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CHAPTER 4

When Migrant Scientists Collaborate with Co-nationals: The Gendered Effects of Diaspora Knowledge Networks on Scientific Research and Knowledge Production

"Recently we got a paper published prepared by two departments here. There were six people and all of them had Russian names"

Anton, professor of computer science at a leading British university

Introduction

Long ago, in 2013, when the Russian Computer Scientists at Home and Abroad Project first started at Saint Petersburg's European University, I was idly surfing through the websites of British universities, hoping to find some Russian-speaking scientists in computer science or information system departments to begin developing a basic understanding of who they were and what kind of work they did. I was successful and I identified many scholars who migrated from Russia and other post-Soviet countries in 1990s and early 2000s. Lecturers, readers, professors, and some research fellows—confident, intelligent male faces gazed at me from the webpages of highly ranked UK universities. They seemed to be well established and enjoying their positions. But that was not the reason for my surprise. Perhaps I unconsciously shared the vision of Russian scientists as particularly appreciated abroad for their exceptional talent and skills in mathematics and related disciplines. The source of my wonder was the abundance of Russian names in their publications' lists. I scrolled down page after page to look at their publications and found again and again—one, two, five Russian names per article! Sometimes the multitude of Russian names occurred at the beginning of their transnational careers, sometimes after considerable periods of employment in Europe and then the UK. Even professors who had been working abroad for twenty to thirty years published extensively with Russian-speaking colleagues. It seemed rather strange and counterintuitive, even improper in such an international professional environment as the majority of British universities claimed to be, and I became perplexed. Why would academics who migrated from the post-Soviet region and built careers in a foreign country actively collaborate with other Russian-speaking scholars? Had I uncovered a few exceptions or was extensive diasporic collaboration a common practice among Russian computer scientists abroad? If so, what does such collaboration bring them and what difference does it make in their scientific work? These questions started

to percolate in my mind and stir my curiosity, eventually leading to a whole PhD project. Now I have an answer or rather a multiplicity of answers, confirming that RCS diasporic ties form diaspora knowledge networks (DKNs) that impact the scientific output and careers of migrant scientists. In this chapter, I would like to discuss these findings.

Analysis of existing scholarly literature on the subject shows that diasporic[80] connections in academia spread and acquire more significance. But available evidence remains fragmented and theoretically unsatisfactory for examining the questions that concern me. In general, migrant or "diasporic academics" disproportionally "work with people from the same background as them" independent of whether background is "defined as a nationality or ethnicity" (Larner 2015). Foreign-born researchers are more likely to collaborate with co-nationals, not only in the country of origin, but also with those "who are working or studying in a third country" (Scellato, Franzoni, and Stephan 2015, 1). However, these studies approach diasporic collaboration as a part of a broad discussion of drivers of international collaboration and global scientific networks, not as a specific phenomenon. Nor do they examine their effects. Another branch of research examines diasporic collaboration between expatriate scientists in destination countries with researchers in home countries, viewing this as a way to mitigate the consequences of brain drain by ensuring knowledge exchange that benefits the home country. Thus, studies focused on Chinese scientists report "an absolute and relative increase in transnational research collaboration between overseas Chinese scientists and researchers in mainland China" (Jonkers 2010, 240), with a growing proportion of internationally co-authored publications written exclusively by scientists of Chinese origins (Jin et al. 2007, 5). Curiously, these studies typically adopt transnationalism as a framework and do not grant full value to the specificity of scientific networks among people of the same national or ethnic origin. Despite stating that diasporic interaction constitutes "the specific field of scientific collaboration across international borders," since it relies on "ethnic origin and migration experience as a resource," researchers of such studies still designate the phenomenon as "migrant transnationalism" or "transnational research collaboration" (Jonkers 2010, 228). They view migrant scientists as valuable "transnational human capital" (Yang and Welch 2010, 594) and interpret their increasing involvement in diaspora knowledge networks as advancing the formation of "global spaces of interactions" in science (Chen and Koyama 2013, 35). Though these researchers

80 The term "diasporic" typically refers to various forms of culturally based commonality (national, ethnic, linguistic). In respect to migrant scientists, diasporic may also imply the specific academic or professional heritage they share (Karaulova et al. 2019), such as post-Soviet mathematical training.

pay attention to the experiences of foreign-born scholars, their primary concern is the benefits of diasporic collaboration for home (and sometimes destination) countries (such as knowledge production and transfer). They do not explore collaboration's consequences and impact on the migrant scientists themselves.

Finally, the third branch of research concentrates on diasporic collaborations in destination country academic contexts, revealing an ethnic affinity effect. Thus, laboratories directed by foreign-born scholars "are more likely to be populated by students from the same country of origin than are labs directed by native faculty" (Tanyildiz 2015, 50). Researchers describe "ghetto laboratories" which are comprised predominantly of foreign-born "scientists of similar origin" (Wagner 2014, 145) such as monocultural Russian laboratories in the US (Allahverdjan and Agamova 2012, 48; Artiushina 2014, 135, 138). A few scholars examine diaspora networks as specific kind of knowledge networks consisting of connections across home and various destination countries (Karaulova 2016; Antoshchuk 2019). These latter studies distinguish diasporic collaborations from other types of professional ties and are more concerned with migrant scientists' experiences. They reveal scientists' motivations for engaging in diasporic collaborations and are concerned with the effects of these collaborations, including on the production of knowledge. They argue that work among co-nationals or co-ethnics facilitates understanding and trust, allowing scientists to save time otherwise spent on building relationships, which brings "more and better results" (Wagner 2014, 165). Foreign-born scientists are found to produce a considerable number of works with diasporic colleagues, which contributes considerably to their overall scientific output (Karaulova 2016; Antoshchuk 2019). Diasporic collaboration is asserted to improve scientists' chances of integrating into academic life in destination countries and to facilitate professional advancement. These findings, however, emerge from qualitative research, based on limited non-representative data, while sound quantitative studies of these phenomena are lacking.

In this chapter, I address these limitations by undertaking a systematic examination of diasporic collaborations using publications data for RCS who lived and worked in the UK and concentrating on the effects of such collaboration on individual migrant scientists. My hypothesis is that involvement in diaspora knowledge networks positively influences scientific research of foreign-born scholars, which in turn increases their chances of having successful academic careers. Therefore, my central questions are: What contribution does diasporic collaboration make to scientific research

of migrant scholars? How does involvement in DKNs impact their scientific productivity, output and academic careers?

An additional serious limitation of many studies of diasporic collaborations is that researchers treat migrant scientists as a homogeneous group, emphasizing common origins and common nationality or ethnicity as key factors binding them in a network, while ignoring internal divisions and hierarchies. Other individual attributes are however important. It is misleading to analyze diasporic collaboration without taking them into account. First, we need to account for gender as a powerful structuring force in academia and scientific collaboration. Scholars speak about "academic patriarchy" a set of institutionalized sexist practices that raise men "to the pinnacle of the ivory tower" while marginalizing women and impeding their professional advancement (Vettese 2019, 8, 2). A substantial body of research demonstrates that scientific networks are gendered across all disciplines and particularly in STEM. Though the gender gap in collaboration activities has gradually decreased, men typically have more co-authors, especially international ones, occupy more central and powerful positions in scientific networks, and are more inclined towards gender homophily than women are (Larivière et al. 2013; Abramo et al. 2013; Belle et al. 2014; Ghiasi et al. 2015; Jadidi et al. 2018). But what about diaspora knowledge networks? Maybe cultural affinity and common migration experiences mitigate the gender imbalance so pervasive in scientific collaboration? Or is diasporic collaboration gendered and its effects are unevenly distributed between females and males? This chapter addresses these questions by engaging in a systematic quantitative analysis of gender differences in RCS diasporic co-authorship and tracing their effects.

Second, scientific collaboration patterns vary depending on academic seniority, largely correlating to career stage and academic rank (Abramo et al. 2011; Wang et al. 2017; Abramo et al. 2018). High ranked senior scientists are typically more productive than junior ones and demonstrate a greater propensity for collaboration, in particular for international collaboration. Senior and junior scientists generally perform different, but complementary roles in scientific research (Beaver 2001), which may mean their collaboration strategies and patterns diverge. Migrant scientists are also stratified according to hierarchical status in academia. How does this stratification manifest in diasporic collaboration and its effects on careers? Drawing on research underlining "pervasive and persistent relationships between gender and full academic rank" (Fox 2020, 1005) and viewing status hierarchy in academia

as a crucial social structure through which "gender dynamics operate indirectly" (Gaughan and Bozeman 2016, 540), I unite two sets of questions and explore gender and position in academia as intersecting in terms of how they affect involvement in and the impact of DKNs.

Theoretically, the chapter draws on highly skilled migration research and social studies of science, developing the notion of diaspora knowledge networks that constitute both a migrant support and a collaboration network (Antoshchuk 2018). As other works cover the specificity of its formation and functioning as a migration network (Antoshchuk 2019; Antoshchuk and Ledeneva 2019), this chapter analyses DKNs as a new invisible college and reveals its significance and effects on knowledge activities. Methodologically, the chapter employs quantitative analysis of RCS publications and social network analysis of diasporic co-authorship connections using data from the Digital Bibliography and Library Project (DBLP) Computer Science bibliography. As noted in the Introduction, the UK provides an excellent setting for this study because its academia is highly internationalized (ScienceWatch, 2010, 3), with 27% of its academic scholars being foreign born (Kim 2009, 398, data for 2005/06) with 26% of sciences and engineering staff being foreign-born (Immigration 2017, 05, data for 2014/15). Russian-speaking computer scientists (RCS) are a highly suitable group to study. The number of IT professionals and computer scientists among highly skilled migrants from the former USSR is high (Biagioli and Lepinay 2019). Moreover, RCS come from a (post)-Soviet research and innovation system that was rather isolated prior to 1991 (Schott 1992). Therefore, they are likely to encounter difficulties in adjusting professionally to the destination country academia. Thus, mobilizing connections with former compatriots may represent a strategy for fulfilling expected research goals, compensating for a lack of local connections and resources. The specific attributes of RCS coupled with Britain as a context generate favorable conditions for the development of diaspora knowledge networks.

Theoretical framework

The central concept of the study is diaspora knowledge network. Initially, in the 1990s, DKNs were detected and investigated by researchers of brain drain, brain gain and scientific and technological diasporas. DKNs denoted transnational associations of migrant professionals and scholars from the same home country, whose members demonstrated a willingness "to contribute to the development of their origin countries" (Meyer 2011, 159) and to engage in "mutual aid and information sharing" (Barre et al., 2003, 1). Because of the presence of internal organization

and motivations to engage in "concerted action" among highly skilled migrants, DKNs earned distinction from diaspora in the sense of the "totality of individuals living abroad" (Kuznetsov and Sabel 2008, 85). DKNs inspired a wealth of research because they "deeply changed the way highly skilled mobility used to be looked at" (Meyer and Wattiaux 2006, 4). First, they demonstrated the significant role of national feeling, ethnic affinity, and cultural belonging among highly skilled migrants. Meyer (2007) argued that DKNs are constituted as a result of identity expression and identity-formation processes, when migrant professionals (re)produce feelings of national, ethnic, or cultural belonging by communicating and cooperating with former compatriots. Second, DKNs showed substantial potential to facilitate learning, knowledge exchange, and knowledge transfer for the benefit of the country of origin in various spheres, including science and technology (Meyer and Wattiaux 2006) and in international business (Cruz and Sabillon 2019). The combination of these two features and their interconnected character, when professional activities become an arena for revitalization of national or ethnic feelings, makes DKN a distinctive phenomenon among other professional networks. Departing from these studies, I argue that diasporic networking among migrant scientists and highly qualified specialists takes places not only in associations, but across different "organizational settings, formally and informally, in academia and industry, locally and transnationally, in the host and in the home country" (Antoshchuk 2018, 4). As diasporic interactions drive new knowledge creation in academia (Tanyildiz 2015; Wagner 2014; Karaulova 2016; Antoshyuk 2015; Antoshchuk 2019) and beyond (Kerr 2008; Almeida et al 2014; Agrawal et al. 2008), I argue that DKNs represent a "newly emergent invisible college" (Antoshchuk 2018).

The term "invisible college" was first used to refer to a group of informally interacting scientists in the 17th century England, who then created Royal Society of London (Price and Beaver 1966). Price (1963) established the concept's new meaning as "informal collectives of closely interacting scientists" (1963, 74), functioning on the basis of regular contacts and interpersonal relations, both distant and face-to-face (Ibid., 83–84). Price identifies several fundamental attributes of invisible colleges: informal communication as a constituting principle, specialty as a container, publications as material output, and highly influential scientists as leaders. He argues that invisible colleges emerge as self-organized networks in response to the communication crisis of "big science", characterized by an unprecedentedly large number of scientists and publications. They serve as a key social mechanism enabling information exchange, and facilitating the coordination of research and development of a scientific field. Crane (1972) developed the concept further, using "invisible college"

to designate "social organization within a research area" and seeking to understand "the social aspects of scientific change" (Crane 1989, 18). Exploring how communication networks affect the spread of innovation (1972) Crane found that invisible colleges possess a particular structure, which can facilitate or impede the growth of scientific knowledge. Though later works emphasised communicative processes (Lievrouw, 1989) and informal interactions as "a pivotal feature of the scientific communication system" (Cronin 1982: 232), a balanced understanding of invisible college as a "multi-faceted phenomenon" prevails (Zuccala, 2004, 69). According to this understanding, invisible college remains confined to the "subject specialty" as the "intellectual basis" for information exchange and is constituted by scientists "who communicate both formally and informally" and "share similar research interests" (Ibid, 11). Importantly, invisible college might be identified through "material contributions" (most often, publications), produced by its participants (Zuccala 2004: 10).

Drawing on Zuccala's work, I define a DKN as a set of interacting migrant and non-migrant scientists of the same ethnicity, nationality, or cultural origin who communicate both formally and informally, remotely and face-to-face, within and across borders, share similar research interests, and produce knowledge in their discipline in the form of publications, patents, and projects. On the one hand, this definition of DKNs includes basic features of the invisible college: interactions giving rise to a collaboration network and common research interests as the basis for these interactions, their effects on knowledge activities, which manifest in visible, tangible forms. On the other, my definition distinguishes diasporic connections and the collaboration networks they create from other professional networks, facilitating separate analysis. It allows me to differentiate diasporic ties in international and national scientific collaborations, what is especially important as DKNs are often masked behind international or national collaboration networks in bibliometric analysis. This occurs because only interactions at "a formal inter-organisational level" are analysed, while they happen "between co-authors that share academic upbringing and culture" (Karaulova and Gök 2019, 1886).

The "neoliberal globalization" of science and higher education (Dervin 2011, 4) leads to a growing presence of foreign-born scientists in developed countries and increasing cultural diversity in research teams and universities, while simultaneously intensifying competition in academia. Under these conditions, cultural, ethnic, and national affinities are mobilised as a vital resource for building collaborative ties

and DKNs emerge as a new invisible colleges. I hypothesize that they become an important mechanism for ensuring information circulation and connection in scientific communities characterized by growing internal divisions on the basis of ethnicity, nationality, or cultural identity. In this respect, DKNs are supposed to stimulate knowledge generation and transfer and support the growth of scientific disciplines. But what role do DKNs play in the scientific research of individual migrant scientists? What impact do they have on their outputs, productivity, and academic careers? These are the questions I explore in this chapter.

Methodology

Sampling

Defining DKN as an invisible college has several implications for sampling and analytical processes. First, it implies that diasporic connections are differentiated and analyzed separately from other professional connections. In my study diasporic refers to a (post)-Soviet background (Byford 2009; Pechurina 2017) which is conflated with specific post-Soviet academic heritage (Karaulova et al. 2019, 491). Post-Sovietness implies a hybridity of cultural and professional identities, but is formally identified through categories of nationality/ common post-Soviet origin and Russian language. Therefore, RCS are sampled according to the following criteria: they migrated from Russia and other former Soviet republics since 1990s (Ukraine, Belarus, Kyrgyzstan etc) and speak Russian language (native speaker/higher education in Russian). In respect to collaboration, diasporic connections designate RCS's ties to other Russian-speaking scientists, residing either in the post-Soviet countries , in the UK or other destination countries.

Second, this definition of DKN presupposes that diasporic interactions take place regarding common research interests in certain scientific disciplines, excluding other fields. Therefore another criterion for sampling RCS is working and doing research in computer science. In this study I included RCS employed in British universities/ research centers, who occupy teaching or research positions in computer science and related areas, who have been producing publications in computer science in 1990-2018.[81] All scientists complying to the set criteria were included in

81 The dblp computer science bibliography (https://dblp.uni-trier.de/) served as the main source of data as it is considered to be the most comprehensive and reliable database of works in computer science (Franceschet 2011). Other specialized publications databases (IEEE Xplore digital library, ACM Digital Library) were used as an additional source of data when the dblp was not sufficient.

the analysis, [82]so the study covers the whole population of RCS in the UK forming a sound basis for the systematic exploration of the effects of DKN

Third, the definition of DKN as an invisible college means that publications and co-authorship relations are treated as reliable indicators of interactions taking place among migrant scientists. Though this approach to studying scientific collaboration has received criticism (Katz and Martin 1997), scholars note a "positive correlation between collaboration and co-authorship" (Glänzel and Schubert 2004, 258). In my study of DKNs' impact I analyze RCS publications as research output and co-authorship as a reliable proxy of collaboration relations. The publication was considered to be written in diasporic collaboration if one or more Russian-speaking co-authors meeting the criteria above were detected in the list of co-authors. The article was considered to be written in exclusively diasporic collaboration if it is written only by Russian-speaking scientists.

Analysis

Analysis was conducted in two stages: quantitative and statistical analysis of publications, collaboration patterns and diasporic co-authorship based on DBLP data for all RCS (298 scientists), followed by social network analysis of connections between RCS diasporic collaborators based in the UK (214 scientists). Social network analysis is used to explain and support the results of quantitative analysis. The main source of data on RCS publications and co-authors is DBLP Computer Science Bibliography. [83]Data was checked and collected manually,[84] entered in Excel database (298 RCS) and then processed by Excel statistical functions. Only UK period of RCS research activity was analysed since I focus on RCS experiences as migrant academics in British academia. Also RCS published the majority of their works (83%) while working in the UK.

The indicators include total number of publications (PB, or overall scientific output),

82 I included RCS with minimum 2 publications or 1 publication if it is written in diasporic collaboration. I also incorporated doctoral students with 1 publication.

83 Last time the data was updated in December 2018.

84 To ensure the correct identification of RCS and their diasporic colleagues, Russian language and post-Soviet background was checked for every scientist and his/ her co-authors manually via open Internet sources.

publication period (PD), number of co-authors (CA), number of publications written in diasporic collaboration (PB DC) or exclusively with other members of the diaspora (PB ODC), the share of such publications in the total number of publications (% PB DC and % PB ODC out of PB), scientific productivity (average number of publications produced per year (PR), number of Russian-speaking or diasporic co-authors (DCA), share of diasporic co-authors in total number of co-authors (% DCA out of CA) and their locations (UK, other destination countries, Russia, or other post-Soviet countries). Main statistical tests which were used for the analysis are Chi-square test, Mann-Whitney test, Spearman's correlation coefficient.[85] For non-normal data median (Mdn) and interquartile range (IQR) are reported as indicators of variance instead of mean (M) and standard deviation (SD) proper for normal data. Social network analysis was implemented in Gephi, using a matrix of RCS diasporic co-authors based in the UK (214 persons).[86]

Characteristics of the Sample

The RCS population in the UK of 298 scholars includes 59 women (19.8%) and 238 men (80.2%). The majority (266 persons, 89.2%) is affiliated with universities, mostly to research-intensive institutions (RI = 178 (59.73%)), less to teaching-oriented institutions (TO = 88 (29.53%)). RCS occupy positions ranging from those of PhD students to professors. While I observed no substantial gender differences in the distribution of temporary and permanent positions (χ^2 (df=1, N = 243[87]) = 0.78, .500 > p > .250)), women were disproportionally underrepresented among professors (χ^2 (df=1, N = 243[88]) = 5.87, p < .025). This confirms my hypothesis that gender and academic rank intersect, with seniority of position associated with masculinity. Small percentages of RCS work in intergovernmental research organizations (IRO – 6.7%) and research companies (RC - 4%). Women are overrepresented in IRO (15.2%, compared to 4.6% of men), mostly engaged in applied research and scientific services, while men more often work in high-profile universities (61.5% compared to 52.5% of women), which

85 Chi-square test was performed in Excel, other tests were done by reliable online calculators: https://www.socscistatistics.com/tests/, http://www.statskingdom.com/

86 This network boundary was chosen as the majority of RCS diasporic collaborators (64.39%) reside and work in the UK.

87 To determine the impact of gender on the distribution of permanent and temporary positions, I conducted the chi-square test for 243 RCS in standard academic positions, excluding unknown ones (14) and those with unclear or unclassified status (9 RCS including researcher and teaching fellow).

88 To determine the correlation of gender with the distribution of professor and non-professor positions, I also conducted the chi-square test for 243 RCS accordingly.

are research oriented (χ^2 (df=3, N = 298) = 8.72, p < .050). Due to the small number of RCS affiliated with IRO and RC, I excluded these types of organizations from further analysis.

Findings

The findings part is structured as follows: first, I discuss the general level of diasporic collaboration among RCS and how inequalities (gender, academic rank, institution) determine involvement in DKNs; second, I demonstrate DKNs generate various positive effects on knowledge-generation activities of individual scientists; third, I explain why these positive effects are unevenly distributed. I find that gender is the central factor structuring diasporic collaborations and its effects, though it intersects with academic rank (permanent or temporary positions)[89] and type of institution scientists work for (research-intensive universities (RI) or teaching-oriented or non-research-intensive universities (TO)[90]).

Diasporic Collaboration Contributes Substantially to RCS' scientific activity

In general, RCS maintain a significant level of diasporic collaboration: the majority (249 persons or 83.55%) write papers with Russian-speaking colleagues (PB RS). Such publications constitute more than half their works (Mdn=66.67%). The general pattern is collaboration with a few Russian-speaking colleagues (Mdn=3 persons), which constitute a sizeable minority among other co-authors (Mdn=23.61%). While incorporating diasporic connections into a wider circle of non-diasporic colleagues is common, more than half of RCS (159 persons or 53.36%) write papers exclusively with other Russian scientists (ODC). Such works constitute almost 30% of their publications (Mdn=28.07%). Thus, diasporic collaborations play a significant role in RCS' scholarly research.

In most cases, the number of Russian-speaking collaborators is not high. Howev-

89 Permanent academic positions include lecturer, senior lecturer, reader, associate professor, or professor; temporary positions include PhD student, postdoctoral scholar, senior research assistant, research associate, research fellow.

90 Times Higher Education ranking based on REF 2014 was used to classify universities as research-intensive (top 30 - RI) and not research-intensive or teaching-oriented institutions (below top 30 - TO): Times Higher Education, "Research Excellence Framework 2014: institutions ranked by subject", n.d., https://www.timeshighereducation.com/sites/default/files/Attachments/2014/12/17/x-/o/z/sub-14-01.pdf.

er, diasporic co-authors occupy an important place in RCS' collaboration networks. Russian-speaking colleagues of RCS reside overwhelmingly in the UK (M=67.67%, Mdn=75%).[91] A much smaller share of diasporic collaborators have affiliations with institutions in other destination countries (M=18.48%, Mdn=0), in the post-Soviet region, mostly in Russia (M=15.28%, Mdn=0), and rarely in other formerly Soviet states, represented largely by Ukraine and Belarus (M=3.32%, Mdn=0). This finding is counterintuitive. The assumption is that scientists maintain diasporic connections with colleagues in their home country. But RCS interact and produce publications predominantly with their former compatriots in the same destination country. This could be an effect of Britain's national system of research funding or evidence of the importance of physical proximity (co-location). This finding shows that transnationalism as a framework is not relevant to analyzing and explaining DKNs. It focuses only on destination-origin country connections, while diasporic connections may proliferate within a destination country.

Gender: Men Surpass Women in Collaborating with Other Diaspora Scientists

The proportion of women and men involved in diasporic collaboration (DC) is approximately the same (F: 47 or 79.66% vs M: 202 or 84.5%),[92] χ^2 (df=1, N = 298) = 0.81, 0.250<p<0.50). Thus, female and male RCS equally adhere to diasporic strategies in their production of scientific work. But men are more prolific in DC: they publish more articles with Russian-speaking colleagues (M: Mdn=5 vs F: Mdn=2; please see Table 1),[93] and exclusively with diasporic colleagues (M: Mdn=1 vs F: Mdn=0), they have more Russian-speaking co-authors than women do (M: Mdn=3 vs F: Mdn=1). The higher figures among male RCS cannot be explained by their greater scientific output and longer period of work tenure. Even when gender discrepancies for output and tenure are insignificant, women and men still demonstrate different patterns of DC (see Table 2 in the Appendix). Thus, if we exclude professors as highly productive scholars, women and men demonstrate a similar level of scientific productivity and period of publication activity, but men have more Russian-speaking co-authors (M: Mdn=1, IQR=4.75-1 vs F: Mdn=1, IQR=2-1) and produce more articles in diasporic collaboration (M: Mdn=4 vs F: Mdn=2). Diasporic collaboration also

91 When analysing diasporic co-authors' locations, I report both mean and median as median alone is not informative.

92 The abbreviations F and M stand for female and male scientists, respectively.

93 Here and further on I present the full results, including interquartile range (IQR) and Mann-Whitley test scores, in the Appendix C.

occupies a more important place in the research activity of male scholars than it does among female scholars. Though there is no statistically significant differences in the proportion of paper, produced in diasporic collaboration, men have a higher share of publications in exclusively Russian-speaking teams (M: Mdn=7.14% vs F: Mdn=0) and larger share of Russian-speaking co-authors (M: Mdn=21.31% vs F: Mdn=13.63%). In sum, involvement in DKNs and the significance of diasporic collaboration for migrant scientists depends on gender. Although the same proportion of female and male RCS sustain diasporic ties, men are more actively involved in DKNs and diasporic collaboration plays a more significant role in men's scientific activity than it does in women's research.

Organizational Context Impacts Women's Involvement in DKNs

The greatest gender differences exist in research-intensive (RI) universities, where men surpass women in four out of six indicators of diasporic collaboration (see Table 2 in the Appendix). They publish significantly more works with Russian-speaking scholars (M: Mdn=5 vs F: Mdn=2) and exclusively with Russian-speaking scholars (M: Mdn=1 vs F: Mdn=0). They have more diasporic co-authors (M: Mdn=3 vs F: Mdn=1), who also constitute a larger share of their colleagues (M: Mdn=21.82%), while the proportion of Russian-speaking colleagues of female scientists is almost twice lower (Mdn: 11.67%). By contrast, there are no statistically significant gender differences across all DC indicators in TO, where both women and men sustain a high level of diasporic collaboration and its contribution to their scientific work is substantial. Men working in RI and TO universities demonstrate similar diasporic collaboration patterns (no significant differences in DC indicators), but women do not. While absolute numbers (PB DC, PB ODC, and DCA) are approximately the same for women in both types of institutions, diasporic collaboration occupies a far more important place in the scientific activity of women working in teaching-oriented universities (TO). They produce a much higher share of papers written in DC (F TO: Mdn=71.71% vs F RI: Mdn=33.33%), exclusively in DC (F TO: Mdn=11.34% vs F RI: Mdn=0) and have twice the number of diasporic co-authors (F TO: Mdn=22.5% vs F RI: Mdn=11.67%).

Thus, organizational environment influences women's involvement in DKNs, but makes no difference in terms of men's diasporic collaboration. Research-intensive universities, where the focus is on groundbreaking research, high competition, and striving for high rankings in national assessments, accentuate gender discrepancies in diasporic collaboration, for some reason discouraging women, or perhaps encouraging non-diasporic strategies. Teaching-oriented universities with lower rank-

ings create conditions in which both women and men maintain a substantial level of involvement in DKNs. Or possibly RCS have fewer incentives to develop non-diasporic strategies. Thus, organizational context, intersecting with gender, affects involvement in DKNs and contribution of diasporic collaboration to migrant scientists' research.

Academic Position: The Gendered Impact of Seniority

Academic position plays a significant role in diasporic collaboration. In general, RCS in permanent positions write more papers in DC (PERM: Mdn=8 vs TEMP: Mdn=3), exclusively in DC (PERM: Mdn=3 vs TEMP: Mdn=1), and have more Russian-speaking co-authors than RCS on fixed-term contracts (PERM: Mdn=3 vs TEMP: Mdn=1; see full details in Table 3). But diasporic collaboration is more important for RCS who work in temporary positions, as they have a much higher share of papers produced in DC (TEMP: Mdn=66.67%, vs PERM: Mdn=40.96%). This suggests that RCS expand their diasporic collaborations as they advance in their British academic careers, increasing their numbers of diasporic colleagues and the number of articles they publish with them. However, the contribution of diasporic collaboration to their research diminishes as they advance into stable, permanent positions. Thus, RCS multiply their diasporic ties, simultaneously developing non-diasporic connections, which gradually acquire more significance in their research.

It is noteworthy that transitioning to a senior position has different effects depending on gender. Female and male researchers on fixed-term contracts demonstrate a similar level of DC, except that male RCS have somewhat more Russian-speaking co-authors (M: Mdn=2 vs F: Mdn=1). Gender discrepancies become more acute in permanent positions: though male and female senior scientists have a similar number of collaborators overall (M: Mdn=18 vs F: Mdn=18.5), men have more diasporic colleagues (M: Mdn=4 vs F: Mdn=2.5), and the share of Russian-speaking co-authors in their network (% DCA) is greater (M: Mdn=20% vs F: Mdn=7.67%). Men also write more articles exclusively with Russian-speaking colleagues (M: Mdn=3 vs F: Mdn=1). A possible explanation for this is that men in permanent positions, having acquired sufficient independence to set their own research agendas and achieve their research goals, use these opportunities to extend their diasporic networks and strengthen diasporic ties, while women are more inclined to use non-ethnic strategies. Indeed, the number of diasporic co-authors is greater for men in permanent positions compared to men on temporary positions (PERM: Mdn=4 vs TEMP: Mdn=2), though their share of total number of collaborators is almost the same

(from 22.72% (Mdn, TEMP) to 20% (Mdn, PERM)). The number of Russian-speaking collaborators does not considerably increase for women who advance to higher positions. I detected no significant differences between females on long-term and fixed-term contracts. Meanwhile, the share of diasporic co-authors among the total number of co-authors dramatically declines (from 25% (Mdn, TEMP) to 7.67% (Mdn, PERM)). Seniority has a gendered impact on the contribution of DC to research output. As men climb the academic ladder, the number of articles they write with Russian-speaking colleagues increases (from 3 (Mdn, TEMP) to 8.5 (Mdn, PERM)), but the share of those in their overall number of publications decreases (from 73.68% (Mdn, TEMP) to 40.96% (Mdn, PERM)). Women in higher positions also write more papers with diasporic colleagues than women in lower positions (6.5 (Mdn, PERM) compared to 2 (Mdn, TEMP)), but the proportion of these papers remains approximately the same (41.67% (Mdn, TEMP) and 40.5% (Mdn, PERM)).

This means that seniority has a varying impact on involvement in DKNs depending on gender. Permanent positions typically stimulate the expansion of diasporic networks for men, but not for women, who maintain a few diasporic ties, but do not multiply them. Instead, they actively develop relations with non-diasporic colleagues. Likewise, diasporic connections retain the significance in men's collaboration network as they ascend the academic hierarchy. But for female RCS, the significance of diasporic ties decreases. Advancing to a permanent position does not reduce the contribution of DC to women's publications, while, for men, ascending the academic hierarchy is associated with a decreasing the role of DC. Combining these results, we suggest that transitioning to a permanent position enables male RCS to multiply both diasporic and non-diasporic co-authors, while women in senior positions develop primarily non-diasporic ties, retaining close and productive connections with a few Russian-speaking colleagues.

Effects of Involvement in DKNs: Scientific Output, Productivity, and Career

In the previous section, I showed that diasporic collaboration is widespread among RCS and occupies an important place in their scientific activities. I also demonstrated that involvement in DKNs and their importance depends on gender intersecting with academic seniority and organizational context. Diasporic collaboration is supposed to provide a number of advantages to migrant scholars, but do RCS actually gain from involvement in DKNs and how are these benefits distributed? Comparing RCS who are and are not involved in DC, I analyze several parameters that shed light

upon the benefits RCS receive from DKNs. First, I look at the connection between diasporic collaboration and scientific output (total number of publications (PB)). Second, I examine the association between involvement in a DKN and scientific productivity (PR=total number of publications (PB) / publication period (PD)). Both scientific output and productivity are important indicators of a successful research career and crucial academic assessment and promotion criteria. Third, I explore the link between diasporic collaboration and place in academic hierarchy (temporary vs permanent; ranks from PhD student up to professor), viewing this as an indicator of an academic career.

Scientific output. In general, RCS collaborating with Russian-speaking colleagues produce many more publications (PB) than those who do not collaborate (DC: Mdn=10 vs no DC: Mdn=5[94]). But this positive impact is unevenly distributed, again depending on gender, academic seniority, and organizational context. This pattern does not work for women, RCS in temporary positions, and those in teaching-oriented universities: in these groups, there are no statistically significant differences in the number of publications between those who are involved and not involved in DKNs. On the contrary, DKNs have a positive impact on the scientific activity of male scholars, RCS in permanent positions, and RCS working in research-intensive universities. Thus, men collaborating with the Russian-speaking colleagues publish significantly more papers than those who do not (DC: Mdn=11 vs no DC: Mdn=5) and than women who do (Mdn=8).[95] RCS in permanent positions who are involved in DKNs have a much higher research output (Mdn=22 papers) than those who do not sustain diasporic ties (Mdn=7 papers). RCS employed in research-intensive universities publish significantly more articles when they collaborate with Russian-speaking colleagues (Mdn=11) compared to RCS who do not (Mdn=6). These findings suggest that involvement in DKNs benefits male scientists and RCS in senior positions and in universities highly ranked in computer science, enabling them to considerably increase their scientific output.

Scientific productivity. Involvement in a DKN also enhances scientific productivity (PR=total number of publications (PB) divided by publication period (PD)): post-Soviet scientists collaborating with diaspora colleagues produce more publications per

94 Please see full results supporting the analysis in "Scientific output" section in Table 4 in the Appendix C.

95 U=5687.50, Z=2.12, p=0.0171788, r=0.13

year (Mdn=1.5) compared to those who do not (Mdn=1).[96] This effect persists across all groups of RCS: for male (1.5 (Mdn, DC) vs 1 (Mdn, no DC)) and female scientists (Mdn=1.33 (DC) vs Mdn=1 (no DC)), for RCS in both permanent (Mdn=1.75 (DC) vs Mdn=1 (no DC)) and temporary positions (Mdn=1.5 (DC) vs Mdn=1 (no DC)), working in both research-intensive (Mdn=2.89 (DC) vs Mdn=1.79 (no DC)) and teaching-oriented universities (Mdn=1.44 (DC) vs Mdn=0.8 (no DC)). Thus, when RCS collaborate with diasporic colleagues, they are more productive irrespective of gender, academic seniority, and organizational context. Then why do DC effects on scholarly output depend on these characteristics? The reason is that involvement in DKNs has a differential impact on the publication period (PD) of post-Soviet scientists. Male RCS and RCS working in permanent positions and in research-oriented universities have longer publication periods than others, when they collaborate with Russian-speaking colleagues. But there are no statistically significant differences between women, temporary researchers, and staff at teaching-oriented institutions in this respect (please see calculation results in Table 4). Thus, diasporic collaboration is associated with a longer period of research activity only for some groups (male RCS, senior scholars, scientists affiliated with RI), which, in the long run, results in more publications. One possible explanation is that holding a senior position and working in a RI university environment provide favorable conditions for DKNs, allowing establishment and maintenance of diasporic connections, which, in turn, supports RCS' engagement in research over long periods of time. By contrast, temporary researchers' fixed-term contracts and the conditions at teaching-oriented universities, which do not prioritize publications, may prevent active, long-duration engagement in research. In sum, involvement in DKNs positively affects the scholarly performance of migrant scientists through increasing their productivity and the period during which they actively conduct research. Because of variations in terms of impact on the length of time that scholars publish, the overall effects of DKNs on scientific performance is uneven, considerably benefiting male RCS, scientists in permanent positions, and those working in research-intensive universities.

Position in academia. As I demonstrated in the previous section, RCS involved in DKNs are more productive researchers than those who are not. Some groups of RCS have greater scientific output because diasporic collaborations help them work in the computer science field for longer than they would otherwise. High productivity and output may increase RCS' chances for promotions and career advancement

96 Please see full results supporting the analysis in "Scientific productivity" section in Table 4 in the Appendix C.

in British academia. The question then arises as to whether involvement in DKNs correlates with a high-status academic position? My analysis of the distribution of academic ranks among RCS working at universities (both RI and TO) shows that scientists who collaborate with Russian-speaking colleagues more often work in permanent positions (53.9% vs 35.1%), while those who do not collaborate more often occupy temporary positions (64.9% vs 46.1%).[97] This effect is practically absent among women, but strong for men: more than half of male RCS involved in DKNs occupy permanent positions (56.1%), while the majority of male RCS who do not sustain diasporic ties are on fixed-term contracts (66.7%). Thus, collaboration with Russian-speaking colleagues correlates with permanent, stable positions in British academia for men, but seems to make no difference for women. My assumption is that women prefer to advance their careers and acquire permanent positions without relying on diasporic ties, while for men these ties provide considerable support.

Detailed analysis shows that RCS who do not collaborate with their Russian-speaking colleagues are underrepresented specifically in professor (10.8% vs 22.8%) and lecturer positions (2.7% vs 12.1%) and overconcentrated in PhD programs (45.9% vs 18.4%).[98] This effect is true for universities irrespective of organizational context, but it is gendered. Male RCS collaborating with their Russian-speaking colleagues more often occupy professorial (25.73% (DC) compared to 13.33% (no DC)) and lecturer positions (12.28% (DC) vs 0 (no DC)), while the number of those who do not is high at the PhD level (46.67% (no DC) vs 16.96% (DC). On the contrary, there is little difference in academic rank between women who sustain diasporic ties and those who do not.

Thus, academic seniority again intersects with gender: men involved in DKNs tend to hold high academic positions, especially senior professorial and permanent lecturer positions. The same is not true for women. This may be because diasporic networks help men secure first-tier permanent positions (lecturer) and advance to the highest tier in academic hierarchy (professor). They may have difficulty collaborating with non-post-Soviets, compared to women, who are inclined to employ non-diasporic strategies. Men may also use the opportunities and status their positions afford as favorable conditions to establish and develop diasporic ties, thus relying

97 Please see Table 5.1 in the Appendix C for frequency tables and Chi-square test scores supporting the analysis in this paragraph.

98 Please see Table 5.2 in the Appendix C for frequency tables and Chi-square test scores supporting the analysis in this paragraph.

on them to advance their careers.

In sum, involvement in DKNs correlates to various positive effects on RCS' scholarly activities: high productivity, long duration of employment in computer science research, increased scientific output, and advancement to stable, high-status academic positions. But these benefits, other than productivity, do not reach all RCS, depending on gender, academic seniority, and organizational context. Thus, diasporic collaborations provide a considerable increase in overall research output to male scientists, RCS working in permanent positions, and those in research-intensive universities. Involvement in DKNs also helps male RCS to obtain permanent positions and advance to the rank of professor, but it makes no difference for women. Thus, diasporic collaboration mostly benefits groups of migrant scientists who are already privileged: male scientists, scholars on long-term contracts, and researchers employed in high-ranked universities. Involvement in DKNs is particularly advantageous for male RCS, as it has significant positive impacts on both their research and careers.

Explaining Patterns and Effects of Diasporic Collaboration: Structural Advantages and Disadvantages

As I demonstrated above, diasporic collaboration makes a considerable and positive contribution to RCS' research, though the extent of the contribution depends on the intersection of gender, academic seniority, and organizational context. Why are some RCS more involved in diasporic collaboration and why do some obtain more benefits from that collaboration than others? I argue that diasporic ties RCS sustain constitute diaspora knowledge networks characterized by a certain structure of relations that produce certain network effects. Migrant scientists with more connections and better structural positions than others receive more advantages in terms of knowledge flows from DKNs. To determine the position of RCS in networks of diasporic ties and trace the impact of gender, academic seniority, and organizational context, I compared centrality measures for male and female RCS across different hierarchical positions and organizational contexts.

Gender: Men are More Central in Networks. Degree (the sum of connections of a node) and weighted degree (the sum of the weights of the node's connections) are considered simple, yet effective means of assessing a node's influence in a network.

Male RCS have a higher degree (M: Mdn=3 vs F: Mdn: 2)[99] and a higher weighted degree (M: Mdn=18 vs F: Mdn=10) than women. This means Russian-speaking men have more diasporic ties than women and these ties are denser: as a result, men are more important and more visible in DKNs than women are, they are more recognized by their diasporic colleagues, and better positioned in terms of knowledge flows.

Women also have lower betweenness centrality (M: Mdn=0, IQR=9.25-0 vs F=Mdn=0, IQR=0-0) than men. This means that male RCS more often act as a bridge connecting network members and have more power in controlling and influencing information flows. But there are no statistically significant differences in other centrality measures. Minor gender discrepancies in eigenvector centrality (M: Mdn=0.019 vs F: Mdn=0.012) imply that men and women are equally linked to important, well-connected nodes. Similar scores in closeness centrality (M: Mdn=0.56 vs F: Mdn=0.57) indicate that men and women are located approximately the same distance from other network members. In sum, male RCS are better positioned in DKNs than women because they are more active in diasporic collaboration, sustain more and denser ties to other diasporic co-authors, and because they more often enjoy structural advantages of a broker.

Organizational Context. On average, RCS working in research-intensive universities occupy a more central position in DKN than RCS in teaching-oriented institutions. Scholars affiliated with RI have a higher degree of betweenness and eigenvector centrality than TO scholars. The differences in other metrics are not statistically significant. This means that scientists in RI institutions have a greater number of diasporic connections, are located closer to powerful network members, and more often act as brokers than those in TO universities. The impact of organizational context is strongly gendered. Thus, male RCS working in RI occupy the most central places in DKNs, somewhat more central than males in TOs, but are much better positioned than females in both RIs and TOs. Male RCS affiliated with TO institutions are better connected than females in TOs and somewhat more central than females in RIs. Thus, men's positions are more central and powerful in both RI and TO universities than women's, who are structurally disadvantaged in comparison to men in both contexts, but in a different way.

99 Please see Tables 6.1, 6.2, and 6.3 in the Appendix C for full results of my comparative analysis of centrality measures.

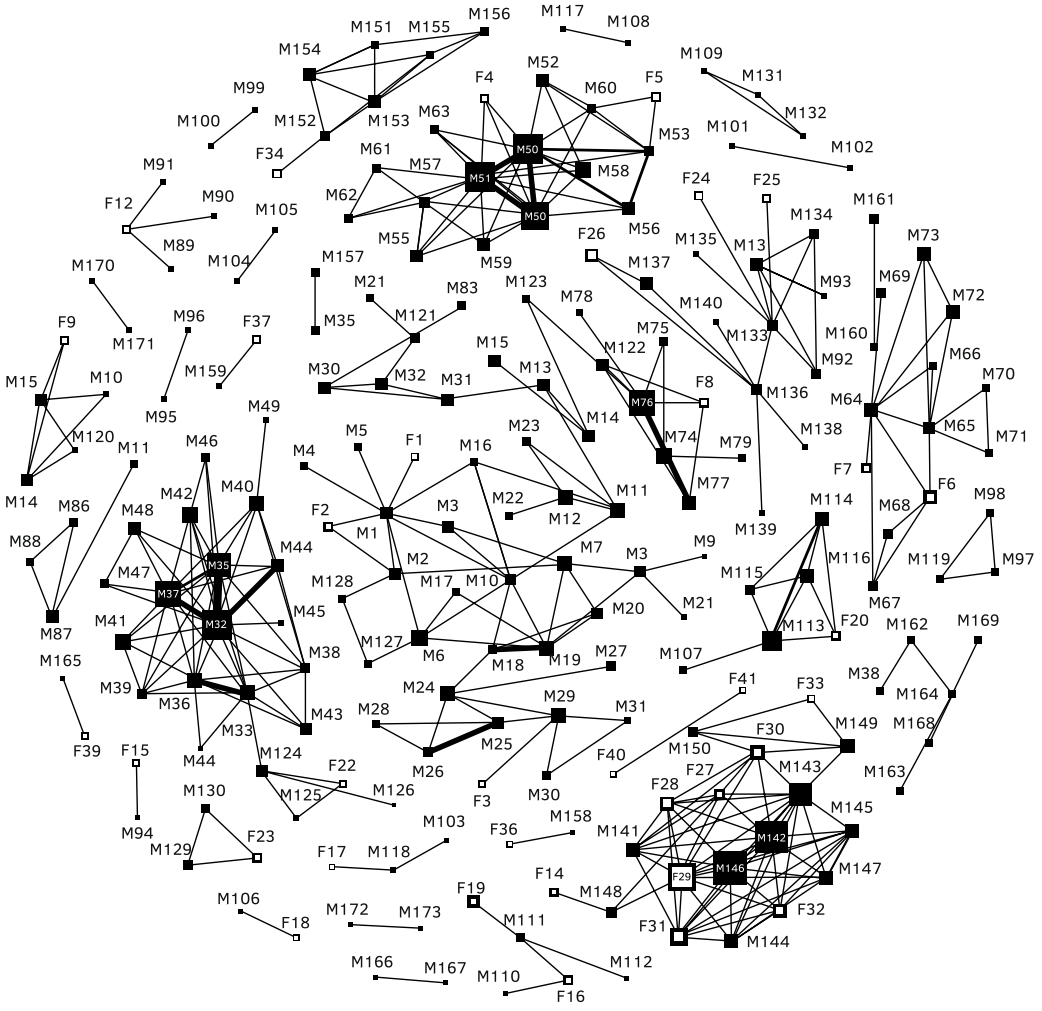

Figure 3. *Women's and men's position in DKNs*.[100]

In RI universities, men surpass women in terms of having more, denser connections and being more closely tied to other influential DKN members.[101] Men have a higher degree (M: Mdn=3 vs F: Mdn=2), weighted degree (M: Mdn=18 vs F: Mdn=10) and eigenvector centrality (M: Mdn=0.021 vs F: Mdn=0.012) than women. But male RCS do not have the ties-brokering advantages, since the differences in between-

100 Notes: F nodes represent women, M nodes - men, size of the node represents the number of publications of the scientist (output), thickness of the edge - the number of co-authored papers (strength of the tie).

101 Please see the full data supporting this paragraph in Table 6.2 in the Appendix C.

ness centrality are not significant. In TO universities, women have a lower degree (F: Mdn=1 vs M: Mdn=2), betweenness centrality (F: Mdn=0, IQR=0 vs M: Mdn=0, IQR=2.5-0) and eigenvector centrality (F: Mdn=0.005 vs M: Mdn=0.009) than men, but the gender difference in weighted degree is not statistically significant. This indicates that women in TO who engage in a substantial amount of diasporic collaboration work with a few close colleagues, but have hardly any influence in the larger network or any control over the flow of knowledge. In contrast to men, women have fewer connections, are more rarely linked to well-connected DKN members, and do not benefit from acting as broker between their diasporic co-authors.

Academic Seniority and Position: Men's Centrality Increases with Career Advancement. RCS' positions in DKNs also depend on their place in academic hierarchies. RCS in permanent positions are more central than RCS in temporary positions. The former have a higher weighted degree (20 vs 12 (Mdn)), closeness centrality (0.69 vs 0.5 (Mdn)), and betweenness centrality (Mdn=0.1, IQR=11.09-0 vs Mdn=0, IQR=0.33-0) than the latter. Though they have similar number of diasporic ties, senior RCS have denser connections, more often act as brokers, and are located closer to other network members. However, the impact of academic rank is not universal for all RCS, but is highly gendered.

Men in senior positions are the most central nodes in DKNs:[102] they surpass women in senior positions (higher degree, betweenness, and eigenvector centrality), as well as men and women in junior positions, though men in temporary positions are more central than women in senior positions (higher degree and eigenvector centrality) and than women in temporary positions (higher degree and weighted degree). In addition, there is a wider gap in centrality between men on permanent and temporary positions (difference in degree, weighted degree, and betweenness centrality), than between women (only weighted degree). Thus, the effect of gender is a more powerful determinant of influence and power in the networks than seniority is. At the beginning of academic careers, gender differences are less pronounced than they become later on. Among researchers in temporary positions, men surpass women in degree (M: Mdn=2 vs F: Mdn=1) and weighted degree (M: Mdn=17 vs F: Mdn=6), but there are no statistically significant differences in other metrics. Men in permanent positions have a higher degree (M: Mdn=3 vs F: Mdn=1.5), but also much higher betweenness centrality (M: Mdn=1.5 vs F: Mdn=0) and eigenvector cen-

102 Please see full data for this paragraph in Table 6.3 in the Appendix C.

trality (M: Mdn=0.011 vs F: Mdn=0.005). These figures indicate that at the start of a scholarly career, male RCS are not much more central in DKNs than females, though they already have more and denser diasporic connections. But as men progress to permanent and independent positions in academia, they expand and develop their diasporic connections while attaining structurally better positions in the networks, increasing their influence and control over information flows. In contrast, women maintain few diasporic connections and do not acquire any structural advantages in terms of links to influential members in DKNs or becoming brokers, facilitating communication between colleagues who otherwise do not have access to each other. Women only increase the density of their diasporic collaboration, but it still remains behind men's.

In sum, my analysis of centrality measures demonstrates that RCS' position in DKNs is determined mostly by gender, intersecting with academic rank and organizational context. RCS in permanent positions and working in research-intensive universities are more central than RCS working on fixed-term contracts and in teaching-oriented institutions. But male scholars are better connected and better positioned in the network in different contexts and position levels, while women are structurally disadvantaged. This finding perfectly correlates with my earlier results and confirms that migrant scientists' ability to obtain benefits from involvement in DKN largely depends on their structural position in the network. It explains why men particularly enjoy the benefits of diasporic collaboration. Deeper involvement in DKNs, maintenance of more and denser diasporic ties, along with higher centrality and influence in the network than women, enables them to benefit from knowledge and information flows, which in turn enhances scientific productivity and output and increases their chances of having successful academic careers. In this section, I also traced the gendered impact of academic seniority, revealing that the positive effect of seniority on men's involvement in and gains from DKNs is connected to their much higher centrality. However, my earlier results regarding organizational contexts were only partially confirmed. Men turned out to be more central than women in both research-intensive (RI) and teaching-oriented (TO) universities, while women in RI proved to be at more advantageous position than women in TO, despite the fact that the latter maintain a substantial level of diasporic collaboration. Thus, conditions in TO institutions are not as favorable to women's involvement in DKNs as supposed.

Conclusion

In this chapter, I explore the diaspora knowledge networks of Russian computer scientists who are migrant scholars in British academia and the role such networks play in their research activity. Based on comprehensive representative empirical data, I identify diasporic collaboration ties and separate them from other professional connections, showing their distinctive character and significance. Systematic quantitative analysis of RCS publications and co-authorship ties reveals that Russian-speaking scientists maintain a substantial level of diasporic collaboration, which occupies an important place in their scientific research. I also demonstrate various positive effects of these collaborations: enhancing scientific productivity, prolonging the period of time during which scholars conduct research, increasing overall scientific output, and stimulating career development. Finally, I show that the diasporic ties of RCS form DKNs as a network with a certain structure, where the positions of individual migrant scientists determine their capacity to capitalize on the network's positive effects. Thus, I prove that DKNs exercise considerable influence on the scientific performance of migrant scholars and play an important role in the knowledge exchange and production processes in which they are involved. I empirically demonstrate that DKNs function as an invisible college, facilitating information circulation and knowledge generation, at a time when migrant scholars find themselves in increasingly internationalized academic contexts and culturally diverse scientific communities.

The novelty of my study is treating migrant scientists as a heterogeneous population characterized by internal divisions, which are rooted in unequal status and positions. Undertaking a multilevel comparative analysis, I demonstrated that involvement in DKNs and their effects on scientific research are not the same for all post-Soviet computer scientists, but rather largely determined by gender, intersecting with academic seniority and organizational context. Gender proved to be the most powerful factor, which is due to male scholars' advantageous position in the network of diasporic ties. Male RCS are more actively involved in DKNs, having more diasporic collaborators and publishing more papers with them, which makes their scientific contribution greater than women's. Only in teaching-oriented universities do women maintain a similar level of diasporic collaboration as men. But, even in those environments, they remain structurally disadvantaged. Meanwhile, men are better positioned in both research-intensive and teaching-oriented universities. Men also surpass women in terms of amount of diasporic collaboration and their positions in the network, whether they hold permanent or temporary positions. Seniority brings them an increased number diasporic ties and greater influence in the

network compared both to junior men and to women. Therefore, men enjoy maximum gains from DKNs, including increased scientific output and career advancement, while women only benefit from enhanced productivity, without the ability to properly capitalize on it. Thus, a DKN is a scientific collaboration network stratified by gender, intersecting with positions in academic hierarchy and organisational context. Diasporic affinity does not help mitigate gender discrepancies and other divisions, which means that DKNs operate like regular scientific networks built on customary academic inequalities and hierarchies.

My study contributes to several branches of scholarly literature. The first is diaspora knowledge networks (Meyer and Wattiaux 2006; Kuznetsov and Sabel 2008) and transnationalism research on highly skilled migrants (Jonkers 2010; Yang and Welch 2010; Chen and Koyama 2013). I show that diasporic ties encompass various connections across origin and different destination countries, proving that diasporic ties within the destination country are more significant than those outside it and they play a major role in the scientific activity of post-Soviet scientists. This finding contrasts with and demonstrates the limitations of earlier studies that rely on a brain drain/gain perspective and focus on transnational destination-home country connections as the most important for knowledge flows. My chapter also develops these branches of research by not engaging in transnational level analysis but rather focusing on individuals, revealing the importance of diasporic connections for migrant scientists themselves, for their research and careers. Second, in this respect, my chapter develops research on the collaboration patterns of migrant scholars (Wagner 2014; Tanyildiz 2008; Karaulova 2016; Antoschyuk 2019), using statistically sound evidence to show that diasporic collaboration positively affects scientific research, knowledge production activities, and even career development. Third, my study contributes to the literature on gender in academia and scientific collaboration networks (Larivière et al. 2013; Belle et al. 2014; Ghiasi et al. 2015), revealing that gender inequality pervades and structures collaboration between scientists of common origins similarly to other academic collaboration relations. Thus, the hypothesis that compared to the general state of gender inequality in academia there is greater gender balance among foreign-born scientists who find themselves in common migrant situation and share common difficulties in the destination country is not confirmed. Even among migrant scientists united by common cultural identity and heritage, men are privileged and gain more from participating in DKNs, while women are not able to enjoy the full advantages of diaspora networks. In addition, a particular gendered effect of seniority was identified, i.e., encouraging diasporic collaboration and increasing influence in the network for men, but not for

women, which contributes to research on "pervasive and persistent relationships between gender and full academic rank" (Fox 2020, 1005). What gives rise to the gendered patterns in diasporic collaboration? How are the gendered structures of DKNs formed and sustained? These questions are for future research that would complement and elaborate my study's findings.

A shortcoming of my study is the intentional exclusion of non-diasporic ties from analysis. I did this to enable detailed examination of diasporic collaboration and processes occuring inside DKNs, though Russian-speaking scientists could be potentially interconnected through non-diasporic colleagues. The role of non-diasporic ties and their influence on DKN effects could be a productive topic for future research. Second, the chapter focuses on individual-level effects of DKNs, but its wider consequences for universities, scientific communities, and national research and innovation systems still need exploration. The present study yields the hypothesis that British academic contexts, ruled by assessments and ranking systems that stimulate research competition among institutions, departments, and individual scholars shape DKNs as scholarly collaboration networks. But how in particular do organizational and national contexts impact DKNs, their formation and structure, and why? These questions are beyond the scope of the current study, but future research could address them. Third, the influence of DKNs on the UK national context deserves a separate enquiry. DKNs make a considerable contribution to the scientific activity of migrant scholars, enabling them to generate many more publications than they would produce otherwise. DKNs probably also contribute to national scientific output, supporting the UK's reputation as a worldwide leader in scientific research. As DKNs develop partly in response to "publish or perish" pressure, they may unwittingly adopt the neoliberal logic of British academia and thus support this highly competitive system. Future studies might explore and clarify these hypotheses.