

Computational Text Analysis of Multiple Translations of *The Popol Vuh*: Is Violence is a Prominent Theme?

Across popular culture films, the ancient Maya are typically portrayed as a barbaric and violent civilization. Although they are recognized for their revolutionary astronomical and scientific achievements, such as the Maya Calendar and the concept of zero, films often cast their accomplishments in an ominous tone associated with doom. This parallels contemporary research in Maya history, where academics are finding that the ancient Maya were more violent than previously considered and that war and rivalry between the Maya city-states likely led to their great civilization's downfall. However, there is still unresolved discussion on the ancient Maya's motivation behind war. Additionally, since the idea of a conflict-oriented Maya civilization is relatively recent, I believe there is still room for discussion to better understand their values and reasoning behind warfare. An analysis of *The Popol Vuh*, a Maya text which uses a blend of mythological, cultural and historical narratives to explain the creation of the world, could give insight into the ancient civilization's culture and value system; due to its continual importance in the Maya community, I believe this text is a reliable source for understanding these concerns.

What could the Maya's most influential text, *The Popol Vuh*, tell us about their actions, and does it align with what is shown in the media and understood in current academic research? Are there discrepancies in violent themes and language across the various translations of *The Popol Vuh*, and may this be a contributing factor to the graphic and violent depiction of Maya civilizations? These are the questions I will be engaging with in my research. Previously, researchers Ignacio Arroyo-Fernández, Mauricio Carrasco-Ruiz, and Carlos-Francisco Méndez-Cruz analyzed *The Popol Vuh* using natural language processing techniques to extract the relationships between entities in Maya culture and visualize them in a semantic network. Researcher Daniel McDonald also analyzed *The Popol Vuh* along with eight other religious texts using text mining methods to explore their relationships in quantitative terms. My approach to this text is distinct from previous research since I will be using computational text analysis methods to identify the themes in *The Popol Vuh* and analyze its vocabulary. I will particularly focus on the presence and importance of violence in the text. Understanding if violence is inherent in ancient Maya culture and exploring their reasoning behind violent actions is important for creating an accurate representation of this influential civilization in modern media and research. In regards to the former, continual misrepresentation of this civilization in Western media casts a negative and inappropriate light on members of current Maya communities. Additionally, if we misinterpret their reasonings, values, and culture, we may still have limited knowledge of how they developed their breakthroughs in science, mathematics, and astronomy. Lastly, by developing a better understanding of the emphasis on violence and warfare in their culture, we may recognize our own civilization's values and how we exemplify them in our society.

I will be using computational text analysis methods to analyze three translations of *The Popol Vuh*, each published in different time periods and translated by different authors. Because the texts I chose come from a range of backgrounds, I believe my results will give me a better representation of the variation across translations of this book. One English translation of this text, *The Book of the People: Popul Vuh*, was written by Delia Goetz and Sylvanus Griswold Morley and was published in 1954. It continues to be a major reference for scholars since it stems from a Spanish translation of the original *The Popol Vuh*, which is written in the Quiché language. The other translation I will be using is by Dennis Tedlock and is called *Popol Vuh: The Maya Book of the Dawn of Life*. This translation was published in 1985 and is notable because it introduces ancient knowledge through commentary and interpretation by a modern Quiche daykeeper (a Maya shaman priest), Andrés Xiloj. The final text I will be using is *Popol Vuh: Sacred Book of the Quiché Maya People*. It was published in 2007 and was translated by and includes commentary from Allen J. Christenson, a leading scholar of Maya literature. I sourced these three translations from the website Holy Books, noted as the largest online

collection of high-quality sacred texts, and then exported the PDF ebook versions into text files for my computational analysis.

I will use the calculated statistic, term frequency–inverse document frequency (TF-IDF Scores), to see how important a word is to one of the translated texts across all three translations. For the purpose of my research, I will focus on words with violent connotations; it will be interesting to see if these words distinguish one of the translations from the others. I will also use the Latent Dirichlet Allocation (LDA) model to uncover the abstract themes across all of the texts. In particular, I will be using this unsupervised machine learning text-mining tool to see if themes associated with violence are prevalent amongst the translated texts. Finally, I will use this same topic modeling approach to analyze the themes in each individual text. I would like to compare the themes across my collection of translated texts to see if variations exist. I will particularly analyze how themes of violence, if present, differ from translation to translation. By focusing on the prevalence of violence and its context in *The Popol Vuh*, we may see if the language and translations of this text are representative of how Maya stories are depicted in modern Western media and research.

I expect that *The Popol Vuh* will include violence to a certain degree since modern understanding of power structures and hero-villain relationships--which are prevalent in this text--typically involve violent interactions. Based on modern analysis of Maya hieroglyphs and books, it has been determined that Maya civilizations practiced ritualistic sacrifices and that warfare between city-states was likely prevalent. However, I assume that there will be a low frequency of violent language and depictions, contrary to modern understanding of ancient Maya customs. Maya culture has persevered throughout the centuries, despite conquest and forces that oppressed their practices. Based on personal experience and the popularity of modern tourism, I believe that the Maya people today are a very proud and kind community. If violence indeed played a major role in their ancient civilizations, I would expect to see this value in modern Maya communities but instead we see the opposite. Certainly, tourism wouldn't flourish in these regions if the inhabitants were violent and aggressive. *The Popol Vuh* continues to play an important role in the belief system of Maya culture, so if modern Maya communities are an emblem of amiability, integrity and pride, I expect these to be the most prevalent values and themes in the text.

By understanding its common themes and language usage, I expect to learn more about the value of *The Popol Vuh* for the Maya community. I also hope to make more informed conclusions on how modern media portrays ancient Maya civilizations after understanding the significance of violence in *The Popol Vuh*. By analyzing these translations, I expect to better understand how the wider public engages with them, like in popular media or research. I will also gain a better understanding of how different translations may offer varying or similar perspectives on the same text. This calls attention to additional concerns in the field of ancient text analysis, such as whether or not to trust a single translation or rather to look at them as a whole--computational text analysis methods may be a useful tool to analyze a collection of translations, in this case. Lastly, recent investigations have shown that these civilizations were more violent than previously thought, so I hope that this research sheds light on this topic and proves to be a useful tool for further analysis.