

Appendix: Analysis of Han Elites' Social Networks

(1) Marriage network

Records of marriages in *Shi ji*, *Han shu*, and *Hou Han shu* are focused on the upper elite, especially members of the imperial lineage and consort families. As a result, the imperial lineage has the highest number of connections with other families and plays a central role in the structure of this marriage network (Figure 1). This is hardly surprising given the source bias, but even if the sources included a wide range of families, the imperial lineage would still occupy a significant position in this network simply because it had a large population and because male members of the imperial lineage took more concubines than other males did.

As scholars have noticed, the marriage circles of the upper elite became more and more enclosed over time. In the Western Han, many empresses and imperial concubines came from humble backgrounds, the famous ones being Empress Wei of Emperor Wu and the Zhao sisters who gained the favor of Emperor Cheng. Only three of them were from the founding elites' families. By contrast, in the Eastern Han, the empresses and imperial concubines were selected from the same pool of consort families, most of whom were also the dynasty's founding elites. The Liang 梁, Dou 竇, Deng 鄧, Yin 陰, Fan 樊, Yan 閻, Fu 伏, Guo 郭, Ma 馬, Song 宋, Geng 耿, and Lai 來 families had the most marriage connections with the imperial lineage, as indicated by the thickest lines in the graph.

These Eastern Han consort families also intermarried among themselves. For example, the Yin and Deng families repeatedly intermarried, as represented by the thick line connecting them in Figure 1. The contrast between the Western Han and the Eastern Han marriage patterns becomes more obvious when we visualize their marriage networks separately (Figure 2 and

Figure 3). The Western Han network has a single center, which is the imperial lineage, whereas the Eastern Han network has the imperial lineage as the largest center but also several smaller centers, which represent the consort families of Ma, Ban, Liang, Yin, Deng, and Fan. This difference is because the consort families of the Western Han almost all exclusively intermarried with the imperial family, whereas the Eastern Han consort families married among themselves and maintained some independence from the imperial family. Statistically speaking, the degree of the imperial lineage in the Western Han network is 64, whereas that of the Eastern Han is 26; the density of the Western Han marriage graph is 0.028, whereas that of the Eastern Han graph is 0.051. These numbers support the observation that the Eastern Han network is more dispersed and multicentered than the Western Han one.

The marriage network data also include marriages of the female members of the imperial lineage. By tradition, Han princesses married marquises. In the early Western Han, princesses mostly married sons of the founding elites. After Emperor Wu, Western Han princesses' husbands included members of consort families, new meritocratic marquises, and bureaucrats who were ennobled for serving as the Grand Chancellor. By contrast, Eastern Han princesses always married members of the founding elites' families or powerful local elites, many of whom were also consort families, especially the Fan, Ban, Lai, and Geng families.¹

The marriage choices of these families were influenced by common geographical origin, the existing relationship between the two families, and the need for political alliances. The interplay of these factors can be observed from the marriages among the imperial lineage and the consort families during the reigns of the first few Eastern Han emperors. The founding elites and consort families of the Eastern Han mainly came from three regions: Nanyang 南陽, Zhending 真定, and

¹ For more detailed discussions of the imperial family's marriages, see Chen, 2013; Liu, 1980.

Fufeng 扶風. Emperor Guangwu married with both the Yin and the Guo families. Representative of the Nanyang elites, the Yin family intermarried with other Nanyang elite families, such as the Deng and Fan families. The Guo family, which was entrenched in Zhending, had marriage relations with the Dou family from Fufeng. Since the Dou family served as officials for generations in Liangzhou 涼州, they had established close relations with the Liang family from Anding. This explains why Dou Rong 竇融 and Liang Tong 梁統 allied with each other at the court.

The interactions among the Ma, Dou, and Liang families illustrate that these consort families in the Eastern Han both allied and competed with one another. The Fufeng Ma family intermarried with the Dou family at the beginning of the Eastern Han. Ma Yuan 馬援 had been friends with Liang Tong. However, Ma Yuan offended Liang Tong's son, Liang Song 梁竦, and was framed by Liang Song and Dou Rong's nephew Dou Gu after a military defeat. The Ma family suffered from this heavy blow. Empress Yin's son later became the next emperor, Emperor Ming. Angry at the slandering by the Dous and Liangs, Ma Yuan's nephew severed the family's marriage ties with the Dou family and sent Ma Yuan's daughter into the palace. Lady Ma served Empress Dowager Yin diligently and was promoted to Emperor Ming's empress with the empress dowager's support. When Emperor Zhang was enthroned, she became the empress dowager. She recommended the Song sisters to be Emperor Zhang's concubines. The Song family was from Fufeng and had marriage relations with the Ma family. Yet Emperor Zhang also married two daughters from the Dou family and two daughters from the Liang family. The Dou

sisters were connected to the Guo family because their maternal grandfather was Empress Guo's son.

Serious conflicts resulting from competition changed the consort families' marriage choices and political alliances. Although the Dou and Liang families had been allies, Empress Dou framed both Lady Song and Lady Liang during Emperor Zhang's reign and caused their deaths. This enabled her to raise Lady Liang's son, the later Emperor He, as her adopted son. Although Dou later became the empress dowager, Emperor He had an adversarial relationship with her. Therefore, when Emperor He grew older, he killed the Dou brothers with the assistance of eunuchs. He then married a daughter of the Yin family as the empress but afterward turned his favor to the later Empress Deng. Although the Yin and the Deng families had repeatedly intermarried, Empress Yin hated Empress Deng so much that she swore that she would kill all the Dengs once she was in power.

As eunuchs became more and more influential in the political realm, they also sought to strengthen their connections through marriage but generally failed to transcend their own circle. Despite the great power of leading eunuchs, few outer court officials were willing to establish marriage relations with the eunuchs' families. During Emperor Yuan's reign, the Prefect of the Palace Masters of Documents (*zhong shu ling* 中書令) named Shi Xian 石顯 attempted to marry his elder sister to Gan Yanshou, a Gentleman-attendant and military official, but was rejected (Ban, 1962). Likewise, the eunuch Tang Heng 唐衡's proposal of marrying his daughter to a scholar named Fu Gongming 傅公明 was declined (Fan, 1965). Hu Guang 胡廣, a technical bureaucrat, was criticized by the classical scholars and literati because he had established marriage relations with the eunuch Ding Su 丁肅. As someone who did not completely refuse to

cooperate with the eunuchs, Hu was considered by contemporary critics as not particularly upright but “going middle of the road” (*zhong yong* 中庸) (Fan, 1965, p. 1510).

The literati families, known as *shi zu* 士族, formed their own marriage circles in their home regions. They normally objected to intermarrying with the consort families or the eunuchs’ families. The few literati who married with the consort or eunuch families for various reasons considered it shameful, and they risked being ridiculed by other literati. Zhao Qi 趙岐, for example, married the daughter of Ma Rong’s elder brother. Because Ma Rong was a member of a consort family, Zhao Qi despised him and often refused to meet him. Although the Ma family had considerably Confucianized and Ma Rong was an expert in the Five Classics, their label as a consort family could not be altered by scholarly learning. Like other literati of the “proscribed cliques”, Zhao detested eunuchs even more. He accepted the invitation of the imperial affine and Grand General Liang Ji 梁冀, served as Liang’s subordinate, and was recommended for the position of the county magistrate of Pishi 皮氏. However, when the eunuch Zuo Guan 左悺’s brother was appointed as the Prefecture of Hedong, Zhao immediately quit his position because he hated eunuchs and felt embarrassed about working as Zuo’s subordinate (Fan, 1965). Xun Yu 荀彧, another literatus, married the daughter of the eunuch Tang Heng because his father feared the eunuchs. Xun was luckily spared ridicule because he had been famous for his talent since he was young, but this marriage must have been unhelpful to his reputation among the “pure stream” (*qing liu* 清流) officials and scholars (Fan, 1965).

(2) Patron-Client Network

I will discuss two types of patron-client relationships. In the first type, the client was called *ke* 客. The practice of hosting clients started with the Four Lords of the Warring States period and still figured prominently in the early Western Han. The relationship between a regional king and his retainers can be considered in this category. A retainer regarded loyalty to his king as the highest moral obligation and loyalty to the emperor as secondary. One example of this ethos is that the retainers of the King of Zhao (named Zhang Ao 張敖, husband of Gaozu's daughter Princess Luyuan 魯元), attempted to kill Emperor Gaozu because the king had been very respectful to the emperor, but the emperor had been arrogant to the king. These retainers conceptualized the relationship between the emperor and the king as one resembling that between two lords of the Warring States period, suggesting that Gaozu was only one of several who had the potential of becoming the emperor. One of the retainers, Guan Gao, was arrested and sent to the capital for trial. Despite being tortured, Guan insisted that the King of Zhao had nothing to do with this crime. The emperor was moved by Guan's integrity and pardoned both the king and Guan, but Guan committed suicide because he had fulfilled his duty to the king and felt too ashamed to continue working for the king with the reputation of a rebel (Sima, 1982). Other regional kings of the Western Han kingdoms also had retainers who prioritized loyalty to them rather than that of the emperor. The retainers of the King and the Prince of Huainan, for example, were accused of planning a rebellion with their lords against the central state (Sima, 1982). It was also common for consort families and powerful local families to have hundreds to thousands of *ke*.

The relationship between the wandering bravos (*you xia* 遊俠) and their clients can also be categorized into this type. From the Warring States period to the Han, the bravos gained respect and admiration in society mainly because they hosted numerous guests and forged wide social connections. The ethos of bravos was rooted in the rules of local society: one must fulfill one's promises and save friends from hardships without hesitating about using violence or risking one's own life. Therefore, the bravos enjoyed a high reputation among the masses as well as many elites (Masubuchi, 1960). However, as *Han Fei zi* says from the state's perspective, they frequently violated laws and government regulations (Wang, 1998). The bravos and their clients were bonded by personal favor and devotion. According to Sima Qian, in the early Western Han, the number of a bravo's clients and friends ranged from hundreds to thousands (Sima, 1982).

The bravos in the late Western Han, however, appeared to be less violent and more cooperative with the government than the earlier ones. This phenomenon could be a result of the court's policy of forcing the local elites to migrate to the imperial mausoleum towns, as well as Emperor Wu's detestation of the bravos. According to Ban Gu, these later bravos, notably Lou Hu 樓護, Chen Zun 陳遵, and Yuan She 原涉, served as government officials. Networking was the main characteristic that they shared with the earlier bravos (Ban, 1962).² At any rate, it is difficult and unnecessary to visualize the patronage network between the patrons and their *ke*, given that the number of clients that a patron had is unclear, not to mention that most of the clients' names are not recorded in historical texts.

The second type of patronage was the superior-subordinate relationship between a high official and his assistants. The high officials, especially officials at the rank of the "Three Ducal

². As Mark Lewis has put it, "For Ban Gu the term 'bravo' no longer indicated bravoos and assassins, but unconventional men of questionable behavior that won them prestige and helped develop social networks" (Lewis, 2021, p. 161).

Ministers” (*san gong* 三公), would summon (*pi* 辟) talents from around the empire and employ them as subordinates in their offices. The relationship between the two is best seen as a patron-client rather than a mere superior-subordinate relationship. The persistent ties between a high official and his former subordinates (*gu li* 故吏) support this view. When a high official was punished for a serious crime, his former subordinates would be dismissed at the same time. In the Eastern Han, when a high official died, some of his former clerks would leave their official posts to observe a mourning period for him (Ebrey, 1983).

Figure 4 is a visualization of the second type of patron-client relationships during the Han, including 203 historical figures and 155 pairs of relationships. The nodes are sized by degree centrality (the number of connections), and the centrality scores are calculated using an undirected graph. Most of the nodes only have one or two connections. The largest nodes, which represent people with the highest numbers of connections, stand for Wang Mang 王莽, Dong Zhuo 董卓, Dou Wu 竇武, and He Jin 何進. This is unsurprising given that Wang Mang and Dong Zhuo controlled the emperors of their own times and that Dou Wu and He Jin were Grand Generals (*da jiang jun* 大將軍) with great military and political power. Some of the second largest nodes stand for Liang Shang 梁商, Liang Ji 梁冀, Hu Guang 胡廣, and Chen Fan 陳蕃. Liang Shang and Liang Ji had a similar background to Wang Mang, Dou Wu, and He Jin—powerful imperial affines who served as regents and Grand Generals. Hu Guang and Chen Fan were bureaucrats who achieved the positions of “Three Ducal Ministers”, the highest level of officials in the central government. While the others in this list always played the patron’s role,

Hu Guang and Chen Fan were both subordinates to some and patrons to others as they gradually ascended the bureaucratic ladder. Table 2 shows the degree centrality and eigenvector centrality of all the individuals who have more than three connections. The individuals are ranked according to the number of connections each node has, i.e., degree (from high to low). Seven of these 13 individuals were imperial affines—Wang Mang, Dong Zhuo, Dou Wu, He Jin, Liang Shang, Liang Ji, and Deng Zhi 鄧鷲.

| Name | Degree | Eigenvector Centrality | Closeness Centrality |
|----------------|--------|------------------------|----------------------|
| Wang Mang 王莽 | 16 | 1.0 | 0.944444 |
| Dong Zhuo 董卓 | 13 | 0.642107 | 0.227273 |
| Dou Wu 竇武 | 9 | 0.267314 | 0.206612 |
| He Jin 何進 | 9 | 0.256064 | 0.785714 |
| Liang Shang 梁商 | 6 | 0.144093 | 0.18315 |
| Hu Guang 胡廣 | 5 | 0.175177 | 0.289017 |
| Liang Ji 梁冀 | 5 | 0.130869 | 0.228311 |
| He Wu 何武 | 4 | 0.036484 | 0.8 |
| Niu Shu 牛述 | 4 | 0.049156 | 1.0 |
| Deng Zhi 鄧鷲 | 4 | 0.074038 | 0.5625 |

| | | | |
|--------------|---|----------|----------|
| Chen Fan 陳蕃 | 4 | 0.147686 | 0.280899 |
| Yuan Shao 袁紹 | 4 | 0.049156 | 1.0 |
| Zhao Qi 趙岐 | 4 | 0.195803 | 0.280899 |

Table 1. Head of the Statistical Table of the Han Superior-Subordinate Network

The eigenvector centrality provides another measure of the importance of nodes in the network. The way it is calculated necessarily means connections to highly influential people are more useful than the same number of connections to those lacking influence. The ranking of nodes according to this standard does not match exactly with the sizes of nodes. The nodes with the highest eigenvector centrality (higher than 0.25) represent the following individuals (from high to low): Wang Mang, Dong Zhuo, Wang Yi 王邑, Dou Wu, Li Que 李權, He Jin. As explained above, Wang Mang, Dong Zhuo, Dou Wu, and He Jin are high-scoring nodes because they dominated the government and appointed many officials. Wang Yi and Li Que are influential because they are connected to high-scoring nodes. Wang Yi served as the Grand Minister of Works (*da si kong* 大司空) during Wang Mang's brief Xin Dynasty. He was thus connected to Wang Mang's other officials through Wang Mang as well as to the subordinates whom he appointed. Li Que was a subordinate of Dong Zhuo and therefore connected to Dong's other subordinates. Moreover, he appointed his own subordinates when he controlled the government after Dong's death.

Considering both degree centrality and eigenvector centrality, the most influential patrons in this network are the powerful imperial affines who served as regents and Grand Generals. When they controlled the government, they appointed many subordinates from around the empire to

assist them with state affairs. If we added the emperors into this network, some emperors might become the biggest nodes because they made the ultimate decisions on official appointments. However, the high officials had decisive power over employing their own subordinates. Furthermore, in times when young emperors were on the throne, the imperial affines actually made the decisions on official appointments.

(3) Teacher-Disciple Network

Classical scholars were defined by their expertise in one of the Five Classics and membership in teacher-disciple networks. My analysis of the teacher-disciple networks during the Han is based on a close reading of “The Biographies of *Ru* Scholars” in *Shi ji*, *Han shu*, *Hou Han shu*; the early Tang scholar Lu Deming’s *Jing dian shi wen* (“Annotations of the Classics”) which recounts genealogies of classical studies in early China; and the “Treatise of Literature” (*jing ji zhi* 經籍志) in *Sui shu* 隋書 (Ban, 1962; Fan, 1965; Sima, 1982; Lu & Wu, 1984; Wei et al., 1973). I identified 325 scholars and 329 pairs of teacher-disciple relationships from these sources. I calculated the statistical measures using a directed graph.

As expected, scholars formed groups based on teacher-disciple relationships and the classics they specialized in (Figure 5). Scholars who studied the “New Script” traditions of the *Book of Documents*, represented by nodes in purple, constitute 19.44% of the nodes. The next three classics with the highest numbers of scholars are the Lu tradition of the *Book of Odes*, the Gongyang tradition of the *Spring and Autumn Annals*, and the “New Script” traditions of the *Book of Changes*.

To highlight the scholars who connected multiple scholarly communities, the nodes in Figure 5 are sized by betweenness centrality. The ten nodes with the highest betweenness centrality scores stand for Zhang Yu 張禹, Xiahou Jian 夏侯建, Hou Cang 后倉, Ouyang Gao 歐

陽高, Xiahou Sheng 夏侯勝, Lin Zun 林尊, Yin Gengshi 尹更始, Shi Chou 施讎, Meng Qing 孟卿, and Ping Dang 平當. This is because they were heavily involved in the transmission of more than one classic or tradition. As a prime example, Zhang Yu learned the “New Script” tradition of the *Book of Changes* from Shi Chou; learned the Lu tradition of the *Analects* from Xiahou Jian, Wang Ji 王吉, and Yong Sheng 庸生; learned the “New Script” tradition of the *Book of Filial Piety* from Yan Zhen 顏貞, who also transmitted the text to four other disciples; learned the “Old Script” tradition of the *Zuo Commentary* from Guan Changqing 貫長卿 and taught it to Yin Gengshi, who transmitted it to disciples. Thus, Zhang was deeply embedded in multiple scholarly communities. The betweenness centrality score does not necessarily correspond to the number of classics a person transmitted or the number of teachers and disciples a person was connected to. For instance, Ma Rong has the highest degree score (14) and Shen Gong 申公 has the second highest degree (11), but their betweenness centrality scores are not among the highest ones because they were not the best connected to the scholarly communities of multiple classics or traditions.

While scholars who transmitted the same classic by no means lived at the same time, a clear genealogy indicates that the teacher-disciple transmission of a tradition was well-documented and relatively exclusive. However, the number of nodes and edges associated with a classic does not reflect the actual number of scholars who studied this classic during the Han. Because the Western Han scholarly lineages are more completely recorded in the sources and Western Han scholars mostly specialized in only one classic, the schools of the Western Han are much better

represented in the graph than those of the Eastern Han. This does not mean these classics were less studied in the Eastern Han. Rather, the powerful families of the Eastern Han were increasingly Confucianized, and the number of students of classics in the Eastern Han Imperial Academy grew to more than 30,000, far exceeding the number of scholars in the Western Han (Fan, 1965). Perhaps due to the prevalence of classical learning, the names of most Eastern Han scholars are not recorded in the sources and thus not visualized in the graph.

Let us take a closer look at the highly influential individuals in the teacher-disciple network. In Figure 6, the nodes with the highest eigenvector centrality scores are Ma Rong, Zheng Xuan 鄭玄, Zheng Zhong 鄭眾, Wang Huang 王璜, and Dai Sheng 戴聖. The high values of the other four scholars in this list are explained by their connections with the highly influential Ma Rong. The nodes which have the highest numbers of connections to other nodes represent Ma Rong (14 edges), Shen Gong (11 edges), and Hou Cang (10 edges). However, this ranking does not necessarily mean that Ma Rong had the highest number of teachers and disciples among all the scholars in the Han dynasty. In the late Eastern Han, it had become common for a single scholar to master several classics. Since Ma Rong taught eight different classics to Zheng Xuan, their connections are counted as eight edges. Ma Rong is peculiar in this network for another reason: Ma was from a powerful and wealthy consort family. Although he mastered multiple classics and taught thousands of disciples, he was never considered by the “pure stream” literati as one of them, and most of his disciples did not leave their names in historical records and thus are not represented in the graph. Shen Gong and Hou Cang are influential in this network because they taught many disciples. Shen Gong was a master of the Lu tradition of the *Book of Odes* and the Guliang tradition of the *Spring and Autumn Annals*. Hou Cang was a master of the Qi tradition of

the *Book of Odes*, the *Book of Etiquette and Ceremonial*, and the “New Script” tradition of the *Book of Filial Piety*.

Many classical scholars held official posts after studying the classics. Some of them started their official careers by serving as clerks and gradually ascended the bureaucratic ladder. Some were summoned to the court by the powerful imperial affines and high officials. Others benefited from their social networks, being recommended by their teachers, disciples, and classmates. Common geographical origin was also a factor in scholars’ networks, but not always an important one because traveling to the capital was often the key step toward classical studies and officialdom.³

(4) Friendship Network

Whether Han sources refer to the relationship between two individuals as “was friends with” (*wei you* 為友/*yu*...*jiao* 與...交/*jie* 結), “was on good terms with” (*shan* 善/*hou* 厚/*qin* 親), “wandered with” (*yu*...*you* 與...游), or “colluded with” (*jiao tong* 交通/*dang* 黨), it can be interpreted as friendship, as it is clearly different from hierarchical relationships. Even when the two individuals’ relationship changed later, or when they had other types of relationships at the same time, I count them as friends. While it is possible that the actual relationship between two connected nodes was not pure friendship but political alliance, I do not intend to probe into the essence of these relationships. Instead, the connection between two nodes in this network only indicates that these two individuals were considered as in a close relationship by contemporary observers and that this relationship is distinguishable from other types of relationships in this study.

³ For a case study of the scholarly networks and official careers of Donghai scholars of the Western Han, see Cai (2019). Cai defines the *ru* scholars as men who immersed themselves in the Five Classics and who participated in teacher-disciple relationships. For Sima Qian’s creation of *ru* identity, see Cai, 2014, pp. 47–53.

My data on the friendship network consists of 227 nodes and 172 edges. The graph visualization reveals that the majority of individuals in this network had only one to three connections recorded (Figure 7). Those with more than three connections are the following individuals: Chen Xian 陳咸, Zhai Fangjin 翟方進, Emperor Guangwu 光武帝, Li Ying 李膺, Chen Tang 陳湯, Zhang Chang 張敞, Ma Yuan 馬援, Guo Dan 郭丹, Wang Fu 王符, Cui Yuan 崔瑗, Guo Linzong 郭林宗, Chunyu Zhang 淳于長. Nine out of these 12 people were classical scholars.⁴ The nodes with the highest eigenvector centrality (higher than 0.3) represent the following individuals: Chen Xian, Zhai Fangjin, Xiao Yu, Zhu Bo, Chunyu Zhang, Wang Li 王立, Wang Fu, Cui Yuan, Dou Zhang 竇章, Ma Rong, Chen Tang, and Xue Xuan 薛宣. Ten out of these 12 people were classical scholars.⁵ Therefore, it is safe to say that the most influential individuals in this network had a common educational background in classical learning and participated in scholarly communities.

It is notable that Chunyu Zhang, Zhai Fangjin and Chen Xian were friends and that each of them was well connected. The profiles of their circle illustrate that friendship, scholarly networks, official careers, and political cliques all interplayed with one another in the late Western Han. To begin with, friendship might develop from participation in a common scholarly community. He

⁴ Except for Emperor Guangwu, Ma Yuan, and Chen Tang, all the individuals in this list studied the classics from one or more teachers and participated in scholarly networks. Although Emperor Guangwu and Ma Yuan's primary identities were not classical scholars, they received education in the classics as well. Chen Tang was a clerk and military official who did not receive a classical education.

⁵ All those except Wang Li, Dou Zhang, and Chen Tang were classical scholars. Wang Li was a member of a consort family—the Wang family of the late Western Han, and a younger brother of Empress Dowager Wang Zhengjun and the Grand General Wang Feng. Dou Zhang was a member of a consort family—the Dou family from Fufeng, and the father of Emperor Shun's concubine, Lady Dou. In contrast to Wang Li's disrespect of the law, Dou Zhang earned a good reputation for living a frugal lifestyle, diligently studying the classics, and recommending talents to the throne.

Wu made friends with Zhai Fangjin when he studied the *Book of Changes* from an Erudite (*boshi* 博士) in the capital and served as a Gentleman-attendant (Ban, 1962). Although He and Zhai did not specialize in the same classic, their common educational background probably contributed to their friendship. Another case shows that scholarly competition, friendship, and political actions influenced one another. Zhai Fangjin studied the Guliang and Zuo traditions of the *Spring and Autumn Annals* from Yin Gengshi. Hu Chang specialized in the Guliang tradition of the *Spring and Autumn Annals*. Hu often disagreed with Zhai Fangjin on political affairs at the court because Hu studied the classic earlier than Zhai but achieved less fame than Zhai among scholars. When Zhai realized the reason, he sent his disciples to Hu's classes to take notes. Hu knew that Zhai intentionally honored his interpretations and felt self-conscious. Thereafter, Hu often praised Zhai among the literati, and the two became friends (Ban, 1962).

Friends would introduce each other to new friends and powerful political actors, thus forming political cliques. Chen Xian, Xiao Yu, and Zhu Bo were friends since they were young (Ban, 1962). Chen Xian was friends with Chen Tang, so Chen Tang recommended Chen Xian to Wang Feng and Wang Yin, who were members of the Wang family (Ban, 1962). Zhu Bo and Chen Xian were close friends with Wang Li, another member of the powerful Wang family (Ban, 1962). Wang Li recommended Chen Xian for a high official post (Ban, 1962).

To confirm the small world effect, I conducted a network analysis of their small social group (Figure 8). In the graph, the nodes are sized by their degrees. It is easy to recognize that Chen Xian and Zhai Fangjin have the most social connections in this small network. They also have the highest eigenvector centrality scores. The measures that are more revealing of this network are the clustering coefficient and the number of triangles, which demonstrate the “triadic closure” phenomenon— a friend's friend is a friend. In this network of 18 people, seven

individuals are in one or two triangles (Table 3). The individuals' names in Table 3 are ranked by their clustering coefficients (from high to low). Xue Xuan and Zhu Bo have the highest clustering coefficient scores, which means they are the best embedded in triangular relationships. Zhu Bo and Chen Xian are involved in two triangles. As a highly interconnected group, the average clustering coefficient of this small network is 0.333, which is significantly higher than that of the large Han friendship network (Figure 7), 0.143.

| Name | Clustering Coefficient | Number of Triangle |
|------------------|------------------------|--------------------|
| Xue Xuan 薛宣 | 1.0 | 1 |
| Zhu Bo 朱博 | 0.666667 | 2 |
| Xiao Yu 蕭育 | 0.333333 | 1 |
| Wang Li 王立 | 0.333333 | 1 |
| Chunyu Zhang 淳于長 | 0.166667 | 1 |
| Chen Xian 陳咸 | 0.095238 | 2 |
| Zhai Fangjin 翟方進 | 0.066667 | 1 |

Table 2. Head of the Statistical Table of a Small Friendship Network in the Late Western Han

Official service in the same location might lead to friendship, especially that in the capital. Zhai Fangjin and Chen Xian made friends when they were both serving as officials in the capital (Ban, 1962). Zhai also made friends with Chunyu Zhang, although Chunyu was an imperial affine with whom few other literati were willing to associate (Ban, 1962). In turn, friends often recommended each other for official positions. Xue Xuan made friends with Zhai Fangjin when

he served as the Grand Chancellor. Xue Xuan was later dismissed by Emperor Cheng for malfeasance and disloyalty. Zhai Fangjin succeeded Xue as the Grand Chancellor. Two years later, Zhai Fangjin recommended Xue again because of their previous relationship. The emperor summoned Xue back to the court, restored Xue's marquis title, and put Xue in charge of the Masters of Documents (Ban, 1962). When Zhai Fangjin was serving as the Grand Chancellor, he and Kong Guang recommended Shi Dan as a capital official (Ban, 1962). Xu Shang also obtained a high official position because he had been friends with Zhai Fangjin (Ban, 1962).

The benefit of friendship came with the risk of losing official positions when one's friend was condemned for serious crimes or failed in court struggles. When Chunyu Zhang was prosecuted for crimes by his enemy Wang Mang, his friends Xiao Yu and Xue Xuan were dismissed from office (Ban, 1962). Chunyu Zhang's former friend Zhai Fangjin felt ill at ease and submitted a memorial to request retirement. Yet the emperor trusted Zhai so much that he comforted Zhai, saying it would be fine as long as Zhai corrected the previous mistake. Zhai then returned to his official duties, memorializing to dismiss over twenty officials who had been friends with Chunyu Zhang, including Sun Bao 孫寶 and Xiao Yu (Ban, 1962).

(5) Recommender-nominee Network

In the early Western Han, high officials usually came from the founding elites' families and consort families. After Emperor Wu's creation of the recommendation system (*cha ju zhi* 察舉制), more and more scholars from less privileged families obtained the opportunity of serving in the government. Although the system was in theory based on the candidates' virtue and ability, in many cases the recommender and the nominee knew each other well. My recommendation network data include 231 nodes and 198 pairs of recommendation relationships throughout the

Western Han and the Eastern Han. Figure 9 is a directed graph, in which nodes are sized by degree and colored by eigenvector centrality (deep shades indicate high eigenvector centrality).

There are many scattered nodes at the periphery of this network, which I have omitted in the current graph. Figure 9 shows the main part of this network graph, and it consists of two major clusters. The community surrounding the largest nodes, which represent Chen Fan, Li Gu 李固, Hu Guang, Li Ying, and Wang Chang 王暢, were all active bureaucrats during the second half of the Eastern Han (the period of the “proscribed cliques”). The community surrounding the second largest nodes, which stand for He Wu, Xue Xuan, and Wang Yin 王音, lived during the second half of the Western Han. The reason why recommendation networks flourished during the second halves of both dynasties is that the founding elites occupied large numbers of official positions at the beginning of dynasties. As time went on, officials from other backgrounds and from non-capital regions joined the central government. The changes in the composition of the central government would bring about changes in the dynamics among different political forces, which helps explain the increasing tensions at the court during the second halves of both dynasties.

Interestingly, political figures who were portrayed as the most upright ones of the late Eastern Han recommended the highest numbers of people for official positions. According to the “Biography of Li Gu” in *Hou Han shu*, Li Gu was a high official who served as the Grand Commandant for several years. After an earthquake, which was widely interpreted as Heaven’s punishment, he memorialized Emperor Shun to impeach the emperor’s nurse and eunuchs. When Emperor Shun died, the Liang family controlled the subsequent two young emperors and dominated politics. Li Gu was trusted by Empress Dowager Liang and summoned by Liang

Shang as a subordinate. However, he became a political enemy of Liang Shang's son, Liang Ji. Moreover, after Liang Ji murdered Emperor Zhi and convinced other officials to enthrone the later Emperor Huan, Li insisted on choosing another prince as the new emperor. Li finally died because of his antagonism with Liang Ji and his support of a different candidate than Emperor Huan.

This biography includes the content of a letter against Li Gu written by more than a hundred former officials who had been dismissed by Li. The writers of this letter accused Li of sowing discord between imperial affines, gathering his own cliques, recommending only his own disciples, and summoning only his acquaintances as subordinates. The historian Fan Ye apparently sympathized with Li Gu, stressing that these accusations were fabricated rumors. However, the recommendation networks of Li Gu invite a modern reader to question Fan's statement. Collecting scattered records from "The Biography of Li Gu" and the biographies of other people in *Hou Han shu*, we see that Li indeed recommended a number of officials, and that Li's recommendations were not unaffected by previous social connections. For instance, when his former superior Wang Gong was accused by eunuchs, Li wrote to Liang Shang, his current superior, to defend Wang (Fan, 1965). When Li Gu was serving as the Inspector of Jingzhou, he recommended his colleague Luan Ba, the Administrator of Gui Yang, for an official position in the capital. The letter might have exaggerated the case but not fabricated it out of nothing.

Chen Fan was another leader of the "pure stream" officials and classical scholars who struggled fiercely against the eunuchs (Fan, 1965). He was nominated by Li Gu for an official post and was also a former subordinate of Hu Guang (Fan, 1965). Like Li Gu, Chen Fan recommended former contacts as candidates for official posts. For example, he recommended Xu Zhi 徐穉 to the emperor. Xu Zhi had been Chen Fan's subordinate for a short period and Chen's

guest several times when Chen was serving as the Administrator of Yuzhang 豫章 (Fan, 1965).

When the emperor appointed Chen as Grand Commandant (*tai wei* 太尉), he submitted a memorial, in which he demonstrated his modesty by recommending Hu Guang, Wang Chang, and Li Ying to serve in the position instead (Fan, 1965). During his service as the Grand Commandant, he recommended his friend Wang Chang, who had been dismissed for some reason, to be reappointed as a Master of Documents (*shang shu* 尚書) (Fan, 1965). In sum, recommendation networks often overlapped with friendship and superior-subordinate networks. It is therefore problematic to assume that the allegedly upright officials did not rely on social connections in their political activities. Rather, a real difference between the outer court officials and the inner court was that they engaged in different types of networks.

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