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# Social networks and resilience in emerging labor markets

Paola Tubaro\*

## Abstract

The recent emergence of digital platforms as labor market intermediaries disrupts collective work practices, fostering fragmentation and individualized sub-contracting. In these environments where isolation dominates, how do social networks operate, and how do they support social resilience? And how can we, as researchers, apprehend them? To address these questions, this chapter reviews insights from socio-economic studies of networks, discusses their applicability to platforms, compares and contrasts them to existing evidence on platform work. The analysis confirms that overall, technology-enabled platform intermediation restrains sociability and limits interactions, but specific cases where networking has been possible highlight the fundamental advantages it may have for workers, and suggest directions for future research and policy action.

## Keywords

Labor markets, digital platforms, decent work, economic networks, formal/informal networks, multi-level networks.

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## **Introduction**

Labor relations are under a sea change. COVID-19 has caused massive lay-offs while also enabling an unprecedented “great work-from-home experiment” (ILO 2021a). Debates about the “future of work” emphasize technology-enabled mobility and flexibility, but also job insecurity, vanishing social protection, and fears of automation-induced unemployment. The pandemic has accelerated a trend which was already under way, propelled by digital platforms as emergent intermediaries for contingent jobs.

Platforms leverage data and algorithms to coordinate workers and clients/employers in real time, for on-demand missions or tasks that can be paid by piecework and do not require long-term commitments. These non-standard earning opportunities span multiple sectors, from delivery and transportation to data entry, translation and coding. Formally, platform workers are independent sub-contractors, not salaried employees, though their status is disputed (Prassl 2018).

If organizations, or workplaces, are the social spaces in which most of the production and distribution of resources take place (Tomaskovic-Devey and Avent-Holt 2019), then the re-organization of labor through platforms will have momentous consequences on economic systems, the labor/capital power balance, and ultimately social stratification. This chapter investigates the role of social network research in studying these transformations, and ideally in sustaining workers’ social resilience. After defining the scope of analysis and identifying a relevant notion of resilience, I review the network analysis literature on labor, and highlight the parts of it which are best suited to effectively venture into these barely chartered territories. Having shown that technology-enabled platform intermediation restrains sociability and limits interactions, I present cases where networking has nevertheless occurred, potentially supporting resilience through the fundamental advantages it brings to workers. I then propose an agenda for future network research.

## **Platforms, resilience, and decent work**

About 8.6% of the European working age population practice platform labor at least a few hours every week, and 1.4% do this as their main source of income (Urzi Brancati et al. 2020). The phenomenon is growing fast: the past decade has seen a five-fold increase in the number of digital labor platforms (ILO 2021b), and the COVID-19 health crisis has triggered many new worker registrations (Tubaro and Casilli 2022a). More importantly, platform labor exemplifies a set of tendencies that pervade the economy as a whole, bringing them to the extreme and thus making them more clearly visible. It is a lens through which broader changes can be understood, and their implications anticipated.

To analyze platform work, it is useful to distinguish its two main types: those where intermediation occurs online but work is performed offline (for example delivery and urban transport) and those where both intermediation and work are performed remotely. The latter trade the non-manual data work that fuels the knowledge economy, ranging from qualified professional freelancing (designing a company logo, writing press releases) to semi-professional or unspecialized “micro-tasking” (labeling objects in images, recording utterances, transcribing short audio clips). Though less widely known, these online-only platforms enact and expose to view profound socio-economic changes. First, these platforms are similar to, and can shed light on, telework, because their workers can be anywhere provided they have a device and an internet connection. The difference is that platform-based remote work is unprotected – with remunerations subject to market volatility, and no guarantees of workplace safety or social protection. Second, the study of especially micro-tasking platforms unveils hidden aspects of automation. Simultaneously executed by myriad contributors, micro-tasks provide data for the algorithms that sustain the production of artificial intelligence (Tubaro et al.

2020), in a paradoxical loop where human workers produce the automated solutions that other humans perceive as a threat to their jobs. Third, location-independent platform labor exemplifies the consequences of outsourcing, of which it is an extreme instance: it is largely tradable across borders, exposes workers to international competition that drives remunerations down, and may induce night working hours or overtime to keep pace with clients in diverse time zones (Graham and Anwar 2019).

The International Labor Office (ILO 2021b) worries about the challenges that platforms pose to its standards of “decent work”, an expression that sums up the aspirations of today’s people in their working lives, comprising for example fair income, workplace safety, social protection and personal development. The notion of social resilience thus comes to the fore, interpreted as the “capacity of groups of people bound together in an organization, class, racial group, community or nation to sustain and advance their well-being in the face of challenges to it” (Hall and Lamont 2013:2). If well-being is taken to mean decent work, then resilience is the capacity of platform workers to reach these aspirations. It does not necessarily mean conservation of the *statu quo*: a hypothetical return to classical salaried employment may not suit everyone. The issue, then, is to identify transformative pathways to resilience, capable of preserving the conditions for decent work without losing the advantages that technology offers, and respecting individual diversity. The stakes are high, as the ultimate outcomes of these processes may not only affect platform workers narrowly defined, but the very definition of decent work, the expectations that come with it, and eventually its application throughout the whole economy.

### **Social networks in “classical” vs platform-based labor markets**

Labor is inherently a social process, defined by the employer-employee relationship while involving collaboration between co-workers and interactions with clients, suppliers and other stakeholders. These relationships, within and across organizational borders, define the core mechanisms through which resources are distributed and social hierarchies are defined. Accordingly, social network analysis has tremendously enhanced our understanding of labor markets. If the seminal article of Granovetter (1973) is remembered for its famous claim that weak ties matter more than strong ties, at a more basic level it was also the first to provide empirical evidence that social relationships affect job search – an insight that has been confirmed several times afterwards. However, this literature has largely taken for granted the “classical” world of work, where the process of search on the labor market stops after a contract is signed and employment starts. At this point, any socio-economic outcomes depend on other types of networks, construed as intra-organizational sets of ties of, say, friendship, advice or collaboration between colleagues (Lazega 2001). Their function differs: rather than helping the individual navigate the market, they support the formation of organization-specific, possibly tacit, knowledge through the sharing of experience and expertise, and may facilitate collective action.

These insights apply imperfectly to platform labor, where workers are typically classified as independent providers rather than salaried employees, and the search process never stops: workers must simultaneously, and incessantly, execute the assignments they have already secured, and bid for new ones. In this respect, they call to mind entrepreneurs, who also have to continuously win new contracts. To what extent can extant research on entrepreneurs’ (rather than employees’) networks be of help here? Numerous studies show that entrepreneurs form alliances (Powell et al. 1996) or even just informal, personal relationships (Ingram and Roberts 2000) to access know-how, techniques and competencies from others. Information shared through networks is key to assessing risks, for example when introducing a new production process, or to identifying potential partners such as investment banks and public institutions (Lazega 2020:163-165).

The difference is that platform workers are tiny one-person enterprises, without a team backing them. In the words of Schor (2020:48), “platform earners are not only independent in a legal sense;

they also typically do their work independently of other workers”. According to Lehdonvirta et al. (2019) the main organizational innovation that platforms have brought about, is the extension of outsourcing to individuals, removing the informational bottlenecks that previously limited it to (multi-person) firms. Together with technology-enabled extreme fragmentation of labor (Casilli and Posada 2019), individualized sub-contracting explains why teamwork (Pauksztat, this volume, 2022) is not normally expected on platforms. In micro-tasking, the common requirement that each IP address should correspond to a unique user, goes as far as excluding co-work with household members. Isolated, workers become more dependent on the organizational design or technical infrastructure of the platform, which may have exclusionary or exploitative effects – for example when payment processing fees are withdrawn from remunerations.

If formal alliances are excluded, what about informal relationships? Even in these highly digitized worlds, neighborhoods and places play a major role (Campana, this volume, 2022). The entrepreneurs studied in the literature are typically co-located, either permanently in, say, industrial districts, or temporarily in trade fairs (Panitz and Glückler 2017). Platform workers in delivery and ride-hailing services also benefit from co-location, as they routinely bump into each other in city spaces, and can transform these occasional encounters into opportunities to socialize (Tassinari and Maccarrone 2019). In contrast, the absence of physical sites at which to meet largely explains why online-only freelancers and micro-taskers “mostly interact as *competitors rather than collaborators*” (Graham and Anwar 2019). Precisely because it can be performed remotely, online labor involves vast masses of the world population, resulting in oversupply, interchangeability of individual workers, and consequently competition on price. In this respect, it is useful to recall a theoretical result of network economics, which specifies how market competition forms shape incentives to create collaboration ties. There will be no tie under price competition, because pressure to lower prices is too great and any costs that ties involve cannot be recovered (Goyal and Joshi 2003).

Lack of opportunities to form peer-to-peer ties may be at least partly offset by advantages deriving from relationships with people outside the world of platforms. Entrepreneurs are known to benefit from the resources embedded in their broader social networks. For example their family may provide advice especially in the preliminary phases of starting a new business (Greve and Salaff 2003). Can platform workers equally benefit from the human environment that surrounds them, for example their family or neighborhood? An established result in the networks literature is that disadvantaged people have smaller, less resourceful networks than the more privileged, and can thus obtain fewer benefits from these networks (Lubbers, this volume, 2022). Platform laborers are often in this situation: Casilli et al. (2019) show that persons living below the poverty line are over-represented among French micro-taskers. It is a vicious circle, as economic necessity is often the reason for starting platform labor in the first place.

### **Economic networks**

A core insight of the (classical) social networks literature is that informal relationships, spontaneously created irrespective of company charts, are sometimes better suited than official structures to attain relevant socio-economic outcomes (Krackhardt and Hanson 1993). Formal ties have been de-emphasized in comparison, but some of them, especially the employment contracts that link individuals to firms, are particularly relevant to compare conventional firms to platforms. Building on the seminal contribution of Breiger (1974) on the duality of persons and groups, formal ties can be framed as affiliations, and modeled as “bipartite” networks. It can be said that affiliation ties materialize once the individual has moved from job market search to a position in a firm. This representation can be refined to view organizations as systems with individuals nested within them, possibly including substructures such as teams, functions, or divisions. In contrast to the informal, “social” ties of, say, advice or friendship, these ties are “economic” because of the transactions they

underpin (such as payment of a wage against labor power). The emerging subfield of multi-level network models (Lazega and Snijders 2016) analyzes jointly the effects of all these networks: social ties (say, advice) between individuals, economic ties (say, employment contracts) between individuals and organizations, and inter-organizational ties (say, for input supply), which are also economic insofar as they are based on contracts.

But by definition, platform workers are not employees. The agreements that link them to platforms are mere Terms of Use rather than employment contracts. They are “weak” affiliation ties that can be terminated easily and unilaterally, do not usually involve any direct control, do not offer any integration into teams, and do not explicitly refer to labor regulations. They still organize the transactions to which workers take part, set standards, define unacceptable behaviors and sanctions. Workers may have one or more such ties, depending on the number of platforms they use.

This does not mean that the affiliation ties that link workers to platforms are all equally weak. In the case of micro-tasking, Tubaro (2021) highlights a difference between platforms that function as lean intermediaries in decentralized marketplaces, such as Amazon Mechanical Turk or Upwork, and platforms that form part of complex production chains with multiple layers of sub-contractors and suppliers, such as Appen and Oneforma. In the former, affiliation ties are extremely weak and workers are largely left to their own devices. The latter still involve no proper employment relationships, but generate economic (individual-organization and inter-organizational) ties that do link workers to the platform that contracted them out, the final client who receives the output of their work, and various subcontractors who provide, for example, technical infrastructures, payment services, or day-to-day management. In these cases, manifold intermediaries replace employment relationships, taking on management roles akin to conventional companies. Tubaro and Casilli (2022b) describe the case of a French micro-worker recruited by a Japanese selector on behalf of a Chinese platform serving an American customer, and supervised by an Italian company subcontracted by the Spanish subsidiary of the platform. Though non-salaried, this platform worker had access to some support services, production tools and supervision. She traded some of the autonomy of “Turkers” against more stable flows of work and relatively better pay.

In short, platforms’ reliance on technologies that enable individualization of assignments and fragmentation of tasks, makes the formation of peer-to-peer social ties difficult by design. This is especially true of location-independent labor platforms. Also by design (lack of proper employment contracts), economic ties are weak, though to a variable extent. Decades of social and organizational network research suggest that there will be substantial negative effects. Besides a sense of isolation (Casilli et al. 2019), workers will be deprived of opportunities to access the knowledge of their co-workers and learn from them. They will also lack benchmarks to compare themselves to, to define their roles, and to position themselves in the productive system of which they are part. How do they react? What forms of resilience attempt to fill the gaps left open by platform architects?

### **Timid forms of resilience**

Despite these obstacles, there are discussion forums, blogs and web pages where platform laborers talk about their experience and share tips with peers. Location-based platform workers (like couriers) have benefited from web forums and social media to organize and demand better conditions (Ticona et al. 2018). Location-independent workers have been less able to organize, but Wood et al. (2018) show that in some African and Asian countries, they have online communities where they meet their peers. But who created these online communities? Rarely platforms, some of which actively discourage them: Casilli et al. (2019) describe a French micro-tasking platform that exerted significant control over its workers’ forum, eventually deterring participation. Some of these online communities were created by workers, for example the Reddit sub-forums of qualified freelancers analyzed by Álvarez De La Vega et al. (2021). In other cases, they are the result of activists’ initiatives,

like Turkopticon, a system devised to allow workers of the micro-tasking platform Amazon Mechanical Turk to rate their relationships with customers, and to engage one another in mutual aid (Irani and Silberman 2013).

What network structures underpin these online conversations? A team at Microsoft Research used network-scientific tools to painstakingly reconstitute the communication ties of Amazon Mechanical Turk workers (Yin et al. 2016). Although only 13.4% of these workers turn out to be connected, they actually operate within a peer social network, far from the image of full independence and autonomy commonly associated to them (Gray et al. 2016). Connections, so claim the researchers, help these workers manage the administrative overhead associated with platform labor, find remunerative assignments, and recreate the social support typical of conventional company environments.

If this is a form of resilience, what conditions facilitate its emergence? The network that the Microsoft researchers observe is enabled by the online forums that activists created for the highly mediated case of Mechanical Turk. Most other platforms lack an equivalent. The opportunity to connect online seems to depend on the power balance between platform management and workers/activists. Connectedness goes hand in hand with agency – or lack of it.

What about the resources that workers may access from their non-platform networks? Many of the French micro-taskers interviewed by Casilli et al. (2019) had not even mentioned this activity to their friends and relatives. In contrast, Wood et al. (2019) do observe instances of helpful offline ties in their study of location-independent freelancers in Southeast Asia and Sub-Saharan Africa. Many of their participants were first introduced to platforms by friends, while others shared online work opportunities with friends and family. Their most interesting finding is re-intermediation, the practice of highly-rated workers to win more assignments than they can manage, and re-outsource them to others. To do so, they often utilize their “local interpersonal networks made up of family, friends and local colleagues” (Wood et al. 2019:940). Compared to commercial hiring of strangers, this strategy minimizes the risk of mistakes, which would result in costly loss of reputation.

Similarly, Gray and Suri (2019:128) report the case of an Indian couple sharing tasks, so that “whoever they think has the best skill set for the task at hand can take the job”. And, while re-intermediation is a for-money (albeit often informal) transaction, local connections may also provide resources on a non-monetary, gift basis. In their study of African freelancers, Anwar and Graham (2020) mention a woman who confides in her network of friends who could help if, say, her internet went down.

These are particularly brave forms of resilience, which often involve violation of platforms’ Terms of Use. If as mentioned above, not even sharing work is normally authorized, re-intermediation is unthinkable. This is because these practices would jeopardize platforms’ information systems based on reputation, as they would result in assignments being actually done by workers who are not those to whom clients entrusted them. But which workers take the risk? The amount of available research is limited, but a pattern begins to emerge. In lower-income countries, lack of alternatives and sometimes poor technical conditions (like power cuts and slow internet connection) increase the appeal of re-intermediation and work-sharing. In richer countries where platform labor is often a side activity, most users do not bother, and avoid risky solutions. Unequal power relationships, notably in terms of workers’ degree of financial dependence on the platform, deepen the gaps between workers in different parts of the world.

Economic networks can exhibit a form of resilience that depends less on workers’ deliberate initiative, and more on overall structures of production. As mentioned above, some platforms are not mere intermediaries but lead firms in global supply chains. These stronger-than-usual formal ties inevitably include a human element – as any form of “relational work” (Bandelj 2020) that deploys sociality as part of intentional efforts towards productive or monetary goals. The above-mentioned French micro-worker who was part of a complex international supply chain was aware of its structure

and had personally been in contact with many of the involved actors. She was particularly happy with her day-to-day manager, always ready to assist. Overall, she enjoyed more support, and more human contact, than the typical micro-tasker on a Mechanical-Turk-like platform. In sum, formal affiliation ties have important effects in the world of platforms. Depending on their relative weakness (or the extent to which a platform resembles a firm), they may or may not embed workers in a production structure that reveals the collective efforts behind it, gives meaning to their activity, and underpins at least minimal human relational behaviors.

### **A research agenda for decent platform labor**

Despite its embeddedness in twentieth-century labor standards, the socio-organizational networks literature has revealed novel and relevant facets of the technology-enabled disruption that platforms have brought about. Leveraging its key insights has allowed identifying the obstacles against peer networking on platforms, the factors that limit workers' reliance on their offline local ties, and the powerful effects of formal (economic) ties. The emerging picture is bleak, with platform intermediation restraining sociability and limiting interactions. But there are encouraging instances of resilience, when favorable conditions are met – in terms of the power balance between platforms and workers, and of the formal organizational structures in place. As of today, these are niche cases that involve small fractions of the platform-laboring population.

To harness the power and potential of social network analysis, more research is needed. First, there is an urgent need for studies of online peer networks of platform workers in different settings. The only effort to systematically map the social ties of online workers of a single platform, Mechanical Turk, is the above-cited one by Gray et al. (2016) and Yin et al. (2016). They applied methodologies and insights that had been originally developed to study internet usages more generally, or what some have qualified as “free” labor (Casilli 2019). Internet research has often showcased users' capacity to network and self-organize even in adverse situations. These methods can still be useful to creatively explore the extent to which workers of not only Mechanical Turk, but also other platforms, may be forming hidden or covert networks beyond official rules. Technically, this may be done through surveys with name generators or with web scraping, possibly accompanied by observations of these groups.

Second, local collaboration practices such as account-sharing, re-intermediation, and informal joint work are still very poorly known. They can be more extensively researched with qualitative observations of workers' day-to-day routines, together with interviews that include maps of their personal networks (Ryan et al. 2014). One issue may be workers' resistance to answer questions on these topics, as breach of platforms' rules, if discovered, may lead to their account being closed. It is therefore especially important for researchers to put in place strong confidentiality-protection measures in order to gain the trust of participants.

Third, even if future research reveals more informal peer networking, or more unofficial offline collaborations, weak economic ties due to individualization of contracts remain distinctive features of platforms. In the case of micro-tasking, it has been found that varying degrees of formal tie weakness differentially affect working conditions and pay (Tubaro 2021). It remains to be seen whether similar structures are observed in other types of platform work, and what are their effects on individual and collective productivity. In multi-level network perspective (Lazega and Snijders 2016), this requires mapping, as precisely as possible, ties at individual, organizational, and individual-organizational levels. To do so, company observations should be done for each relevant platform, using existing databases and published sources (like annual reports) to reconstitute their supply network of contractors and clients, combined with surveys of workers.

Finally, work is needed to convert these research findings into actionable proposals and policy recommendations: how to foster “decent work” through better networking among platform laborers?



Enhancing socialization would let them reap the benefits of networks, and pave the way toward forms of labor organization, like those that have already been partly deployed among location-dependent platform laborers such as drivers and couriers (Graham and Shaw 2017). Even when all interactions occur online, it is clear that activists' initiatives to create web-based forums have had decisive effects in creating contact opportunities, and might in future help establish common understandings and expectations in terms of working conditions and remunerations – as a basis to reclaim “decent work” standards. If successful, these forms of networking may also spill over to teleworkers more generally. Diffusing knowledge about these emerging labor markets, the workers that populate them, and the online devices that some of them have put in place to reach out to others, is a first step in this direction.

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## References

- Alvarez De La Vega Juan Carlos, Marta E. Cecchinato and John Rooksby 2021. “‘Why lose control?’ A study of freelancers’ experiences with gig economy platforms.” *ACM CHI Conference on Human Factors in Computing Systems* 2021.
- Anwar Mohammad A. and Mark Graham. 2020. “Hidden transcripts of the gig economy: labour agency and the new art of resistance among African gig workers.” *Environment and Planning A: Economy and Space* 52(7): 1269-1291.
- Bandelj Nina. 2020. “Relational work in the economy.” *Annual Review of Sociology* 46: 251-272.
- Breiger Ronald L. 1974. “The duality of persons and groups.” *Social Forces* 53(2): 181-190.
- Campana Paolo. 2022. “Criminal networks and social resilience.” This volume.
- Casilli Antonio A. 2019. *En attendant les robots: Enquête sur le travail du clic*. Paris: Seuil.
- Casilli Antonio A. and Julian Posada. 2019. “The platformization of labor and society.” Pp. 293-306 in *Society and the Internet. How Networks of Information and Communication are Changing Our Lives* (second edition), edited by Mark Graham and William H. Dutton. Oxford: Oxford University Press.
- Casilli Antonio A., Paola Tubaro, Clément Le Ludec, Marion Coville, Maxime Besenval, Touhfat Mouhtare and Elinor Wahal. 2019. “*Le micro-travail en France: Derrière l’automatisation, de nouvelles précarités au travail?*” Paris: Digital Platform Labor (DiPLab) project.
- Goyal Sanjeev and Sumit Joshi. 2003. “Networks of collaboration in oligopoly.” *Games and Economic Behavior* 43(1): 57-85.
- Graham Mark and Mohammad A. Anwar. 2019. “The global gig economy: Towards a planetary labour market?” *First Monday* 24(4), DOI: 10.5210/fm.v24i4.9913.
- Graham Mark and Joe Shaw, eds. 2017. *Towards a Fairer Gig Economy*. London: Meatspace Press.
- Granovetter Mark. 1973. “The strength of weak ties.” *American Journal of Sociology* 78(6): 1360-1380.
- Gray Mary L. and Siddharth Suri. 2019. *Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass*. San Francisco: Houghton Mifflin Harcourt.
- Gray Mary L., Siddharth Suri, Syed S. Ali and Deepti Kulkarni. 2016. “The crowd is a collaborative network.” Proceedings of the 19th ACM Conference *Computer-Supported Cooperative Work & Social Computing*: 134-147.
- Greve Arent and Janet W. Salaff. 2003. “Social networks and entrepreneurship.” *Entrepreneurship Theory and Practice* 28(1): 1-22.
- Hall Peter A. and Michèle Lamont, eds. 2013. *Social Resilience in the Neoliberal Era*. Cambridge, MA: Cambridge University Press.
- International Labor Organization (ILO). 2021a. “*Working From Home: From Invisibility to Decent Work*.” Geneva: ILO.
- International Labor Organization (ILO). 2021b. *The role of digital labor platforms in transforming the world of work*. Report. Geneva: ILO.
- Ingram Paul and Peter W. Roberts. 2000. “Friendships among competitors in the Sydney hotel industry.” *American Journal of Sociology* 106: 387- 423.

- Irani Lilly C. and M. Six Silberman. 2013. "Turkopticon: interrupting worker invisibility in Amazon Mechanical Turk." *SIGCHI Conference on Human Factors in Computing Systems (CHI '13)*, ACM: 611-620.
- Krackhardt David and Jeffrey R. Hanson. 1993. "Informal networks: the company behind the chart." *Harvard Business Review* 71(4): 104-11.
- Lazega Emmanuel. 2020. *Bureaucracy, Collegiality and Social Change: Redefining Organizations with Multilevel Relational Infrastructures*. Cheltenham: Edward Elgar.
- Lazega Emmanuel. 2001. *The Collegial Phenomenon: The Social Mechanisms of Cooperation Among Peers in a Corporate Law Partnership*. Oxford: Oxford University Press.
- Lazega Emmanuel and Tom A.B. Snijders. 2016. *Multilevel Network Analysis for the Social Sciences*. Cham: Springer.
- Lehdonvirta Vili, Otto Kässi, Isis Hjorth, Helena Barnard and Mark Graham. 2019. "The global platform economy: A new offshoring institution enabling emerging-economy microproviders." *Journal of Management* 45(2): 567-599.
- Lubbers Miranda 2022. "Social networks and the resilience of marginalized communities." This volume.
- Panitz Robert and Johannes Glückler. 2017. "Rewiring global networks at local events: congresses in the stock photo trade." *Global Networks* 17: 147-168.
- Pauksztat Birgit. 2022. "Social networks and resilience in work groups." This volume.
- Powell Walter W., Kenneth W. Koput and Laurel Smith-Doerr. 1996. "Interorganizational collaboration and the locus of innovation: networks of learning in biotechnology." *Administrative Science Quarterly* 41(1): 116-145.
- Prassl Jeremias. 2018. *Humans as a Service: The Promise and Perils of Work in the Gig Economy*. Oxford: Oxford University Press.
- Ryan Louise, Jon Mulholland and Agnes Agoston. 2014. "Talking ties: Reflecting on network visualisation and qualitative interviewing." *Sociological Research Online* 19(2): 1-12.
- Schor Juliet. 2020. *After the Gig. How the Sharing Economy Got Hijacked and How to Win It Back*. Oakland: University of California Press.
- Tassinari Arianna and Vincenzo Maccarrone. 2020. "Riders on the storm: Workplace solidarity among gig economy couriers in Italy and the UK." *Work, Employment and Society* 34(1): 35-54.
- Ticona Julia, Alexandra Mateescu and Alex Rosenblat. 2018. *Beyond Disruption: How Tech Shapes Labor Across Domestic Work & Ridehailing*. New York: Data & Society Institute.
- Tomaskovic-Devey Donald and Dustin Avent-Holt. 2019. *Relational Inequalities: An Organizational Approach*. Oxford: Oxford University Press.
- Tubaro Paola. 2021. "Disembedded or deeply embedded? A multi-level network analysis of online labor platforms." *Sociology* 55(5): 927-944.
- Tubaro Paola and Antonio A. Casilli. 2022a. "Who bears the burden of a pandemic? COVID-19 and transfer of risk on digital platform workers." *American Behavioral Scientist*, DOI: 10.1177/00027642211066027
- Tubaro Paola and Antonio A. Casilli. 2022b. "Human listeners and virtual assistants: privacy and labor arbitrage in the production of smart technologies." Pp. 175-190 in *Digital Work in the Planetary Market*, edited by Mark Graham and Fabian Ferrari. Cambridge, MA: MIT Press,.

Tubaro Paola, Antonio A. Casilli and Marion Coville. 2020. “The trainer, the verifier, the imitator: Three ways in which human platform workers support artificial intelligence.” *Big Data & Society* 7(1), DOI: 10.1177/2053951720919776.

Urzi Brancati Maria Cesira, Annarosa Pesole and Enrique Fernández-Macías. 2020. *New evidence on platform workers in Europe. Results from the second COLLEEM survey*. EUR 29958 EN, Luxembourg: Publications Office of the EU.

Wood Alex J., Mark Graham, Vili Lehdonvirta and Isis Hjorth. 2019. “Networked but commodified: The (dis)embeddedness of digital labour in the gig economy.” *Sociology* 53(5): 931-950.

Wood Alex J., Vili Lehdonvirta and Mark Graham. 2018. “Workers of the Internet unite? Online freelancer organisation among remote gig economy workers in six Asian and African countries.” *New Technology, Work and Employment* 33(2): 95-112.

Yin Ming, Mary L. Gray, Siddharth Suri and Jennifer W. Vaughan. 2016. “The communication network within the crowd.” *Proceedings of the 25th International Conference on World Wide Web*, 1293-1303.