The Benefits and Limits of Guanxi in US–China Research Collaborations

Morris Hsin-Mu Chen, John P. Haupt, Die Hu, Wen Wen and Jenny J. Lee

Abstract
Social networks based on Chinese culture, or *guanxi*, played an important role in scientists' capacity to produce knowledge, their collaboration experiences, and in navigating the securitized research environment targeting collaboration between the United States and China.

As the United States and China vie for the top spot in the global knowledge economy, international collaborative research has been increasingly subjected to greater politicization and securitization. The COVID-19 pandemic exacerbated existing geopolitical tensions and resulted in greater governmental and institutional oversight over international collaborations. Given these developments, we were interested in how US and Chinese scientists continued to collaborate on COVID-19 research. Our bibliometric findings show, among other things, that the majority of US–China publications on COVID-19 included at least one ethnic Chinese scientist/author based in the United States. Among our final survey sample of 241 scientists (United States, N=91; China, N=150), ethnic Chinese scientists' culture, in the form of *guanxi*, played an important role in shaping scientists' networks and knowledge production capacity, in how the pandemic impacted their collaboration experiences, and in how scientists navigated the securitized research environment between the two countries.

Guanxi is a Chinese term that refers to a social network informed by shared cultural knowledge and experience. The basis of *guanxi* is a relationship between two individuals, whose personally defined and reciprocal bonds form the fundamental unit of larger *guanxi* networks. *Guanxi* contrasts with Western notions of social capital and networks, which tend to focus on the network structures and individuals' positions in networks. China is a highly relational society, and a well-socialized Chinese person (or anyone who is aware of and practices *guanxi* principles) is culturally obliged to answer requests within one's networks. There are many ways to differentiate types of *guanxi*, depending on the background on which *guanxi* is built (e.g., family, school, workplace, hometown, etc.) or the nature and purpose of interactions involving *guanxi* (e.g., love and sense of belonging, resource exchange). *Guanxi* evolves over time, and its state at a specific time or in a specific context can trigger different principles of interaction and potential outcomes.

Guanxi Promotes US–China Collaboration

Our findings revealed that ethnic Chinese scientists in the United States and China rated shared culture and ethnicity as more important motivations for collaboration than did non-ethnic Chinese scientists based in the United States. The ethnic-Chinese *guanxi* networks enabled easier and faster access to samples and first-hand knowledge of the pandemic in its earliest days. These findings highlight the importance of tie formation and collaborative relationships beginning during noncrisis times. Ethnic Chinese scientists in China mobilized their overseas *guanxi* networks to develop international research ties and to be more productive in their research publications. *Guanxi* also motivated US-based ethnic Chinese scientists who had completed parts of their education in China to collaborate with scientists in China. *Guanxi* has a strong affective dimension, and the instrumental and sentimental aspects of *guanxi* helped to promote reciprocity and motivation for scientists' international collaborations. The affective and social norms prescribed by *guanxi*—including reciprocity, a sense of obligation, and long-term equity—allowed ethnic Chinese scientists in the United States and China to better mobilize weak ties with the goal of later forming stronger ties for the purpose of collaboration.

Guanxi Facilitates Access to Research Projects

Since China had the majority of COVID-19 cases and data at the onset of the pandemic, some US-based ethnic Chinese scientists were able to use *guanxi* to access critical research data, samples, clinical expertise, and more. For example, a US-based ethnic Chinese scientist reported that his strong trust and *guanxi* with Chinese scientists and employees at several regional centers for disease control and prevention in China kept him better informed and allowed him to negotiate with governmental bureaucracy and overcome internal department politics to access COVID-19 data, as well as to obtain a permission to analyze it. In another case, a US-based ethnic Chinese scientist used his *guanxi* network to secure medical care for a family member in China who was infected with COVID-19—the scientist and his Chinese collaborating clinicians published the experience as an early successful treatment model for COVID-19. In both cases, the US-based ethnic Chinese scientists did not necessarily know the decision-makers personally, but they were able to mobilize weak ties by pulling *guanxi* through mutual friends and colleagues who did have strong ties with relevant decision-makers.

Guanxi as the Basis of Trust

Scientists in both the United States and China rated shared research goals and trust as the most important motivations for collaboration and reported that they had known their collaborators or worked with them prior to the start of the COVID-19 pandemic. US-based ethnic Chinese scientists established *guanxi* with their Chinese colleagues in formal settings during noncrisis times—they used to be classmates, colleagues, shared the same advisor, or met at conferences. As *guanxi* between pairs of scientists grew over time, researchers benefited further from each other's deepening academic interests and expertise through multiple collaborations. Given the highly politicized and urgent nature of COVID-19-related research and restrictions on international travel, it made sense for scientists to look within one's trusted *guanxi* network. *Guanxi*, as a form of trust, was also essential for ethnic Chinese scientists in the United States and China for navigating a highly scrutinized research environment.

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Limits of *Guanxi* in the Current Geopolitical Environment

Most scientists have witnessed the geopolitical climate's effects on science. Variations of "leave politics out of science" were echoed repeatedly. Beyond their immediate projects, some US-based ethnic Chinese scientists talked to us about restricting relationships with Chinese scientists or cutting ties with them all together, losing US government funding, or being investigated and disciplined by their universities. Such effects on working relationships were also discussed by China-based scientists, who have experienced distancing by US colleagues, and more restrictions on collaboration and exchange due to changes in US university-level and government policies. All this helps understand the limits of personal *guanxi* in navigating institutional climate and policy.

Our findings suggest that culture, in the form of *guanxi*, is not only a useful framework for analyzing and promoting tie formation between ethnic Chinese scientists in the United States and China, but also an instrumental tool used to help US-based ethnic Chinese scientists gain resources and improve productivity. This is an important finding, especially as US–China collaboration tapers and China moves away from its overreliance on SCI/SSCI-indexed journals. Further research could examine *guanxi* formation between nonethnic Chinese scientists to determine its applicability across diverse groups. Our findings also underline the need to ensure international mobility of students and scholars, remain open to scientific cooperation between the United States and China, and continue supporting cross-border tie formation among scientists in the long run. Formal education and institutional affiliation can be important bases for *guanxi* formation, and many US scientists whom we interviewed reported a sharp drop in Chinese graduate students or visiting scholars at their institutions. Losing Chinese students and scholars to other popular destination countries not only negatively impacts collaboration between the United States and China, but also may have long-term impacts on both countries' abilities to produce leading research internationally. ◢

Morris Hsin-Mu Chen is a PhD student at the University of Arizona, US. E-mail: morrishchen@ arizona.edu.

John P. Haupt is research specialist at the University of Arizona. E-mail: hauptj@arizona.edu.

Die Hu is a postdoctoral researcher at Tsinghua University, P.R. China. E-mail: hudie311@gmail.com.

Wen Wen is associate professor at Tsinghua University. E-mail: wenwen@mail.tsinghua.edu.cn.

Jenny J. Lee is professor at the University of Arizona. E-mail: jennylee@arizona.edu.

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