closest to the West physically, yet furthest from western ideals of democracy and personal freedom. As a citizen standing in Portugal on that day, you would have been under one of the longest dictatorships in Western European history: a dictatorship marked by colonization and heavy restrictions on civil liberty. People could only hope of being in the West while standing there dreaming about the haven for democracy, freedom, and possibilities that lie across the Atlantic Ocean. As the sun set that day and rose the next, those dreams became a reality. On April 25, 1974, the Carnation Revolution – a military coup followed by a social revolution – freed Portugal from over forty years of authoritarian rule, under the Estado Novo regime, and gave the Portuguese people hope for democracy.

This shift toward democracy was not without struggle, including rising and competing political parties, decolonization policies, and new relations with Europe. This struggle shaped Portugal into the republic it is today. The Carnation Revolution bolstered ideologically driven groups, yet many people were left to question what it meant to be Portuguese. Multiple schools of thought exist regarding identity, but in this paper, I will focus on two. One bases national identity solely on



common ancestry or ethnicity, and the other as a “malleable term with no fixed properties” (Dahbour 1). National identity can be regarded as a “complex of common ideas, concepts or perception schemes of related emotional attitudes intersubjectively shared within a specific group of persons, all of which are internalized through ‘national’ socialization” (Ribeiro 4). In contrast to political ideologies, national identity is focused upon the unification of people with shared backgrounds rather than inspiring action for political issues. Identity can help one distinguish “them” from “us,” for better or worse. It can be used to justify persecution and aggression, or maintain a successful, modern political order (Fuyukama 1). The political left has focused less upon economic quality to determine identity and more toward promoting the interests of marginalized groups such as immigrants, women, and the LGBT community (1). The political right started moving to protect traditional senses of national identity, which is often connected to race, ethnicity, and religion (1). Analyzing national identity becomes a complex issue because of a multitude of factors that one could use to create the notion of “us” versus “them”: language, ethnicity, religion, and geography. Identity is best understood as the distinction between one’s true inner self and the outer world of social norms and rules that do not recognize the value of the self (1). Recognition is crucial to the validation of identity, without it, people feel as though their true self is denied in favor of the general population. The historical identity of the Portuguese wears a disguise, manipulated by political ideologies that aim to change the collective memory of the country (Silva 40). It is increasingly more difficult to recognize one’s true self in Portugal because of the numerous social norms and rules that serve to impede individual respect.

Following the Revolution, Portuguese identity was split between two schools, a more left and right interpretation of identity. To be Portuguese was either to live in Portugal and speak the language, a more traditional and conservative approach, or to embrace multiple cultures and histories, a more

progressive stance. In January of 2019, I was able to go to Portugal and learn about its history and culture. Every person I interacted with, especially taxi drivers, all shared different moments in the country's history that stuck out to them. Hearing their stories taught me how people are proud of Portugal and how this belief influences their daily lives. Analyzing the Portuguese national identity provides a deeper understanding of the ideologies and politics of the nation, as well as how their national identity affects Portuguese democracy. In this paper, I will review the factors that prompted and shaped the Carnation Revolution, discuss political changes after the revolution that bolstered political ideologies in Portugal, and analyze how these ideologies have broadened the Portuguese national identity. Ultimately, I hope to use the Portuguese national identity as a case study to examine why national identity is important for creating a diverse and enriching political discourse. The Portuguese national identity is still heavily influenced by the Carnation Revolution and that influence is predicated upon the division between respecting the humanity of the Portuguese people and remembering the history of both the Estado Novo regime and the Portuguese empire.

The Policies of the Estado Novo Regime and the Causes of the Carnation Revolution

From 1933 to 1974, the Estado Novo regime, officially known as the Second Republic of Portugal, held complete control over the Portuguese people. The head of this regime was Antonio de Oliveira Salazar, who served as President of the Council of Ministers (informally referred to as the Prime Minister) from 1932 to 1968. Salazar died in 1968, after suffering from a stroke. He was succeeded by Marcelo Caetano, who led the country until the Revolution in 1974. Salazar led the regime and was heavily influenced by conservative, Catholic, and corporatist ideologies (Lobo, "The Making and Remaking of Portuguese Democracy: An Overview" 3). At his core, Salazar focused on promoting nationalist values upon

the Portuguese population. This value “embodied the myth of a multiracial harmonious Portuguese Empire” (Ribeiro 6). The Portuguese Empire Salazar referred to dates to the sixteenth century, when Portugal had become a prominent world-power during the era of colonization. At the Empire’s peak, Portugal controlled around 7% of the world’s land mass, with colonies established across several islands, parts of Africa (Guinea, Angola, and Mozambique), and Brazil (“The Portuguese Empire”). The Empire made Portugal a hegemon for its spice trade, colonial expansion, and brute strength. By applying the goals and success of the past Empire to the present nation, the regime hoped to spark a deeper sense of nationalism. Salazar channeled the country’s past in order to redefine the future of Portugal.

Two goals of the regime are crucial for understanding the fall of Estado Novo: 1) Portuguese colonization in Africa and 2) restriction of civil liberties at home. Regarding the former, the regime assumed the “historical mission of colonizing and civilizing the native populations” and became the “mission and burden of the Portuguese people” (Ribeiro 7). With this mission, Salazar stressed maintaining control over Portuguese colonies, most importantly Angola and Mozambique. In 1951, a constitutional revision marked “colonies” as “overseas provinces,” though these provinces were treated as a part of the “colonial empire” (Jerónimo 14). This revision was an attempt to remove the negative connotation associated with the term “colonies,” while still treating them as such. Mozambique was home to coal deposits and Angola had oil, copper, and manganese deposits that fueled a Portuguese desire to control economic activity. Salazar imposed legal racial limitations on all societal levels, and the colonized people were not granted political or socioeconomic rights (15). Salazar’s vision was to have a hierarchy within the Portuguese identity, with colonized natives being labelled as Portuguese, but at the bottom of the societal hierarchy. By restricting the rights of the colonized native people and exploiting their natural resources, the regime followed in the

footsteps of the Portuguese Empire with the hope of reproducing their former hegemony.

During the 1960's, the regime's control slowly began to slip. Violent organized conflicts arose among the Portuguese provinces: Angola in 1961, Guinea-Bissau in 1963, and Mozambique in 1964 (Jerónimo 16). Conflicts abroad led to resentment in Portugal. Colonial wars significantly drained the national budget and demanded many young male recruits to squelch the conflict (Ribeiro 7). Additionally, the economic gains from the colonies decreased as conflict spread. Metropolitan Portuguese exports to Angola and Mozambique in 1968 were at 13.31% and 9.05% respectively, while in 1972, exports decreased to 6.50% and 5.40% (Graham 22). With respect to imports, in 1968 Metropolitan Portugal imported 9.35% of goods from Angola and 5.62% from Mozambique. These numbers decreased to 7.80% from Angola and 3.20% from Mozambique in 1972 (23). Meaning, Portugal was forced to decrease exports to their colonies and, subsequently, the colonies found other trade partners, infringing on Portugal's economic dominance over the region. In the years before the Carnation Revolution, the colonization platform the Estado Novo regime proudly stood upon began to crumble as the economic and social burden of maintaining control over provinces grew.

The tension between the Estado Novo regime and the Portuguese people was also sparked by domestic policies on civil liberty. Estado Novo is often referred to as fascist, or clerical fascist, due to Salazar's background from the Catholic Centre party and restriction of other religious practices (Feldman 1). In order to preserve the national identity, the regime became the "keepers of order" (Silva 28). The preservation of this identity was achieved by the existence of a single party, the National Union, and through political police that initiated violence against anyone who opposed the regime. The Portuguese people faced restrictions on expression, attacks against political opposition, violence from the political police, lack of labor movement autonomy from strict corporativism actions,

and an overwhelming lack of control over the political process (28). To be Portuguese under the Estado Novo regime meant hiding your own values and favoring the government's in fear of persecution.

In the time leading up to April 25, 1974, the domestic and colonial pressures on the Estado Novo turned Portugal into a "pressure cooker" ready to explode (Silva 30). The chronological events during the day of the revolution, as well as the years after, are not the focus of this paper, but two aspects of the revolution are important to understand. On April 25, the revolution began with a military coup by leftist military officers that sought to overthrow Caetano, Salazar's successor, and replace him with a committee of military officers ("Remembering Portugal's Carnation Revolution" 2). The coup then quickly evolved into a social revolution as thousands of Portuguese flooded the streets, calling for the end of the regime (30). One such street was the Lisbon flower market. The name Carnation Revolution stems from this place because people put carnations in the barrels of their guns as a display of resistance against the authoritarian regime. Within a day, one of the longest reigning dictatorships of the twentieth century came to an end. The Portuguese population was able to take part in the transition toward a fully institutionalized democracy. A new democracy was officially formed with the implementation of a new constitution in 1976 (30).

Changes in Political Ideologies after the Carnation Revolution

Political ideologies present a pattern of complex political notions, like economic stances, and serve to incite action with the aim of achieving certain goals, such as running for public office or initiating grassroot movements (Skidmore). Ideologies are important to understand as they bring cohesion to society. In the case of Portugal, the Revolution and the formation of the

Third Republic of Portugal in 1976, drastically changed and strengthened political ideologies. The two years after the Revolution were filled with political unease as neither the far-left or far-right parties were able to attain power; instead, the country was run by the military officers who oversaw the coup. The fall of fascist ideology gave way to multiple ideologies that served as the catalyst for the formation of new groups that attempted to rally and promote political action with the aim of simplifying political dissention. No longer under the regime's influence, political groups like the Communists and Socialists no longer faced persecution and could participate in government and religious groups. Additionally, by 1975, all of Portugal's former colonies had declared independence, adding another layer of complexity to the political sphere. Radicalization became a fundamental division throughout Portuguese politics, meaning that individuals began to seek more extreme political views and reject things that were of the status quo (Lobo, "The Making and Remaking of Portuguese Democracy: An Overview" 7). The formation of these new groups initiated a strong division between the extreme left and extreme right, as both sides sought to gain control over the new democracy.

Out of the rising ideologies, communism played one of the most important roles. During the summer of 1975, during the so-called "Hot Summer of 1975," Portugal faced the possibility of the Communists and other far-left groups gaining power. Compared to the other political parties, the Communist party was the only group with significant local roots and a national political organization (Lobo, "The Making and Remaking of Portuguese Democracy: An Overview" 15). Fear of a "Marxist/ Communist/collectivist/totalitarian dictatorship worse than Salazar's" began to take over (Silva 31). Tensions between the Communists and other political groups ended on November 25, 1975, when the Communists launched a failed coup against the military committee with the aim of bringing Communist ideals and leaders to power. Those in the government who aligned themselves with these far-left views were ousted by a

coalition of moderate Socialists, right-wing parties, the Catholic Church, and groups of military officers (Loff 5). Twenty years later, the failure of the Communists is seen as an attempt to replace an authoritarian regime with a totalitarian one (2). Though they did not achieve governmental control in 1975, the Communist party is still highly active in Portugal today. Communist advertisements are prevalent throughout the country, especially in rural areas. The case of the Portuguese Communists is interesting because the regime before the revolution was on the extreme right of the political spectrum, and yet, the extreme left was unable to seize control during the fall and transition of Portugal's government.

The following year, parliamentary elections were held and the Socialists, a left leaning party, won. The Socialist party did not, however, gain enough seats to hold a parliamentary majority, so they entered a coalition government with the Democratic People's Party and the Democratic and Social Centre, two right-winged groups (Loff 3). This partnership was short lived during the next election cycle in 1979, when a right-leaning coalition took power, led by the Social Democratic party (formerly known as the Democratic People's Party). During the next sixteen years, the Social Democratic party stayed in power, only sharing control with the Socialists from 1983 to 1985 (3). With right-wing parties in control, those parties changed the focus of discussion to the negative legacy of the Carnation Revolution rather than remembering the fascist rule of the Estado Novo.

Conservative parties like the Social Democrats were able to avoid debate relating to the political police's actions, the repression of civil liberties and left-winged political groups, corporatism, and the colonial wars in Africa (Loff 3). In a contrast to Estado Novo, who sought to embrace Portugal's history, the conservative government focused on wiping away the negative memories, essentially forgetting the events in history that divided the Portuguese people, and turn national attention toward the future. Right-wing parties hindered legislation that

imposed open access to archives from the former dictatorship until 1996 (3). The government was able to devalue the memory of resistance to Estado Novo through “sheer whitewashing” (Silva 38). The public was denied access to political information while former Estado Novo political police members received pensions for their services. This control of political discourse molded the Portuguese people’s political ideologies in favor of right-winged groups and against the Carnation Revolution.

Manuel Loff, a professor at the University of Porto who has written extensively on Portuguese identity, reviewed survey data from 1984 and 1994 from the Portuguese magazine *Visão*. Participants in the survey were asked a series of questions regarding how the Revolution has affected their lives on a cultural, economic, and political level. It is important to analyze public opinion during 1984 and 1994; in 1984, Portugal was experiencing the worst economic crisis since the dictatorship and, in 1994, was at the near end of the conservative party reign of government (Loff 3). Though Professor Loff did not provide the specific sample size and demographics of these surveys, the data he analyzed suggests how public opinion can be influenced by political leaders. A third of respondents stated that the revolution improved their personal fulfillment in 1984, this number doubled to 67.3% in 1994 (3). Additionally, in 1984, 20% experienced positive improvement on economic situation, 22.5% had a positive impact on social stability, 24.5% answered yes to improvement on youth prospects, and 33.4% felt the revolution improved access to education (3). Ten years later, these numbers rose to 56.2%, 73.6%, 65.1%, 55.3%, and 66.8% respectively. Ten years after the Revolution people felt less empowered, economically stagnant, and had a negative view of Portugal, while twenty-years after the revolution these feelings reversed. Opportunities for members of society, especially among the youth, became brighter as the conservative party lost power and the economic situation in Portugal improved. Furthermore, 35.2% believed the revolution had a positive effect on political independence, 15.4% showed posi-

tive support toward economic independence, 82.5% answered “yes” on the revolution having a positive effect on freedom of speech, 54.8% believed there has been a positive effect on youth freedom, and 49.2% thought the revolution has had a beneficial impact on Portugal’s image in the world in 1984 (3). In 1994, these numbers rose to 62.7%, 55%, 88.4%, 71.8%, and 82.2% respectively (3). It is important to note the drastic rise in people supporting the notion that the revolution helped their economic independence and Portugal’s image in the world, showing that overtime the Portuguese were able to be better off financially and have a stronger sense of national pride. Not every opinion of the revolution improved, however, with public morality decreasing from 49.7% to 45.9%, 66.4% of people believing that revolution expanded crime in 1984 while 76.4% believed said idea in 1994, and 73.4% thinking that revolution caused stronger drug influence on society in 1984 and 84% sharing that belief in 1994 (3). This shows that the revolution did not completely fix the lives of the Portuguese, yet overall, they believed it helped them.

Why do opinions of the Carnation Revolution change drastically between 1984 and 1994? That change is because the government in 1984 manipulated the views of the general public. The government blamed the “irresponsible hazards” of the Revolution for the economic troubles the country was going through (Loff 5). Recession, decolonization, and structural problems of the economy brought daily challenges to the Portuguese’s lives. When faced with these problems, the government used the Revolution as a scapegoat to shift the blame to political change, instead of counterproductive policies (5). At the end of the Social Democrats being in power, views of the Revolution became highly positive in terms of personal fulfillment, quality of life, and Portugal’s stance in the world. Since the Carnation Revolution, political ideologies in Portugal strengthened as more political groups became active in the political sphere. Yet, with more ideologies attempting to simplify complex political issues, especially post-revolution,

individual choice and thought became clouded in Portugal, causing these changes in historical memory.

Influences on Portuguese National Identity Post-Revolution

Portugal's national identity is centered on the division between respecting humanity and remembering history, as the only thing that unites the Portuguese is Portugal itself (Almeida). The Revolution brought this division to light as the people could express their personal values under the new democratic regime without backlash from the government. Identity became a recurrent theme in discourse. In my research, I focus on three aspects of Portuguese culture when discussing Portugal's national identity. These include: 1) interpretation of the Carnation Revolution, 2) immigration and European integration, and 3) the legacy of the Portuguese Empire. In the two decades following the Carnation Revolution, interpretations of its legacy varied with the political power in charge. The Revolution is still a source of political inspiration, but the effect on the citizens varies.

In January of 2014, GfK Metris, a data analysis company, interviewed 1,256 residents of Portugal (ages 15 or over) and asked them to answer "of the following phrases, please choose all those that correspond to your opinions on the intentions of those who carried out the 25 April revolution" (Lobo 168). The respondents were chosen out of a representative sample and were selected through randomized quota methods that utilize a matrix to cross sex, age (seven groups), education (two groups), occupation (two groups), region (seven groups), and settlement size (five groups) (169). The results were weighted based on data provided by the National Statistics Institute and compared to a similar study conducted in 2004 that had a respondent sample size of 1,216. The study found that approximately 79% of respondents felt proud of the Carnation Revolution (169). The focus of the data gathered by GfK Metris was

to compare opinions of the intentions of the Revolution from 2004 and 2004. In 2004, 50% answered that the goal of the Revolution was to establish a democratic regime, 45% said it was to end the colonial wars, 39% answered that it was to modernize and develop the country, 36% said it was to promote social justice in Portugal, 26% answered that it was to improve their own (referring to the instigators of the revolution), and 11% said it was to establish a Communist regime (170). Ten years later these opinions changed to 55%, 38%, 38%, 29%, 22%, 5% respectively (170).

Though nearly 80% of the country is proud of the transition, just over half of the population believes the point of the revolution was to create a democratic regime. The Revolution has become a watershed moment in Portuguese history; a symbol of the country's history and an instruction for movement forward. People still disagree on the true goal of the transition. These disagreements create an interesting clash with respect to historical interpretations of Portugal's current regime. The alternative goals, such as establishing a Communist regime, are similar to the ideological changes that occurred in the 1970s. Events such as the Hot Summer of 1975, and the decolonization of Portugal's colonies, still influence identity politics today.

Briefly referring to the sixteenth century, the Empire spread its language, culture, and claimed colonies in its name. After these colonies became independent, however, people returned to Portugal and identified themselves as Portuguese, regardless of their national origin. The blending of native Portuguese and colonized Portuguese is a point of tension in terms of the formation of a national identity. To be proud of Portugal's past also means acknowledging the dark parts of the nation's history. When I travelled to Portugal, I was able to tour the Portuguese Parliamentary building. One ceremony room's walls hold murals of colonization, slave trade, and expansion. These murals, I was told, became highly controversial and groups advocated to have them painted over. My tour guide said the government decided to not paint over them, to not erase the

past, and instead declared all people to be “free.” This was an important decision because the government decided that they would not cherry pick parts of their history; they would accept the good and bad as it occurred. Declaring people as “free,” however, does not ignore the differences in racial background among the Portuguese population that subtly influences national identity today. My experience in the Parliament building was an excellent example of this division between respecting humanity and remembering history.

Following the decolonization of Portugal’s colonies in 1975, Portugal opened its borders to new and diverse groups of people. Half a million former African settlers returned home, almost two-hundred-thousand people immigrated from France and Germany, and one-hundred-thousand servicemen stationed in former colonies were relieved of duty (Loff 5). Additionally, there was mass migration from rural to urban areas and migrant-laborers arrived from Brazil and Eastern Europe (Ribeiro 12). These numbers increased the Portuguese population by around 5% and served as a drastic change from the Estado Novo regime’s idea of a racially and ethnically homogenous Portugal (12). With the large diversity of people and backgrounds living in Portugal, it has become harder to identify what is a “typical” Portuguese person. Integration of people from all over the world into Portuguese culture produced another layer of complexity regarding identity. Portugal is proud of its Empire’s history. They were a world hegemon and controlled 7% of the planet’s landmass. Furthermore, in 1986, Portugal joined the European Union, increasing the globalization and integration of their economy, and leading to new discussions of surrounding Portugal’s national identity (13). Becoming a part of the European Union led to a struggle between joining a unified Europe and maintaining a national Portuguese identity.

Conclusion

The events on April 25, 1974, not only led to a revolution that brought-down the Estado Novo regime, the Carnation Revolution brought about a change of ideologies and identity politics within Portugal. The end of forty years of fascism fueled by colonialism and restriction of civil liberties created the opportunity for new political groups, primarily Communists and Socialists, to become active in a democratic government. However, the bolstering of political ideologies has obfuscated the Portuguese national identity. What it means to be Portuguese has never been harder to answer, making Portu-guise a more appropriate label to use. From my experience in Portugal, national pride is a central characteristic of their national identity. Pride seems to be the only common feeling brought by the legacy of revolution, immigration and European interaction, and the significance of the Portuguese Empire. Amid challenges within the European Union today as well as recent economic struggles in Portugal, ideologies are being tested. If these issues persist, the differences in national identity will come to a head, and the people of Portugal will be forced to unmask the guise that covers more than forty years of political events and molded the current confusion of identity. It comes as no surprise that the people of Portugal are proud of their nation, yet as they recognize different aspects of their culture and the events of their nation's history, having a serious and open discussion of identity will become a greater challenge. Often the Portuguese people reflect on their history of discovery to look toward the future. If people were to stand on Cabo da Roca in 2019, they would not only be the closest to the West physically, but also ideologically. The Carnation Revolution created a new democracy and returned political freedoms to the people, yet at what cost? They would be the furthest from their own Portuguese identity; they unknowingly question the history of that beautiful cape and country, their culture, and their political ideology, forming the Portu-guise.

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The Impact of the Third Reich on Famous Composers

By Bwaar Omer

Germany is known as a land of poets and thinkers and has been the origin of many great composers and artists. In the early 1920s, the country was becoming a hub for artists and new music. In the time of the Weimar Republic during the roaring twenties, jazz music was a symbol of the time and it was used to represent the acceptance of the newly introduced cultures. Many conservatives, however, opposed this rise of foreign culture and new music. Guido Fackler, a German scientist, contends this became a more apparent issue when Adolf Hitler (1889-1945) took power in 1933 and created the Third Reich. The forbidden music during the Third Reich, known as degenerative music, was deemed to be anti-German and people who listened to it were not considered true Germans by nationalists.

A famous composer who was negatively affected by the brand of degenerative music was Kurt Weill (1900-1950). Weill was a Jewish composer and playwright who was using his compositions and stories in order to expose the Nazi agenda and criticize society for not foreseeing the perils to come (Hinton par. 11). Weill was exiled from Germany when the Nazi party took power and he went to America to continue his career. While Weill was exiled from Germany and lacked power to fight back, the Nazis created propaganda to attack any type of music associated with Jews and blacks. The "Entartete Musik" poster portrays a cartoon of a black individual playing a saxophone whose lips have been enlarged in an attempt to make him look more like an animal rather than a human. The cartoon character wears a patch with the Star of David to indicate that Jewish music is also animalistic, inferior, and non-German.

During 1937 and 1938, the view of degenerative music became worse as the Nazi political leaders deemed it to be illegal to listen to jazz and swing music. The presence of a new, modern "Swing Youth" made the situation worse, making a strong jazz and swing music culture, and the police enforcement could not stop them (Fackler par. 2). While Hitler was against any "Jewishness" in music, he respected and supported Ludwig van Beethoven, Richard Wagner, Anton Bruckner, and Richard Strauss. The legacies of these composers were affected by the Nazi regime and appropriation of their music has changed how they are perceived in contemporary society.

Known as the innovator of the Romantic era, Ludwig van Beethoven's (1770-1827) music influenced both the Allies and Axis during the time of the Third Reich. Famous for his Nine Symphonies, Beethoven introduced new ideas to the world of music and is regarded as a renowned figure. Many statues and paintings have been created to honor him and his work, such as the Beethoven Frieze by Gustav Klimt (1862-1918). His legacy has lasted to this day and his music was, like today, an idealized work during the second World War. In World War II, both the Allies and Axis used Beethoven's music to represent different ideals and purposes.

Adolf Hitler admired Beethoven. Douglas Johnson, Scott G. Burnham, William Drabkin, Joseph Kerman and Alan Tyson observe that Beethoven's music served as the symbol of German Heroism to the Nazi supporters and Nazi soldiers. Soldiers used his music to invoke feelings that gave them the courage to fight. The Third Reich also used his emotional and dramatic music in their propaganda and to further their political initiative of German nationalism (Johnson et al. 263). The Nazi regime took the identity of Beethoven and appropriated his work for their own will. Hitler loved the fame associated with Beethoven and wanted to use his music as an example of what it was to be German. Beethoven's presence was known throughout Germany as his music boomed in concert halls and across the radio.

The Third Reich was not the only side to use Beethoven. The Allies used Beethoven's compositions as well, but for very different reasons. For example, Beethoven's Fifth Symphony symbolizes contrasting attitudes between the Allies and Axis. The Nazi regime used his music as a source of power to show that the German people were strong and elite, while the Allies used the Fifth Symphony as a composition to represent peace and victory (Fancourt par. 2). People in the United States used the opening of the Fifth Symphony during the development of Morse Code. This is seen in the letter "V" of Morse Code (short-short-short-long). The clicks used for this letter are made up of the same four opening beats of the composition. The Roman numeral for five is the letter "V", connecting back to Beethoven's Fifth Symphony. The use of Beethoven's symphony illustrates how the Allies wanted to attack the psyche of the Third Reich by using their most beloved German figure against them. Reclaiming the name Beethoven, and utilizing one of his most famous motifs to say, 'we are the victorious ones, not you'. The British Broadcasting Company had a hand in spreading this idea throughout the different countries that were a part of the Allies, and the BBC news had a four-note timpani that played at the opening of their broadcast that was similar to the four-note motif of the Fifth Symphony. The French also made great use of Beethoven's Fifth Symphony as a symbol of endurance and steadfastness during an awful German blitz on London in 1941 (Fancourt par. 4). Daisy Fancourt writes, "Maurice van Moppes wrote lyrics to the opening bars of the symphony, calling it 'La chanson des V' (The song of V)." The song was broadcasted on Radio-Londres, most influentially on 1 June 1944, when the Allied forces sent the first messages to France to prepare for attack. The French used the Nazis' propaganda against them by incorporating Beethoven's iconic motif into music of their time.

The Third Reich turned to Beethoven's compositions during their times of despair. When Hitler's death was announced over the German radio, the Funeral March from the Eroica Symphony was played (Johnson et al. par. 263). This piece evokes emo-

tion and although the composition wasn't written for the death of Hitler, despair can be felt through this piece - the same type of despair felt by the Nazi regime.

While Adolf Hitler was still alive, he wanted Richard Wagner (1813-1883) to serve as a German icon, because Wagner was an anti-Semite and a German national. Wagner wrote an anti-Semitic essay that claimed Jewish participation in German music was immoral. Although there are many different views on what Wagner had to say about Jews and Judaism in music, some people argue he was very anti-Semitic while others say his words have been taken out of context. Regardless, there was enough anti-Semitism in Wagner's essay for Hitler to manipulate and use it to aid to his argument of the inferiority of the Jewish people. Wagner's *Judaism in Music* (1850) had two overarching points: first, was that the Jewish people were not able to reach the "musical heights" of European composers; and second, Jewish composers would just throw together different forms from composers throughout time and that they were incapable of composing original pieces (Friedmann par. 2). Works of Jewish composers became more and more famous during Wagner's time, and there are many accounts of remarks saying that Wagner was envious of the growing popularity of Jewish music, yet there is no account of Wagner acknowledging such a statement. Wagner's contribution to the Third Reich was mostly political, because he was an avid essay writer and the Nazis wanted to use his nationalistic viewpoints as validation for their malicious intents.

With these two views of Wagner's essay, Hitler was able to portray this musical genius as a supporter of the Nazi regime and all of their ideals. Although we cannot know to what degree Wagner agreed with the beliefs of Hitler, we can see that he was anti-Semitic. Wagner was used as a symbol of the Third Reich through his glorious "music dramas." Due to Wagner's anti-Semitic background, some musicians and scholars believe we should not play his music. His background affects how we see him today compared to how we see Beethoven. There is

reasonable evidence showing Wagner held some anti-Semitic beliefs, but there is no proof that Beethoven had any. Although the Nazis used both composers, the animosity scholars feel for musicians of the Third Reich is directed toward composers like Wagner.

Focusing on the more religious aspects of Nazism, Hitler turned to a man known for his masses, religious compositions, and for being the organist at the St. Florian Church in Austria. Hitler admired Anton Bruckner (1824-1896). Bruckner's music style was derived from sounds of the organ, military bands, and dance orchestras (Pace 26). Hitler associated himself with Bruckner because both of them were born in Linz, Austria. Hitler used Bruckner's compositions to legitimize and build a Nazi identity through music. For example, Bruckner's trumpet opening to his Third Symphony was the opening to radio broadcasts of the Nazi agenda. Bruckner's compositions were played profusely at cultural events, such as Hitler's cultural speeches at the Nuremberg rallies (Korstvedt 139). Hitler was aiming to define the perfect Aryan race from a religious perspective and the use of Bruckner's music helped him make his point. Benjamin Korstvedt writes: "Bruckner's music fit Nazi aesthetic desiderata: with its monumental sweep, its outwardly clear and balanced formal outlines, its chorale-like passages, and its prominent use of brass instruments, it was easily heard as profoundly 'German' music untainted by decadent cosmopolitanism" (133). It almost seemed that either the Third Reich was built upon the sounds of Bruckner or that Bruckner's compositions fit the nationalistic sound of the Third Reich. Hitler attempted to argue that Bruckner was most likely against all Jewish influence, because Hitler was unsuccessful at establishing himself as an artist in Vienna. He paralleled the idea that Bruckner was unaccepting of foreign music to the reluctant acceptance of Bruckner's music in the Viennese music community, and Hitler blamed that reluctance on the Jewish presence in Vienna (Korstvedt 139). Hitler wanted Bruckner and himself to appear "of the same kind." He wanted to present himself as

humbled and hardworking as Bruckner. He wanted to transform Bruckner's ideals to align them, in appearance, with his own. Bruckner never outright stated that he was anti-Semitic, yet Hitler drew connections from his own beliefs to make it seem as though Bruckner was against Jewish presence in music. With Bruckner's past and the manipulations that Hitler used it is easy to assume he was an anti-Semitic composer. Like Beethoven, no evidence has been found to prove Bruckner held anti-Semitic beliefs, which is why he still strives in the music community. Composers such as Beethoven, Bruckner, and Wagner did not live to see the rise of the Third Reich, or to witness the affect it would have on their music. For composers who were part of the Nazi regime, their situation was arguably far worse.

The Reichsmusikkammer was an institution that promoted true German music in Germany during the Nazi regime, and their president was the composer Richard Strauss (1894-1949). Whether Strauss agreed with the anti-Semitic ideals of Hitler remains unknown, yet it is recognized that the situation in Germany improved his position and career. When he was appointed the president of the Reichsmusikkammer in autumn of 1933, he received copyright protection for *all* German composers (Gilliam and Youmans par. 27). Although Strauss' views toward the Nazi ideals is unclear, it is evident that he was more concerned with his own career over political gains. Strauss was afforded a great deal of influence through his position at Reichsmusikkammer, yet he chose ignore most of the political events that surrounded him. His personal life and connections with people were more important to him than the politics of Germany. Bryan Gilliam and Charles Youmans wrote that "by replacing Toscanini, who had resigned in protest from the Wagner festival in 1933, Strauss saw an opportunity to make a gesture of goodwill towards the Wagner family, yet in doing so he clearly chose to ignore the fact that this played right into the hands of the National Socialists, who were eagerly seeking international legitimacy"(par. 28). Strauss held his artistic ego and

the connections he had with other composers in a much higher regard than the radical politics that enveloped him. He was so removed from the politics and the Nazi regime that he would not call Hitler "der Führer," his official title (Gilliam and Youmans par. 28). It is difficult to pin blame on Strauss for not actively fighting against the politics of the Third Reich, because if he did then he would have likely been killed or exiled. He worked in the best interests of himself and of his loved ones. And, as Beethoven never pronounced anti-Semitic beliefs, neither did Strauss. Strauss was solely focused on life and music.

These composers were heralded by Adolf Hitler in his pursuit to legitimize and validate the Nazi Regime. They were known as influential figures of their time and were looked upon with admiration, but Hitler changed the legacies of some of these men. The composer most affected by Hitler's scheme was Wagner. Scholars are divided between rejecting Wagner for his anti-Semitic beliefs or letting his music stand for itself. Some people argue that Wagner was dead at the time of the Third Reich and should not be so closely associated with Hitler's ideals, while others believe Wagner deserves to be treated with the same contempt as other anti-Semites of that time. One must also consider Strauss, who was alive during the time of the Third Reich, had a large part to play in the selecting the music that was allowed in the Nazi State, yet his legacy has not been tainted as badly as Wagner's. Bruckner was also deemed to be associated with Nazi ideals, though he did not have any outright anti-Semitic beliefs, yet his legacy remains intact. Beethoven and his legacy emerged from the Third Reich completely unscathed which is likely due to the immense popularity and influence Beethoven has around the world, transcending any association with Nazism. The impact of the Third Reich on many great composers can be seen through these examples, and because of the Third Reich, many will forever be remembered differently.

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