Dear Reader--

Welcome to Vol. VI of U-High’s history and economics Journal, *InFlame!* Dedicated to publishing excellent student papers written in history and economics, Inflame is published annually. This issue marks our first of the year, and the ninth overall for the journal.

All U-High students are eligible to submit papers written during their high school career. Submissions are reviewed anonymously by our student board composed of seven members. Please see page 4 for submission guidelines — we look forward to reading your papers!

Happy Reading!
The Inflame Board
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Mission Statement

We are a student-run journal dedicated to publication of work in history and economics. We wish to promote scholarly discussion by providing students a forum in which to publish and share work with their peers. Our editorial staff works directly with authors at each stage of the publication process. As a journal, we hold ourselves to a high standard of excellence. We value honest academic research and strong theses. We look for papers of a high quality that demonstrate a clear understanding of the material, draw meaningful conclusions, and present new and interesting ideas. Our goal is to foster a community that encourages thoughtful and creative writing in history and economics.

Criteria for Submission

All submissions must be written by a U-High student during their tenure at U-High for a history and economics class or independent study course. Papers must meet the following formatting and length criteria:

• Between 4 and 20 pages in length
• Include proper citations (footnotes/endnotes and works cited list) in Chicago Turabian format (guidelines here)
• Include a cover page which contains: title and class for which paper was written
• Double spaced
• 1 inch margins
• 12 pt., Times New Roman font
• Header with page number
• Illustrations, maps and tables are welcome but should be properly cited

All submissions are reviewed anonymously by the student board. No decisions may be repealed, however all students are encouraged to revise and resubmit their papers if not accepted. No special consideration is given to papers that have received external recognition. InFlame typically publishes between 3-5 papers an issue.

Submissions should be sent in via the Inflame Turnitin Class. For instructions on how to do this, visit https://hshapir.github.io/inflamejournal/. Questions about any of our policies should be directed to cgerst@ucls.uchicago.edu.
John W. Boyer, a Martin A. Ryerson Distinguished Service Professor in the Department of History, was reappointed to a sixth term as Dean of the College in 2017. He became Dean of the College in 1992. Boyer regularly teaches the history of European Civilization in the College, as well as courses on religion and politics in modern European history and on the history of the Habsburg Empire and modern Germany.

Boyer has served as an Editor of the *Journal of Modern History* since 1980. A specialist in the history of the Habsburg Empire and of Central Europe in the nineteenth and twentieth centuries, Boyer received his Ph.D. from the University of Chicago in 1975 and joined the faculty in the same year. Boyer has written three books on Central European history: *Political Radicalism in Late Imperial Vienna: Origins of the Christian Social Movement, 1848-1897* (for which he was awarded the John Gilmary Shea Prize), *Culture and Political Crisis in Vienna: Christian Socialism in Power, 1897-1918*, and *Karl Lueger (1844-1910): Christlichsoziale Politik als Beruf*.

Boyer recently published *The University of Chicago: A History* with the University of Chicago Press in October 2015, which seeks to elucidate major themes in the institutional, curricular, and financial evolution of the University since its founding in 1890.
**InFlame:** What drew you to the study of history?

**John Boyer:** I always enjoyed reading history when I was young. I had, like many kids, a couple of teachers in high school who were historians and I admired them and found the teaching that they did interesting. They were both teachers of American history. So, when I went to college, I decided to major in history. I decided that I liked writing enough that I might want to try to become a professor. So, in college I majored in history, mainly US history. Then when I came to graduate school, I came here, really by accident. It was in the late 60s and early 70s and there were a lot of student protests and UChicago was one of the only places not shut down by student protests and I ended up coming here because I was an army officer with a 3 exemption but needed to enroll directly or take a long ocean voyage to Vietnam. So, I decided to major in history.

**IF:** And what drew you to your particular studies of European political and cultural history, Germany and Habsburg Monarchy?

**JB:** I knew I wanted to study European history of some kind. I knew some French, and had studied German. I became interested in the Hapsburg Empire largely because a faculty member in Graduate school offered a course on the Hapsburg Empire. I knew nothing about it, I kind of knew where Germany, and Berlin and Hamburg were but the lands to the East were a complete mystery to me. I found the material fascinating. In fact, it reminded me of American history, except that in the case of the Hapsburgs the “great” frontier was in the East not the West. So, I ended up deciding to write my dissertation on it and decided to apply to Vienna and never turned back. Like many things in life my decision to study the Hapsburg Empire was a combination of good intellectual reasons and happy accidents.

**IF:** Out of all the incredibly interesting things you have researched and written on what was your favorite topic?
**JB:** I’ve written three books involving the Hapsburg Empire and Vienna and one on the University of Chicago, so obviously I have two different areas of intellectual interest. One of the things I found very fascinating about Vienna during the 1900s was that it was very much like Chicago. Even though you must think how can that be? Vienna is a very old city and a very Baroque city with nobility and monarchy. And Chicago is this large burgeoning migration city full of displaced people from Europe. The thing is that the politics are very similar, especially big city “machine politics” such as the Daley machine. In fact, the closest approximation you can find in Europe is in Vienna and my first book was about how you can have “boss” or “machine” politics in Europe and why in Vienna in particular. I find that comparison of U.S. and European history by examining Vienna provides very unique perspective that has had a lot of influence on me.

**IF:** Do you have any advice you would give to high school students regarding history or historical research?

**JB:** Here’s just an interesting tidbit before I answer that question: When my daughters were growing up, who were Lab school students, I would take them to civil war battle fields and stuff and they would always complain. The funny thing is now I find them doing that with their own children, so it’s a question of the passage of time. Anyway, I think that it’s important for students that are interested in history to read as much “good” history as they can since there is so much “bad” history that is written. Good history is not only something that is written by professional historians and scholars but also something written by Lay people and there are many examples of this more popular history and with the internet it’s very easy to access. To read as much good history as you can and read widely and then to read some of the more documentary evidence that goes into making good history possible. In other words, historians work with original sources, they work with documents and archives and generate narratives and stories out of these original written records and what one learns is that often there are many sides to a question and the initial perspective you get by reading something may not be right and you have to do further
investigation and research to compare. It’s kind of like finding a dark object in your back yard and shining a flashlight on it from many different angles and it looks differently depending on the angle. Ultimately, having students read original documents and construct their own stories and narratives creates “good” history but it is also difficult to do so I hope teachers will also push their students to read such documents.

**IF:** Why do you think it is important to study history?

**JB:** Oh gosh that’s a big question, one that you could really ask for any discipline, and the answer would be different for mathematics, physics, chemistry or any other science and they would all have good answers. The way I can best explain this is that around fifteen or twenty years ago we did a major curriculum review in the college, when I had just become dean, and I went to each department and just asked them “why study history or why study biology or chemistry.” The mathematicians of course had and easy answer: if you want to do economics or anything like that you have to have calculus. But many people scratched their heads and said “if you study X it’ll make a better citizen” and I always asked “can you give the next three sentences in that argument” because anything can make you a better citizen. Studying a year of Roman Law might, but we don’t require that in our curriculum. The faculty became kind of frustrated with me like, “why are you asking these questions and what answer do you want” and I said, “well how did you get in the business of being a sociologist or physicist or whatever” and “me” they would say their faces lighting up. Then they would say, “well I love to study and research it, or do Lab experiments in chemistry or field experiments in sociology.” Well, I would say, “maybe that’s why you should have other people do it for the love of the research or what you could call the creative act.” Any of these disciplines are occasions for people to be creative, so how can you be creative in history?
**IF:** Why should you love the study of history?

**JB:** There are several reasons, one seems to be that we realize that we didn’t come out of an egg, that we come from some place. That we stand on the shoulders of those before us. We don’t just come from parents and grandparents but our cultures come from same place, that there are roots and norms, and presuppositions that influence our lives. And not to understand where I come from or if you’re from a different culture where you come from is kind of like treating the current world like a piece of paper, there’s not depth, form or substance.

**IF:** The second is that somebody is going to study history. You know, Khrushchev once said “historians are dangerous you have to watch them.” So, somebody is going to write history, even if it’s not you or me or people whom we respect. People are captivated by history and its study but it can also be misused in very distorting or un-objective way. In that line of thinking not only should we focus on studying history but also writing “good” or quality history that takes into account multiple viewpoints because one way or another it’s going to be written and it shapes the way people think about the first point.

**JB:** The third point is that history is not a handbook or handy-dandy guide book to what to do in the future but it does offer framework of choices of past leaders and individuals facing problems. So, it’s always seemed to me kind of foolish not to avail ourselves of some consideration of what past generations have done because often times they are dealing with problems very similar to our problems. For example, if you’re dealing with how to reform the social security system it turns out there are hundreds of years of people in Europe learning how to support and deal with social safety systems, if you’re trying to worry about poverty and injustice these are not issues that were born yesterday. Those are some of the reasons people should study history not everybody should get a PHD but everybody should certainly read it.

**IF:** What role do you think history has in shaping the present?
JB: Probably too little, many people in public life don’t know a great deal about their own history. So, they cherry pick things that are useful in the moment not taking into account the context or nuances of the greater issue. So, there’s a lot of history around but people don’t avail themselves of it. To give you a good example, when I published my book on UChicago people would phone me up and say:

“Are you John Boyer?”
And I would reply, “Yes”

Are you the Historian of the University?”
Then I’d go, “Well I wrote a book on it, I’m not sure it makes me the historian”

And of course, the last question they would ask would be, “Is this and this true?” (of course, expecting a specific answer)
And often I would have to respond, “I’m sorry they didn’t say that or they didn’t mean that”

And I would get this kind of disappointed “oh” because I didn’t confirm their preconceived notions.

And this is a very human thing, it’s happening in Washington right now, to kind of consume history that’s friendly to them, useful to them, that confirms their own views, and prejudices. It might not be a misuse of history but it is certainly a failure in using all the options history may present. Moreover, you’ll probably learn more if you search for the answer yourself rather than just having one nugget of truth confirmed.
Ella Flagg Young, Margaret Haley, and the Chicago Public Schools
By: Mili Shah

Education plays an essential role in all citizens’ lives, and the education system in Chicago, Illinois is due to the work of generations of teachers, administrators, and other members of society. During the nineteenth and twentieth centuries, many activists worked to improve educational conditions for teachers and students alike, contributing significant changes to produce the modern educational system. Ella Flagg Young and Margaret Haley were two activists that became involved in the Chicago Public Schools, various federations and associations, and with other teachers during the Progressive Era.1 Throughout their careers, Young and Haley worked to improve school curriculums and the educational system as a whole, and they tried to aid other teachers. Young and Haley were forward-thinking and understood what had to be done in order to achieve a successful educational system. Against all odds, Ella Flagg Young and Margaret Haley worked to improve working conditions for teachers and the educational system as a whole. However, due to the opposition Young and Haley received against their Progressivist ideas, views, and methods, and largely due to the sexism that persisted in their field, their attempts to contribute to the Chicago Public Schools failed to leave a lasting impact.

The Progressive Era, lasting from 1890 to 1920, set many people in active pursuit of bettering the society, including Young and Haley.2 Some wanted to make the government more efficient, others looked for a more orderly economy, and still others worked for social justice for the various classes in America.3 The progressives were known as reformers, not revolutionaries, because they wanted to improve, not recreate, the American system. However, these progressives often imposed their ideas by focusing on the end result, such as the elimination of slums,

3 Ibid.
regardless of what the marginalized communities that they were trying to help thought.\(^4\)

Additionally, the Progressive Era saw a change in the previous “woman’s sphere,” as many women wanted to move beyond their traditional paths of the home and family.\(^5\) They chose to be a part of various organizations and were involved in community decisions about schools, public health, and religion.\(^6\) This allowed women to pursue activities they wanted to, and some took up professions of their own - nurses, librarians, and settlement house workers - many of which aligned with their traditional nurturing role.\(^7\)

Before the Progressive Era, the schools in Chicago, and throughout the country, were disorganized and lacked proper management. Chicago’s first schools were established in the 1830s, but these early institutions were extremely chaotic.\(^8\) Funds for the public schools only reached a small amount of the population, and teachers supervised classes of over a hundred students, from ages four to seventeen.\(^9\) In order to bolster organization of the schools, the first superintendent of the Chicago Public Schools, John Dore, was appointed in 1854, but he struggled to implement reform.\(^10\) By 1870, the public school population had quadrupled, surpassing the city’s growth, and so the Board of Education was established in 1872 to oversee the different aspects of public school education.\(^11\) This propelled the leaders of each sector to develop more complex systems to deliver education, as well as create courses for secondary education.

During the Progressive Era, the educational system changed, as did the role of women in the field. Many new, independent, progressive schools developed in this time. These schools catered to middle-class children and were often founded by women across the United States,

\(^5\) Davidson and DeLay and Leigh, 597.
\(^6\) Ibid.
\(^7\) Ibid.
\(^9\) Ibid.
\(^10\) Ibid.
\(^11\) Ibid.
including The Organic School, The Walden School, and The Arthurdale School. However, Progressive reformers in the early twentieth century also concentrated their efforts on public education, reformed the curriculum by providing a clear structure, and invested their time in vocational education. However, many new independent, progressive schools also developed in this period. Although many of the newer schools were independent and private, the progressives, and still more women, dominated public education as well. Women rose to administrative roles in the educational system during this era, which allowed them to work in capacities greater than before, opening a path that would later allow Young and Haley to take on influential roles in reforming the Chicago educational system.

Ella Flagg Young held a variety of jobs in the fifty years she devoted to the educational field, and she unintentionally promoted the role of women in occupation. Born in 1845, Young did not attend school until she was almost eleven, but received tutoring from her mother during her early years. When the Civil War broke out, Young took advantage of the opportunities for women to replace men in the field of teaching, and from there she became the principal of the first “practice school” in Chicago. In fact, Young was the first female superintendent of schools and first female president of the National Education Association. The numerous positions Young held show her dedication to the Chicago Public Schools. After completing her education at the Chicago Normal School, Young led her first primary school class at age seventeen. In her earlier teaching roles, Young moved away from the traditional instructional methods in order to meet her pupils frankly and openly. Young began teaching soon after the feminist movement

12 Ibid, 2.
13 Alan R. Sadovnik and Susan F. Semel. Founding mothers and others; women educational leaders during the progressive era (New York, NY: Palgrave, 2002), 1.
14 Ibid, 2.
15 Donatelli, 66.
16 Rosemary V. Donatelli. The contributions of Ella Flagg Young to the educational enterprise (1971), 1.
started - when men went to war and women were required to step into their roles.\textsuperscript{20} From a young age, she demonstrated the capacities in which women could partake in society. After serving in various administrative roles, Young became the assistant superintendent to the Chicago schools for twelve years. However, she resigned in 1898 due to a disagreement with superintendent Edwin Cooley about his arbitrary control of his staff, which, ten years later, forced Cooley to resign as well. This signified the beginning of the conflicts Young would be a part of.\textsuperscript{21}

Young’s commitment to higher education, after her resignation as assistant superintendent, allowed her to better contribute to and advocate for the reform of the educational system. Young decided to devote herself entirely to her study of educational theory and philosophy at the University of Chicago, and within a year, she wrote her dissertation, \textit{Isolation in the Schools}, under the supervision of John Dewey, who then asked her to join the faculty at the university.\textsuperscript{22} In her dissertation, Young looked at the relationship between schools and industrial society. Essentially, she believed that the current rigidity of the school system alienated many students as they tried to find the meaning in what they learned.\textsuperscript{23} Young continued to write about the flaws she found in the current educational system in \textit{Isolation in the Schools}, and stated that the inner problem was the lack of reciprocity between the administration, teachers, and students.\textsuperscript{24} Young believed the higher in the chain that the administrator was, the less they worked with or knew about the primary work of schools. In addition to \textit{Isolation in the Schools}, published in 1900, Young wrote other books about the current and potential future state of schools, including \textit{Ethics in the School, Some Types of Modern Educational Theory}, and \textit{Scientific Method in Education}.\textsuperscript{25} Her main goal in \textit{Ethics in the School} was to assist inexperienced teachers and provide new methods on how to discipline and lead the classroom,

\textsuperscript{20} Ibid, 32.
\textsuperscript{21} Donatelli, 72.
\textsuperscript{22} Sadovnik and Semel, 166.
\textsuperscript{23} Ella Flagg Young. \textit{Isolation in the school} (Chicago: University of Chicago Press, 1900), 36.
\textsuperscript{24} Ibid, 52.
\textsuperscript{25} McManis, 77.
many of which were critiqued to be too modern. Through her teaching, studying, and own writing, Young truly tried to enhance the educational system of her time.

The peak of Ella Flagg Young’s career occurred when she was superintendent of the Chicago Public Schools and president of the National Education Association. Appointed as the superintendent of the Chicago Public Schools in 1909, Young became the first woman to lead the school system of a major city. As soon as she was elected, speculation ensued regarding how a woman of that age was to be the superintendent, and some believed that Young would just act as the face of the system as a neutral party. According to the Chicago Daily News, “members of the board who do not look with favor on the idea of a woman for superintendent are talking against Mrs. Young under their breath.” However, Young stated that she would rely on her district superintendents for assistance, since she believed no single person could know everything. Young was already at a disadvantage, but at such a high post in the administration, she wanted to use her power effectively and initiate change in the schools, as she had written about in her books. Young decided to maintain her stoic, stubborn, and shrewd leadership in order to accomplish her tasks, which included serving as the leader of the educational enterprise, an advisor to the Chicago Board of Education, a trustee of the educational system, and a reformer of various operations. In Young’s early days as superintendent, the Chicago Tribune commented favorably on her request for more work in oral expression among the new teachers ready to graduate from the Chicago Normal School, along with other changes Young wanted to make. Her relations with the members of the Board of Education appeared to be positive. During her first term as superintendent, Young was also elected, as the first woman in that office, as president of the National Education Association (NEA), in July 1910; in this role, however,
she faced opposition from various groups, including the Board of Trustees. Regardless, Young tried to lead the members of the NEA as best as she could, with her visions for the future.

During her second term as superintendent of the Chicago Public Schools, Young faced opposition from a variety of sources, making her post ineffective at initiating change. John McManis wrote, “Mrs. Young did not find the administration of schools a bed of roses...The last two years of her term as superintendent were comparatively ineffective because of all the determined opposition and efforts to rid the schools of her service.” As Young tried to impose her progressive ideals for the school system on administrators and teachers, the members of society were pushed farther away. Additionally, in 1913, Young complained about the overuse of the college lecture system in high schools and that recitations still consisted of memorization. She believed that learning in the high school and earlier levels should be more inherent and valuable. The combination of the new administrators and Young’s unflinching ideals and complaints brought on more opposition. However, one of her other attackers came from someone outside the educational system: the mayor of Chicago, William Thompson. Thompson’s sexism was evident in his attacks on teachers, as he characterized the federation as controlled by “labor slingers,” and about Young, stated that the public schools “employed too many 75 year olds.” Young had to move past the hostilities from others, but it was extremely difficult, as clashes between the superintendent and board were becoming difficult to conceal and Young was subjected to many “little humiliations.” As the opposition continued against her every move, Young felt less attached to her role as superintendent.

Eventually, in 1915, Young tired of the fighting around the politics of education and decided to resign from her post as superintendent, later bringing out the sexism that followed her.

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34 Smith, 40.
35 Mcmanis, 158.
39 Donatelli, 320
After her resignation, perhaps one of the best tributes paid to her as a leader, teacher, and woman came from William B. Owen, her successor at the Chicago Teachers College. About Young, he said, “Had she been a man, she would have held a foremost position in the world of affairs… But the fact is that the first woman to break into a man’s world would have to purchase the experience at a high cost. Mrs. Young throughout all her career had the experiences of a woman pioneer, took all her chances with clear intelligence, asked no favors because of her sex…”

Owen’s view effectively summarizes what Young had to go through during her career. She could have accomplished much more if she was a man, but she also paved the way for females in the future.

Like Ella Flagg Young, Margaret Haley fought for education specifically through her role in the Chicago Teachers Federation, which allowed her to pursue her goals for the betterment of the educational system. Born in 1861 as the child of Irish immigrants, Haley described her childhood as happy, with a loving family, although her family was socially and economically marginalized. Because of her family’s economic troubles, Haley was forced to become a schoolteacher at age sixteen. She was well-suited for the job given her education, and later moved to Chicago and obtained the position of a sixth grade teacher in 1882. She maintained this job until the end of her teaching career, in 1900, although Haley’s largest contributions to the educational system came from her work with the Chicago Teachers’ Federation (CTF). The CTF was a union organized among elementary school teachers and fought for teachers’ rights and working conditions, including the right for female workers to earn as much as their male counterparts. Haley took on the role of a paid business representative of the CTF in January

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40 Smith, 224.
42 Ibid, 2.
44 Ibid.

University of Chicago Laboratory High School
1900, and during her time, the CTF played an important part in the progressive reform movement in Chicago.45

Although Haley’s time and effort on the CTF was characterized by battles from male politicians, she still attempted to fight on behalf of teachers and students. Almost immediately after joining the CTF, Haley spearheaded a legal case in which the CTF sued a state organization for incorrectly assessing the taxes of major corporations of Chicago. This battle lasted for five years, and Haley experienced many male dominated systems along the way.46 For example, Republican State Representative David Shanahan angrily explained to Haley, about the taxation situation, “When you teachers stayed in your school room, we men took care of you, but when you go out of your school rooms and attack these great, powerful, corporations, you must expect that they will hit back.”47 People like Shanahan could not bear being questioned by the CTF, a women’s group. In later battles, Haley challenged the Chicago Board of Education’s leasing of school properties, fought for teachers’ salary increases, and objected to the increasing rigidity and standardization she saw in the early twentieth century schools by proposing an alternative model where teachers’ authority and students’ interests drove the day.48 Through the CTF, Haley wanted to improve students’ and teachers’ lives alike, while tackling issues such as the political control of schools, financial support of system, and equal wages for female teachers.

When Margaret Haley progressed to the national stage with the National Education Association (NEA) and other projects, she faced resistance from others that lead to her demise. Although Haley’s work continued throughout the 1930s, she reached the national stage in 1904 with her speech “Why Teachers Should Organize” before the National Education Association in St. Louis.49 Haley’s speech was the first call to unionize teachers on a national level, and gained

45 Ibid.
46 Sadovnik and Semel, 153.
48 Rousmaniere, ix.
support by advocating for it as a professional duty. Her speech appealed to educators, progressives, and labor activists alike, as it outlined the union rhetoric that had the potential to transform public education. After her speech, Haley worked to ensure Ella Flagg Young was elected as the president of the NEA, and was credited as the “master hand” in doing so. The NEA then gave much more attention to the needs of the classroom teacher, and in later years, the NEA was one of the few organizations with equal opportunities for men and women. Moving forward, however, Haley’s focus on teachers’ working conditions added to her exclusion from other progressive education activities in Chicago, and her intense and uncompromising character made some middle-class women uncomfortable in working with her. Although Haley won some of her battles, she was unable to see that her character warded off even more people.

Furthermore, Mayor William Thompson, who criticized Ella Flagg Young, and School Board President Jacob Loeb, helped take down the CTF by passing various rules, appointing a school board opposed to the CTF, and naming Haley and her associates “lady labor sluggers.” Although Haley continued her work with the CTF, the women’s suffrage movement, and other educational projects, her peak had come and gone, and she faded from the spotlight.

Ella Flagg Young and Margaret Haley, both impressive women of their time, worked to improve the educational system, in spite of the opposition they faced. They worked for the teachers and students of Chicago, and wanted to effect change in the current system, which they perceived as old. Their efforts as teachers, administrators, and business representatives gave them a greater sense of what the educational system and Chicago Public Schools needed. However, because of the opposition they faced against their progressive sentiments and methods, Young and Haley faded out of sight once they died, and they failed to leave an impact. When Ella Flagg Young died, few newspapers noted her death, and those who did wrote about the time

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50 Ibid.
51 Haley and Reid, Battleground: the autobiography of Margaret A. Haley, xxiii.
53 Sadovnik and Semel, Founding mothers and others; women educational leaders during the progressive era, 158.
54 Carl, 311.
from her life she dedicated to the school system.\textsuperscript{55} Although Young was missed for her strong leadership and steady counsel, the Chicago Board of Education unraveled much of what she had worked to do.\textsuperscript{56} Young’s resignation as superintendent was her ultimate defeat and her submission to the opposing forces. For all of her significance and rhetorical power, Margaret Haley’s legacy is hard to notice in today’s schools.\textsuperscript{57} Haley’s visions were often overcome by forces greater than herself, the political situation of her time, and her own views on education.\textsuperscript{58}

However, one of the most important reasons as to why Young and Haley failed was due to the sexism rooted in the field of education at the time. From the beginning, Young and Haley had to forge their own paths as women in positions of power. Administrators, politicians, and citizens were always skeptical about a woman in a position of leadership, showing all that was out of Young and Haley’s grasp. While she faced sexism throughout her career, the effects were most clearly present for Young when she was elected superintendent. Haley led to her own demise through her leadership strategy, which was polarizing as she charged against male legislatures, who pushed her aside since she was a woman.\textsuperscript{59} If Young and Haley did not face such apparent sexism in their careers, their progressive ideals might have been more easily embraced by other educators. In the current age, teachers, administrators, and students alike can learn from Young and Haley’s victories and shortcomings in an attempt to institute the systems Young and Haley once envisioned, and understand effective leadership strategies in the educational field.

\textsuperscript{55} Horace Ellis. "Mrs. Ella Flagg Young." \textit{Journal of Education} 88 (1918), 542.
\textsuperscript{56} Donatelli, \textit{The contributions of Ella Flagg Young to the educational enterprise}, 354.
\textsuperscript{57} Rousmaniere, \textit{Citizen teacher: the life and leadership of Margaret Haley}, 213.
\textsuperscript{58} Nancy Niemi, Review of \textit{Citizen teacher: the life and leadership of Margaret Haley}, by Kate Rousmaniere, \textit{Feminist Teacher} 18, no. 2 (2008): 167.
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The Effect of Tattoos in Behavioral Economics

By: Emma Picker

For this research paper, I wanted to examine the effect of tattoos on the way that people are treated. Originally, this was not the area of behavioral economics that I planned on studying. I was going to look at what affects one’s willingness to lend another person money, but this idea was not very thought out or clear. Discrimination has always been an issue in our society. Stories headline about discrimination by race, ethnicity, sexuality, gender, yet we do not often address less obvious issues of discrimination. We constantly judge one another based on actions, appearance, and choices. So, after talking through possibilities for this project, I had come up with some ideas. I thought of looking at the effects of hair dye, makeup, hair texture, etc. and ultimately ended up deciding to look at the effects of tattoos. Makeup and hair are less obvious, and generally more normalized and temporary than tattoos; many people have hair, and makeup is considered a cultural norm, if not an expectation. Tattoos, on the other hand, are permanent marks, chosen to make a statement on someone’s skin. As someone who finds tattoos to be aesthetically pleasing, but has parents who are not huge fans of them, this idea sounded very interesting to me. My hypothesis was that the presence of tattoos would have a negative impact on how people are treated. I did not have a hypothesis about specifically what negative effects tattoos might have, but I thought that people with tattoos might be seen as more intimidating and less approachable. Tattoos are often associated with aggression, intensity, and pain. Though not all these assumptions are necessarily justified, people with tattoos are sometimes seen as having higher levels of these qualities: if you can get through the pain of a tattoo, you must be pretty tough. Additionally, stereotypical tattoos do not always depict pleasant images. For some, tattoos provoke images of harsh lines, skulls, and snakes, contributing to their intimidating nature. I thought that tattoos might create immediate assumptions about the person with the tattoo, potentially affecting them socially and in the workplace.

In order to conduct this study, I first created a survey using the website SurveyMonkey. Using this site, I easily made a quiz which prompted the participant to select one of two images. My initial question was this: “Which person do you find more approachable?” to which images
of two different people were possible answers. I did not feel as though this question was appropriate for my research. It was a biased question, implying that at least one of the people was approachable, which may not have been plausible or comfortable for all the participants. Ultimately, I settled on the following: “For each pairing, this is the question: There are two open seats left on a bus, one next to each of these people. Who do you choose to sit next to? Please respond with your first reaction.” I felt that this question was appropriate and challenged the participants, whilst not adding unnecessary pressure.

The survey was made up of a series of 8 pairings that went along with the aforementioned question, alternating between pairings of males and females. Pairings 1, 3, 5, and 7 were males, and pairings 2, 4, 6, and 8 were females. Within each pairing, I made sure that the two people had similar “looks” including facial expression, accessories, style, clothing, and hair. I did this so that these qualities would not act as influential factors or lurking variables affecting the participant's choice. That being said, there were still differences within the pairings that could have affected participant’s choices, since I could not make them precisely identical. As I was searching for pictures to use in the survey, it happened that the majority of images depicted Caucasians. Ultimately, all of the images in my survey were of Caucasian people. This controls for any racial bias that individual participants may have. Thus, there is no question of whether race had an influence on the participants’ choices since race was a constant variable.

To select participants for my survey, I used a systematic sample of the U-High student body. To carry out the systematic sample, I used the people that I am friends with on Facebook in the group “Overheard at U-High” (all students at U-High) as my sampling frame. One of the limits of my study is my population parameter. Clearly, it would be better to select my sample from all of the students at U-High, but this was not as practical as selecting from a Facebook group. I acknowledge that this choice could be perceived as creating a limit in the application or extent of the results of my study, but I assume that this difference in sampling frame will not have a large impact on the results of the study. There is no reason that the students on Facebook should be any more or less in favor of tattoos as students not on Facebook. I could not seem to access a complete list of all 765 members in the Facebook group, and so instead used the members that I am friends with (413 members minus any members not at Lab) as my sampling
frame. Next, I randomly selected a number between 1 and 10, which resulted in 3. Thus, starting with the third person on the list, I wrote down every 10th person and sent them a message inviting them to take my survey. I repeated this a second time, this time starting with the sixth person. Ultimately, I sent my survey to 50 individuals and received 35 responses.

Before carrying out the survey, my expectations were that most participants would be biased against people with tattoos, and thus would be less likely to sit next to those with tattoos on the bus as the survey proposed. My expectations came from preconceived notions based on society and personal experience. As I have expressed interest in tattoos, I was warned against getting any too visible as they might impact my ability to get certain jobs, or people might not want them to show in wedding pictures in the future.

Throughout history, tattoos have been controversial. Dating back to 3000 B.C., the earliest tattoos were found in Egypt mostly on female mummies. Scholars believe that these tattoos were signs of prostitution or were used to ward off sexual disease.¹ In contrast, amongst “Scythians and Thracians, ‘tattoos were a mark of nobility.’” Not having a tattoo was an obvious mark of low status.² In most Greek and Roman groups, tattoos were seen as evidence of someone being a follower of a religion, or were used to showcase that someone was a slave or criminal.³ Then, tattoos were called “stigmata,” alluding to the word “stigma,” a word now associated with discrimination towards those with tattoos. By the 19th and 20th centuries, the practice of tattooing was adopted by men across the world, with tattoos being especially predominate as markings of soldiers, criminals, and working men with physically laborious jobs such as coal-miners.⁴⁵ Sailors were among the working men who came across tattoos earlier, even as early as the 18th century.⁶ Other than the aforementioned tattoos on female mummies, women in the 19th century sometimes had tattoos as parts of sideshows or to demonstrate that they were part of

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² Ibid.
³ Ibid.
⁴ Ibid.
Victorian societies. In addition to function, tattoos have also been seen as a form of artistry. Though this concept of tattoos has more recently come into fruition in modern culture, tattoos have been considered as art in Polynesia for much longer. Samoan culture contains a longstanding tradition of tattoos as a part of art and demonstration of rank. In New Zealand, Maori warriors are given tattoos at different stages of life, “as a kind of rite of passage, the decorations [are] regarded as enhancing their features and making them more attractive to the opposite sex.” In many indigenous cultures, like the Maori, tattoos are seen as highly desirable and signify high status. In the United States, around the 60’s, tattoos shifted from signifying a certain occupation to being common amongst bikers, but now tattoos are much more common in the general population. Because of a large increase in the commonness of tattoos, it might be expected that the stigma around them would have decreased, yet it seems that many societies still find tattoos troubling. Some argue that certain popular religions, such as Judaism and Christianity, do not approve of and even ban tattoos. Though this perspective is not true for all followers of Judaism and Christianity, comments against tattoos and similar skin markings can be found in religious texts such as the Book of Leviticus, which states, “You shall not make any cuttings in your flesh [...] or tattoo any marks upon you.”

Despite the relatively common presence of tattoos in current society and the long history of tattoos, I expected the participants to prefer associating with people without tattoos than those with them. It seems that many adults warn younger generations about getting tattoos as they might impact their abilities to get jobs, and there is evidence to support that. Amii Parr reported to BBC that when she told her by-phone interviewer that her arms were tattooed, “he just hung

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9 Lineberry, “Tattoos.”
10 Thompson, Covered in Ink, 2015.
Another reader of BBC relayed that she was seen as “unapproachable and scary with tattoos and piercings and could lose potential clients.”

Based simply on real-world experiences, tattoos clearly have effects in the workplace. While I was curious to see if tattoos had an impact on daily interactions, my proposed scenario for the participants does not involve potential interaction with another person, with or without tattoos. The participant simply had to sit next to them on a bus ride. Yet, overall participants chose to sit next to people without tattoos 68.91% of the time. Looking at the male and female pairings, people chose to sit next to women without tattoos 63.43% of the time and men without tattoos 74.44% of the time. Based on these raw percentages, it appears that the majority of participants chose to sit next to people without tattoos. The difference of 11.01% between women and men raises the question of whether or not tattoos are perceived differently based on gender and if so, why.

Though the percentages suggest that people would rather sit next to people without tattoos, it must be determined whether or not this difference is significant. Additionally, not all individual questions or pairings followed the same trend as the overall data. 7 of the 8 questions had higher percentages of people without tattoos being selected, but one did not. In this pairing (Question 2, shown below), 19/34 respondents or 55.88% of respondents chose to sit next to the woman with tattoos.

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It is not clear if this is significant enough to change the general consensus that participants prefer being near strangers without tattoos. While the tattooed woman was more favored in this question, she is not overwhelmingly favored. In contrast, some of the other questions showed heavy favoring of people without tattoos. These are the data gathered for the entire survey:

<table>
<thead>
<tr>
<th>Question #</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man w/o tattoos</td>
<td>30/35 = 85.71%</td>
<td>24/32 = 75.00%</td>
<td>26/33 = 78.79%</td>
<td>19/33 = 57.58%</td>
</tr>
<tr>
<td>Man w/tattoos</td>
<td>5/35 = 14.29%</td>
<td>8/32 = 25.00%</td>
<td>7/33 = 21.21%</td>
<td>14/33 = 42.42%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question #</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woman w/o tattoos</td>
<td>15/34 = 44.12%</td>
<td>24/34 = 70.59%</td>
<td>18/33 = 54.55%</td>
<td>28/33 = 84.85%</td>
</tr>
<tr>
<td>Woman w/tattoos</td>
<td>19/34 = 55.88%</td>
<td>10/34 = 29.41%</td>
<td>15/33 = 45.45%</td>
<td>5/33 = 15.15%</td>
</tr>
</tbody>
</table>

According to these percentages, it seems that participants favored people without tattoos when evaluating males, whereas when evaluating females, only two of the questions presented large biases in favor of women without tattoos. Both of the women in questions 4 and 8 were heavily
tattooed, with the tattoos on the woman in question 8 extending to her neck. It is possible that their high levels of tattoos could be associated with the larger difference in the bias against them. That being said, the woman in question 6 is also heavily tattooed, yet the discrepancy between her and the respective woman without tattoos is not as noticeable. However, this still brings into question how the amount, placement, or content of tattoos affects how one is perceived. Amongst the men, three of the questions presented large biases against the man with tattoos. It is noteworthy that those three questions all contained men with smaller, less noticeable tattoos than the tattooed man in question 7 and the females’ levels of tattoos. The men in questions 1 and 3 only had visible arm tattoos, yet their rates of being chosen are among the top 3 lowest overall. The tattooed man in question 7 is fairly heavily tattooed (of a comparable level to many of the women), yet there was not as large of a bias against him. In looking at the overall data, it appears that my hypothesis is valid. Overall, participants did not choose to sit next to individuals with tattoos as frequently as they did individuals without. But, when each question is looked at and compared, major questions arise promoting the idea that there are complicated elements contributing to tattoo stigma.

While tattoos and their effects have been examined extensively in psychological and sociological studies, their presence in economic studies is less predominant. With an economic outlook, it is evident that tattoos can be related to marketing, business operation, and differences between social and professional perception. If there is a correlation between tattoos and how tattooed people are perceived, businesses must take this into consideration in terms of employment and what image they are promoting to the public. Quoted in the The Economist, Felix Salmon has an unconventional outlook on tattoos in the workplace, saying “Businesses with tattooed employees are signalling to me that they have better service, and as a result I’m more likely to try them out.”14 15 By this Salmon indicates his belief that people with tattoos are often discriminated against in the workplace, and that ultimately because of this, they would produce higher quality service as a preventative measure against discrimination and job loss. Essentially, if one is accustomed to discrimination, Salmon believes they are more likely to be on

their guard about their actions and thus work in a better fashion. The response to Salmon’s comment was that “the persistence of social conventions in hiring suggests that most people don’t tend to see things the way Mr. Salmon does.”\textsuperscript{16} If Salmon’s comment were true, more companies would hire employees with visible tattoos since this would increase the quality of their work and services. Salmon proposes that there could be a shift in the dynamic of the workforce such that people with tattoos have an advantage because of his reasoning, yet the workplace culture we see does not fit with Salmon’s predictions. In this manner it is evident that social biases regarding tattoos have invaded their way into the professional world. Additionally, the concept of “pulchronomics” connects tattoos back to economics. Coined by Daniel Hamermesh, pulchronomics is the study of the economics of physical attractiveness. In July of 2016, a study was published titled “CEO Pulchronomics and Appearance Discrimination.” The study aimed to see if “a beauty premium exists in CEO compensation.”\textsuperscript{17} The study hypothesizes that there could also be a connection between physical attractiveness and productivity. Even just the fact that studies such as this have been done demonstrate how prevalent “lookism,” as Hamermesh refers to it as, is in our society.

Subsequently, numerous studies have been done to suggest that tattoos have an effect on physical attractiveness. Not only does physical attractiveness have an effect on individuals in the workforce, but also in terms of social value. Hamermesh predicts that across the course of a lifetime, “a handsome worker in America might on average make $230,000 more than a very plain one. There is evidence that attractive workers bring in more business, so it often makes sense for firms to hire them.”\textsuperscript{18} Evidently, physical attractiveness affects one’s economic prospects and job possibilities, but beauty also affects how people are valued in society. In 2007, a study was done to better understand perceptions of women with different levels of tattoos. The study found that “ratings of physical attractiveness decreased systematically with increasing

\textsuperscript{16} Economist, “The economics of tattoos.”
\textsuperscript{17} Jung Yeun Kim et al., “CEO Pulchronomics and Appearance Discrimination,” SSRN (2016).
\textsuperscript{18} The Economist, “The economics of beauty,” The Economist (2011).
number of tattoos,””\(^{19}\) despite the fact that tattoos are quite common and, to many, tattoos are “now considered chic. Estimates are that ten percent of the population in the United States is or has been tattooed [...] twenty percent of men and seven percent of women.”\(^ {20}\) This study also found that “there was a general pattern of increasing perceived sexual promiscuity with greater number of tattoos.”\(^ {21}\) Additionally, women with more tattoos were perceived as consuming more alcohol, so on the whole it appears that women with tattoos were perceived negatively in that study. Even though tattoos are supposedly becoming more “attractive” and “chic” in current society, the evidence that these studies provide do not suggest this idea to be true, at least not yet. Not only does their level of physical attraction decrease, affecting them socially and economically in their work, but they are perceived as having higher rates of activities considered vices. High sexual promiscuity and levels of drinking are not traits that businesses would like their employees to encourage. These negative perceptions could be contributing factors to my study; people with such unfavorable habits may not be chosen as optimal strangers to sit with on the bus. Thus, tattoos may affect women economically not just in terms of physical attractiveness, but also in terms of what messages their tattoos give off. The study I have done does not seem to agree completely with the conclusions that were made in this 2007 study. Though this study concluded that tattoos have quite a large negative effect on how women are perceived, two of the pairings in my study found that the women were of similar probabilities to be chosen by participants, whether or not they had tattoos. That being said, my results were ultimately not very conclusive and were not done on a very extensive scale. Another study found that a man who viewed a woman with tattoos described her as less athletic, motivated, honest, generous, religious, intelligent, and artistic than a woman without tattoos.\(^ {22}\) Again, many of these are qualities that employees look for, especially motivation, honesty, intelligence, and artistry.


\(^{21}\) Swami, “Unattractive, promiscuous and heavy drinkers.”

Thus, if the lack of these qualities is attributed to women with tattoos, it seems quite obvious that their professional success would be negatively impacted.

Like with women, tattoos seem to have effects on the perceived attributes of people with tattoos, yet the qualities assumed are quite different. In regards to the effects of tattoos on men, a study was published in 2017 titled “Tattooed men: Healthy bad boys and good-looking competitors.” This study found that men with tattoos were perceived as healthier, more masculine, dominant, and aggressive, but not as more attractive, at least by women. These perceived qualities could be factors in my study. If men with tattoos are considered to be more dominant and aggressive, they may be less likely to be chosen as bus partners which matches with the large differences in the rates of participant choice amongst the male pairings of my study. As was evidenced before, it seems that the more attractive one is, the higher their economic prospects (and social prospects) are. So decreased attractiveness in men due to tattoos would not be completely beneficial. Even though dominance may be desirable in the professional world as a trait associated with good leaders, high levels of aggression are not generally what businesses aim to promote. This study demonstrates how the effect of tattoos on men is just as complicated as it is for women, though the complications carry different social outcomes as people respond differently to, for example, aggression (men) as opposed to sexual promiscuity (women).

Though my study did not directly deal with the effects of tattoos in the professional world, it did address the social aspect, and clearly social and professional biases are heavily intertwined. An association between presence of tattoos and decreased desirability, even just as a person on a bus, suggests that even socially, people with tattoos may not deemed as as desirable. Decreased social desirability does not breed professional desirability.

I believe the results of this study are not fully acceptable to draw complete conclusions from about the U-High population. As my sample was very small (33-35 participants), it is not necessarily justifiable to make general conclusions about Lab’s perception of tattoos. That being said, it is somewhat surprising that there seemed to be a bias against tattoos given that the sample

surveyed is part of a much younger generation, which is often associated with greater self-expression. Fewer topics are taboo, and current culture generally encourages tolerance for differences. It may be good for our community to continue thinking about how we feel about tattoos as we move forward into our adult life. Not only should we consider the effects of tattoos in our own decisions, but also in how we move forward with treating others and considering how we feel about different aspects of workplace discrimination.
Bibliography


How Muslim Scholarship Influenced the Renaissance

By: Neha Ramani

The Renaissance, a movement spanning from the fourteenth to seventeenth centuries, is known as the cultural rebirth that led to modernity. However, many people do not take into account the pivotal role that Muslim scholarship played in several of the central beliefs and ideas of the Renaissance. One such concept, the revival of classical learning, was prevalent in the Middle Ages. In addition, early Muslims produced some of the greatest intellectuals of scientific knowledge. The Islamic sciences were profoundly important in providing the tools for the West to study the sciences of nature. Muslim scholars were already using logic and experiments in the areas of philosophy, science, medicine, and math. Specifically, Avicenna wrote *The Canon of Medicine*, al-Rāzī discovered the difference between smallpox and the measles, al-Khwārizmi and al-Kindi popularized the use of Indian numerals, and Alhazen wrote *The Book of Optics*. Muslim scholarship inspired and allowed for advancements in math, science, medicine, and philosophy during the Renaissance; however, many Renaissance historians falsely attributed certain innovations to European thinkers, creating an illusion of originality. Not acknowledging the importance of Muslim scholarship considerably changes the way one views the Renaissance and the novelty of its ideas.

Muslim scholars, such as Avicenna, explored new ideas of philosophy in the Middle Ages that later helped shape philosophical beliefs during the Renaissance. Abū Ali al-Hussein ibn Abdullah ibn Sina, known as Avicenna in Europe, was one of the principal philosophers in the medieval Hellenistic tradition. He explored subjects including astronomy, medicine, logic, and

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philosophy. One of his key contributions to philosophy was his distinction between ‘essence’ and ‘existence.’\(^5\) Avicenna had a considerable influence on Western philosophy and Western medicine, to the point where his medical thought is still widely used in the Arab world today.\(^6\) Latin versions of his work started to surface in the late twelfth century, which subsequently influenced contemporary philosophers in addition to his pupils. Albert the Great, the thirteenth century German philosopher, and his most famous student, the medieval Christian theologian St. Thomas Aquinas, discussed Avicenna’s work extensively.\(^7\) Avicenna is perhaps most well-known for his comprehensive medical text, al-Qānūn fi ’l-tibb (The Canon of Medicine).\(^8\) In it, he writes that the “Practice’ of medicine is not the work which the physician carries out, but is that branch of medical knowledge which, when acquired, enables one to form an opinion upon which to base the proper plan of treatment.”\(^9\) The Canon of Medicine exceeds one million words and contains all that was known about medical science up until the tenth century.\(^10\) It was translated into Latin in the twelfth century but did not make an impact on Western scholarship until the fifteenth century. However, during the Renaissance, its impact was significant as the text gained prominence in the medical literature of the time.\(^11\) Avicenna’s work challenged the established medical text of Galen and replaced it during the Renaissance, becoming the chief medical textbook in European and Middle Eastern universities until the seventeenth century.\(^12\) Avicenna’s contributions greatly influenced European medical thought and literature and resulted in advancements in the field of medicine, especially in cardiology, during the Renaissance; not


\(^6\) Leaman, *An Introduction to Classical Islamic Philosophy*, 22-23.

\(^7\) Leaman, *An Introduction to Classical Islamic Philosophy*, 23; Lindsay, *Daily Life in the Medieval Islamic World*, 199.


\(^10\) Morrison, “Avicenna and his Legacy,” 245.

acknowledging the importance of his scholarship diminishes his worth as a scholar and significantly changes the way historians view these medical developments.

Not only did Muslim scholarship affect medical literature, but another influential Muslim scholar, al-Rāzi, formed the basis for many key advances in the field of medicine, including how physicians practice today. Abū Bakr Muhammad ibn Zakariyya al-Rāzi was a physician and clinician who established many areas of medical science including pediatrics and psychiatry.13 He was also a chemist, philosopher, and musician. His medical texts in Arabic and Latin were relied on along with those of Galen in Europe during the Middle Ages.14 Similar to Avicenna, al-Rāzi synthesized all known medicine by sorting it into categories and different areas of study, such as diseases of the eye and dietary advice.15 Al-Rāzi’s best-known text is most likely his monograph on smallpox and measles called Kitab al-Judari wal-Hasba.16 Al-Rāzi was the first to distinguish between these two diseases by using what is now called a differential diagnosis, which is the process of differentiating between multiple conditions that share similar symptoms. In fact, this method is still used in modern medicine today. Al-Rāzi’s text was translated into Latin and various modern languages multiple times from the thirteenth to the eighteenth centuries and emphasized al-Rāzi’s commitment to empirical medical science. Despite the fact that al-Rāzi’s work on subjects including differential diagnosis led to many innovations in medicine development during the Middle Ages and the Renaissance, he was not credited in the Renaissance for his ideas, which considerably affects the way historians view his contributions to society.

In addition to advances in medicine, Muslim scholars discovered key mathematical concepts that strongly influenced Renaissance mathematicians. The ninth-century mathematician Muhammad ibn Mūsa al-Khwārizmi introduced algebra and the Arabic numerals into the Islamic world. He is considered the father of the field of algebra.17 His greatest legacy comes from his remarkable book on algebra: Kitab al-Jebr. The world ‘algebra’ is derived from the “al-Jebr” in

13 Al-Khalili, The House of Wisdom, 140.
14 Ibid., 143.
15 Ibid., 146.
16 Ibid., 146.
17 Al-Khalili, The House of Wisdom, 73, 110; Lindsay, Daily Life in the Medieval Islamic World, 198-199.
the title. “Al-Jebr” means the reconnection of broken parts while “kitab” means book, thus al-
Khwarizmi’s *Kitab al-Jebr* essentially translates to “the book of reconnecting broken parts” and
is representative of what one fundamentally does in algebra. In this mathematical text, al-
Khwarizmi developed methods for solving quadratic equations and laid out the rules and steps of
solving algebraic equations. Al-Khwarizmi’s book was translated into Latin twice in the twelfth
century by the Englishman Robert of Chester and the Italian Gerard of Cremona. Fibonacci,
considered the greatest European mathematician of the Middle Ages, quoted al-Khwarizmi in his
Liber Abaci of 1202. Fibonacci was strongly influenced by al-Khwarizmi’s work and introduced
algebra and the Arabic numerals as a result of this influence. Although popular opinion credits
Fibonacci with the introduction of the Arabic numerals, their origin can be traced to al-
Khwarizmi and another great Abbāsid polymath, Ya’qūb ibn Ishāq al-Kindi. Al-Kindi wrote an
important treatise on Indian numerals, *Kitab fi Isti’mal al-‘Adad al-Hindi* (*The Book on the Use
of Indian Numerals*). Al-Kindi’s influence was similar to that of al-Khwarizmi. Both scholars
were versatile as they contributed to mathematics in addition to astronomy, geography, optics,
medicine, music, and cryptography. Al-Khwarizmi and al-Kindi both significantly advanced
central ideas in the field of mathematics but their importance is overshadowed by the
Renaissance scholars who are now credited with these ideas.

The influence of Muslim scholarship on mathematics and science contributed to its
subsequent effect on art. The *visual theory* of Arab civilization is distinct from the *pictorial
type* that has become essential to Western civilization since the Renaissance. The role of
mathematics in these two civilizations differed accordingly. The mathematical theory of optics
comes from an Arab treatise: *Kitab al-Manāthir* (*The Book of Optics*) by Abū Ali al-Hassan ibn
al-Haytham, also known as Alhazen in Latin. Alhazen revolutionized optic theory and his greatest work, *The Book of Optics*, became the guide for Western visual theory through its Latin translation in the late twelfth or early thirteenth century. In *The Book of Optics*, Alhazen wrote that “sight does not perceive any visible object unless the object has some light in it either from itself or from another object; and that the light of many visible bodies appears on the bodies situated opposite them and that their light appears on the eye that perceives them.” Alhazen’s book contained seven volumes that discussed facts such as these, and after being translated from Latin into common Italian, his book became more accessible to a wider audience. Subsequently, Alhazen’s work influenced the theory of perspective that developed in Renaissance Europe in science and art. Although Renaissance work on mathematics has been thoroughly studied, it can be seen in a new light when considered in the context of Arab visual theory, which is exemplified by *The Book of Optics*, whose Latin name was “*Perspectiva*.” Because Renaissance thinkers focused on their own mathematical theories, other theories of different origins were ignored and lost, just as they have been in modern research. Despite the fact that Alhazen was a remarkable mathematician and experimental scientist of the Islamic Golden Age, most historians have not mentioned him in the studies of perspective in art relating to optics. It seems that historians focus on the knowledge about visual perception gleaned during the Renaissance. In the West, most people believe that Isaac Newton is the father of modern optics. This is reflected in textbooks, in schools, and even in the opinions of scientific historians. In addition, the influence of Muslim scholarship on the Renaissance can also be seen in the modern scientific method, which did not originate during the Renaissance, contrary to popular belief. It was, among other scientific

28 Ibid.
concepts of the time, well established in the tenth and eleventh centuries.\textsuperscript{31} Although the visual culture of the Renaissance was created due to its interaction with Arab math, science, and art, the contributions of Muslim scholars to these areas have been eclipsed by Renaissance historians.

Muslim scholarship significantly influenced many of the ideas in Renaissance society. Although many discoveries and inventions in areas of philosophy, medicine, science, math, and art had already been made by Muslim scholars in the Middle Ages, historians and people in modern times are unaware of their contributions to these areas of study as these scholars were rarely credited and thus over time, forgotten. Because the majority of the Muslim scholars’ findings had been recorded in Arabic, many philosophers used Latin translations instead of the original Arabic texts; thus, in books of their own, they documented ideas that originally belonged to Muslim scholars and neglected to recognize the history Muslims had built during the Middle Ages with their own discoveries. Nevertheless, history was irrevocably shaped by the Muslim scholars’ advances in philosophy, science, and math during the Middle Ages

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