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The Impacts of Education on Marital Practices in Morocco

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The Impacts of Education on Marital Practices in Morocco

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I hereby recognize and pledge to fulfill my responsibilities as defined in the Honor Code and to maintain the integrity of both myself and the College community as a whole.

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Abstract

Higher education among young adults in Morocco have increased tremendously in the past ten years, nearly 25%. A significant rise in college enrollment will undoubtedly have an impact on any society; however, many of the cultural and interpersonal affects higher education may have go unrecognized. While GDP growth, labor participation, and immigration are all critical factors to measure the changes in a quickly evolving country like Morocco, examining the cultural and social shifts that may occur are equally critical to better understand how a country is changing. This project identifies, measures and analyzes the impacts of higher education on Moroccan marital practices, to unveil unknown correlations within Moroccan society. Throughout this research, factors such as health, priorities, age, labor, and the circumstances through which spouses meet are investigated in both scholarly and statistical approaches. Utilizing literature from scholars of varying fields of study, this paper explores these factors in order to relate it to the question at hand by using computational calculations to determine the direct correlation between these effects and education over the last ten years. The results of this study are displayed on a website that is widely accessible, making this information useful to anyone who may have misconceptions about varying Moroccan marital practices and why they have changed in the last ten years.

Arabic Language Abstract

كُلنا نعرف أن هناك علاقة بين مستوى التعليم و حياة المجتمع. في المغرِب، اِرتفَع مستوى التعليم بشكل كبير في العشرَ سنوات الماضية. مع انَّ الدَّخل القومي و فُرَص العمل و الهجرة كلها عوامل مُهمة في التغيّرات في بلد مثل المغرب ، برّ ان نبحث في الخَغيرّ ان المجتمعيَّة ايضاً.هذا البحث يحددو يقيس العوامل التي تؤثر على الزواج المغربي. في هذا البحث أنظر إلى العوامل مثل مكان اللقاء و العمر و الصحة و العمل خلال الكتب و البيانات. أقرأ مقالات من أساتذة دراسات مختلفة ، وكيف يتحدثون عن هذه العوامل لكي أفهم كيفية ارتباطها بالسؤال. بعد ذلك ، استخدمت علوم الكمبيوتر لمعرفة العلاقة بين العوامل والتعليم خلال السنوات العشر. ختام هذه الدراسة موجود على موقع إلكتروني يمكن لكل شخص الاطلاع عليها للحصول على معلومات حول الزواج في المغرب.

Arabic Glossary

مَقْبول	acceptable, passing
تَرتيب	arrangement
رَتَّبَ	to arrange
الثَّقافة	culture
قَرار	decision
الطَّلاق	divorce
التَعليم	education
خُطِبَت لِ	(got) engaged to
خَطيب/ة	fiance/fiancee
مالِيّ/ة	financial
تَعَرَّفَ على	(to) get to know
حُكومة	government
تُراث	heritage (literacy and cultural)
تعارُف	making the mutual acquaintance (of), getting to know (one another)
المَغْرِب	Morocco
حَماة	mother in law
حَفْلة	party
فَقير	poor
غَنِيّ	rich
عُرس	wedding
وَثِقَ "ب" أو "في"	to trust, have confidence in
مَخزَن	storehouse, warehouse

القُرآن	Quran
زَواج	marriage
وَلِيّ	guardian
البيانات	data
حضري	urban
نَفَقَة	alimony (mans financial obligation towards his wife)
قروي	rural
زِنًى	fornication

Chapter 1: Moroccan Marriage Across Time

Rites of passage that people consider valuable, traditional, and respectable differs between communities. While some countries place a higher value on some social benchmarks than others, marriage is a tradition that is for the most part, universal. While marriage is essentially a global practice, the process of finding a spouse is specific to each culture. In Moroccan culture, finding a spouse is not only expected, but widely encouraged.[1] Throughout the few months I spent in Morocco, I witnessed first hand the cultural significance of marriage, seeing how different communities in Morocco practiced and valued the occasion. The most apparent observation I noticed was how Moroccan college students viewed marriage, compared to what I had learned about marriage within Islam in courses I have taken. This observation left me with questions that were worthy of exploration. This comprehensive project will answer the question of how education impacts marital trends and practices in Morocco through literary review and statistical analysis. Before unpacking how education currently impacts marriage, understanding the historical background and cultural significance of Moroccan marriage will provide context as to why education plays a role today.

Historically, the most common marital practice in Morocco is arranged marriage, however this has slowly changed over time.[2] The term "arranged marriage" sparks many different thoughts and feelings depending on the cultural context. What is considered an arranged marriage in one country may be considered a traditional marriage in another, depending on how common it is for the family to have an influence in the engagement. An arranged marriage is

[1] Landinfo. Translated by Office of the Commissioner General for Refugees and Stateless Persons, Norwegian Country of Origin Information Centre, Oslo, Norway, 2017, Morocco: Marriage and Divorce – Legal and Cultural Aspects, pp.9
[2] Ibid, pp.12

generally understood as a consensual marital practice where family members facilitate a marriage between two individuals.[3] Both the man and woman have agency in this union, and can say no at any point throughout the engagement. Agency is the biggest difference between arranged and forced marriage. Forced marriage is outlawed in most countries including Morocco. While many people see arranged marriage exclusively as a young girl being forced to marry an older man, this is not the case, even if an age difference may occur. In regards to this project, the datasets being analyzed will only consist of data from legal marriages.

Marital norms and practices in Morocco have changed drastically in the past century due to colonization, changes in leadership, and feminist movements demanding political and social reform. The colonization of Morocco officially began on March 30th, 1912, when France signed the Treaty of Fez, establishing a protectorate over Morocco.[4] "The standardization of customary law codes, whether written or oral prior to submission to the makhzan (the central Moroccan government, lit. "storehouse") under the Protectorate, required that French officials both maintain pre-contact codes and create new institutions to administer and monitor them."[5] From 1912 to 1956, although France had little political influence on family law in bigger Moroccan cities, what little invention they had in the more rural parts of Morocco had a major impact on why marriage laws varied throughout Morocco.

Due to its proximity in relation to Spain, as well as the 7th century expansion of the Islamic Empire into North Africa which brought Arabs and the Arabic language, Morocco is made up of various groups that have different approaches to family matters such as marriage.

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[3] Ibid, pp.12

[4]University of Central ARKANSAS: UCA. (n.d.). Retrieved April 13, 2021, from https://uca.edu/politicalscience/dadm-project/middle-eastnorth-africapersian-gulf-region/francemorocco-1930-1956/

[5] Hoffman, Katherine E. "Berber Law by French Means: Customary Courts in the Moroccan Hinterlands, 1930-1956." Comparative Studies in Society and History, vol. 52, no. 4, 2010, pp. 851–880. JSTOR, www.jstor.org/stable/40864899, p. 852

While the French government had a hand in Morocco's legal inconsistencies, the ethnic, linguistic, cultural, and geographical diversity of Morocco made marital practices even more specific to each group. In the rural villages of Morocco live the Amazigh people, formally known as the Berber community. While Imazighen (plural of Amazigh) were referred to as Berber during this period, this ethnic label is now outdated as it means "barbarian" and was used in discriminatory contexts by European colonizers and some Arab conquests.[6] The Amazigh community pushed back the most on French colonial policies. Once France took control, they established institutions to oversee their pre-colonization laws in 1912, however the Amazigh customary courts were established in the 1930s in response to the fact their native laws were not being respected. These courts were run by members of the Amazigh council that were all approved or selected by French officials.[7] From 1934 until Morocco gained its independence, these courts regulated family law which includes laws surrounding marriage. These laws aligned more closely with Islamic values which the French took no issue with as they did not find many of these legal practices offensive or controversial. This quickly changed however, since some Amazigh customary laws were practiced differently throughout the country, and some were even opposing to Sharia law (rooted in Sunni Islmaic law).[8]

Due to the diversity of Morocco, it was unclear which villages and cities were following Amazigh custom laws, Islamic law, or a mix of both. This was mainly because so many rural communities had different interpretations of the Quran, which serves as the main text of Islam based on revelations directly from God, including rules and values surrounding marriage and

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[6] Hanafi, Leila. The Legal System of Morocco - Konrad Adenauer Foundation. www.kas.de/documents/265308/265357/Legal+System+of+Morocco.pdf/23060d5a-26e0-64a0-7b8f-8b3640d68865?version=1.0&t=1596788324505. p.2

[7] Hoffman, Katherine E. "Berber Law by French Means: Customary Courts in the Moroccan Hinterlands, 1930-1956." Comparative Studies in Society and History, vol. 52, no. 4, 2010, pp. 851–880. JSTOR, www.jstor.org/stable/40864899, p. 860

[8] Ibid.

family law. The French could not monitor how everyone was applying family law, especially since many communities adopted a mix of laws, which caused the French to feel threatened. The French issued two decree's in order to regulate justice systems among Amazigh communities, however this only emboldened Imazighen to resist French authority. "Both the 1914 and 1930 decrees mandated the urgency of identifying and codifying juridical differences between tribes according to their allegedly Islamic or non-Islamic customary properties. Article 6 of eight in the 1930 decree stipulated that criminal cases in Berber lands be tried under French law, and this became a rallying cry for urban nationalists."[9] French officials were not content with these differing familial practices, as they felt Islamic law was more similar to French values, and were threatened by Amazigh custom law, as some allowed women to have rights the French did not deem necessary. They felt threatened by this as they did not want a feminist revolution, seeing any possibility of a social movement as a step towards men trying to overthrow their colonial power.[10] While this legal battle was happening, there were many Moroccan nationalist movements, as well as pressure from the League of Arab States Council for Morocco to gain its independence. After a battle between French troops and Moroccan nationalists from August to November of 1955, which resulted in nearly a thousand casualties, France agreed to grant Morocco independence, which was officially enacted on March 2nd, 1956.[11]

Once Morocco became independent, it became a constitutional monarchy with two branches of parliament, one being the House of Representatives and the other being the House of Councillors. While there are many members of government, the King holds almost all the actual

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[9] Hoffman, Katherine E. "Berber Law by French Means: Customary Courts in the Moroccan Hinterlands, 1930-1956." Comparative Studies in Society and History, vol. 52, no. 4, 2010, pp. 851–880. JSTOR, www.jstor.org/stable/40864899, p. 855

[10] Ibid, p.862

[11] University of Central ARKANSAS: UCA. (n.d.). Retrieved April 13, 2021, from https://uca.edu/politicalscience/dadm-project/middle-eastnorth-africapersian-gulf-region/francemorocco-1930-1956/

power. In 1957, King Mohammed V adopted Morocco's first Personal Status Code which is the only part of Morocco law based on Islamic traditions.[12] Considering that Sunni Muslims make up 99% of Morocco, Moroccan family law is rooted in the interpretation of Sharia law is based in the Sunni legal tradition, specifically following the teachings of the Maliki school of thought.[13] Sharia law is applied to domestic households within Morocco, meaning that laws concerning marriage stem from the scripture of the Quran. Although some values in the Quran concerning marriage are more widely understood such as marriage being between individuals who identify as a man and a woman, as the laws in Morocco do not permit same sex marriage, other values were under debate area due to prior colonization. "The specific issue in the country is that of the inheritance of different laws from past colonial periods that disharmonised within the legal system."[14] While Moroccans in different parts of the country initially had different interpretations and understandings of the family laws already in place, King Mohammed V implemented the first Personal Status Code which contained laws concerning family practices that were rooted in his interpretation of the Quran. Unfortunately, this code of law had many societal issues which led to multiple changes in marriage law due to social movements and religious values.

Although consent is a requirement of marriage under Islamic law, this Moroccan code of law did not require that women had to consent to a marriage, which thereby made forced marriage legal, and almost preferred. Under Islamic law, every woman is appointed a وَلِيّ (wali), which translates to guardian, who acts on her behalf in the ritual of marriage and secures her rights in the contract. Since the وَلِيّ is usually a family member, it is assumed under Islamic law

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[12] Zoglin, Katie. "Morocco's Family Code: Improving Equality for Women." Human Rights Quarterly, vol. 31, no. 4, 2009, pp. 964–984. JSTOR, www.jstor.org/stable/40389983. p.966

[13] Hanafi, Leila. The Legal System of Morocco - Konrad Adenauer Foundation. www.kas.de/documents/265308/265357/Legal+System+of+Morocco.pdf/23060d5a-26e0-64a0-7b8f-8b3640d68865?version=1.0&t=1596788324505. p.4

[14] Ibid, p.5

that he will follow the rules and make decisions that are in her best interest. Unfortunately from 1956 to 1993, the وَلِيّ had the power to make all the decisions including the selection of the woman's spouse under Moroccan law. This meant that women needed the consent of their وَلِيّ to agree to a marriage, even if they didn't have their best interest at heart.[15]

While marriage in Morocco is under Sharia law, there was much debate on the interpretation of the Quran, and how much agency women should have in the practice. This societal debate caused a divide between Moroccan society, as one side believed that the Quran does not justify young girls getting married, women lacking agency in choosing a spouse, and confining gender roles, while the other side argued that gender roles were traditional and concrete Islamic values.[16] "Many who opposed the Plan pointed to traditional, restrictive interpretations of the Koran and Islam, while those who favored it cited verses from the Koran that support the equality of women".[17] Many Moroccan feminists and women's organizations, including Union De L'Action Feminine, rallied for reform as the Personal Status Code did not protect women.[18] They used many strategies such as gathering signatures, and quoting the Quran in support of their rights as women. This led to revisions in 1992, which led to an official yet ineffective change in 1993.

The revised Personal Status Code did not give women full agency to choose a spouse, but simply limited the authority of the وَلِيّ, and still had clear inequalities when it came to divorce, making it so that men had the unilateral right to divorce their wife.[19] Hundreds of thousands of

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[15] Zoglin, Katie. "Morocco's Family Code: Improving Equality for Women." Human Rights Quarterly, vol. 31, no. 4, 2009, pp. 964–984. JSTOR, www.jstor.org/stable/40389983. P. 966
[16] Landinfo. Translated by Office of the Commissioner General for Refugees and Stateless Persons, Norwegian Country of Origin Information Centre, Oslo, Norway, 2017, Morocco: Marriage and Divorce – Legal and Cultural Aspects, pp.10
[17] Zoglin, Katie. "Morocco's Family Code: Improving Equality for Women." Human Rights Quarterly, vol. 31, no. 4, 2009, pp. 964–984. JSTOR, www.jstor.org/stable/40389983. P. 967
[18] Ibid
[19] Ibid

Moroccan citizens were not happy with this revision, which resulted in demonstrations in Casablanca and the capital Rabat in March 2000.[20] This led to three women being appointed by King Mohammed VI to serve in the Commission to rewrite the laws of the Personal Status Code. It was not until 2004 that these changes were finalized; however, they were seen in the newest version, which is referred to as the Moudawana. The creation of the Moaudawana was a significant step towards establishing the norms and rules for arranged marriages in Morocco. The role of agency finally came into play, as the وَلِيّ was no longer allowed to make the sole decisions for women, as they were finally able to consent to a marriage on their own. Other major reforms included women and men having equal rights within the marriage, the female age of marriage raising from 15 to 18 (although marriages from ages 15-17 are allowed under certain circumstances by a judge), divorce becoming a mutual agreement, and polygamy being harder to establish without the permission of the first wife.[21] These revisions made Morocco considered to be one of the most progressive in the North African region in terms of preserving women's rights within marital practices.

While women legally had more rights within marriage, this did not automatically stop forced and abusive marriages. Due to the literacy and poverty rates, as well as people not fully knowing their rights, these revisions were not put into action as needed. Many women in rural villages were not even aware that family laws had changed, therefore never adopted new marital practices.[22] Many women were also afraid that they would lose financial stability if they were to divorce their husband, therefore they never exercised their right to file for divorce. This has slowly changed since 2004, however even during big movements such as the Arab Spring in 2011, abusive marriages were not directly addressed and dealt with until a young woman

[20] Ibid, p. 967-968
[21] Ibid, p.970-972
[22] Ibid,p. 977

committed suicide from an abusive marriage in 2014.[23] "Morocco did not go through upheavals like other countries in the region during the Arab spring, but the events in countries like Tunisia and Egypt have led to increased pressure on the government to implement reforms. The king has expressed his willingness for political and social reform and has personally initiated a new constitution (2011) and new special laws, including the 2004 family law."[24] Although many were not aware of their rights, many communities were educated on legal practices, yet still preferred to keep their original practices.

Although the Moroccan government developed national guidelines and laws concerning marriage, marriage practices continued to vastly differ depending on the geographical location. What people in more rural areas consider to be traditional marriages, many people within the cities of Morocco such as Casablanca, Fez, and Tangier would refer to an arranged marriage. This is for a few reasons, one being that people in rural villages are more likely to marry their neighbor simply due to the lack of options in their community. Cities are also more likely to have common spaces that both genders can occupy; therefore, it is easier to meet people. While the process of finding a spouse may differ depending on the community, the active involvement of both families applies throughout most of Morocco.

In Moroccan culture, marriage is directly linked with social mobility; therefore, avoiding marriage is not ideal. Marriage is a sign of financial stability, adulthood, and respectability. Those who are not married, especially women, are not seen as full adults, and have little to no social value. "An unmarried person will never be fully regarded as a responsible adult, irrespective of age, and will never be able to take on serious, respectable positions in society,

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[23] Sylvia I. Bergh & Daniele Rossi-Doria (2015) Plus ça Change? Observing the Dynamics of Morocco's 'Arab Spring' in the High Atlas, Mediterranean Politics, 20:2, 198-216, DOI: 10.1080/13629395.2015.1033900

[24] Landinfo. Translated by Office of the Commissioner General for Refugees and Stateless Persons, Norwegian Country of Origin Information Centre, Oslo, Norway, 2017, pp. 14, Morocco: Marriage and Divorce – Legal and Cultural Aspects. p6

such as the dutiful task of leading the Friday prayer, which is only entrusted to married men (El Harras 2006).”[25] While the overall importance of marriage is apparent throughout Morocco, the reasons for getting married can vary. For example, marriage is seen as an important rite of passage that increases one’s social standing. In addition, marriage is also used as a solution to various legal conflicts. Premarital sex for example, which is referred to as زِنًى (zina), is outlawed in Morocco under Article 490, therefore if a woman is suspected of being sexually active before marriage, she may be advised to get married to avoid imprisonment and social backlash.[26] This has consequences as well for a child born out of wedlock, as it is hard for them to attain citizenship, since premarital sex is illegal. A woman's virginity is considered to be one of the most important and valuable assets of a suitable wife. She will not be considered desirable if she has had past sexual relations; however, the same standard is not in place for men. The preservation of virginity was so prominent in Moroccan society that it was legal until 2014 for a woman or girl to marry her rapist, in order to keep honor in the family, and for the man to avoid imprisonment under Article 475.[27]

While there are a few legal reasons for arranged marriage in Morocco, there are also many social and financial reasons. As stated before, marriage is extremely important for social mobility and honor to the family, and should maintain family wealth, identity, and value. “Despite the fact that under the new family law the spouses have equal responsibility for the family, the husband is in reality regarded as the head of the family and has a – if not legal – then at least a social and religious duty to maintain and provide for the family.”[28] It is extremely

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[25] Ibid,pp.9
[26] Ibid,pp.10
[27] Zoglin, Katie. “Morocco's Family Code: Improving Equality for Women.” Human Rights Quarterly, vol. 31, no. 4, 2009, pp. 978. JSTOR, www.jstor.org/stable/40389983. Accessed 6 Feb. 2021.
[28] Landinfo. Translated by Office of the Commissioner General for Refugees and Stateless Persons, Norwegian Country of Origin Information Centre, Oslo, Norway, 2017, pp. 9, Morocco: Marriage and Divorce – Legal and Cultural Aspects.

important that the husband is able to financially provide for a family before getting engaged, which is often something women look for in a husband. The husband's ability to provide for his spouse نَفَقَة (nafaqa) is rooted in Islamic law. This is also why in some cases, endogamic marriage is most preferable in Morocco.[29] Endogamic marriage is when people get married within the same community, ethnicity, tribe, and sometimes family. This type of marriage is usually arranged as it ensures ethnic purity and sustained wealth.

In Moroccon society, marriage is usually performed through the families of both parties. Typically the man's family is the one who chooses the wife, and it's up to the woman to accept. While the opinions of each party is not always equally considered, it is very important for an arranged marriage to be equal among spouses. This means that men and women getting married are of a similar social status, educational level, and upbringing.[30] Typically, the spouses will know each other at least casually before getting engaged. Their families might be friends, they may be neighbors, or they may even be distant relatives. Most recently, more Moroccans are attending secondary school, and college, therefore paths cross more often; however, they still need permission from their families to get married. As long as they are of a similar social class, families will usually be open to spouses picking each other. Sometimes, couples will even go as far as to secretly date, act as if they are not too familiar with each other and ask parents to arrange the wedding. As long as the man can provide financially, and the woman will fulfill her maternal obligations, both families are usually accepting of the union.[31]

Once a marriage is arranged, the couple will usually have a wedding soon after. Men or their families are also required to pay the bride price *al-mahr*, which goes directly to the bride.

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[29] Ibid, pp. 14

[30] Ibid, pp. 16

[31] Ibid, pp. 17

This is not like a dowry as the transaction is not from one family to another, but the money goes straight to the bride as a form of insurance. This bride price must be agreed upon and paid according to Articles 26 and 27 of the Moudawana. The bride price is important to break down as this gives no incentive to get married, as the price is usually fairly modest.[32]

While women can say no to an arranged marriage, the lines between arranged and forced marriage can be blurred due to the family pressures of getting married. While a woman can refuse an arranged marriage, the family will not be thrilled about it, and may try to change her mind. This is where agency gets put into question. As long as both parties can refuse the union the marriage is arranged; however, this does not always mean that the people involved will not be chastised later for making a choice that differs from their family wishes.[33] That being said, arranged marriage does not usually require family pressure since for most people, finding a spouse and starting a family is more important than indefinitely searching for a significant other that may not meet their cultural or financial expectations.

Understanding the history and cultural significance of marriage in Morocco is essential to unpacking how education may factor into it. Many scholars who have focused on arranged marriages both in Morocco and internationally have reached the conclusion that lower levels of education immediately correlate with an increase in arranged marriages. These arguments will be explored in the next chapter, which then leads to my question of whether this a common sense claim to make. My research explores whether or not education actually has directly correlated with arranged marriage in the last decade, and some reasons for why that may be. Some factors that will be taken into account are literacy rates, school enrollment, and marriage rates. These

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[32] Ibid, pp. 19

[33] Batabyal, Amitrajeet A. "On the likelihood of finding the right partner in an arranged marriage." The Journal of Socio-Economics 30.3 (2001): 275.

factors along with scholarly research will provide answers to whether or not education and marriage are correlated.

Chapter 2: Literature Review of the Impacts of Education on Marriage Practices in Morocco

After exploring sources with differing perspectives, many scholars have introduced various insightful ideas surrounding the role of education within marital practices in Morocco. These perspectives opened up more conversations than expected, addressing how education affects the medical, circumstantial, emotional, professional, age, and cultural aspects of people within marriage practices in Morocco. While scholars held contrasting opinions, all of them agreed on the significance of education within this practice. Scholars utilized personal experiences from Moroccan spouses, evidence from women of different education levels, and their own research in fields outside of anthropology, to address the research question, offering viewpoints from various fields of practice. After examining Moroccan marriage from multiple lenses, the conclusions these scholars draw are critical to understanding the overall impacts education has on marriage practices in Morocco, offering insight into factors that were not previously discussed. Recognizing these previously unknown elements drives the project forward, as it ties in new variables to analyze, providing more possible answers to the research question.

While the study of education and marriage may fall under the fields of anthropology and history, many medical doctors have offered insight as to how education relates to marriage in Morocco. Both international and Moroccan scholars in the medical field who study the potential health consequences of certain marriage practices believe that lack of education contributes to future health problems. In the 2013 article “Determinants of child and forced marriage in Morocco: stakeholder perspectives on health, policies and human rights”, the authors, who are all

scholars in the medical field from Morocco and Belgium, argue that forced and child marriages in Morocco are due to a lack of education for those involved. "Educational attainment is an important determining factor of marriage and adolescent childbearing. The number of women in Morocco who have had five years or more of schooling drops dramatically among women who married before the age of 20. Over 70% of this group only attended school between 0 and 4 years."[34] While this project is not considering forced marriage, as this project only focuses on legal marital practices, child marriages for girls as young as 15 are legal in Morocco as long as a judge authorizes it, which has increased at a significant rate of 23.59% from 2007 to 2009.[35] The authors argue that if the majority of child marriages are among girls who lack a higher education, let alone a secondary education, this means that they are very unlikely to have learned about sexual or reproductive health. This means the majority of girls who are married won't have knowledge of birth control, which can lead to health complications in the future if they have children soon after marriage. "Due to their bodies being not fully developed, mothers under the age of 18 years experience higher rates of maternal mortality and higher risk of obstructed labour, postpartum haemorrhage and sepsis. Pregnancy related deaths are among the leading causes of mortality for 15–19 year old girls worldwide."[36] Even if girls do achieve a secondary education, many secondary schools don't teach about reproductive health due to the legal and religious expectation of waiting until marriage to have sex, which can lead to health issues down the road. Both the stigma of teaching sex education in secondary school as well as child marriages being linked to very little education can have detrimental medical effects on young

[34] Sabbe, A., Oulami, H., Zekraoui, W. et al. Determinants of child and forced marriage in Morocco: stakeholder perspectives on health, policies and human rights. BMC Int Health Hum Rights 13, 43 (2013). https://doi.org/10.1186/1472-698X-13-43
[35] Ibid
[36] Ibid

women. This article suggests that an increase in education could potentially decrease the rate at which child marriages occur in Morocco.

The authors of the 2007 "Arranged Marriage, Consanguinity and Epilepsy", are published neurological doctors who all practice in New Delhi, India, express a similar perspective to the previous article for arranged marriages, focusing on the unknown health risks of arranged marriages within the same family that are a result of low levels of education. While this article primarily focuses upon Middle Eastern and South Asian countries, this perspective is applicable to Morocco, as arranged marriage and consanguinity are both present and legal. "Marriage between relatives is common throughout North Africa, including in Morocco. In a study conducted in Rabat in 2004-2005, it appears that about 20% of the respondents are married to a relative."[37] The authors discuss how the effects of lack of education play out in consanguinity marriage, a practice that is almost always the result of an arranged marriage. "The main thrust towards a reduced frequency of consanguineous unions remains in the field of preventive genetics in the form of general education of society. The public education may have to be taken at school level during adolescence to instill the biological risk of close marriages."[38] Lack of education is common among consanguineous marriages, as there are usually higher rates of illiteracy among related spouses. The authors discuss the potential risks, stating that there are higher rates of epilepsy in children who are products of this consanguineous marriage, especially when it comes to cousins, aunts, nephews, and siblings. The authors of this piece make it known that lack of education correlates with consanguinity marriage which they identify as an issue in the practice. This article offers a perspective that addresses a different marital practice from the

[37] Landinfo. Translated by Office of the Commissioner General for Refugees and Stateless Persons, Norwegian Country of Origin Information Centre, Oslo, Norway, 2017, pp. 16, Morocco: Marriage and Divorce – Legal and Cultural Aspects.
[38] Mehndiratta, M. M., B. Paul, and P. Mehndiratta. "Arranged marriage, consanguinity and epilepsy." Neurology Asia 12.Supplement 1 (2007): 15-7, p. 17

first article, yet similarly expresses the importance of the role of education within marriage for medical reasons.

Although both medical perspectives emphasize health concerns connected to the correlation between lack of education and marital practices in Morocco, neither of them offer insight as to why lack of education and arranged marriage directly link. While the first article mentions that lack of education can lead to unintended teen pregnancy, it does not directly state why lack of education would lead to an arranged marriage in the first place. The same can be said of the second article as it states that lack of education often leads to genetic effects of consanguinity marriage, however does not state why lack of education factors into the arrangement initially. Both articles clearly state the results of an arranged marriage where both or one party is less educated; however, they don't state why this inherently leads to an arranged marriage, as if the reader should understand that this correlation is inherently the case. This presents a gap in research between the role of education and the establishment of arranged marriages.

This gap gets slightly closed with studies done in 2011 in "The Influence of the Socioeducational Environment on Marriage Formation in Morocco", which explains how education impacts the circumstances in which spouses in Morocco initially meet. The authors Dr. Vicente Llorent Bedmar, who specializes in comparative education predominately in Spain, and Dr. Verónica Cobano-Delgado Palma, who also specializes in comparative education in both Spain and Morocco, argue that Moroccans with similar education levels are more likely to get married. Since school is a great way, and one of the few ways men and women interact, the longer people are in school, the more likely they are to meet someone they want to marry. "Such signs of progress as women entering the labour market, being seen in public and studying in

higher education are tending to diversify the opportunities for meeting people, especially in the more modernised regions."[39] If the education level is low, such as both parties only going to primary school, it's much harder for them to find someone on their own to marry. While the author made it clear that education plays a large role in the formation of marriage, he also mentions that school is not always the main place that Moroccans meet before marriage. While this author identifies the instantaneous trends in data, he does not show how this data changed over time.

With higher education comes higher age for marriage, which is another important factor involved in Moroccan marital practices that were impacted by many societal factors, one including education. In the article "ارتفاع متوسط عمر الزواج" (The average age of marriage is high), the journalist, Yousra Oweifi, argues why the age of marriage went up over the last eight years for both sexes in both urban and rural parts of Morocco. She argues that a gradual change in culture changed the societal norms of the age at which marriage starts. Based on her findings, in 2010 the average age of marriage was approximately 24 for men, and 17 for women. This is very telling since the minimum age for marriage for women at the time and still is 18. She argues that a cultural shift, as well as the increase of medical education in urban communities must have occurred.

أن نسبة النمو الديمغرافي لسكان المغرب، عرفت تراجعا مهما خلال الأربعين سنة الماضية (من 2,6 بالمائة خلال 1980 إلى 1,25 حاليا)، بفضل الاهتمام الزائد الذي عرفته الرعاية الطبية والوقائية والعلاجية، وظروف المعيشة...، أثر بشكل كبير على التركيبة الديمغرافية للسكان حسب السن، والتي عرفت بدورها تحولات هيكلية مهمة.[40]

[39] Bedmar, Vicente Llorent, and Verónica Cobano-Delgado Palma. "The Influence of the Socioeducational Environment on Marriage Formation in Morocco." Journal of Comparative Family Studies, vol. 42, no. 6, 2011, pp. 780–781. JSTOR, www.jstor.org/stable/41604489.

[40] Oweifi, Yousra (2019, November 16). ارتفاع متوسط عمر الزواج., from https://assabah.ma/428999.html

In this quote, Oweifi is explaining how the growth rate of demographics of population by age in Morocco were significantly lowered, changing the age demographics in Morocco, due to an increase in the educational awareness of contraceptives, which proves that an increase in education led to the marriage age increasing in Morocco. This is also supported in the data collection in 1994 المملكة المغربية السكان والتنمية في المغرب خمس وعشرون سنة بعد مؤمتر القاهرة from the United Nations Population Fund. The figure below shows how contraceptive use changed from 1979 to 2018 for Morcoccan women ages 15 to 49 years old, from various sources. The first two columns represent the percentages of women who use contraceptives in urban and rural areas, and the last column shows the total. The graph proves that contraceptive use has gone up significantly in the past four decades, along with the increase in education Oweifi was referring to. This data along with Oweifi's argument proves that education has impacted the demographics of Morocco, thereby impacting the age at which people get married.

الجدول 2: تطور نسب النساء اللواتي تتراوح أعمارهن بين 15 و49 سنة ويستخدمن وسائل منع الحمل حسب وسط الإقامة ما بين 1979 و2018

السنة و المصدر	قروي	حضري	مجموع
البحث الوطني حوت الخصوبة والتخطيط الأسري 1979–1980	9,7	36,0	19,4
البحث حول السكان والصحة 1995	39,2	64,2	50,3
البحث الوطني حول السكان والصحة العائلية 2003	59,7	65,5	63,0
البحث الوطني حول السكان والصحة العائلية 2011	65,5	68,9	67,4
البحث الوطني حول السكان والصحة العائلية 2018	70,3	71,1	70,8

[41]

Another Moroccan journalist, Laila Anouzla, takes this concept a step further in أزيد من 70 ألف مغربية أبرمت زواجها بنفسها سنة 2019 ("More than 70,000 Moroccan women entered into marriage on their own in 2019"). Anouzla argues that there has been a significant

[41] المملكة المغربية السكان والتنمية يف المغرب خمس وعشرون سنة بعد مؤمتر القاهرة 1994, United Nations Population Fund

change in Moroccan marriage practices, due to the marital statistics collected in 2019. She emphasizes a significant increase in women entering into marriage on their own, without the consent of their father or any guardian. According to her studies, about 24% of women entered into a marriage on her own in 2019. In addition to that, there has been a prominent decrease in polygamy marriages as well as underage marriage. While she was able to identify these trends, she too was not able to explain this shift.

While many articles from Moroccan news sources acknowledge the shift in marriage age, and practice, one article in particular was able to explain why this shift might have occurred. In the article الزواج المتأخر وإثبات الذات (“Late marriage and self-affirmation”), the author explains how women’s values have shifted, which has therefore resulted in the cultural shift of marriage. Rather than providing quantitative data to explain this shift, they provide information gathered from self-development trainers that justify this gradual change. Based on evidence from self-development trainers, women in Morocco have different priorities than they used to, placing a higher value on education and career development, rather than marriage and building a family. While they still want to have a husband and have a family, this is getting prolonged as women focus more on attaining an education and career first.

ويرى مدربو التنمية الذاتية أن المرأة أصبحت أكثر وعيا بمصلحتها وما تعتبره اختيارا صائبا لها، مشيرين إلى أنها أصبحت على إدراك كبير لأهمية اعتمادها على نفسها، وهو أمر يتطلب انتهاءها من المراحل التعليمية كلها وخروجها لميدان العمل لتثبت ذاتها في المجتمع.

This explains why the age of marriage has gone up, and why underage marriages have gone down. The author also emphasizes that as women spend more of their adult years single, they are able to find themselves more and interested, making it easier to find a spouse on their

own, as they know what they want. The author doesn't specify a time frame, however this was written in 2020 which correlates with this trajectory in other articles.

Many scholars have identified the societal and medical factors involved in how education impacts Moroccan marriage, however none of them touched on how higher levels of education influence the way people feel towards their spouse or the concept of marriage, and how it might cause them to lean towards arranged marriage more. In the article "Love marriage or arranged marriage? Choice, rights, and empowerment for educated Muslim women from rural and low-income Pakistani communities", the author Ayesha Khurshid, focuses on women who have acquired an education, and unpacks why more educated Muslim are more open to arranged marriage. In this article, Dr. Khurshid, who specializes in the cultural policies of education, examines arranged marriages in the Muslim community, makes a clear distinction between a love marriage and an arranged marriage, alluding to the idea that they can not be mutually achieved. After asking college educated women how they felt about arranged marriage, Dr. Khurshidhe argues that Muslim women are not just their religion, but other things as well, reasoning that other factors will decide the success of the marriage. "She believed that education made women aware of their Islamic rights and also instilled wisdom in them to understand when to practice their rights. Safi believed that educated women were able to make the right choices as education had enabled them to understand the consequences of their decisions and choices."[42] This article was one of few to provide stories, and primary sources on women in Pakistan who participated in or denounced this arranged marriage. Although this source does not speak specifically on Moroccan arranged marriages, it is relevant in that it tackles a perspective many articles did not touch on. Amplifying the voices of Muslim women, Dr. Khurshid acknowledges that educated

[42] Khurshid, Ayesha. "Love marriage or arranged marriage? Choice, rights, and empowerment for educated Muslim women from rural and low-income Pakistani communities." Compare: A Journal of Comparative and International Education (2018).

Muslim women feel open to partake in arranged marriages, as acquiring an education provided them with a confident grasp of their identity, faith, and values.

Douglas A. Davis and Susan Schaefer Davis expand on this conversation in a Moroccan context by publishing hands-on research in 1995 about how people of various educational levels view love within marriage in Morocco in their written work, “Possessed by Love: Gender and Romance in Morocco”. Dr. Davis, a professor of psychology in Haverford College and Cross-Cultural Coordinator in the U.S. Peace Corps Training in Morocco in 1971, and Dr. Davis, who has done extensive anthropological research on women in Morocco, publishing two books on gender in Morocco, convey that Moroccans with higher education tend to lean more towards a self-selected marriage, asking their parents once they choose someone if they can get married. “Public education barely existed before Morocco became independent from France in 1956, while today all children should attend at least primary school. Although this goal is still being pursued in remote rural areas, in cities nearly all children attend. Many young people attend high school, while few parents did; in the mixed classes, young people have a chance to meet. Marriages in earlier generations were mainly alliances arranged between families, to which the young people were supposed to agree. Today many of the young, especially males, select a potential mate and request their parents' approval.” While this research was done in the late 90’s, identifying the cultural shift that took place during that time, paves the way for better understanding future engagements. After interviewing 20 young adults in Zawiya, a rural area in Morocco located in the Atlas Mountains, and Rabat, the capital of Morocco, about their views on love and marriage from 1989-1990, the authors argue that higher education usually leads to self-selected marriage. “Older youth, and those with more years of education, were more likely to want to make the choice themselves.” The women in these interviews who had received a

primary education spoke more about marrying a man for her family, and fulfilling that familial obligation, whereas women who attended college explored a little more, then settled down once she reached her late 20s. Every woman that was interviewed that was single or married later in life had attended university, and had dated around more. The men spoke more about marrying for love, and a few women did as well, but at this time it seemed as though men had more choice when it came to a spouse than women did, as long as both families approved of the other family. Overall, men expressed more intense feelings of love, while women expressed marrying out of respect to her family.

In both written works discussing the relationship educated Muslim and Moroccan women have with arranged marriage, the authors argue that educated women are just as accepting of arranged marriage as women who have lower levels of eductaion, however they may do so at a later age. Both of these sources offered personal stories where both college graduates, as well as women who received very little education, expressed their views on the matter. Based on these perspectives, it seems as though the difference between women acquiring higher and lower levels of education are not necessarily the determining factor of whether or not women will pursue an arranged marriage versus a self-selected marriage, but rather determines the age at which they decide to settle down. This relationship was further explained in the article الـزواج المتأخـر وإثبـات الـذات, which stated that college educated women prioritize their educational and professional career first,which is why they wait a little longer to get married. These written works all contribute to the study in a meaningful way, as it explains how education affects the age at which women both in Morocco, and internationally, get married.

While those articles both explain the role of love in marriage, in the article “Copious relationships: transnational marriages and intimacy among Moroccan couples in Italy”, Dr.

Francesca Decimo focuses on arranged marriage practices for Moroccan families that migrated to Italy, emphasizing the purpose and benefits of arranged marriage. Decimo is an Italian professor in sociology who specializes in transnational migration, reproduction, and ethnic studies. She argues that not all arranged marriages lack agency, passion, and love, touching on the many benefits of the practice. She first argues that the comfort of having a life long companion to have children with creates a sense of fulfillment, almost acting as a safety net for familial goals. "... intimacy is related to the experience of belonging, of being at home and part of a family, of enjoying domestic order and warmth, and the satisfaction of having been able to achieve such a goal despite displacement."[43] Arranged marriages can serve as a way for people to feel socially acceptable, find companionship, and find love along the journey. It also helps for social mobility, as a married couple usually gains more respect and benefits in the long run. Decimo also emphasizes the importance of research into what happens after the arranged marriage, examining the quality of the marriage over time to see if it's successful or not, which is strongly worth considering. Decimo's argument provides a more positive perspective on arranged marriages, discussing its significance, and why it is embedded in Moroccan culture even when Moroccan families emigrate to other nations.

After researching arranged marriage from various viewpoints, and examining the important role education plays within the practice, it is apparent that scholars have noticed direct, unintentional, and unavoidable effects of varying levels of education within Moroccan marital practices. Scholars discussed the medical, societal, and cultural impacts more or less education can have within marriage in Morocco. While every source did not speak to the experiences of people specifically in Morocco, many of their findings were applicable to Moroccan society.

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[43] Decimo, Francesca. "Copious Relationships: Transnational Marriages and Intimacy among Moroccan Couples in Italy." Journal of Family Studies, 2020, pp. 1-17.

Many questions could be raised after this review of literature due to the gaps in research that were only briefly addressed. While a few authors discussed the role of socio-economic standing within families, none of them discussed the role of money in depth, or explained how financial status correlates with arranged marriage. This would seem to be particularly important as families must consider financial standing when choosing a spouse, therefore a dialogue about class and social hierarchy should have been discussed in the articles. The effects of education on divorce rates were also not mentioned. While understanding the formation of marriage is important when discussing marital practices in Morocco, these educational factors did not directly address the quality of marriage, and the emotional effects of the marriages long term. This analysis would have been helpful since those are not quantifiable factors that I can analyze in the statistical part of the project. Understanding the long term effects of education within marriage would have been beneficial, however this literature was insightful, and will set the stage for exploring the statistical analysis of how higher education, specifically, affects marriage practices in Morocco.

Chapter 3: Method of Approach

Reading, understanding, and analyzing the literature surrounding marriage in Morocco has not only provided context for the relationship between education in Morocco and marriage, but also narrowed down the variables to pull for further exploration. Understanding the history, stories, and written works surrounding Moroccan marriage is important when exploring the various impacts and factors that weigh in on the formation of marriage, however examining the numerical trends in the Moroccan population makes for a holistic analysis. The qualitative data that's been used thus far has been extremely helpful, however did not provide enough evidence specific to the direct correlations between higher education and marriage in Morocco. This is why I decided to conduct my own research by gathering data, and implementing its automated analysis, then displaying my findings on a website that is accessible to everyone. These trends were explored using the data from the World Bank, the United Nations, World Health Organization and the literary source, "The Influence of the Socioeducational Environment on Marriage Formation in Morocco", as they all contain data that addresses a different component of the literature review. Analyzing a data driven perspective by discovering the relationship between variables and visualizing data trends and dependencies was helpful in understanding how higher education plays a part in marriage. After preliminary exploration of data using Python programming languages, the relationship between higher education and marriage proved to be apparent.

Based on the literature concerning marriage and higher education in Morocco, factors of age, health, circumstances through which spouses meet, and gender mattered the most

concerning how education affects marital practices in Morocco. While it was not difficult to identify measurable variables, what took time was finding the actual data for these factors in Morocco. Accurate data concerning education, health and labor are widely available on large platforms like the World Bank, the World Health Organization and the United Nations database, however data concerning marriage in Morocco is scarce. Unfortunately, it was very difficult to find data on intimate matters such as the average age of marriage, divorce rates, and the average length of marriage due to the process of data collection.

Data collection appeared to be limited when it came to the familial aspects of Moroccan life. While there is a substantial amount of data collected on the rates of school completion and enrollment among men and women, statistics on family life and marriage were much harder to find. According to the World Bank, this is not uncommon. "Some countries do not regularly report data due to conflict, lack of statistical capacity, or other reasons (e.g. Somalia, North Korea, and some Caribbean and Pacific island economies)."[44] Being that Morocco is a fairly stable country, one reason for the lack of data on social matters could be that the rural parts of Morocco often get neglected when it comes to data collection. Those who work in gathering census data tend to dismiss these areas and villages, which is why it made more sense to originally focus on research in the bigger cities such as Casablanca and Tangier. Although the World Bank and the United Nations do not explicitly state the cities in which they were recording, typically data collection occurs in the most populated and accessible areas of Morocco. The other, and more important reason, as to why data collection is not extensive in Morocco is due to its location and perceived relevance in international affairs, as many other

[44] The World Bank. Data Not Available. datahelpdesk.worldbank.org/knowledgebase/topics/19285-data-not-available.

smaller countries in the African region often get neglected when it comes to worldwide data collection.

Although there was scarce data when it came to marriage, I was able to find data on the percentage of Moroccans married in 2011 and 2018 for various age groups, as well as the data concerning how people met in 2011. What little data this was, helped identify a few trends between marriage and college education. Luckily, it was not too difficult to find data regarding the education rates and health statistics in Morocco. On the World Bank website, users are able to clean their data by selecting the specific variables being measured and the time frame for that data collection. The same was the case for the World Health Organization. Once the dataset was cleaned in Excel, there were about 40 variables being measured over the course of the last ten years. While 40 variables may seem like a lot to measure, it was necessary since not all the variables had been considered during that time frame, but rather scattered across decades.

Circumstance of Meeting	Casablanca	Tangier
Family meeting	13.9	23.2
Blind engagement	5.9	1.2
Relationship with neighbours	17.2	5.8
Go-between	5.2	5.4
Public place	22.6	22.2
Place of study	6.6	8.3
Workplace	16	7.5
Popular or religious festivity	2.1	2.7
Wedding ceremony	0.7	2.6
Travel	5.7	3.2
DK/NA	4.1	17.9

Years	Children c	Children c	Labor forc	Labor forc	Lower sec	Lower sec	School en	School en	School en	School en	Maternal	Number o	Death by s	Death by
2010	7.481589	6.031429	25.52599	53.29000	62.11589	57.72853	13.82102	15.31542	91.65842	92.88682	92	630	0.097	0.11
2011	6.189700	5.192669	25.53599	51.25	63.98633	58.97002	15.71061	17.03672	92.88851	93.54796	86	600	0.095	0.12
2012	6.718239	5.874710	24.78800	49.29999	65.80061	60.68231	18.68466	20.20594	92.25834	92.70113	81	570	0.094	0.12
2013	5.275209	4.562719	24.60099	46.97999	67.95163	63.60636	22.11935	23.15169	93.01111	93.36266	78	550	0.093	0.12
2014	5.825230	5.302680	23.80500	46.25	70.46736	66.41166	24.89558	25.75683	93.17198	93.34682	76	540	0.092	0.13
2015	..	..	23.02300	42.84000	70.55258	70.76814	27.78318	29.00202	..	..	74	520	0.091	0.13
2016	4.489709	4.249949	22.25499	41.22000	66.88374	69.11273	30.72886	33.19441	94.65637	94.5756	72	500	0.091	0.13
2017	2.559289	2.254040	21.50399	..	62.34970	67.80319	33.29095	34.25777	96.96158	96.83048	70	480	0.09	0.13
2018	..	..	21.57799	..	61.85018	68.13630	35.69778	36.16394	..	..				
2019	..	..	21.46899	..	60.92171	68.06468	39.05136	38.06085	..	..				

Number o	% married	% marriec	% married	% married	% marriec	% marriec	% married	% marriec	% marriec	% married	% married	% married F [40-44]
18554	0.6	6.4	29.2	58.1	73.5	85.1	11	38.4	56.4	68.4	70.1	76.6
18006												
17396												
16716												
15998												
15230												
14456												
13717												
13035	0.4	5.5	26.9	56.1	76.3	83.4	8.8	40.9	65.2	72.3	76.2	78.6
12397												

Once the datasets were finalized and cleaned, it was immediately downloaded straight into R Studio to be analyzed. R Studio is a computer software that serves as an environment for statistical analysis using the programming language R.[45] While R Studio is a widely used software that is commonly used for analyzing and graphing data, it became evident that given the small amount of data necessitating simple analysis, complex statistical analysis tools provided in R Studio would not be needed. Rather than continuing in R Studio, it seemed wise to switch to a different programming language that would be easier for programming and graphing called Python. Python is a widely popular programming language that can be used for various purposes such as web development, software development, data analytics, and object-oriented programming.[46] Since Python is well established in managing scientific data, and has many libraries pertaining to graphing and analyzing it, it made the most sense to install and use these libraries to analyze and visualize my data.

When referring to a library in a programming language, this is referring to a collection of resources, features, and pre-completed mechanisms that help make certain computational actions efficient. In order to use a library it must be installed on the computer in use and imported into the desired program. To import a library in a program means to load a library into a program's memory so that all the features are easily and efficiently applicable for use. Many libraries were

[45] PBC. "Open Source & Professional Software for Data Science Teams." RStudio, 17 Feb. 2021, www.rstudio.com/.
[46] Warchol, Kit. "What Is Python Used For? 5 Industries That Use It Daily." Skillcrush, 28 Sept. 2020, skillcrush.com/blog/what-is-python-used-for/#:~:text=Python%20is%20a%20general%2Dpurpose,system%20scripts%20among%20other%20things.

used when graphing and analyzing the data for this project, one of which was Matplotlib. Matplotlib is a plotting library that produces figures of different formats, which was useful in this project as it allowed me to plot line graphs, bar graphs, and scatter plots. Throughout the process of graphing my data, I also heavily utilized the Pandas library which serves as a library for data manipulation and analysis. Pandas functionality was used often throughout the program to read in my datasets, meaning to recognize the data in order to manipulate it. Pandas was especially helpful in plotting specific variables that showed the correlations and relationships between them. NumPy was another library used, which was not as essential as the others, but served as a way to label the x axis, as well as being able to perform various mathematical functions. SciPy was the last library used, as well as its add ons, to create a multivariate scatter plot that shows the correlation between education and married women from ages 15 to 19. After figuring out the logistics of Python, installing the libraries, and researching how to analyze and visualize results, I was able to generate output. The imported libraries are shown below.

comp.py

```
1  import matplotlib.pyplot as plt
2  import seaborn as sns
3  import pandas as pd
4  import numpy as np
5  import scipy.stats
6  from sklearn.preprocessing import scale
7  from sklearn.decomposition import PCA
8  from sklearn.discriminant_analysis import LinearDiscriminantAnalysis
9  from scipy import stats
10 from IPython.display import display, HTML
11 plt.style.use('bmh')
12 from pandas.plotting import scatter_matrix
```

After importing these libraries, I began analyzing and graphing the data. There were a few factors that needed to be compared, which is why I chose to investigate the correlation between the college enrollment rate and the marriage rate for men and women in that age group. This correlation was studied because it shows the relationship between marriage and college enrollment over time for adults in their 20s. This analysis is critical to the study since the late 20s

is the average time at which Moroccans get married. There were many other factors that were considered in this analysis to show trends, but this one represents a direct correlation for this study. Below are the lines of code that plots this correlation in a line graph.

```
plt.plot(x, y1, marker='o', label='male college enrollment rate')
plt.plot(x, x1, marker='o', label='female college enrollment rate')
plt.plot(x, tvy1, marker='o', label='male marriage rate (20-24)')
plt.plot(x, tvx1, marker='o', label='female marriage rate (20-24)')
plt.plot(x, tvy2, marker='o', label='male marriage rate (25-29)')
plt.plot(x, tvx2, marker='o', label='female marriage rate (25-29)')
```

The next element that was analyzed was very important in determining how spouses in Morocco initially meet. In order to understand how higher education impacts marital practices within cities, it was important to look at the different ways spouses met to see how college fits into the initial stages of marriage. Based on my literary review, the assumption was that people who acquired a higher education would meet their spouse in an academic environment, however my analysis of these factors show whether or not that is true. After graphing the percentages of circumstances through which spouses meet, I began graphing the correlations concerning health, analyzing the correlations between consanguinity marriage and maternal death rate, with college enrollment.

```
labels = ['Family Meeting', 'Blind Engagement', 'Place of Study', 'Workplace']
casa_means = [13.9, 5.9, 6.6, 16]
tan_means = [23.2, 1.2, 8.3, 7.5]

x = np.arange(len(labels))  # the label locations
width = 0.35  # the width of the bars

fig, ax = plt.subplots()
rects1 = ax.bar(x - width/2, casa_means, width, label='Casablanca')
rects2 = ax.bar(x + width/2, tan_means, width, label='Tangier')
```

Moving towards the less visual statistical analysis, I decided to calculate the mean and standard deviation of college enrollment and marriage rates for both genders, deaths due to consanguinity and child marriage, and the labor participation rate for women. The mean of a

dataset is the average value of all the values within that set of data. Calculating the mean of a series of values allows researchers to get a sense of where most of the data falls, and what the overall value of a dataset is. In this case, I was calculating the average rates of marriage and college enrollment within the last ten years to get a sense of the average percent of people going to college and getting married since 2011, as well as the change in average percentage of deaths due to child and consanguinity marriage. Calculating the standard deviation of values incorporates the mean, using that as the base of calculations. Standard deviation is the measure of how spread out a dataset is. A low standard deviation means the values within a dataset are close to the mean, meaning in this case that the values within the dataset are not changing very much over the course of ten years. A high standard deviation means the values of the data are spread out, meaning that there were bigger changes occurring in the past ten years. For higher standard deviations if a data value from any year is one or more standard deviations higher or lower than the mean, then that is a significant difference that should be acknowledged in analysis. Data within one standard deviation represents 68% of the data, two standard deviations is 95%, and three accounts for 99.7% of the data.

Along with the mean and standard deviation, covariance and correlation among variables in my datasets were also calculated. Covariance is the statistical metric of the relationship between two variables, measuring the extent to which they change together. It measures how variables relate to each other in terms of how they change, if this change is positive or negative, and how strong the relationship is. If the covariance calculated is a positive number then the variables are positively related, and vice versa for negative values calculated. If these values are high, then there is a strong relationship between two variables. Covariance also indicates how dependent the variables are, 0 indicating they are completely independent. Covariance will be

calculated to determine the relationship between labor participation and college enrollment among women.

Correlation, however, tells researchers how strong the relationship is between two variables simply ranging from -1 to 1. A correlation value of 1 means that two variables are perfectly and positively correlated, whereas -1 would mean they are perfectly negatively related. A correlation value of zero indicates there is no relationship between the variables. There are two ways to analyze correlation, one being the Pearson correlation which calculates the linear relationship between two variables, and the other being the Spearman correlation which measures how much two variables change together, even if they are not at the same rate. I used the Pearson correlation to calculate the correlation coefficient of the labor participation rate along the college enrollment rate.

Once the data was processed, cleansed, and analyzed, the website started to be developed. Rather than creating a website from scratch, I decided to deploy a website template from Netlify as a foundation to start. Netlify is a platform used to build, deploy, and collaborate on web applications.[47] To deploy a static website template is to copy and transfer the web template from one computational environment to another, in order to later add my content to fit the purpose of the project. A static site is a website that contains web pages with unchangeable content that displays the same information for every visitor.[48] Many static sites, including this one, are created using the programming language, HyperText Markup Language (HTML), which is the foundational program for Javascript that structures web content. Javascript is a programming language that adds functions and interactive elements to a static website, which was heavily used in this template. Cascading Style Sheets (CSS) is another programming language that was

[47] “Develop & Deploy the Best Web Experiences in Record Time.” Netlify, www.netlify.com/.
[48] “Static Website.” Static Website Definition, techterms.com/definition/staticwebsite.

utilized in the same family as HTML which is used for styling the website. I chose to use the template Awake, which is a Nuxt.js template that generates a complex static site using Vue, which is a framework of Javascript. Awake comes with many features such as a site search, tabs, and boxes that can contain organized content. This was an appropriate static site to use since it would be able to contain my research in an organized and presentable way. After taking out parts of the website that did not fit such as the subscribe button, extra boxes, and comment sections, I was able to fill in the boxes and tabs with information answering my research question.

Chapter 4: Results

After reading literature that identified the effects higher education has on marital practices in Morocco, as well as conducting my own statistical analysis, many questions were answered. Scholars have recognized the many ways education affects marriage, acknowledging health, age, and priority shifts that arise. Once these impacts were identified, I pulled some of these factors into my own research. Using Python to visualize the relationships between college enrollment, marriage, the circumstances through which spouses meet, health, age, and labor participation, I was able to analyze these variables by calculating correlations, mean, standard deviation, and covariance, and created graphs to see if the quantitative data supported the qualitative research. I have concluded that an increase in higher education has increased the age at which spouses get married in Morocco in the past ten years. The results of these conclusions are expressed both in this chapter and the website. All statistical results reached in this chapter were produced by programming in Python, utilizing their statistical and graphing libraries.

When calculating the mean of college enrollment and marriage rates for men, there were a few results that stood out:

Male college enrollment rate mean	27.21
Male college enrollment rate standard deviation	7.74
Male marriage rate mean (20-24)	5.95
Male marriage rate standard deviation (20-24)	0.45
Male marriage rate mean (25-29)	28.05
Male marriage rate standard deviation (25-29)	1.15

Table 1: Mean and Standard Deviation of Male College and Marriage Rates

The mean values of marriage and education rates for men ages 20-24 imply that education is more of a priority than marriage for Moroccan men in their early 20s. The standard deviation of men in both age ranges is less than two, whereas the standard deviation of the male college enrollment rate was almost eight, which means there has been a significant increase in the amount of men enrolling in college over the past 10 years. These results mean two things, one being that a huge increase in education had very little impact on how likely men were to get married. This also shows that marriage rates for men increase dramatically based on age.

The data concerning women looked very different, since for women ages 20-24, marriage was more popular than college enrollment, as the mean of marriage was over 10% higher than college enrollment:

Female college enrollment rate mean	26.18
Female college enrollment rate standard deviation	8.17
Female marriage rate mean (20-24)	39.65
Female marriage rate standard deviation (20-24)	1.25
Female marriage rate mean (25-29)	60.8
Female marriage rate standard deviation (25-29)	4.40

Table 2: Mean and Standard Deviation of Female College and Marriage Rates

This could mean that marriage was more of a priority, but this also implies that on average, Moroccan women are at least five years younger than men in a marriage. The standard deviation of college enrollment for women, similar to men, is much higher than marriage which shows that women have been going to college at a faster rate than marriage from 2011 to 2018. This shows over the past ten years, more women have been going to college which has not had a huge affect on their rate of marriage. These findings are consistent with the graph in Figure 1, as the change in college enrollment does not parallel with marriage rates for both genders. Although

there is not as much data collected for marriage rates, the graph shows that not much has changed from 2011 to 2018 in terms of how often Moroccans in their early 20s get married.

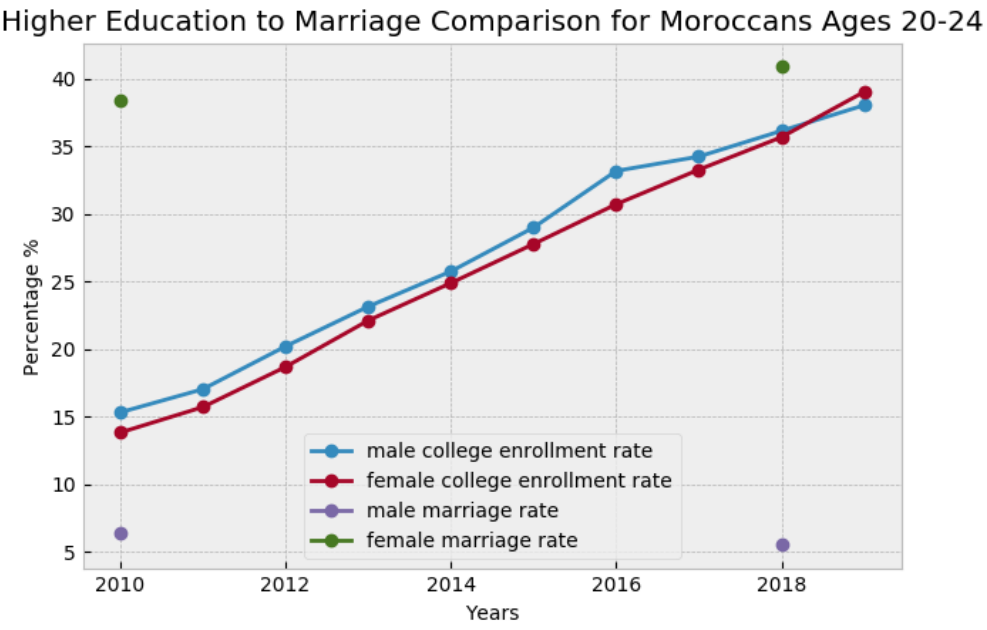


Figure 1: Higher Education to Marriage Comparison for Moroccans Ages 20-24

For both men and women ages 25-29, marriage became more popular than having a college background, which suggests a shift in priorities, however it was much more prominent among women. Men and women both got married at almost a 30% higher rate from ages 20-24 to 25-29. While women ages 25-29 marry over double than that of their college enrollment, for men, marriage and college enrollment means are nearly the same, falling within 1% of each other. This implies that men within this age range prioritize marriage and higher education somewhat equally, whereas women may prioritize marriage more as they approach their 30s. This correlation is consistent with the findings in "Possessed by love: Gender and romance in Morocco", as the women being interviewed expressed their desire to get married once they reach their mid twenties. Women were still 10% more likely to be married when they are 20-24 than men when they are 25-29. Although significant age differences in marriage were only discussed

in the context of child marriages in “Determinants of child and forced marriage in Morocco: stakeholder perspectives on health, policies and human rights”, these calculations imply that there are significant age differences between Moroccans who get married in their 20s as well, which indicates that age gaps are not exclusive to child marriage, but are relatively normal. While age has a clear effect on marriage rates, the graph in Figure 2 suggests that higher education does not directly affect the rate at which Moroccans in their late 20’s get married.

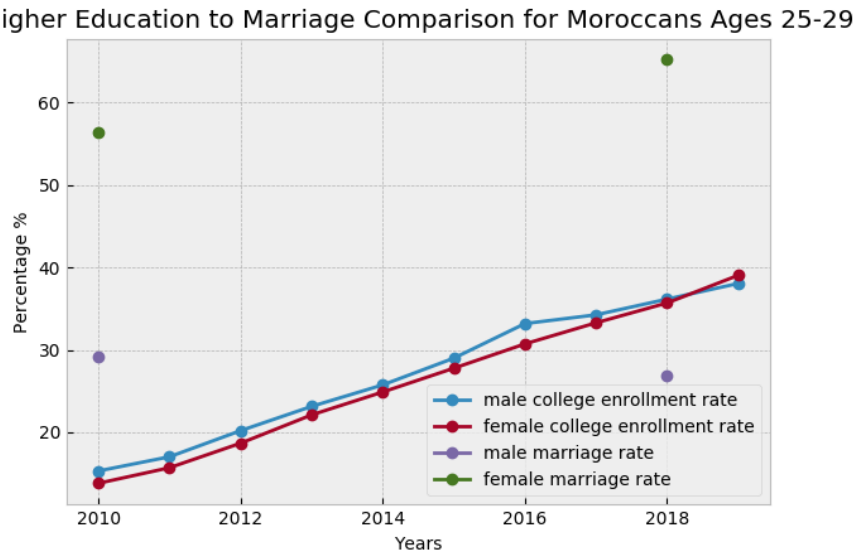
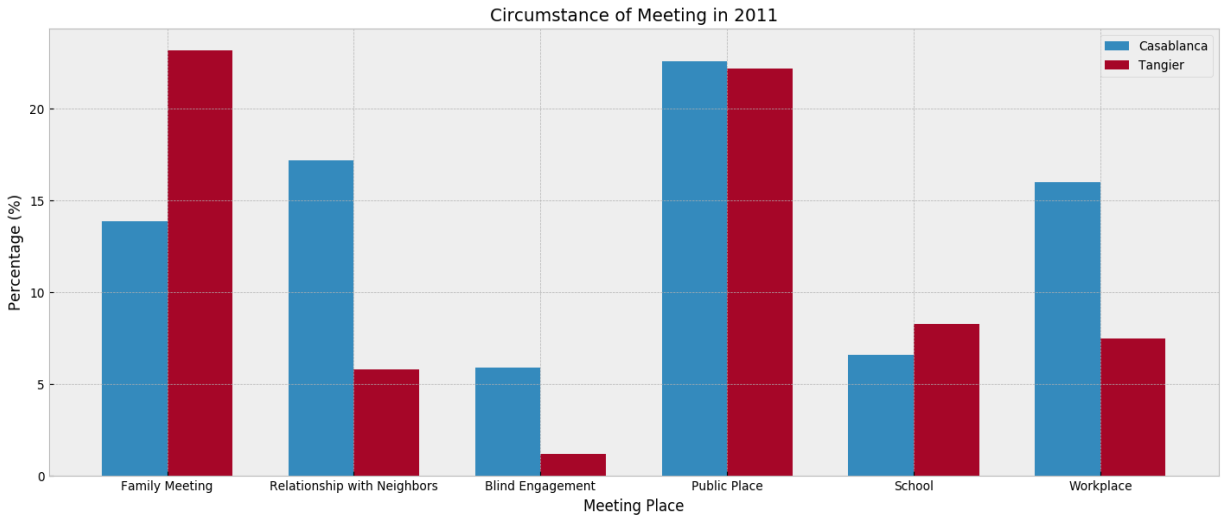


Figure 2: Higher Education to Marriage for Moroccans Ages 25-29

After reading “The Influence of the Socioeducational Environment on Marriage Formation in Morocco”, I wanted to analyze how education affects the ways in which Moroccans meet, as this article stated that increasing interactions in a school environment could influence the rate at which spouses meet in an academic setting. Using the data from this reading, I created a visual of these trends in Python to compare the circumstances through which spouses meet in Casablanca and Tangier in 2011.



[49]

Figure 3: Circumstance through which Spouses Meet in Casablanca and Tangier, 2011

The graph above displays how spouses in Morocco were typically meeting in 2011 in two of the most populated cities in Morocco, Casablanca and Tangier. While only six different places are being considered, this graph shows that education, compared to other locations of meeting during this time, were not the most common way for spouses to meet one another. Although it's hard to see the exact percentage on the graph, only 6.6% of spouses in Casablanca met at school and 8.3% in Tangier. This means that education, while it might have an influence on marriage, does not greatly affect where spouses are meeting. That could have drastically changed since then however, since the amount of men and women enrolled in college has jumped about 25% in the last 10 years. In 2011, if the average percentage of people meeting in a school environment was roughly 7.45% in Casablanca and Tangier, and the average rate enrollment in college between men and women during that year was 14.57% then 38.56% in 2019, using the mean of

[49] Data from "The Influence of the Socioeducational Environment on Marriage Formation in Morocco." by Bedmar, Vicente Llorent, and Verónica Cobano-Delgado Palma.Journal of Comparative Family Studies, vol. 42, no. 6, 2011, pp. 771–785. JSTOR, www.jstor.org/stable/41604489.

the two values, the average percentage of meeting in a school environment would be approximately 19.72% in 2019.

The article “Arranged marriage, consanguinity and epilepsy” discussed how lack of education on the health risks of consanguinity can lead to birth defects for children that are products of consanguinity marriages. Since the author argued that an increase in education could potentially decrease the health consequences of this type of marriage I wanted to see if this was true. After researching the health risks that come with consanguinity on the World Health organization’s website, I programmed the mean and standard deviations of the potential health risk of congenital anomalies:

Congenital anomalies death rate mean (ages 0-4)	0.12
Congenital anomalies death rate stand deviation (ages 0-4)	0.01

Table 3: Mean and Standard Deviation of Congenital Anomalies Death Rates

Based on these calculations it initially seems as though deaths due to congenital anomalies are uncommon in Morocco, as the mean is nearly 0.1%. The standard deviation indicates that hasn’t changed much in the last ten years, as it is extremely low. While this may seem insignificant, the graph in Figure 4 shows that these rates increased from 2010 to 2014:

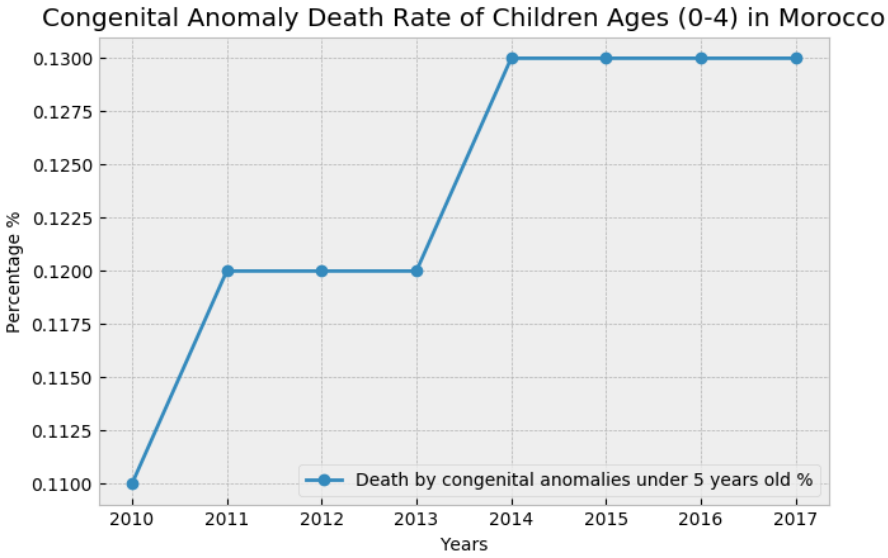


Figure 4: Congenital Anomalies Death Rate of Children Ages (0-4) in Morocco

The population of Morocco was roughly 32.34 million in 2010, which means that approximately 36,000 children died from congenital anomalies that year, and roughly 46,000 in 2017.[50] This does not necessarily mean that they were all due to consanguinity marriage, however based on a study done in "The Prevalence of Congenital Malformations and Its Correlation with Consanguineous Marriages", about 25% of congenital anomalies are linked with consanguinity marriage.[51] This means that 11,500 children could have died from consanguinity marriages in 2017, and 9,000 in 2010. Compared to the total population, this is not a huge increase, however this still contradicts the claims made in "Arranged marriage, consanguinity and epilepsy" as an increase in higher education did not decrease congenital anomalies in Morocco, but rather there was an increase.

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[50] World Bank. "Population, total - Morocco" World Development Indicators, The World Bank Group, 2019, https://data.worldbank.org/indicator/SP.POP.TOTL?locations=MA. Web.
[51] Tayebi, Naeimeh, et al. "The Prevalence of Congenital Malformations and Its Correlation with Consanguineous Marriages." Oman Medical Journal, OMJ, Jan. 2010, www.ncbi.nlm.nih.gov/pmc/articles/PMC3215379/.

In addition to consanguinity marriage, the author of "Determinants of child and forced marriage in Morocco: stakeholder perspectives on health, policies and human rights", discuss other possible health risks within Moroccan marital practices that could be less prevalent with more education. They explain the potential risks of child marriages in Morocco, stating that an effect of child marriage is the mother dying due to complications at birth, since their bodies are not yet fully developed for child birth. Being that this a potential health risk, I graphed the rate at which maternal deaths occur to see if they have changed recently:

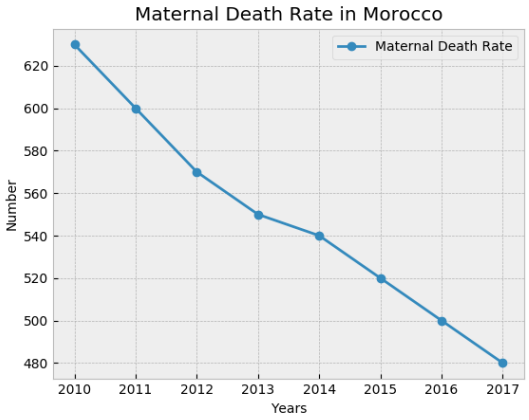


Figure 5: Maternal Death Rate in Morocco

After graphing this correlation, it's clear that maternal deaths have decreased significantly in the last ten years, decreasing from 630 to 480. Although the standard deviation for maternal deaths is less than one, this shows that they will most likely continue to decrease at a decent rate. This analysis proves that there could be a correlation between higher education, and the age at which Moroccans get married, as this data could imply a decrease in child marriages and early pregnancies. This point is argued further in الـزواج المتأخـر وإثبـات الـذات.

Maternal death rate mean	548.75
Maternal death rate standard deviation	47.02

Table 5: Mean and Standard Deviation of Maternal Death Rates

In the article الزواج المتأخر وإثبات الذات ("Late marriage and self-affirmation"), the author argued that an increase in education led to women prioritizing career development more than marriage, which therefore led them to get married later in life. Her research was based on data from 2020, however I wanted to see how this has changed over time, graphing the data from the World Bank to see if this change was evident from 2010 to 2019:

Female labor participation rate mean (15+)	23.41
Female labor participation rate standard deviation (15+)	1.57

Table 6: Mean and Standard Deviation of Female Labor Participation Rates

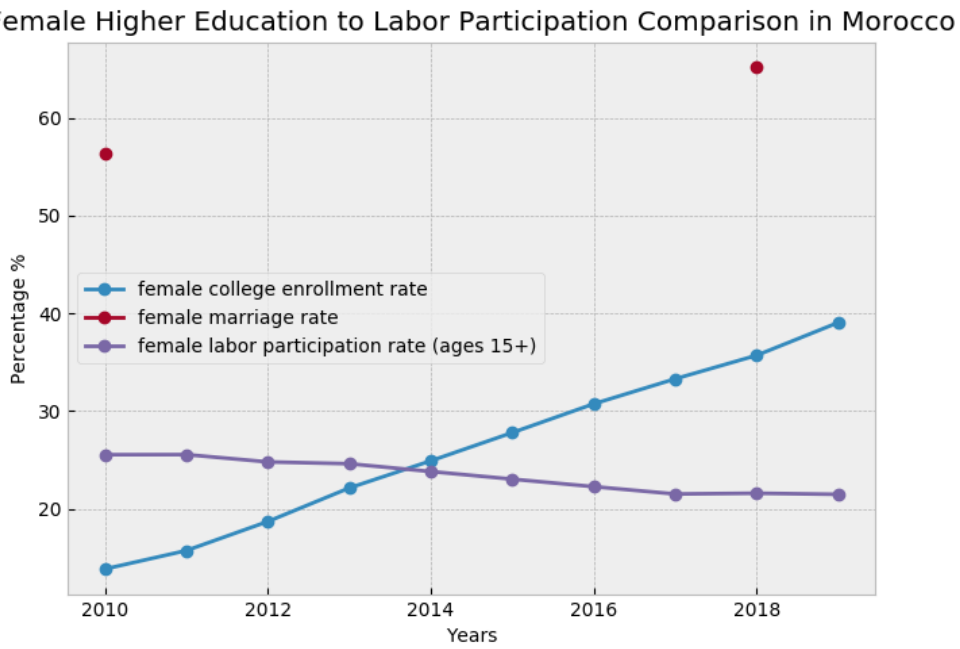


Figure 6: Female Higher Education to Labor Participation Comparison in Morocco

Based on the line graph in Figure 6, the mean and standard deviation in Table 6, and the covariance and correlation calculations in Table 7, the influence that education has on the labor participation rate for women is not consistent with the article. This may be due to the fact that the data in the article was recorded for one year, rather than following a trend over several years, however the author implied that women's increased labor participation in Morocco was a cultural and social shift influenced by an increase in higher education. Data from the World Bank, however, suggests that education and labor have an inverse relationship. From 2010 to 2019, labor participation which was once higher than education, decreased slightly, while education increased dramatically. The shift occurred sometime in 2013, making higher education more prevalent among women than work. The standard deviation for female labor participation is high enough to suggest that there was a slight shift in priorities for women ages 15 and up.

Female college enrollment and labor participation rate covariance	([[74.08,-13.99], [-13.99, 2.75]])
Pearson's correlation of female college enrollment and labor participation rate	(-0.98, 0.00000055)

Table 7: Covariance and Correlation of Female Labor Participation and Education

The covariance values confirm this, as the first value, 74.08, represents the large increase in college enrollment among women, while the second value, -13.99, represents the subtle yet apparent decrease with a negative value. The second value of -13.99 represents the hypothetical decrease in college enrollment, which would result in a slight increase of 2.75 in labor participation. The correlation values tell a similar story, the first value of -0.98 representing the negative correlation of the college enrollment rate in relation to the labor participation rate. The second value ,0.00000055, represents the very slight positive correlation of the labor participation in relation to college enrollment. While these calculations are not consistent with

الزواج المتأخر وإثبات الذات in terms of an increase in labor participation, the author's claim that marriages are happening later in life for Moroccan women is consistent with the calculations and graphs in Table 2, Figure 1, and Figure 2, as well as the article "Possessed by love: Gender and romance in Morocco".

After analyzing the datasets, in addition to the conclusions drawn in the literature review, there are a few conclusions that can be drawn. Two elements that were contradicted or simply incomplete in the quantitative data concerned the circumstance through which spouses met, and consanguinity marriage. Although it was stated in "The Influence of the Socioeducational Environment on Marriage Formation in Morocco" that spouses would meet more often in an educational setting with an increase in education, their own data through which I graphed and analyzed, showed that roughly 7.5% of spouses met in a school environment. This percentage seems lower than it should be considering that education levels were beginning to rise, however without seeing this change over time, it was hard to tell what this meant in terms how an increase in higher education impacted the circumstances through which spouses met.

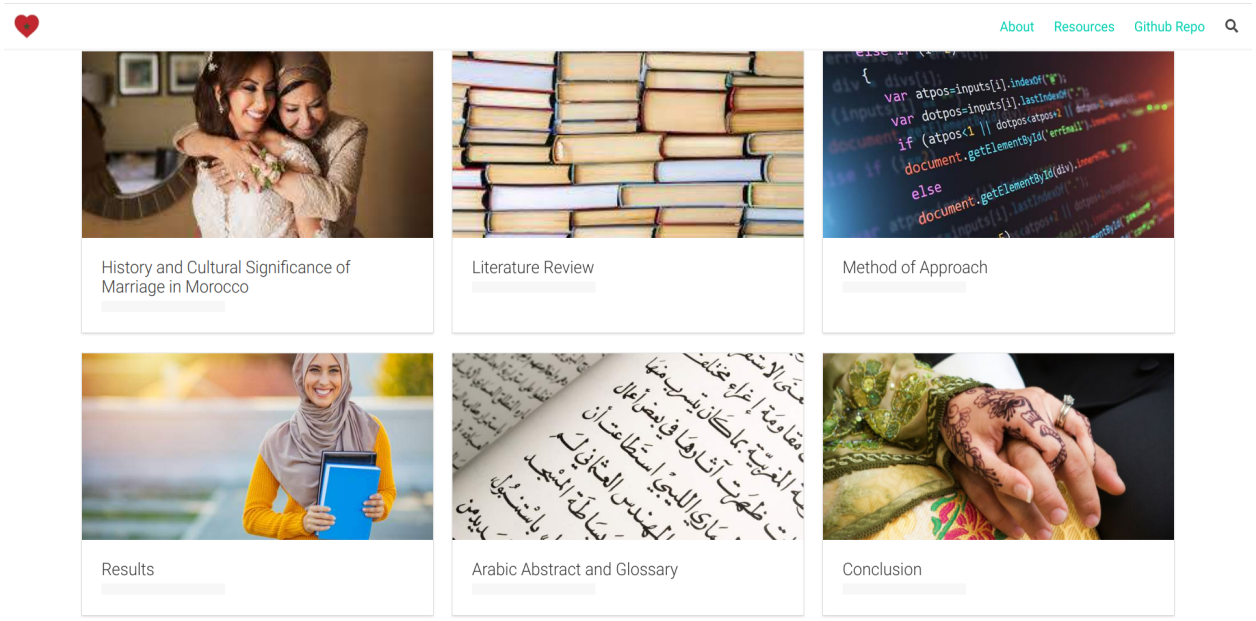
While the situation of spouses meeting was not completely clear through quantitative analysis, the impact of education on consanguinity marriages that was argued was not consistent in the quantitative and qualitative research. In "Arranged marriage, consanguinity and epilepsy", the authors argue that an increase in education would decrease consanguinity marriage, as people would be more aware of the health risks associated with having children. This claim however was not validated in quantitative research, as the graph in Figure 4 and table in Table 3 both show that as education increases, death due to congenital anomalies, a side effect of consanguinity marriage, increases too. Although it is not clear what percentage of congenital anomalies are a result of consanguinity marriage, the information in "The Prevalence of

Congenital Malformations and Its Correlation with Consanguineous Marriages" states that about 25% of congenital anomalies are due to consanguinity marriage, therefore a correlation between education and consanguinity is very possible. This result shows that an increase in education may lead to, or not effect, and increase in consanguinity marriages.

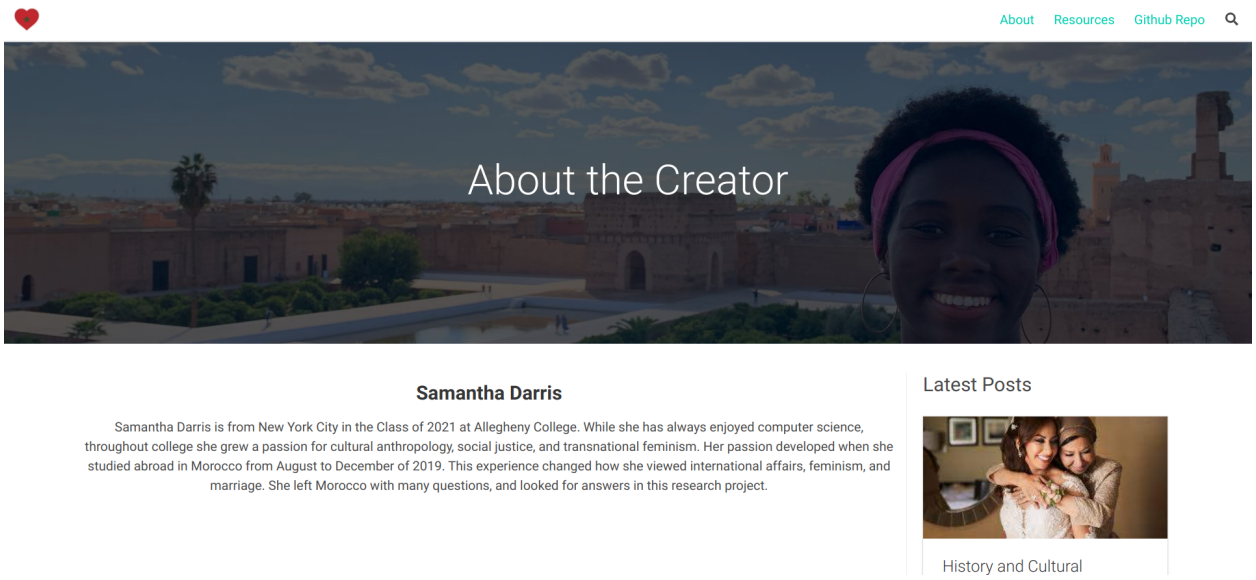
Although the results concerning health and meeting circumstances were somewhat inconclusive in regards to the effect education has on Moroccan marriage practices, there is a common trend in Morocco that the qualitative and quantitative data both support. Most of the information from both the scholarly sources and my statistical analysis confirm that as higher education increases, the age at which Moroccans get married, even more so for women, gets higher. This argument is stated in the articles "Possessed by love: Gender and romance in Morocco", "Determinants of child and forced marriage in Morocco: stakeholder perspectives on health, policies and human rights", and "الزواج المتأخر وإثبات الذات", as well as further proven by the trends seen in Tables 1 and 2 and the Figures 1 and 2. This could be even be inferred in Table 5 and Figure 5, as the decrease in maternal deaths rates could mean there was a decrease in child marriages, due to an increase in marriage age. Although every claim made in the literature review and statistical reports don't align, they do not contradict the relationship between higher education and age. In the past ten years, higher education has impacted Moroccan marital practices by increasing the age at which people get married and shifting priorities by making education almost as important if not the same importance as marriage.

Utilizing both qualitative and quantitative data was beneficial in understanding the relationships between education and marriage in Morocco, as different approaches to research are critical for a holistic analysis. Once these datasets and literature were analyzed, it was time to make this information public on a website. The website is organized in boxes, each one

containing a chapter to show the different types of research and results related to the research question:



The tabs at the top of the page each contain a different component. The About tab is about my background, my experience in Morocco, and how that led me to create this project.



The resources tab contains all the sources and references that were used in this project, and the GitHub Repo tab is linked to my repository to create the website. The goal of this website is to

make all this information accessible and visually appealing. A blend of literature, graphs, calculations speaks to different audiences to understand how higher education impacts marital practices in Morocco.

Conclusion

Throughout this project, many scholarly sources and data were examined to answer the question of how higher education impacts marital practices in Morocco. This project was able to provide a small portion of the answer, that increased higher education increases the age at which Moroccans get married. This was figured out through analyzing scholarly articles from authors of various fields of study, and analysis of data collected from the World Bank, World Health Organization, and United Nations. While this was an enlightening conclusion to reach, it is clear that there is much more research to be done on this topic, as both qualitative and quantitative research are essential for a holistic understanding of a society. It is critical to utilize both approaches to research, especially if one component is lacking, as one approach can not tell a full story. Using qualitative data allowed me to identify the factors that should be further explored in quantitative research, while quantitative research and statistical analysis allowed me to see if the information from the qualitative sources were apparent on a national level. Unfortunately, there wasn't as much data on Moroccan marital practices as I needed, therefore some of my results were based on circumstantial evidence. For example, although quantitative research implies that higher levels of education does not decrease consanguinity anomalies, these correlations may have nothing to do with consanguinity marriage. More quantitative data would have been helpful in either proving or disproving arguments made in the literature review more directly. Data collection needs to be prioritized more in evolving countries by international organizations.

Although quantitative data on marriage in Morocco was not as abundant as needed, through qualitative research, many other questions were answered in the process of finding results. While digging for the answers to my topic, I learned about the history, significance, and

changes that have occurred within Moroccan marriage. While I came in with some knowledge having studied abroad in Morocco, and learning about Arab culture in college, there was so much more I learned about the importance of education and how societal and cultural practices utilize it. If this research project were to be continued, the use of more hands on research would be helpful in understanding how marital practices vary from community to community, and what level of education impacted those practices. The use of interviews, as well as more data collection would provide a wider range of answers to this question, and could potentially lead to understanding more unknown correlations in Morocco.

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المملكة المغربية السكان والتنمية يف المغرب خمس وعشرون سنة بعد مؤمتر القاهرة
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