University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Honors Theses, University of Nebraska-Lincoln

Honors Program

Preliminary Analysis of Hieroglyph and Iconography Placement on Freestanding Monuments at Copán, Honduras

Elizabeth Koenen
University of Nebraska-Lincoln

Follow this and additional works at: https://digitalcommons.unl.edu/honorstheses

Part of the Anthropology Commons, Digital Humanities Commons, and the Latin American Languages and Societies Commons

PRELIMINARY ANALYSIS OF HIEROGLYPH AND ICONOGRAPHY PLACEMENT ON
FREESTANDING MONUMENTS AT COPÁN, HONDURAS

An Undergraduate Honors Thesis
Submitted in Partial fulfillment of
University Honors Program Requirements
University of Nebraska-Lincoln

By
Elizabeth Koenen, BA, BSBA
Spanish, Accounting
College of Arts and Sciences, College of Business

March 12, 2018

Faculty Mentors:
Heather Richards-Rissetto, PhD, Anthropology
Lola Lorenzo, PhD, Spanish

Abstract

This paper analyzes the placement of hieroglyphs and iconography on freestanding monuments at the ancient Maya site of Copán, Honduras--today, a UNESCO World Heritage Site, but from the 5th to 9th centuries it was a major ancient Maya city ruled by a series of dynastic kings (Fash 2001). Preliminary spatial analysis using Geographic Information Systems (GIS) highlight two potentially important findings. First, stelae in the main civic-ceremonial precinct (Principal Group), while erected in the most centralized and public location in the city, are not always placed to allow for public viewing of their fronts. Second, differences may exist in the number of logographic and syllabic glyphs used on a object depending on the type of object and its location. Further research and data collection are needed in order to perform statistical methods to further explore the preliminary results presented in this paper.
Keywords: Ancient Maya, Archaeology, Hieroglyphs, Spatial Analysis, GIS

Dedication/Appreciation

Preliminary Analysis of Hieroglyph and Iconography Placement on Freestanding

Monuments at Copán, Honduras

Introduction

This paper focuses on the placement of hieroglyphs and iconography carved into freestanding objects at the ancient Maya site of Copán. The focus is on initial emerging trends based on object location, direction, and iconographic details that appear in the analyzed data. The goal is to provide preliminary data and analysis to set the stage for future investigations into the topics explored.

The sections of the paper are resumen en español, background, methods, analysis, and conclusion. The section named resumen en español gives a summary of the paper in spanish. The background section covers an overview of glyphs and cardinality due to their relevance in understanding the content of the paper. The methods section of the paper contains a discussion of the information source and the process used to prepare and analyze the data. The analysis section discusses initial results regarding cardinality and the subcategories of stela, inscription, theme, figure type, and motif description. The final section is the conclusion that contains a summary of the findings and a discussion of future research that could be done.

Resumen en Español

Información. El sistema de escritura de la maya es compuesta por jeroglíficos. Los jeroglíficos mayas pueden ser silábicos o logográficos. Los jeroglíficos silábicos significan las sílabas y se usan para formar las palabras (Johnson, 2014). Los jeroglíficos logográficos significan las ideas o las palabras (Johnson, 2014).

Los puntos cardinales eran importantes para los antiguos mayas. El este y el oeste eran muy importantes. El norte y el sur tenían menos importancia. El este significaba el nacimiento y era más prestigioso que el oeste (Coggins, 1980). El oeste significaba la muerte (Coggins, 1980).

Métodos. Los datos utilizados son de MayaArch3D Project. Son de tres tablas (bauwerk, inschrift, y reliefszene). Los datos no son completos ni uniformes. A causa de esto, necesitaba crear los subconjuntos para analizar los datos. Usa el libro de Baudez (1994) para identifica el frente de la estela.

Análisis. Se analizan la posición y la dirección de un subconjunto de la estela maya al sitio Copán. Se analizan los jeroglíficos mayas de un subconjunto de los datos de la tabla inschrift. Se analizan los subconjuntos de los datos de la tabla reliefszene.

Conclusión. La locación del frente de la estela no siempre corresponde a la vista del público. La locación de las estelas de la plaza norte forman un círculo. Las imágenes ocurren más de los puntos cardinal del este y el oeste que del norte y el sur. La utilización de los jeroglíficos silábicos y logográficos es diferente de los altares y los incensarios.

Los datos no son completos. Se necesita más datos por el análisis futuro. Algunos supuestos fueron hecho para analizar los datos. Se deben verificar los supuestos por el análisis futuro.

Background

Glyphs. The Mayan writing system is composed of hieroglyphs (glyphs). Glyphs are picture-like symbols that are used to write words. These glyphs can be syllabic or logographic. Syllabic glyphs represent sounds that can then be used to make words (Johnson, 2014) .

Logographic glyphs represent an idea or word (Johnson, 2014). The use of logographic versus syllabic glyphs on various objects is analyzed in this paper.

Glyphs can be found in many places, but three of the most prominent places are on stelae, pottery, and in codices (bark-paper or deer-skin books) (Johnson, 2014). In this paper the glyphs that are analyzed are found on stelae, pottery, incensarios, and other objects. Glyphs are found in public as well as private spaces. The ability of the average individual to read glyphs remains unknown.

Cardinality. The cardinal directions were important to the ancient Maya. Eastern and western symbolism is quite prominent whereas northern and southern is less common (Coggins, 1980). The east was the most revered direction and was connected with "the rising sun and birth" (Coggins, 1980, p. 729). The west was considered less sacred compared to the east, and was associated with "the setting of the sun" and "death" (Coggins, 1980, p. 729).

Cardinality is one variable used in this paper to analyze the placement of stelae. Do stelae tend to face specific cardinal directions, i.e. are their fronts oriented to specific directions? If so, does their location affect their orientation? Cardinality is also used to determine if there are any patterns in the location of glyphs or images on stelae; that is, do glyphs or images tend to face specific cardinal directions? Due to the significance of the cardinal directions to the ancient Maya, there is the possibility that the direction a glyph or image faces would be significant and have held particular meaning and/or had more or less impact on viewers.

Methods

Information Sources. The information that was used was obtained from the MayaArch3D Project--a collaboration among the University of Nebraska-Lincoln, German

Archaeological Institute, Heidelberg University, and the Honduran Institute of Anthropology and History. Three main tables are used in this research. They are bauwerk (building), reliefszene (relief scene), and inschrift (inscription). Information was not uniformly entered into the forms that were utilized to create the reliefszene and inschrift tables; therefore, I manually examined subsets of data from these tables and then devised queries to export subsets of cleaned data. Information was also pulled from *Maya Sculptures of Copán* by Baudez (1994) to determine the front sides of stelae.

Process. The information in the reliefszene table contained multiple fields that held information about the location of glyphs. This information ranged from the cardinal direction to location (middle, center, top, etc.) to which side (front, all sides, etc.). However, this information was not consistently coded across fields, requiring additional processing to clean the data. In order to better analyze these data, a query was generated to find if a cardinal direction was mentioned in any of the fields and if so, then put into a new field. Some entries included information about stela orientation (e.g. front, back, etc.), many did not include cardinal direction. The GIS for Copán was employed to acquire data on cardinal direction and then I correlated directionality to stelae front and entered these data into the reliefszene table. The assumption is that the stelae front assigned in the reliefszene table corresponds with the sides assigned by Baudez (1994) as the front. The front side was determined to be the side that is listed first in the book when the stela had multiple sides with a main figure on it. The front was also based on the side that faced the altar. Next, subsets of data were created to include only data where there was no null value for cardinal direction and no null value for the attribute being

examined. Because the table held many null values, much data was omitted, possibly impacting the initial results, and as mentioned later required additional data acquisition and analysis.

Data entered in the inschrift table was also not uniformly coded. This mismatch of data also required that some data be excluded from the analysis. Only a small subset of the data in that table had information on the number of syllabic or logographic glyphs on an object. This limitation in the data also means that there were limited number of occurrences to observe and only on three types of objects: altars, incensarios, and "other".

Analysis

Stelae. As mentioned in the methods section, it was necessary to perform a query to populate a new field in the reliefszene table that listed the cardinal direction for the "front" of the stelae. When creating this table, I noticed that the majority of the stelae had their fronts positioned facing the west. Figure 1 illustrates that east and west front-facing steale occur much more often than do north or south front-facing stelae. This pattern could be due to the importance of the east and west in Maya cosmology, or could be due to how the buildings are situated--steale abutting structures seem to have their fronts facing outwards away from the building.
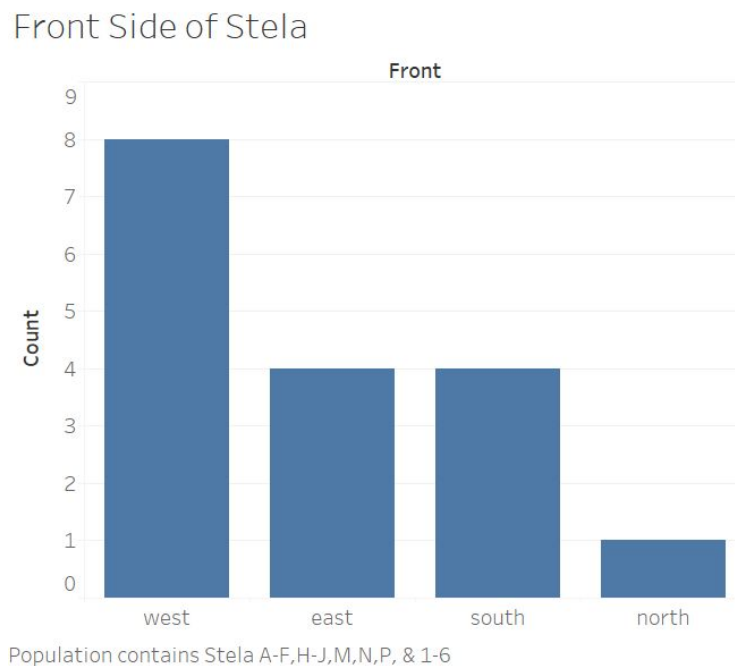
Front Side of Stela

Figure 1: Chart illustrating cardinality for the front side of stelae

Figure 1 shows that west is the most common side for the front of a stela. In fact, 47% of Copán's stelae, i.e., eight out of seventeen stelae face towards the west. Interestingly, north is only facing front for a single stela. However, it must be noted that this does not contain all stela found at Copán, but it does include the majority located in the Principal Group. As mentioned in the methods section, the front side was determined to be the side that is listed first in the book by Baudez when the stela had multiple sides with a main figure on it. The front was also based on the side that faced the altar.
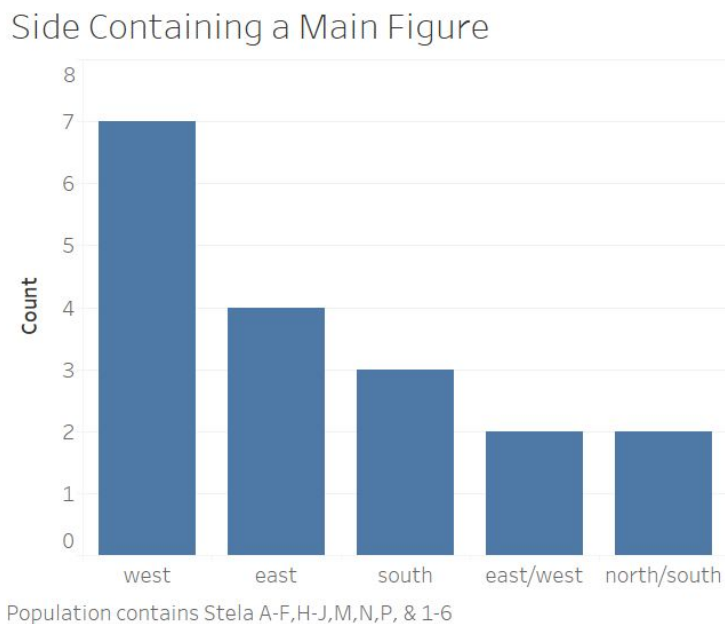
Figure 2: Chart illustrating cardinality for the main figure(s) on stelae

Figure 2 shows that the most common side for a main figure (person or deity) on a stela is the western side. Figure 2 is different from Figure 1 because it categorizes the sides that contain a figure. The east/west and north/south categories signify that the stela has a carving of a person or deity on both sides listed, and the front-facing side of the figure cannot be identified. Displaying a figure on the west or east side is more common than on the south or north. Out of the eighteen stelae investigated, 72% face either west, east or east/west. There is not a stela in the group of stelae analyzed that had a figure on only the north side. The significance of the each cardinal direction could have played a role in how the stelae were placed.
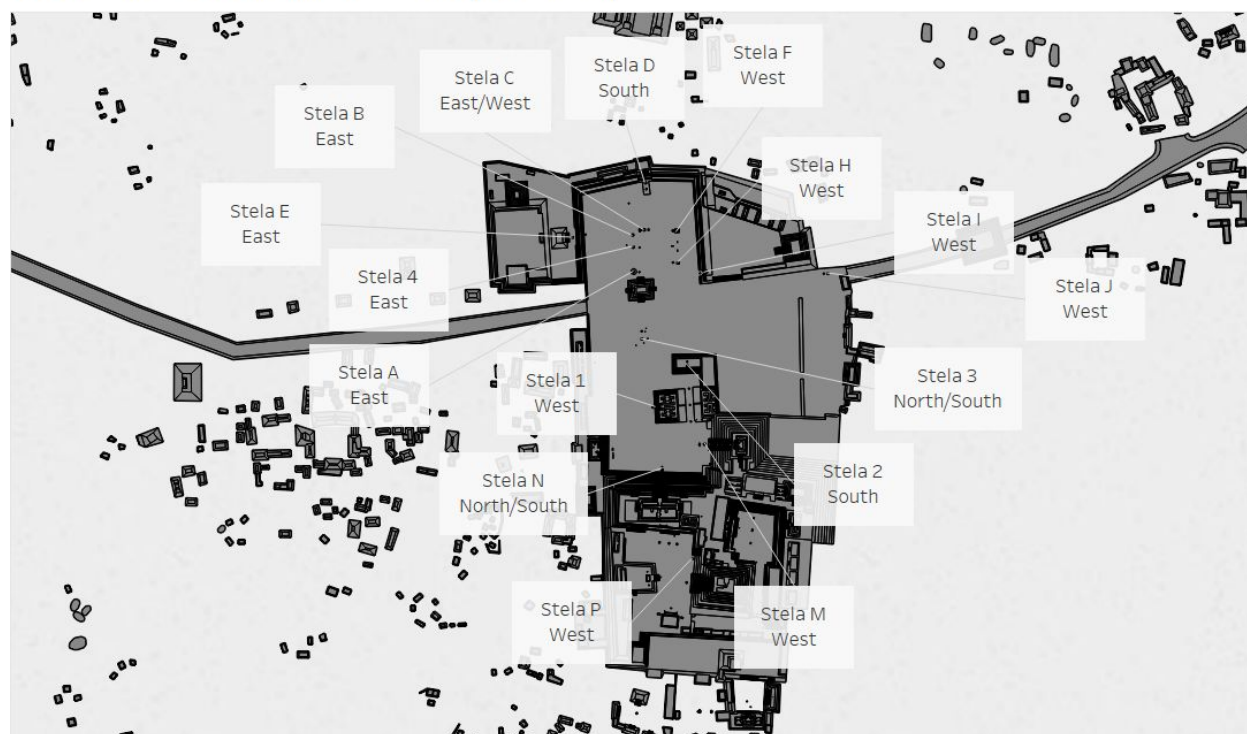
Figure 3: Map illustrating the cardinality of the main figure(s) on stelae in the Principal Group at Copán, Honduras

Figure 3 gives an overview of the location of the stelae examined within the Principal Group. Not all of the stela that were included in figure 2 are in figure 3. This image is enlarged across several figures (Figures 4 and 5) to examine the data and pattern in more detail.

Figure 3 shows that most stelae only have one main figure on them. Of the 16 stelae shown in figure 3 only 18.75% have a main figure on more than one side. This would then indicate that having only one main figure on a stela was more common than stelae having main figures on multiple side. Further data would be needed to determine if this is the case.
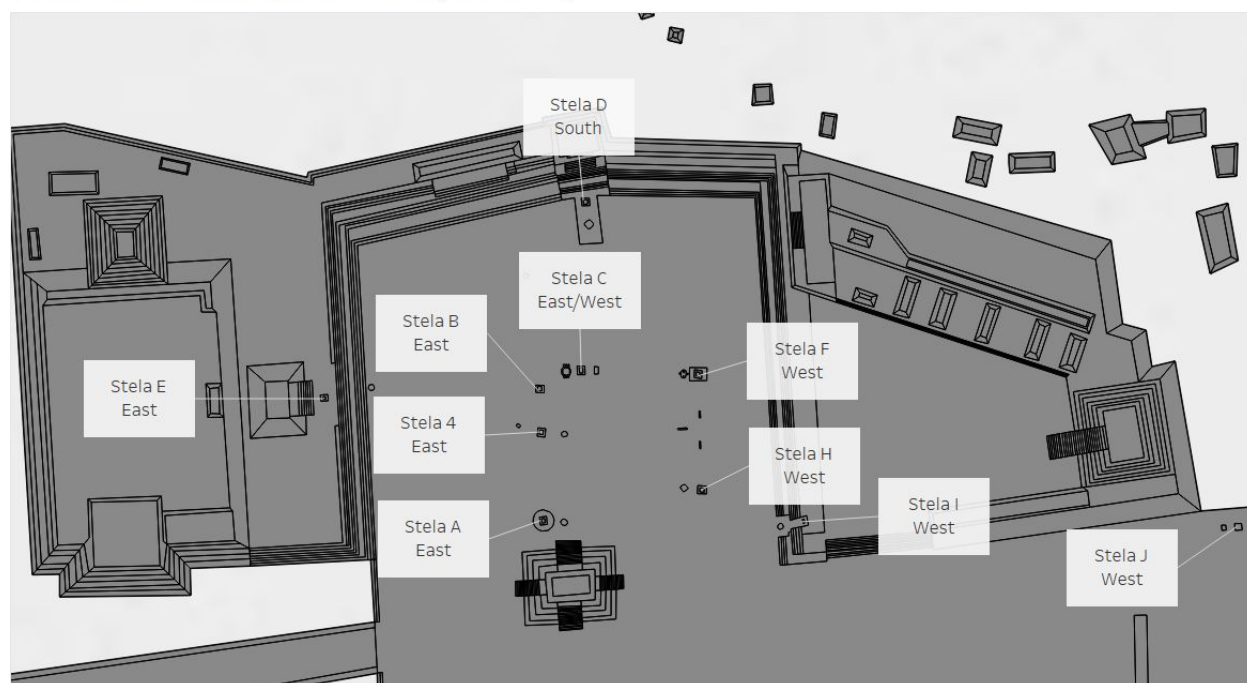
Front Side of Stelae in Principle Group

Figure 4: Map illustrating a closer view of the north side of the Principal Group at Copán, Honduras

Figure 4 shows that the ten stelae located in the northern part of the Principal Group of

the Great Plaza face inwards towards the center of this public space. Even Stela J that is situated

outside this more enclosed space at the eastern entrance of the Principal Group faces west

towards the center of the group. Stela C seems to be the top of the circle and was the first to be

placed in the area (Newsome 2001). Interestingly, it is the only stelae in this area to have two

main figures facing both east and west, representing a young Ruler 13 on the East and an old

Ruler 13 on the West (Baudez 1994; Newsome 2001). Stela B, Stela 4, and Stela A all face

inwards towards what might be deemed an "enclosed" space and in fact has been posited to be

part of a stelae circuit traversed by Ruler 13, who erected them (Newsome 2001).They all face

east even though the public would be on the western side of them. The same occurs with Stela F

and Stela H, which face west towards the center of the circle of stelae even though the public

would have been to their east. Although outside the central "circle" of stelae, Stela D and Stela E both also have their fronts facing inward rather than towards the audience seated in the bleachers.

Front Side of Stelae in Principle Group

Stela 3
North/South

Stela 2
South

Stela 1
West

Stela M
West

Stela N
North/South

Stela P
West

Figure 5: Map illustrating a closer view of the south side of the Principal Group at Copán, Honduras

Most of the stelae in the southern part of the Principal Group (figure 5) face away from the buildings that they abut, and interestingly they too face inward towards an enclosed space and yet the area and viewer experience seems differently orchestrated from the northern part. There are no "bleachers" for an audience to sit and watch ritual performances, and no centralized stelae to serve as performance pieces. The exceptions are Stela N and Stela 3. Both have figures

on north and south sides. Stela 3 is in the center of an open space, but Stela N is not. The reason

for this difference is not known, and requires more investigation.

      Inscription. I used the inschrift table to investigate whether it is more common for

syllabic or logographic glyphs to be used in general. The inschrift table was also utilized to

determine if there was a correlation between the number of syllabic glyphs versus logographic

glyphs used based on the type of object. There are only three types of objects analyzed because

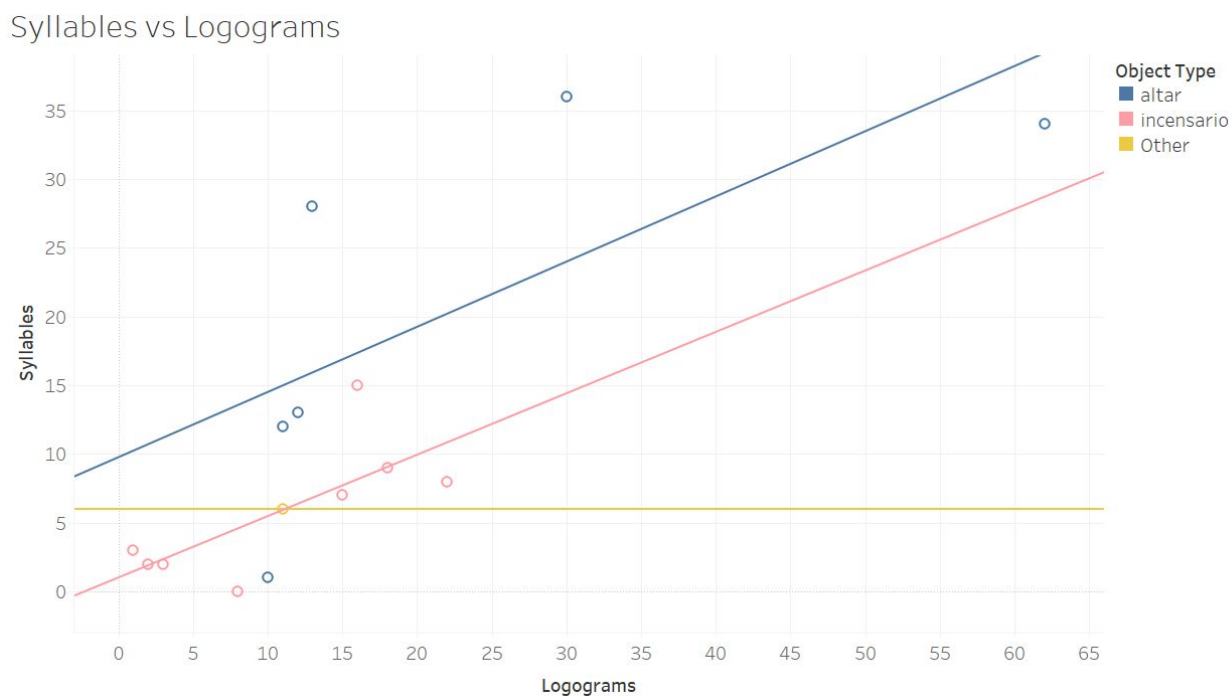they are the only ones that had data on the number of syllables and logograms on them.

Figure 6: Chart illustrating the count of syllables and logograms by Object Type. Trend lines are displayed

for each Object Type.

      As can be seen in Figure 6 above, altars seem to display more syllabic glyphs than do

incensarios. Interestingly, the rate of change for the addition of each syllable per each additional

logogram used seems to be similar between altars and incensarios. This indicates that there is not

much of a difference in the number of each additional syllable per logogram. The results indicate that approximately one syllable is added for every two logograms.

There is not much information to draw from the object type of "other" because there is only one occurence. It does, however, seem to fall within in the normal range of points for the incensario object type. Further clarification is needed on what this "other" type item is.

In Figure 6, two outliers can be seen for the object type of altar that have significantly more syllabic glyphs than logographic glyphs. These altars are Altar W' and Altar H'. Altar W' is located in Las Sepulturas--an elite residential area to the east of the Principal Group, and was commissioned by Ruler 16. Altar H', commissioned by Ruler 12, is located in the West Court of the Acropolis in the Principal Group. The location for both is in private, more enclosed spaces. Altar G3, commissioned by Ruler 16, is an outlier in that it only has 1 syllabic glyph, but 10 logographic glyphs. It is located in the northern part of the Great Plaza and is in public space. These findings show a potential difference in the use of syllabic and logographic glyphs on altars that are in public versus private spaces. Additional data and further analysis would need to be done to investigate this possibility further.
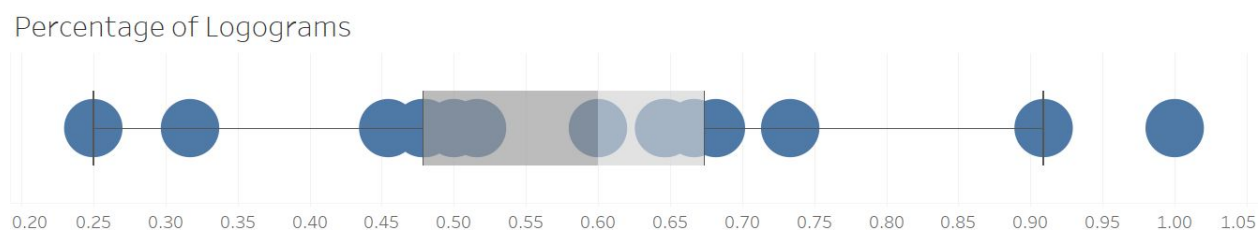

Figure 7: Graph illustrating the percentage of logograms displayed on an object.

Figure 7 demonstrates that the median object is comprised of 60% logograms for all the data points when not broken down into object type. The graph also shows that there is a data

point where 100% of the glyphs on an object were logographic, while there are no occurrences

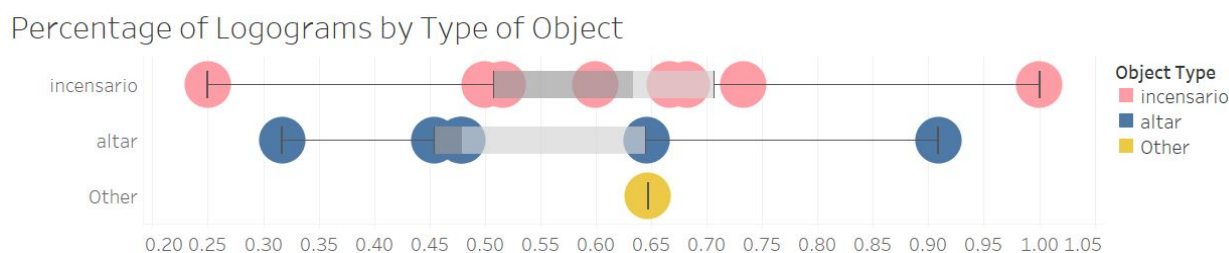where 100% of the glyphs on an object were syllabic.

Figure 8: Graph illustrating the percentage of logograms displayed on an item based on Object Type.

Figure 8 breaks down the percentage of logograms by the type of the object. The graph

shows that altars have a lower median percentage of 47.91% of logograms, whereas incensarios

(median of 63.33%) and "other" objects (median of 64.71%) are around the median for the

whole group that was shown in Figure 3. This indicates that more logograms are used on

incensarios than altars. There could be many reasons for this pattern. One possible explanation is

that the subject matter being written about may necessitate the use of more syllables. It could

also be due to the small sample size utilized in this analysis. Obtaining a larger sample size

would help to further investigate this potential difference.

Emerging Trends: Theme. From the reliefszene table data a subset was created that held

no null values for either the cardinal direction or the theme categories. The theme field holds

information about the key ideas presented on a stelae. A few trends emerged in this smaller set of

data. Further clarification on the the meaning of the theme classifications as well as additional

data would improve and enrich the analysis of theme and cardinality.
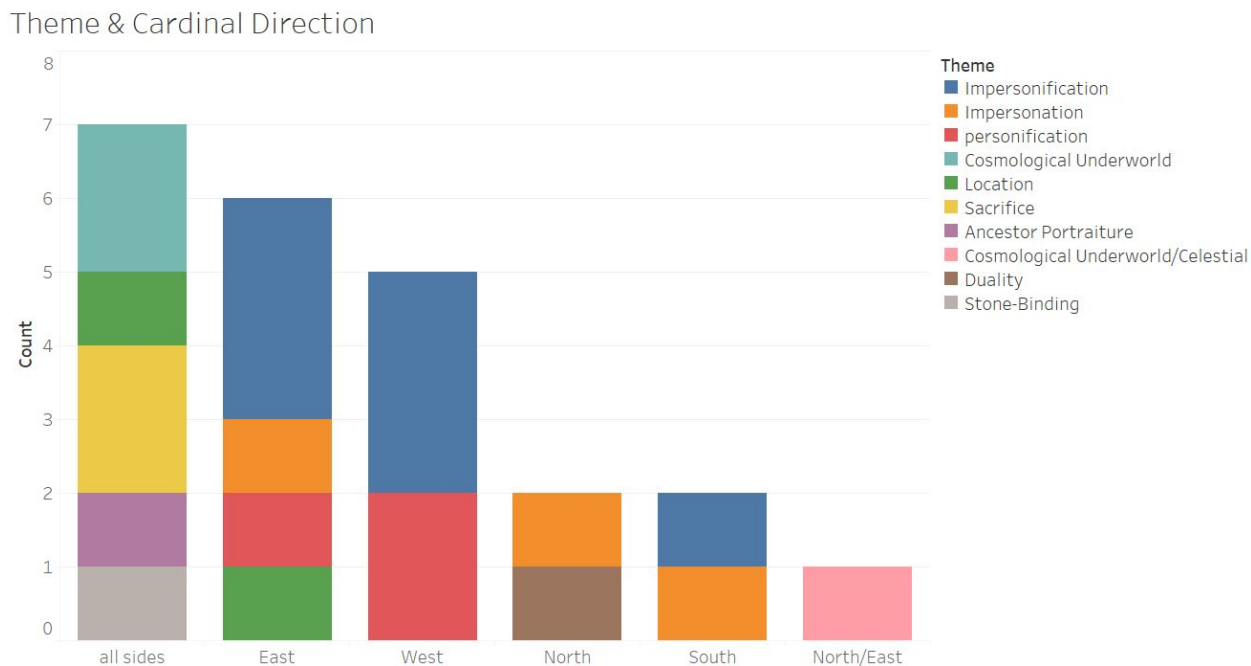
Theme & Cardinal Direction

Figure 9: Chart illustrating the cardinality of all value analyzed in the data subset and occurence of each Theme for each Cardinal Direction.

As can be seen in figure 9 above, the themes of impersonification, impersonation, and personification are the most common categories. Impersonification and personification seem to be mainly on the east and north sides. However, impersonation seems to occur on all major cardinal directions except for the west. The theme of sacrifice occurs twice in this data set and both of occurrences are on "all sides". This is the same case for cosmological underworld which occurs only twice and is depicted on all sides in both occurrence.

The most common side for this subset of data in the reliefszene table to occur on is all sides. East and west are then the most common cardinal directions. It is shown that occurrences for the subset of the data on the north and south sides are not prevalent.

Emerging Trends: Figure Type. From the reliefszene table data a subset was created that held no null values for the categories of cardinal direction or figure type. The data was then

analyzed by breaking it down into figure type to discern if there was a cardinal direction that was more prevalent for certain figure types (e.g., god/deity, ancestor, etc.). The two largest categories, God/Deity and Ruler, were then isolated to be further analyzed.
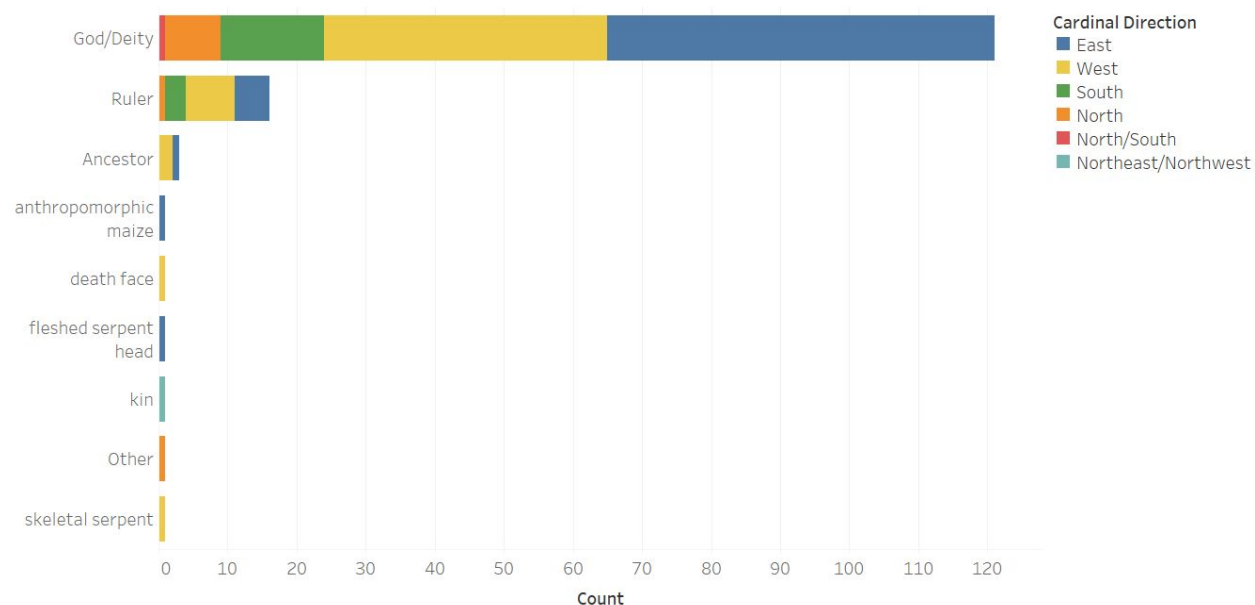

Figure 10: Chart illustrating the count for each Figure Type and the Cardinal Direction for the Figure Type subset data.

Figure 10 shows that God/Deity references occur more often than any other figure type. In this subset there are 121 occurrences of the God/Deity figure type which means that 82.9% of the occurrence are the God/Deity figure type. All figure types other than God/Deity, Ruler, and Ancestor only have one occurence. These results indicate that God/Deity, Ruler, and Ancestor images were the most prevalent on objects including stelae, altars, and incensarios at Copán. However, due to relatively small sample size and potential issues of data standardization, it could also mean that more data need to be collected and structured in a standardized way.

East is the most commonly occuring side in Figure 10. This finding is similar to the analysis done on cardinality and theme, where east was the most common. However, these results differ from the findings for the front of the stelae, where west is more common than east. Nonetheless, it continues the pattern where the count of occurences in the subsets of data, such as in figure 9, occurs more on the east and west sides than on the north and south sides.
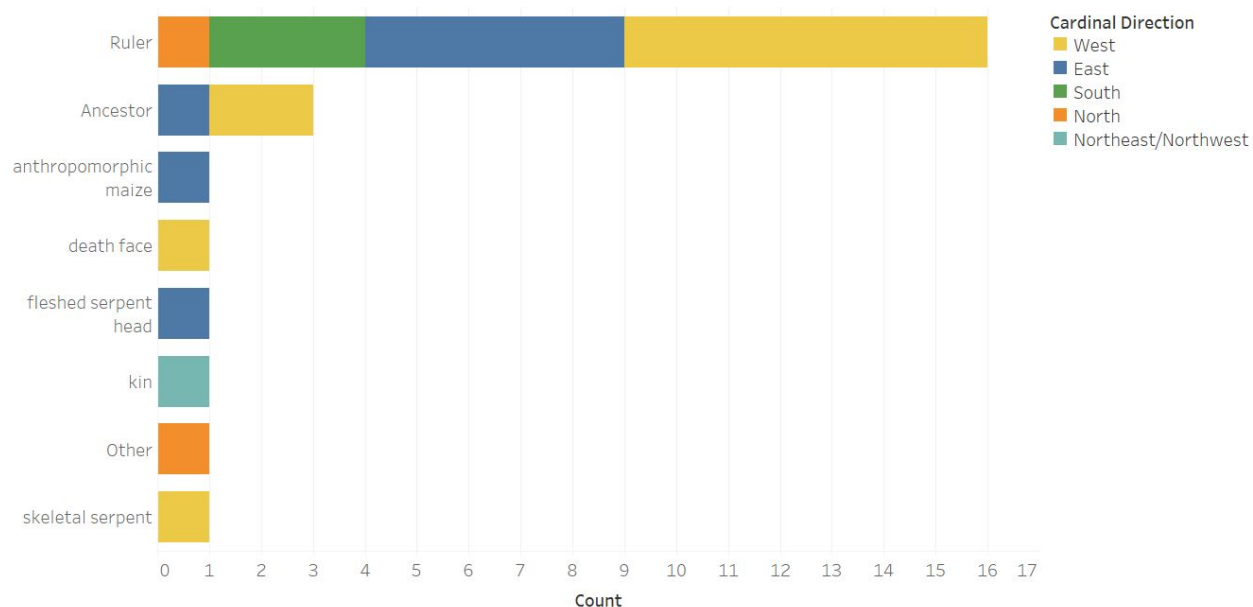

Figure 11:Chart illustrating the count for each Figure Type and the Cardinal Direction for the Figure Type subset data excluding the God/Deity Figure Type.

In Figure 11 the Figure Type God/Deity is removed to analyze the data without it due to how many more values it had compared to the other categories. West is the most common cardinal direction when the God/Deity type is excluded. When the God/Deity figure type is removed 44% of the subset of data has the cardinal direction of west. The count for south is still greater than north, as shown in Figure 10. Interestingly, if we exclude Ruler and God/Deity type from the sample then there would be no occurrences of south.
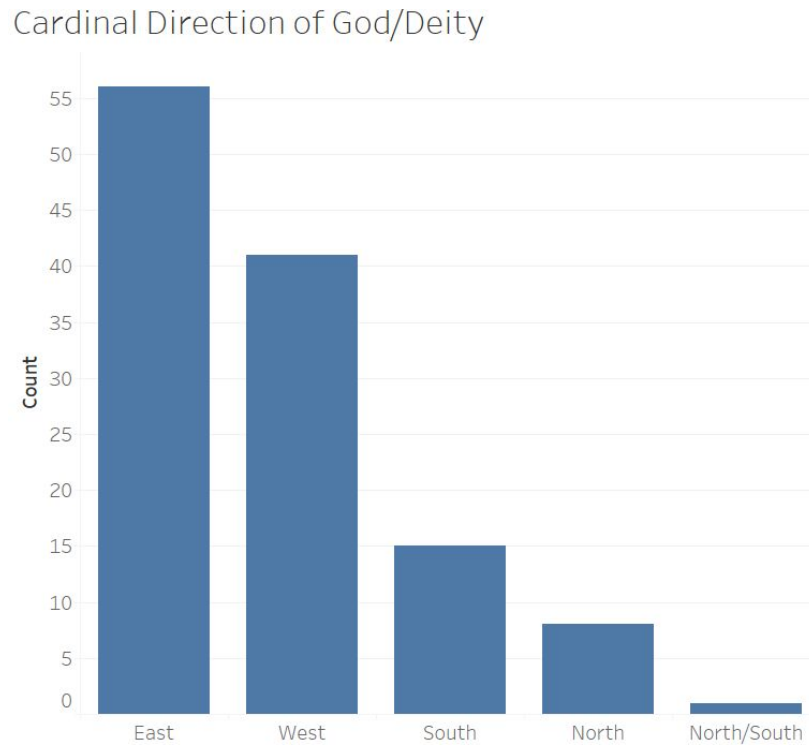
Figure 12: Chart illustrating the cardinality of the God/Deity Figure Type.

Figure 12 illustrates the most common cardinal directions for the God/Deity figure type. The figure shows that such references are much more common on the east side than the west, because it occurs over then times more on the east than west. In fact 46% of the occurences of the God/Deity figure type occur on the east. This finding is interesting when considering that the ancient Maya considered the east to signify birth and was the direction that was the most revered.
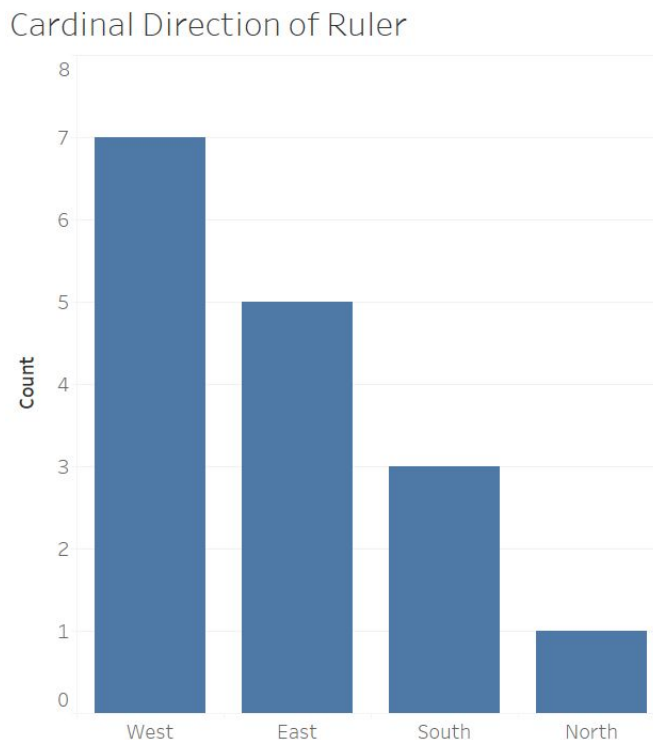
Figure 13: Chart illustrating the cardinality of the Ruler Figure Type.

Figure 13 shows that west was more common for the Figure Type of Ruler, and references on the west and east occur more often on the south and north. In fact 75% of the time the figure type Ruler occurs towards either the west or east. However, the small sample size requires more data collection. Overall, when the results of Figures 12 and 13 are compared, they show that references to the Ruler occurs more often on the west side, while God/Deity references occur more frequently on the east side.

Emerging Trends: Motif Description. From the reliefszene table, a subset was created that held no null values for either the cardinal direction or the figure type categories. A chart divided into motif categories and cardinal directions was generated to analyze potential relationships between cardinality and motifs. A second graph was created to further analyze

these data to identify the total number of occurrences, i.e. count for each motif based on side (cardinal direction).
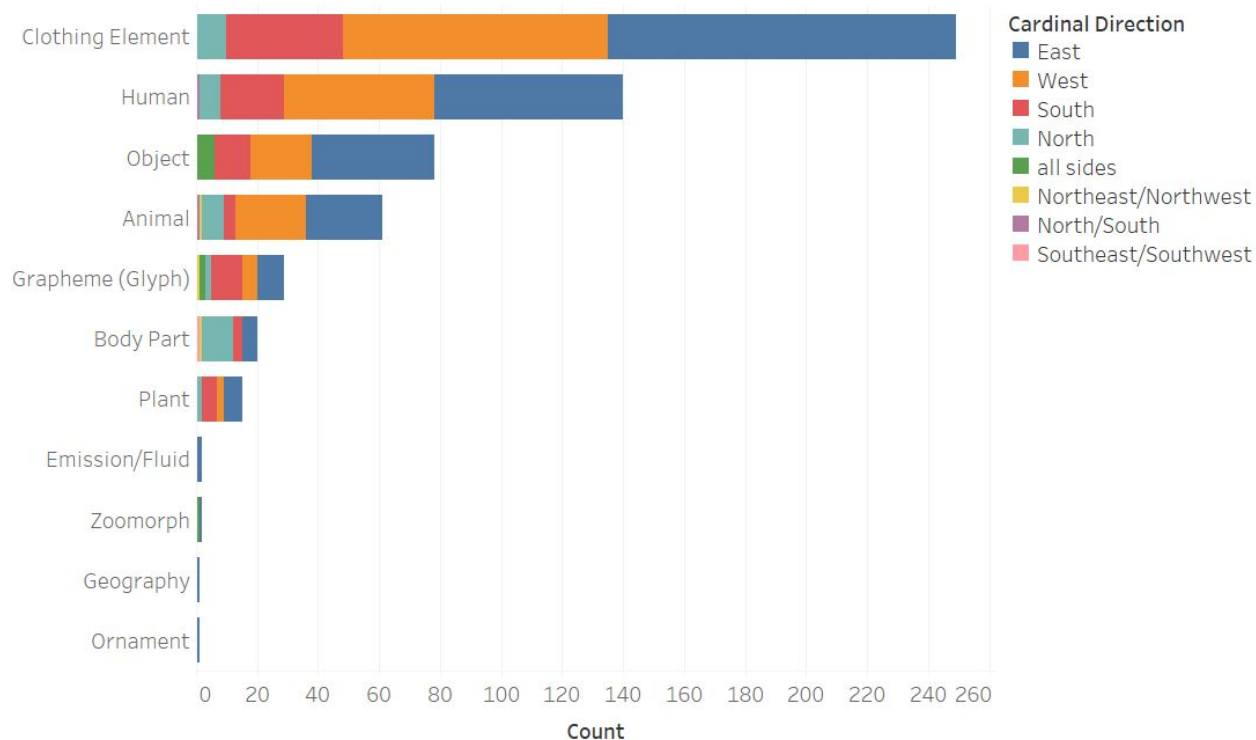

Figure 14: Chart illustrating the occurence of each Motif Description and cardinality for the data subset of Motif Description.

Figure 14 shows that the category Human occurs more often than Animal or Plant. East is the cardinal direction that occurs most frequently. It also shows that the cardinal directions east and west occur more than north and south. This result of east and west occuring more than north and south is similar to the other data analysis and results that were examined earlier.

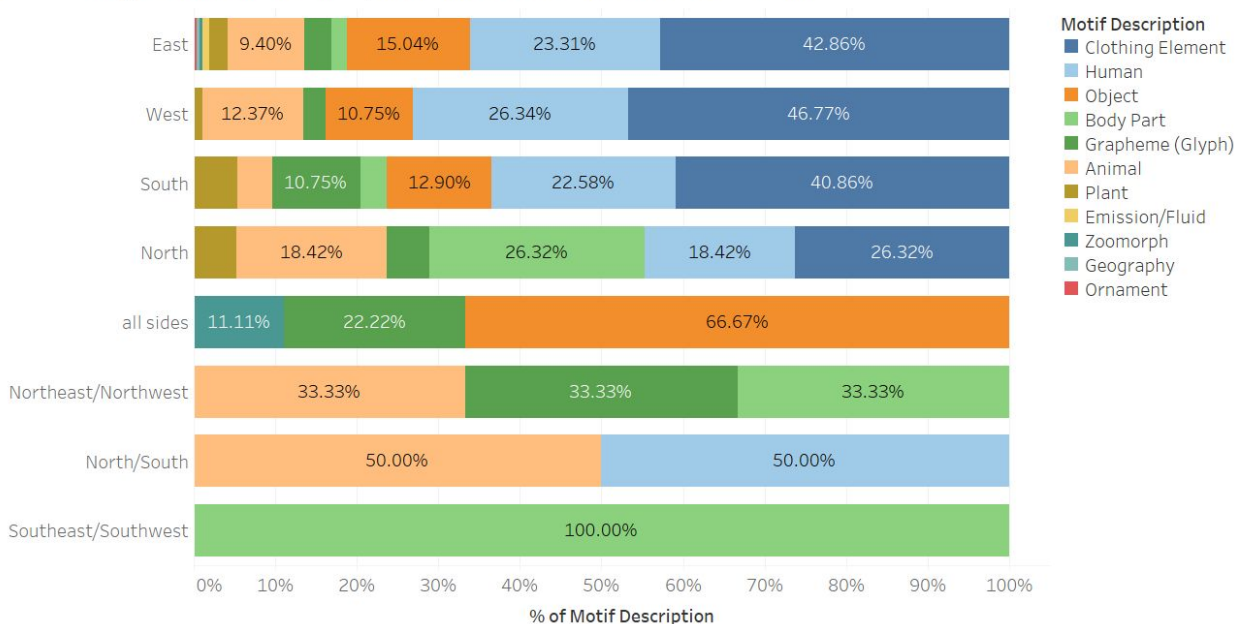Percentage of Motif Description based on Cardinal Direction

Figure 15: Chart illustrating the percentage that each direction is composed of each Motif Description.

Figure 15 demonstrates the percentage of motifs that occur on each cardinal direction.

The objective is to determine if specific sides exhibit singular themes or more diverse themes to

better understand if certain sides were typically used to convey specific ideas or communicate

certain messages. East and west are composed of similar percentages of a variety of motifs. In

contrast, north has a larger percentage of Body Part motifs in comparison to all other cardinal

directions. Interestingly, south sides exhibit a larger percentage of Grapheme (Glyphs) than other

directions. While these are interesting findings, again I emphasize the small sample size and

potential data standardization errors.

Conclusion

Findings. Initial results analyzing a sample of stelae, altars, and incensarios provides new

data suggesting potential spatial patterns in the placement of hieroglyphs and iconography at

Copán, Honduras. For example, the front sides of stelae in the northern part of the Great Plaza in

the Principal Group do not face towards the public. Instead, the placement of the stelae in the North Plaza seem to form an enclosed "circle" facing each other perhaps corresponding to Elizabeth Newsome's hypothesis that Ruler 13 erected these seven stelae as a ritual circuit (Newsome 2001). In contrast, many stelae in the southern part of the Great Plaza in the Principal Group, i.e. the Hieroglyphic Court, do face outwards towards the public. These results might reflect differential uses of these two spaces, different target audiences, or other ideological ideas (Richards-Rissetto 2010, 2017).

The data analyzed from the reliefszene table indicate that the east and west sides exhibit more diverse themes and motifs than do the north and south sides. Furthermore, the data indicate that references to rulers occurs more frequently on the west sides of freestanding monuments and in contrast, God/Deity references occur more frequently on the east side. While exploring the significance of these findings is beyond the scope of this thesis, the results suggest potential spatial patterning of specific themes on monuments. Additionally, there is the potential that the use of logograms and syllables may differ based on where they are placed and on what object they are placed. In the data examined altars seem to use more syllabic glyphs than do the incensarios. In the observation of three outliers for the altars, it can be seen that the two altars with the highest syllable to logogram ratio were in private spaces and the altar with the lowest syllable to logogram ratio was is public space. Generally speaking the results may point to differential placement of glyphs and iconography in relation to cardinal direction of object sides and possibly use of space (Ashmore and Sabloff 2002; Coggins 1980, Sanchez 1999).

Future Efforts. The data used in this study was only a subset of data on glyphs and iconography on freestanding monuments at Copan. More data should be gathered for future analysis. Statistical tests could be performed with larger, more complete data sets.

There were also certain assumptions made during the analysis of the data. For example, one assumption was the determination of the front of stelae. It is not completely certain that "front" entered into the MayaArch3D database was the same for as the front sides assigned by Baudez (1994); however, in many cases the presence of an altar "in front of" a stelae likely denotes the front (Plank 2004). However, this assumptions and others should be further examined and verified.

The unstructured nature of the data could be due in part to the way the database form described the categories that were to be entered. For example, there was variance in the data entered into the reliefszene table for relevanteseiteeins (position on artifact). In the future, there should be more concrete descriptions of what data is supposed to be entered into specific places. One possible solution is to have a drop-down menu that allows only for specific values to be selected. An example would be one entry for direction that only allows north, south, east, west, or combinations of those values. This change would help create uniform data and avoid vague entries such as center or left.

Generally speaking, additional data acquisition and data standardization for the MayaArch3D Database would allow for future investigations into the potential significance of some of the preliminary results identified in this research.

References

Ashmore, W. and J. Sabloff (2002). Spatial Orders in Maya Civic Plans. In *Latin American Antiquity*, Vol. 13, No. 2, pp. 201-215.

Baudez, C. (1994). *Maya sculptures of Copán: The iconography*. Norman: The University of Oklahoma Press.

Coggins, C. (1980). The Shape of Time: Some Political Implications of a Four-Part Figure. *American Antiquity,45*(04), 727-739.

Fash, W. (2001). S*cribes, Warriors, and Kings: The City of Copan and the Ancient Maya*. London: Thames & Hudson.

Johnson, S. A. (2014). *Translating maya hieroglyphs*. Place of publication not identified: Univ Of Oklahoma Press.

Newsome, E. A. (2001). *Trees of paradise and pillars of the world: the serial stela cycle of "18-Rabbit-God K," King of Copán*. Austin, TX: University of Texas Press.

Plank, S. (2004). *Maya Dwellings in Hieroglyphs and Archaeology*. BAR International Series 1234.

Richards-Rissetto, H. (2010). *Exploring Social Interaction at the Ancient Maya City of Copan, Honduras: A Multi-scalar GIS Analysis of Access and Visibility.* Unpublished PhD Dissertation. University of New Mexico, Albuquerque.

Richards-Rissetto, H. (2017). "An Iterative 3DGIS Analysis of the Role of Visibility in Ancient Maya Landscapes: A Case Study from Copan, Honduras." Digital Scholarship in the Humanities, 32(2): ii195–ii212.

Sanchez, J. (1999). *Royal Strategies and Audience: An Analysis of Classic Maya Monumental Art.* Unpublished PhD Dissertation. University of California at Los Angeles.