Eetu Taatila

Gods in Sumerian royal inscriptions

A computational study on the relationships between kings and gods in Sumerian royal inscriptions

Introduction

This project aims to compare the most prominent gods of four periods in Mesopotamian history, using a computational approach to Sumerian royal inscriptions from the third millennium BCE. The periods that are studied are Early Dynastic period (c. 2900-2350 BCE), Old Akkadian period (c. 2340-2200 BCE), Lagaš II (c. 2200-2100 BCE) and Ur III (c. 2112-2000 BCE). The research question is what kind of change and what kind of similarities can be seen in the group of the most prominent gods in the royal inscriptions from different periods. Also, the similarities and differences between kings from all periods regarding their favored gods will be investigated.

Studying only the royal inscriptions does not in itself provide a comprehensive insight to the Mesopotamian pantheon, but they can enable us to see, which gods were prominent from the perspective of royal ideology. Often these inscriptions mention that the king was chosen by a certain god, or that the king is a servant of a certain god. The inscriptions also often depict the construction of temples and other buildings, and they are often dedicated to certain gods. Thus, mentioning a god in most cases seems to be a way of establishing the status of the king as a ruler favored by the gods.

The dataset used in this project is The Electronic Text Corpus of Sumerian Royal Inscriptions (Etcsri) from the Open Richly Annotated Cuneiform Corpus (Oracc) downloaded from the Language Bank of Finland.[1] With each inscription, the king the inscription is attributed to is extracted, and all the gods that are mentioned in the inscription are counted as gods that the king has a relationship to. This project uses network analysis to display, which gods are the most prominent in each period, and which gods are mentioned by each king. Network analysis is also used to see, whether the kings form communities regarding the gods they seem to favor. Thus, the overall most

[1] Jauhiainen et al. 2019

prominent gods of each period are studied along with the network of kings from all periods. This enables a thorough study of the differences and similarities between all periods.

Dataset and data processing

As mentioned, the data are Sumerian royal inscriptions from an annotated corpus. The inscriptions in the dataset are tagged by their period, which makes the distinction between the four studied periods possible. However, the time periods are tagged as uncertain or unspecified in some inscriptions, and therefore those texts are discarded. Also, since the goal is to study the inscriptions from the third millennium BCE, inscriptions from the Old Babylonian period are also ignored. The number of texts from the Early Dynastic period is 333, from the Old Akkadian period 63, from the Ur III period 692 and from the Lagaš II period 250.[2] However, since the goal is to study the relationship between kings and gods, only the texts that have a royal name and a divine name in them will be considered.

Each text in the corpus is identified by their CDLI (Cuneiform Digital Library Initiative) number, and the kings and gods that are mentioned in the text are grouped with the corresponding CDLI number. The annotation of the corpus allows an easy way of recognizing the gods and kings from the texts. Because the inscriptions tend to follow a pattern, where the first royal name is a king, who is in the main role in the inscription, it is convenient to pick the first name annotated as a royal name from each text, and consider the names annotated as divine names as the gods the king has a relation to.

However, the texts also have other royal names in them, and to minimize error, only the kings that are not preceded by a kinship term are picked. Therefore, if the text happens to be fragmented in a way that the king is not the first royal name mentioned, it is made sure that the relatives of the kings are not picked if the preceding words imply a kinship. The preceding words that would cause a name to be ignored by the code include dumu (child), dumu.KA (grandchild), pabilga (a kinship term), egia (daughter-in-law), dam (spouse) and šeš (brother). Also, a longer construction ”šeš ki aŋ” (the beloved brother) would cause a following royal name to be ignored.

Some of the inscriptions also mention kings from other cities, and I did not find a way to make sure that they will not be picked by the code. Additionally, some of the inscriptions are also

[2] The number of texts from each period was calculated by the lengths of the dictionaries named by the periods in the process_corpus.py file.

written by non-royal people, and often their king is mentioned in them. The way that the dataset is processed unfortunately handles these cases in a way that the gods mentioned are counted as gods mentioned by the king. Nevertheless, in the large majority of inscriptions, it should suffice that the first royal name of the inscription is picked, and the possible exceptions should not cause any significant issues. It is also likely that a king's subordinate will mention a god that is in the favor of the king. I also noticed that the king Utuheŋal caused problems, because it had not been tagged as a royal name in the corpus, meaning another king, for example an enemy, was picked by the code, so I added Utuheŋal to the code to pass the filter.

To explain the data processing done by the code in detail, the process_corpus.py module reads the oracc_etcsri.vrt file containing the dataset, and appends the CDLI number and period of each text to a list called corpus, along with the lemma, transcription and subcategory of a word from each line of the text. After that, the code iterates through the corpus-list and categorizes texts by their CDLI number to dictionaries corresponding to their period. Each key (CDLI number) in the dictionary has a list of two lists as values. From each text, all the lemmas of the royal names that pass the filter are appended to the first list and each lemma of a god is appended to the second list. Thus, the texts have been categorized and all the relevant information from the texts is easily accessed from each text.

After that, the four functions in the process_corpus.py module return the kings and the gods they mention corresponding to their period. For example, the function ED_kings() goes through the dictionary where the Early Dynastic texts are categorized and picks the first king of the list of kings from the text, adds it to the kings-dictionary and proceeds to add the gods that the king mentions to the value of the dictionary's key. Thus, the functions return the relevant information that can be easily used by the modules god_network.py and king_network.py that are responsible for creating the networks.

Methods

In order to see, which kings mention which gods, network analysis is used to visualize those relationships. Network analysis is also used to see which gods are the most prominent, meaning which gods are mentioned by most kings in the inscriptions. To account for the different amounts of text from each king, the analysis will ignore the number of times an individual king mentions a god, and therefore only whether the king mentions or does not mention a god matters.

From each period, a network is displayed, where the nodes are kings and gods, and the sizes of the nodes depend on the number of directed nodes arriving to them. This is achieved by setting the size of a node, which is at first set as 5000 in the code, to be multiplied by the in-degree centrality of the node. The nodes start from kings and are directed towards the gods they mention, and therefore since the in-degree-centrality of the kings are 0, only the names of the kings are shown, and the most mentioned gods are the largest nodes.

In order to analyze and compare all periods at once, another kind of network is analyzed. The network consists of kings from all periods, where the periods are marked by the colors of the nodes, and each king has an edge to a king with whom he has at least two gods in common with. The width of the nodes correlates with the number of common gods between two kings, a wider edge meaning a larger number of common gods. Two common gods imply a weak connection, and the larger the number of common gods is, the clearer the connection is.

This method enables us to see the similarities and dissimilarities between different periods and between the kings of an individual period. It must be noted however, that not all kings are displayed in this network, since not all kings have two or more gods in common with another king. This makes the network clearer, and for example if the limit for an edge is one god, the produced graph does not look interpretable. In addition, having just one god in common does not seem significant, so ignoring that kind of relation between kings does not prevent us from seeing any major insights.

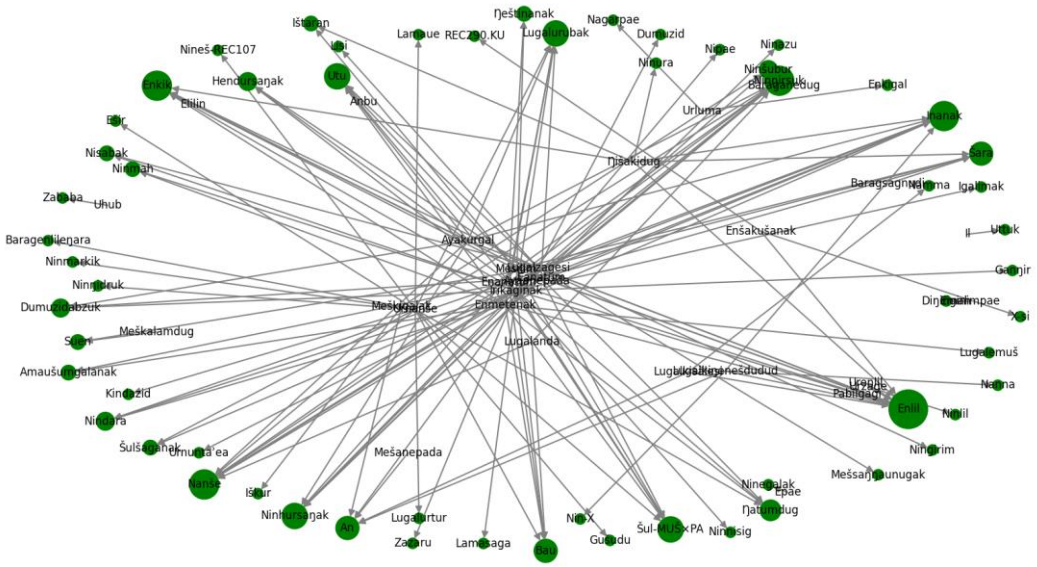
The networks are made with the NetworkX library[3] in Python, and they are drawn with the matplotlib library[4] using the matplotlib.pyplot interface. The layout used in the graphs is the spring layout, which positions the nodes using the Fruchterman-Reingold force-directed algorithm. The algorithm treats the nodes as repelling objects, and makes the edges hold the nodes closer to each other. This algorithm does not provide any additional insights to the graphs with the kings and gods, but rather just makes the graph easy to interpret. In the graph of kings however, the algorithm does provide additional insights, because the kings that have many gods in common will be closer to each other. This allows us to see the possible groups that the kings form regarding their favored gods.

[3] Hagberg et al. 2008.
[4] Hunter 2007.

Results

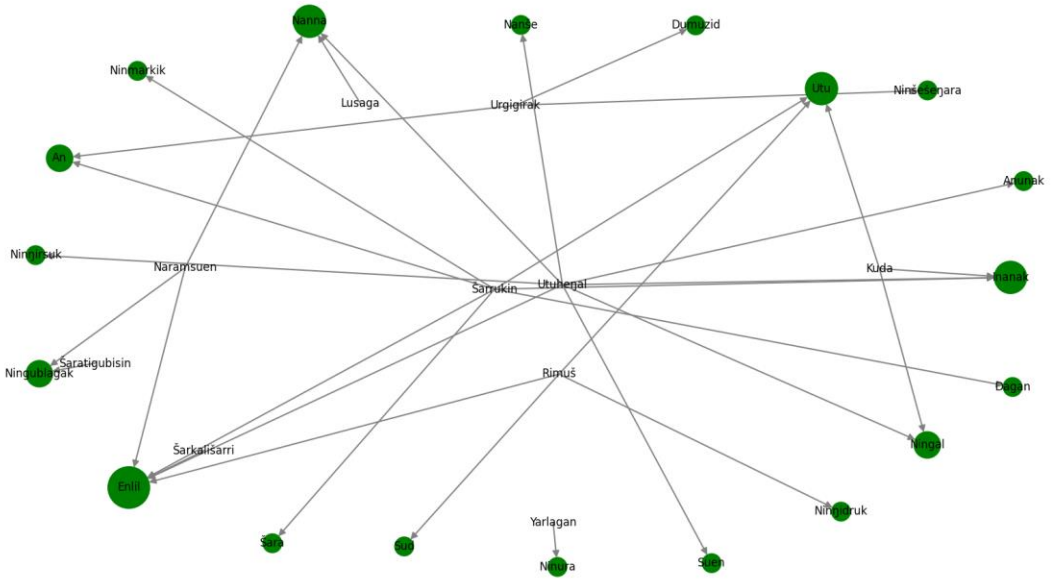
Early Dynastic period

In the Early Dynastic period we can see that some of the most mentioned gods include Enlil, Nanše, Inanak, Ningirsuk and Enkik. It can also be seen that Enlil is mentioned by the largest number of kings.



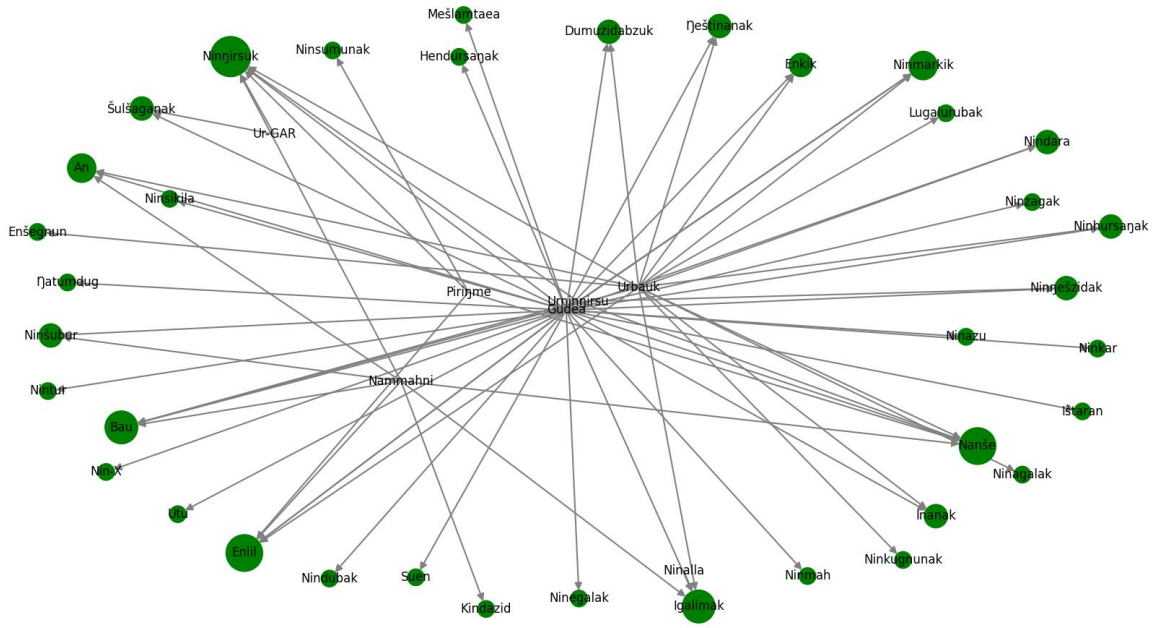
Old Akkadian period

In the Old Akkadian period, the number of kings and gods is much smaller than in the Early Dynastic period. Looking at the graph, the most mentioned gods include Enlil, Inanak, Nanna and Utu. However, due to the small amount of data, the results are probably not as reliable as in the Early Dynastic period. For example, Nanna, who has three edges has visibly a larger node than An, who has two edges. Comparing the prominence of these gods with such small amount of data might not provide any meaningful insights. To get better results from the Old Akkadian period, it would probably be necessary to count all mentions of a god, not just how many kings mention them.



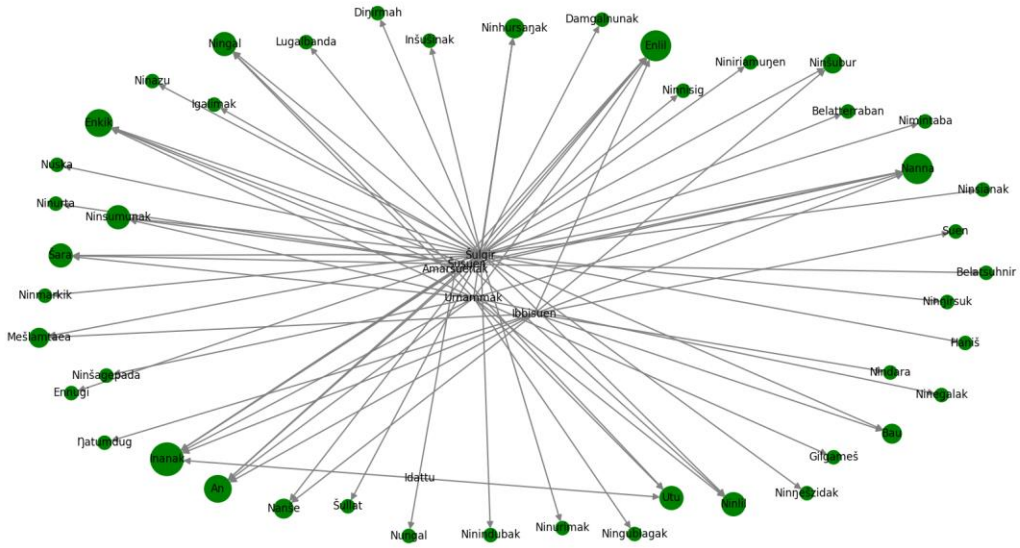
Lagaš II

In the graph from the Lagaš II period, the number of gods the inscriptions mention is much larger than in the Old Akkadian period. Looking at the graph, the gods that are mentioned by the largest number of kings include Ningirsuk, Nanše, Enlil and Igalimak. Comparing to the previous graphs, Enlil is no longer the most mentioned god but comes third after Ningirsuk and Nanše.



Ur III

In the graph from the Ur III period, the number of kings is small, but a lot of gods are mentioned. The most mentioned gods include Inanak, Enlil and Nanna.

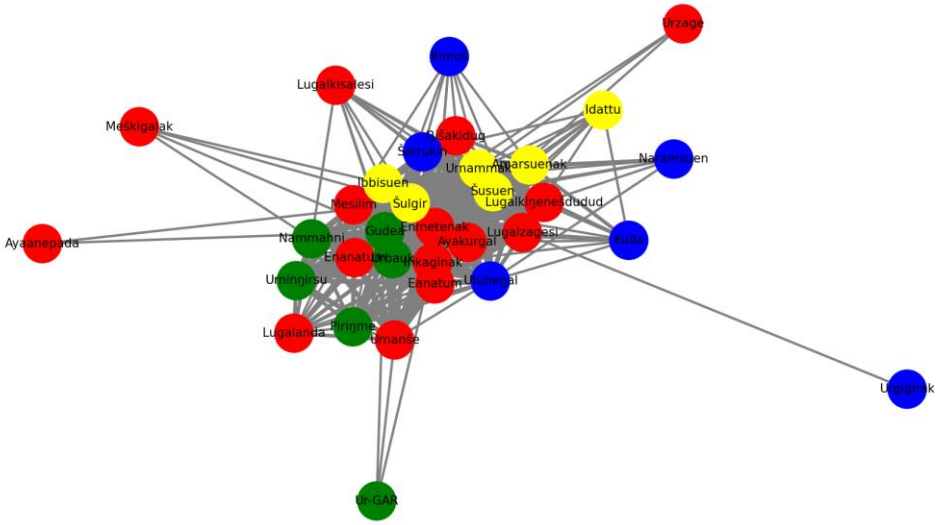


All periods

In the following graph the red nodes represent the Early Dynastic period, the blue nodes represent the Old Akkadian period, the green nodes represent the Lagaš II period, and the yellow nodes represent the Ur III period. A king has an edge to another king, if they mention at least two same gods. The width of an edge represents the number of common gods between two kings.

Looking at the graph, it seems that the kings representing the Early Dynastic period have gods in common with kings from all periods, and the kings representing the Old Akkadian period do not seem to form a clear group. Ur III and Lagaš II kings form somewhat tight groups, if Idattu, who is an Elamite king and therefore represents a different dynasty, is not considered. It also needs to be considered, that Utuheŋal is a king whose successor, Urnammak, started the Ur III period.[5] However, he seems to be somewhat separated from the group of Ur III kings. Even if the graph suggests slight differences between the kings from the four periods, it is also clear from the graph that these kings also share a common pantheon.

[5]Van de Mieroop 2016, 79.



Discussion and conclusions

To put the results into historical context, in the Early Dynastic period Babylonia was divided into city-states, and these cities had their patron-deities. For example, Ur's patron-deity was Nanna, Uruk's patron-deity was Inanna and Nippur's patron-deity was Enlil.[6] However, these city-states had a common religious system, where at the start of the second millennium Uruk had a major role as a cultic center, which then later shifted to Nippur.[7] Looking at the network from the Early Dynastic period, Enlil and Inanak, the patron deities of Nippur and Uruk, are among the most mentioned gods, Enlil being the most mentioned. Another major god in the graph, Ningirsuk, on the other hand was the patron-deity of Lagaš.[8]

During the Old Akkadian period, it can be seen from the Graph that Enlil is still the most mentioned god, and Inanak, Nanna and Utu are the most mentioned after Enlil. As mentioned in the results-section, it is hard to make any definite conclusions based on the number of kings mentioning a god, when comparing a god such as Utu, who is mentioned by three kings, with a god such as An, who is mentioned by two kings. The graph might give us a hint that, for example, Utu was more significant for the royal ideology than An, but I would refrain from drawing that conclusion based on this methodology itself. To get further evidence, it would be necessary to count the times they occur in texts or to proceed by philological work.

[6] Van de Mieroop 2016, 50.
[7] Van de Mieroop 2016, 55.
[8] Van de Mieroop 2016, 62.

However, the historical context can, again, give us better insight into the data and the results. As the name of the period suggests, in the Old Akkadian period the rulers were Akkadian, not Sumerian. This affects the reliability of the dataset, because they also produced Akkadian inscriptions, and therefore investigating only the Sumerian inscriptions does not give us the most comprehensive picture of the period. This can also be seen in the small number of texts in the dataset from this period. For example, the Ur III period has over ten times more texts than the Old Akkadian period.

During the Old Akkadian period the dynasty sought to unite the cultic system of Babylonia, and for example Sargon (in the graph Šarrukin) installed his daughter as the high priestess and wife of Nanna at Ur, thus affecting the religious life of one of the main Sumerian centers.[9] Thus, it is no surprise that Nanna is one of the most mentioned gods in the graph from the Old Akkadian period. Also, since the dynasty sought to unite the cultic system, and not necessarily cause any major changes to the pantheon, it makes sense that Enlil continues to be the most mentioned god.

During the Lagaš II period, Lagaš was ruled by a Sumerian dynasty. Ningirsuk being the patron-deity of Lagaš already in the Early Dynastic period,[10] the god continues to be prominent in the Lagaš II period, as it is the most mentioned of all gods in the graph. Other major gods in the inscriptions of the period are Enlil and Nanše. As Nanše was considered the sister of Ningirsuk and Enlil the father of Ningirsuk, it is no surprise that Nanše and Enlil are in a major role in the inscriptions. The graph also shows that Gudea mentions a large number of gods, many of them being only mentioned by him. This reflects the fact that the inscriptions attributed to Gudea can be extremely long, compared to many other inscriptions. Gudea also has a lot of texts attributed to him.

In the graph from the Ur III period, the most mentioned gods are Inanak, Nanna and Enlil. As already mentioned, Nanna was the patron-deity of Ur, so it is somewhat surprising to see Inanak, the patron deity of Uruk, being the most mentioned god in the graph. However, Uruk was an important center even in the Ur III period.[11] Therefore the prominence of Inanak can be explained by Uruk's importance. Additionally, one of the kings mentioning Inanak is an Elamite king Idattu, and therefore, that king does not represent the third dynasty of Ur. In the graph showing the kings from all periods, we can also see that Idattu is the only king from that period deviating from the otherwise tight community of Ur III kings. Additionally, it is interesting to see, that

[9] Van de Mieroop 2016, 70.
[10] Van de Mieroop 2016, 52.
[11] Garfinkle 2022, 142.

Ningirsuk, being a very prominent god in the Lagaš II period, is mentioned by just one of the kings from the Ur III period.

Taking the graphs from all periods into account, it is very clear that Enlil, the patron-deity of Nippur, is one of the most prominent gods in all four periods. This fits into the historical context of the third millennium BCE, because during the Early Dynastic period Nippur became the focal point of the unified cult, and Nippur's unique status lasted to the second millennium BCE.[12] Another god that seems to be prominent for the whole millennium is Inanak. She is one of the most mentioned gods in all but one graph, the graph from the Lagaš II period.

Other gods seem to be prominent in certain periods, for example Nanna seems to be prominent in the Old Akkadian period and the Ur III period, whereas Nanše seems to be prominent in the Early Dynastic period and the Lagaš II period. Enkik seems to be among the most prominent gods in the Early Dynastic period and the Ur III period. An is also mentioned in each period by at least two kings, but is never the most mentioned god. Thus, it seems like An is a relevant god for the whole millennium, but never the most important.

Looking at the graph of kings, it seems that while Lagaš II kings mention common gods with Ur III kings, they form their own groups somewhat separate from each other. This is also clear for the god-graphs, since the periods share only one prominent god, Enlil. The difference between these dynasties is not due to distance in time, since Lagaš II period ends when Ur III dynasty conquers Lagaš.[13] It seems that the difference is due to the different geographical focal points of these dynasties. Ur III dynasty was centered around Ur and Lagaš II dynasty was centered around Lagaš. As already mentioned, each city had their own gods that were the most prominent.

The geographical focal points of different periods would seem like a sound explanation for the differences between kings from different periods, as the kings from the Early Dynastic period, where many competing city-states existed, are clearly spread out in the graph, some closer to the Ur III kings and some closer to the Lagaš II kings. For example, the Early Dynastic kings Lugalzagesi and Lugalkiŋenešdudud were kings of Uruk, and they are close to the Ur III kings in the graph. As already mentioned, Uruk was a major city in the Ur III period, and thus the strong connection makes sense. Respectively, the Early Dynastic kings Urnanše, Eanatum, Enanatum and Lugalanda, that are close to the kings of the Lagaš II dynasty, were kings of Lagaš.

[12] Van de Mieroop 2016, 55.
[13] Garfinkle 2022, 136.

Again, due to the low amount of data from the Old Akkadian period, it is hard to draw any definitive or detailed conclusions from the period itself. Nevertheless, at least two things can be said based on the graph of kings. First, it is clear that the kings of the Old Akkadian period share common gods with kings from other periods, and thus are not separated from them. And second, Šarrukin (Sargon) has a strong connection to the kings of the Ur III dynasty, which probably is linked to the fact that he installed his daughter as the high priestess of Nanna at Ur.

To conclude, based on the graphs and historical context, it seems that the most prominent gods of each period depend on the geographical focal points of the periods. The graphs indicate that regardless of the period, the kings from the same cities have a connection to each other, regarding their favored gods. Looking at the god-graphs, the most mentioned gods of each period can be explained by their geographical focal points. Additionally, along with the patron-deities of the cities relevant to each period, it seems that in all periods Enlil persists as one of the most important gods for the royal ideology.

References

Garfinkle, S. J., Moeller, N., Potts, D. T., & Radner, K. (2022). The Kingdom of Ur. In *The Oxford History of the Ancient Near East: Volume II*. Oxford University Press. https://doi.org/10.1093/oso/9780190687571.003.0013

Aric A. Hagberg, Daniel A. Schult and Pieter J. Swart, "Exploring network structure, dynamics, and function using NetworkX", in Proceedings of the 7th Python in Science Conference (SciPy2008), Gäel Varoquaux, Travis Vaught, and Jarrod Millman (Eds), (Pasadena, CA USA), pp. 11–15, Aug 2008

J. D. Hunter, "Matplotlib: A 2D Graphics Environment," in *Computing in Science & Engineering*, vol. 9, no. 3, pp. 90-95, May-June 2007, doi: 10.1109/MCSE.2007.55.

Jauhiainen, H., Sahala, A., & Alstola, T.. *Open Richly Annotated Cuneiform Corpus, Downloadable Version, May 2019* [data set]. Kielipankki. Retrieved from http://urn.fi/urn:nbn:fi:lb-2019121801

Van de Mieroop, M. (2016). *A History of the Ancient Near East ca. 3000-323 BC / Marc Van De Mieroop.* (Third edition.). Wiley/Blackwell.