

Making Personal Networks with a Computer: Lessons from the Field using Vennmaker

Ignacio Fradejas-García^{1*},
Francisca Ortiz Ruiz²

¹University of Oviedo

²Centro de Economía y Políticas
Sociales, Facultad de Ciencias Sociales
y Artes, Universidad Mayor, Santiago,
Chile. Millennium Institute for Care
Research (MICARE), Santiago, Chile

*E-mail: fradejasignacio@uniovi.es

Abstract

Vennmaker software was created as a tool for actor-centered and interactive networks. It has many options that users can implement at different stages of their studies. Documentation is available showing how to use it technically and the steps to follow for its correct use. However, less has been documented about the experience of using it in fieldwork to establish personal networks, a gap which this article aims to fill. This article combines the experiences of doing fieldwork using Vennmaker in two very different contexts and research designs. It concentrates on its advantages and disadvantages, as well as its usefulness in learning, while also sharing some useful information for those who are planning to use it in future research.

Keywords

Vennmaker; personal networks; case study; data collection; data analysis; mixed methods

Introduction to Vennmaker Software

Vennmaker is a software program for collecting and elaborating actor-centered and interactive networks. In this article, the reader will find lessons from the field for using this software to collect network data. The novelty of this article is that, unlike other studies, for example, by Hollstein et al., who compare different visual tools and show how it affects network data collection (2020), we demonstrate specific lessons from our experience in collecting personal networks with the Vennmaker software. In doing so, we are reviewing the theoretical and methodological implications of studying personal networks, including Vennmaker's pros and cons, namely the theoretical background, the methodological and ethical difficulties of gathering data on personal networks, and the software possibilities. We use our research experiences of two different case studies respectively to reflect on the use of Vennmaker as a research

tool. We conclude with some suggestions for using this software that would be useful for any researcher, but especially for single researchers who need a free, user-friendly, powerful tool that has some limitations but also many advantages for research into personal networks.

What is Vennmaker?

The initial aim of the transdisciplinary group of Vennmaker developers was to create a software tool that “enables users to interactively collect network relationship data from an actor's point of view and render them comparable and quantitatively analyzable by means of an intuitive graphical user interface” (Kronenwett and Schönhuth, 2011: 9). The software takes its name from the Venn diagram, developed by the mathematician and philosopher John Venn in his *Symbolic Logic* (1881). These Venn diagrams have been used widely to represent

relations between sets. In personal networks, Kahn and Antonucci (1980) introduced social convoys as concentric circles representing degrees of social support. Recent comparative research on network data-collection and visualization has found that research participants prefer concentric circles over other tools like free drawings or funnels, although that does not affect the network's composition or size (Hollstein et al., 2020).

Indeed, Vennmaker is a user-friendly software for easily building, visualizing, and analyzing networks. Its welcoming environment allows paper-to-laptop solutions and permits using participatory interviews to make networks on the screen. It does this not only after making a structured questionnaire, but also by directly "drawing" on the screen and making an audio recording, among other features. Its applications are therefore numerous, depending on the research objectives. For example, it allows questions and answers to be posed, while the networks themselves can be visualized and qualitatively changed or evaluated while simultaneously reflecting on their structures and characteristics. Hence, interviewees might co-construct their networks, which provides agency to the research participants and gives preeminence to the process, thereby achieving scientific standards in generating and processing social-network analysis while narrowing the quantitative and qualitative gaps in network research.

Vennmaker has been available since 2010, along with other similar software with visual interfaces, such as Egoweb or OpenEddi (Maya-Jariego and Cachia, 2019), while comparable new and modernized software such as Network Canvas is also appearing (Birkett et al., 2021). Nonetheless Vennmaker continues to be used both for those who are beginning personal-network analysis and those who have not found software that surpasses it, or only one whose learning curve or price is too high. And yet, given the pros and cons, the software is free and easy to use, can be self-taught, runs well in both Apple and Microsoft environments, does not need a powerful computer or a lot of battery power, and it is available in English, German, Russian, Spanish, Chinese and French. All these characteristics make this software very well suited for researchers with no resources to invest in hardware or software, nor the funding to travel and pay for specialist courses, and it is available in other languages, which helps those with limited knowledge of English. Our intention in this article is to map out how the software has been used and give some examples from our own respective experiences for those who are assessing software(s) or just wondering about the potential of Vennmaker.

Used of Vennmaker as a tool for research

Gamper, Schönhuth and Kronenwett (2012) describe how Vennmaker can be used for research, especially when bringing together qualitative and quantitative data. They argue that using this software makes possible a combination of these two worlds in a clear way: adding data is through visualization, not a matrix, even though everything is at the same time coded as a matrix that can be exported. In relation to data-collection, this combination is unique and useful. The advantages of using this software include the range of possible representations and storing network maps, maps that can be flexibly adjusted to the interview, audio files that can be recorded at the same time as the visual representation, easy collection of time periods, and ease of sending data to collaborators. However, there are also some drawbacks: digital network maps may not be suitable for the less educated, the elderly and those who cannot cope with computers. Moreover, the requirement to use a good-quality computer, possibly involving extra cost and needing to adapt smart-phones or tablet computers, together with the possibility of having to use a computer during fieldwork, are potential disadvantages, as are issues of data security and the protection of sources.

Vennmaker has been recognized by many authors as a legitimate tool for analyzing ego's network data because it allows the researcher and ego to move alters on the screen and add information about the types and strengths of ego's relations with their alters (Halgin and Borgatti, 2012). The software seems to be accessible to anyone because Vennmaker does not require users to enter relational data in a matrix; instead, they produce a visualization of their networks, to be exported as a database later (During et al., 2011). Vennmaker has been used as a software tool for digitalized visualizations of networks after collecting them manually with pen and paper (Herz and Oliver, 2012). In this case, the software is helpful in making a clearer representation accompanied by the categorization and codification of the relations within it. For example, this ease of use has been exploited in historical research to draw networks of families in ancient history and the personal networks of Jews hiding during the Nazi period (Düring et al., 2011). This ability to draw, which is characteristic of Vennmaker, also allows individuals, groups and organizations to be included in the same network, thus facilitating, for example, the study of migrants' transnational businesses (Sommer and Gamper, 2021), as well as assessing their transnational ties and practices qualitatively (Bilecen, 2021).

If, then, we draw a random network in Vennmaker, we can export that drawing as data categorized in an Excel document, among others. Another alternative is to assist the interviewees to make their own networks in the program as a visualization rather than an adjacency matrix avoiding errors (Cachia and Maya, 2017). This approach has been recognized for being a simpler and faster method of codifying, visualizing and analyzing networks (Gamper, et al., 2012; Bilecen, 2013).

Vennmaker is commonly used as part of a mixed-methods approach. For example, a study of female sex-workers in Mexico collected quantitative network measures, qualitative narratives and network visualizations simultaneously (Wagner et al., 2018). The potential of the program to collect both qualitative and quantitative data while permitting reflection and validation was also highlighted by Borucki (2022) in her study of the local networks of politicians and welfare workers in Germany. Vennmaker allows the data to be exported so that it can be analyzed in statistical software such as SPSS, as is done by Borucki (ibid.). It could also be rendered complementary with another tools, such as Qualitative Data Analysis Software, to analyze reflections or discourses, as shown by Santha's research among trainee teachers (Santha, 2017). Despite the different perspectives that can be taken by the researcher, this type of software could actually help in improving the quality of the data that has been collected (Hancean, Molina and Lubbers, 2016).

Lippe and Gamper (2016) made a comparison to try and clarify which methods are better for collecting ego-centered networks. They compared using a questionnaire with visualization-based data-collection in two different studies with the same objectives and questions. The second of these used the digital visual method that Vennmaker allows them. Even though the design of both pieces of research were the same, some differences were reported: those who answer in Vennmaker tend to have larger networks, as they do not have so many restrictions other than the limitations of the screen drawing. Respondents in Vennmaker reported more family members, while there was a greater variation in the number of non-kin in the questionnaire. Besides, the questionnaire produces a higher rating of alter-alter closeness and of denser and more strongly interconnected alter-alter relations because in Vennmaker people can create each of these connections with an arrow manually or in a matrix. Indeed, drawing or presenting alter-alter relations directly on the screen might reduce the burden on the respondent (McCarty et al., 2007) and produce more participation and satisfaction

than using matrices (Eddens and Fagan, 2018). Making alter-alter ties one by one is quicker, though it also introduces an overall bias in large networks due to the fatigue in listing ties visually. This can cause interviewees to stop listing their ties before they exhaust them or reorientating the software's visualization, which is modified when ties are added (McCarty et al., 2019). Therefore, the authors concluded that "it might not be a question of 'right or wrong' method, but instead that of what we wish to achieve" (Lippe and Gamper, 2016: 12).

Another study conducted by Lelong et al. (2016) comes to a similar conclusion. They made a comparison between two different software products, Net-Map and Vennmaker, concluding that each one works best for different purposes: Net-Map is helpful for exploratory research, while Vennmaker seems to work best for pre-structuring interviews and comparisons between different networks. Besides, they stressed that Vennmaker is especially helpful in avoiding "research fatigue" (Stevenson, 2003: 2). These are the types of reflection that this article tries to make visible and available to any other researchers who, in the future, would like to use this software. Using this article, they can take them into consideration beforehand.

Before describing our case studies, we explain some of the methodological decisions we have made. Both authors of this paper had used Vennmaker as the main software in conducting social network analysis, and both collected personal networks during long ethnographic fieldwork, which is helpful to reflect on data collection, analysis and visualizations of networks. In the next section, each researcher makes an account of their study by focusing on seven main aspects that allow comparison: (1) description of case study and main question; (2) identification of benefits and challenges during research with the program; (3) description of fieldwork and data collection; (4) the influence of using a computer both during and after fieldwork; (5) description of data analysis; (6) visualization and presentation of networks; and (7) research findings. Then, after our two case studies have been presented, we will reflect on our respective experiences to try to disentangle some of the benefits, challenges and lessons of using Vennmaker in studying personal networks before offering some concluding remarks.

Two case studies using Vennmaker

Transnational personal networks of aid workers in Turkey

This first case study was led by the first author of this article, Ignacio Fradejas-García. It forms part of an unfinished PhD thesis entitled “Aid workers: work–life practices in the Syrian humanitarian cross-border operation from Turkey”. This study analyses humanitarian cross-border operations from Turkey to Syria, and specifically the work–life practices and power dynamics of aid-workers. Although the thesis remains unfinished for political and ethical reasons, some research results have been already published (Fradejas-García, 2019; Fradejas-García and Mülli, 2019). In this article, I, as first author, will zoom in on the use of Vennmaker software and consider what lessons can be drawn from the experience I gained from this research.

My fieldwork extended over two years (2015–2016) while I was living in the border city of Gaziantep in Turkey. This twin city of Aleppo, with two million inhabitants, promptly became an important destination for Syrian refugees fleeing the civil war in their country and was transformed into a node for sending cross-border humanitarian aid into Syria. Numerous headquarters of NGOs, UN agencies and international organizations were settled in this ‘duty station’, producing a new transnational space in *Aidland* in which three categories of aid-worker emerged: internationals, Syrians and Turkish. Participant observation was carried out in various local and international NGOs, as well as in other public and private spaces in which different aid-workers work or spend their free time. In some cases, I was able to volunteer for an NGO, having already been accepted by workers and organizations to conduct my research. Moreover, I performed dozens of informal interviews; few people were interested in being formally interviewed using audio-recordings. I also held a focus-group discussion about humanitarian work and completed sixteen formal qualitative interviews, in which I used Vennmaker as follows.

The qualitative interviews were designed with a strong biographical focus in a flexible model divided into three parts: (1) life-history, (2) personal network(s), and (3) current humanitarian life–work balance. The first part included interviewees’ life-courses and trajectories, with special emphasis on their long-term trajectories, (im)mobilities and working experiences, and it lasted between thirty minutes and one hour. The second part extended to one hour and covered

the creation, visualization and on-site analysis of the interviewee’s personal network using Vennmaker. The software enables audio-recordings and drawings to be made and allows the network to be modified on the screen in line with the interviewee’s corrections until an accurate final network emerges. These features allow one to focus on the content and meaning of the interviewee’s network by collecting relevant qualitative information (Ryan et al., 2014).

The third part of the interview was kept open-ended and focused on current aid-workers’ lives and work, the humanitarian operation and future plans. The aim of this chronological structure was to cover the biographical aspects and to revisit some questions if they had been left unclear in previous answers. Also, the breaks between each part allowed the interviewees to rest, which might increase the duration of the interview but also helped them to reflect on or cross-examine previous questions, and even to postpone one part, thereby avoiding interviewee fatigue (in a couple of interviews, the last part of the interview was held in a second session). The total duration of most of the interviews went beyond the two hours initially set aside for them.

The use of Vennmaker in the second part of the interview brought in my own laptop. However, if the laptop had any problem or if the interviewee, who had previously been informed about the interview’s parts and process, did not want to construct the network in the laptop, I also brought with me paper on which I had marked out concentric circles, coloring pencils and little post-it notes. During the design of the personal network interview, I carried out one pilot interview on paper (see Figure 1 left). This helped me spot some minor issues with the interview design in Vennmaker when the data gathered were entered into the software (see Figure 1 right), and to work out how to conduct the interview on paper in case the laptop or the software failed.

Interviews were carried out in public spaces such as coffee shops, but some were done in interviewees’ homes or in NGO offices after working hours and with permission. The laptop was received positively, as informants’ anonymity and confidentiality were guaranteed through their giving their informed consent and through encrypted data storage. Indeed, Vennmaker allows anonymization using a password, and every network was anonymized in front of the interviewee. Images of their networks, both anonymized and not, were shared with them, which they usually received and welcomed as a gift.

The interview process is as follows. To start the interview, I sit together with the interviewee looking at the screen. I manage the keyboard and open

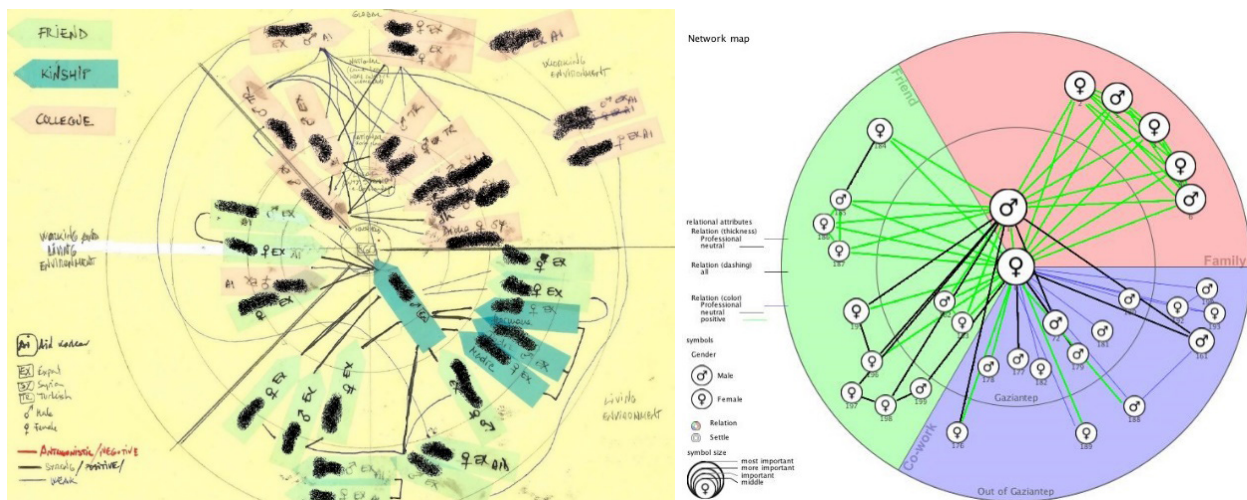


Figure 1: At left, anonymized personal network of an international (expat) aid worker made with paper, sticky notes and colored pencils. The inner circle is for ego's household, the outer circles, which are inside out and in order, locate alters living in the same city, alters living in other cities in Turkey, and alters living elsewhere in the world, i.e. outside Turkey. The circles are divided into three parts: living, working and working-living environment. Alters are organized within three main categories of sticky notes, distinguished by color: friends in green, relatives in blue, working colleagues in orange. Then the interviewee was asked which alters are expats, Syrians or Turkish, their sex/gender, and whether they were aid-workers. The interview was audio-recorded. On the right is the same network from the left, but done in Vennmaker and simplifying some of the circle divisions to ease the placing of alters. Source: elaborated by first author.

Vennmaker. As a default, the software shows a network map with ego in the middle, which helps to explain how the alters are created and located, and what the network looks like at the end using this software. Second, I open the questionnaire with five questions with name generators designed in accordance with my objectives. These questions elicit the following information about the interviewee's alters:

1. Who supports you emotionally?
2. With whom do you usually spend your free time?
3. With whom do you speak about bad work experiences?
4. Who are your co-workers?
5. Who are the key figures in your professional career?

Third, at the end of the questionnaire, the software places all alters on to the side bar, and one by one they can be dragged and located into the network, according to their place of living and profile. Also, some attributes are requested and filled in for each person: sex/gender, age, place of origin (nationality), place of residence (duty station); Family, Friends, Co-worker, Others (girl-boyfriend/fiancée/spouse); Expat / Turkish / Syrian / Other; Work organization (just

for aid workers); Job position (just for aid workers); and salary. This is the most difficult part of the questionnaire, as filling in each alters' attributes takes time to answer and is very repetitive.

Then some other alters and their attributes can be added or modified directly onto the map. This is an important feature because, when the network is visualized, it is easier for research participants to spot individuals who were missed in the questionnaire. Indeed, follow-up questions and thinking aloud increase network size and aid the interviewee's memory by adding important alters previously forgotten (Hollstein et al., 2020). The next step is to ask interviewees about relations with their alters. Thus I asked: *Have your "alters" been contacting each other independently of you?* Following interviewees' instructions, lines indicating relations are drawn between alters. There is no need to draw all the lines between ego and his or her alters if it is assumed that ego has a relationship with them. The question of bad relations was also raised, but no one reported any.

Finally, the interviewee was asked to make any changes and reflect on the resulting network, which also validated the results. Overall, in some situations these reflections were very hard for international

workers and refugees to express, as it caused them to visualize how their personal networks have “detonated” due to the Syrian war or to their family members living apart from each other. In all cases, interviewees were surprised by the results and the image of their networks. Some took photos of the laptop screen to have an image of their networks, and the rest were also asked if they wanted to have such an image. Most of them agreed and were sent them by email afterwards. The qualitative analysis of personal networks was carried out as material complementary to the interviews and fieldnotes, all of them being codified with RQDA for coding and subjected to qualitative analyses.

My first aim in using Vennmaker was to conduct a qualitative analysis of how working in Aidland shapes aid-workers’ personal networks. However, the number of elicited alters (approximately 300) allowed me to map, albeit incompletely, the social structure of international aid in Gaziantep at the time, a sector that employs only a few thousand people. No such quantitative analysis has been conducted before, which may facilitate a mixed-methods form of analysis. The plan is to conduct the analysis and then repeat the interviews ten years after the first interview, in 2025, to make a longitudinal analysis. I asked interviewees about this possibility, and all were open to doing it, although I would not expect all of them to agree to participate in a second wave. Moreover, as they would now have previous experience of constructing networks in Vennmaker, it is to be expected that they could do this by remotely sharing my screen, which might facilitate remote online interviews.

To provide a true picture of the interview *while it is ongoing*, the Vennmaker images below (Figure 2) are *exactly* those that interviewees visualized at the end of the interviews on their personal networks. They have not been edited to add extra information or to make the material more attractive for publication; only their names have been anonymized. As can be seen in the images below, the three categories of aid-worker had very different networks. The first network corresponds to an expat aid-worker who is well connected with friends (green) and co-workers (purple) both locally (inner circle) and internationally (outside circle), although she no longer has any connection with her family after many years working abroad. The second example shows the network of a Turkish aid-worker who lives with his close family and is already well connected locally with co-workers and friends. After three years working in this sector, he is starting to have contacts abroad, which motivates him to pursue a career as an international aid-worker in

the future. The third network is of a Syrian aid-worker and refugee who fled Syria and started to work in the aid sector. Most of his family and friends are living in Syria or just fled as refugees to Europe, and he has only one close friend in the city, a co-worker.

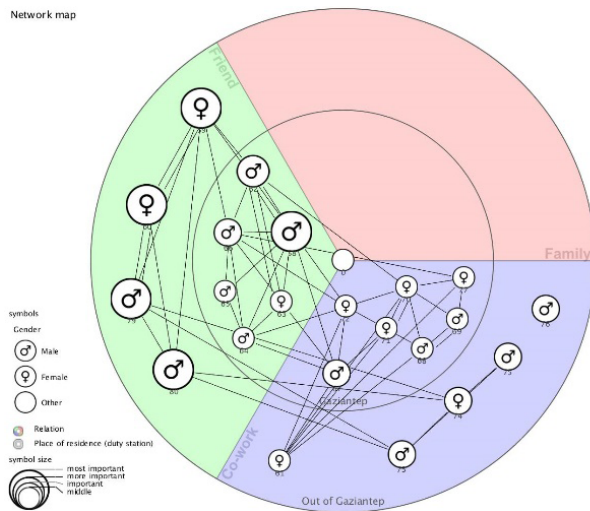
In sum, the use of Vennmaker in qualitative analysis was a key tool for the emergence of research findings, and it clearly revealed how aid-work structures personal networks. For example, most of the Syrian aid-workers had suffered what they called the “explosion” of their kinship and friendship networks due the Syrian war, and Aidland offered few but promising contacts to go ahead and make it their career. However, for international aid-workers, being far from their families and friends is common. Instead they can rapidly construct new relations within *expat aid bubbles*, which is part of the networking business to get good jobs at the international level, which are best paid, have more status and entail less risk (see more detailed research findings: Fradejas-García, 2019; Fradejas-García and Mülli, 2019).

Older people’s social support networks in Santiago, Chile

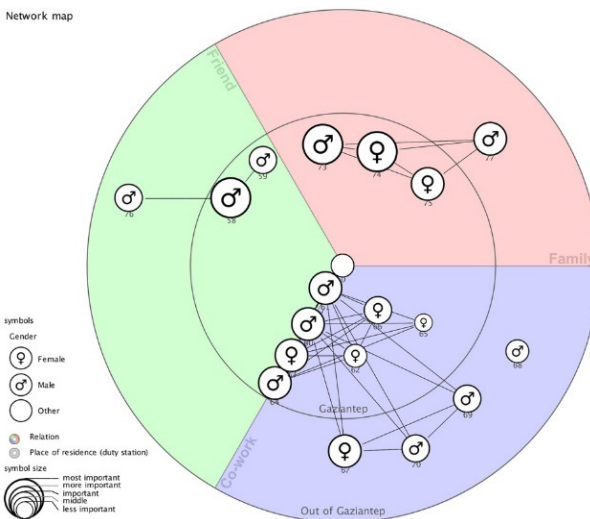
This second study was led by the second author of this article, Francisca Ortiz Ruiz. It was conducted for her PhD thesis, and the main focus was older people’s social-support networks. The main objective was to understand how the elderly in Santiago, Chile, deal with their pensions through their social-support networks. Some of the results have been already published (Ortiz, 2021; Ortiz and Bellotti, 2021). In this paper, I, as second author, will concentrate only on those stages in the research where Vennmaker was used.

As already noted, the study was conducted in Santiago, Chile, South America. The research used a mixed-methods approach involving different tools of data collection and analysis. The fieldwork was conducted between October 2019 and January 2020. During that time, the life histories of thirty elderly people and their social-support networks were collected. The sample was divided between fifteen older women and fifteen older men, who were also divided by socioeconomic level: ten were from a higher-class district, twenty from a middle-class district, and ten from a lower-class district.

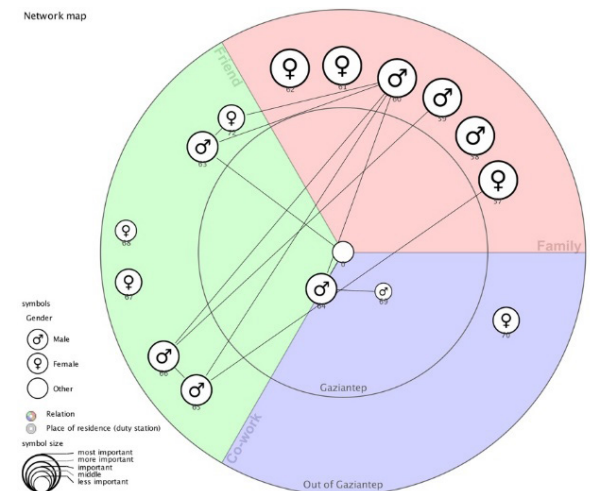
After the life history of each person had been constructed, another interview was held, sometimes two more, to complete the name generator. In the subsequent interview(s), Vennmaker was used. During each of these conversations, I as the researcher have the computer with me. Sometimes people make



Social Network of an
'international' aid-worker.



Social Network of a local
'Turkish' aid-worker.



Social Network of a 'Syrian'
aid-worker.

Figure 2: Notes for the three networks: The inner circle is for people living in the same city (Gaziantep), while the outer circle locates alters living outside it. The green area is for friends, purple for co-workers and orange for family. Closeness is symbolized by the size of the circle representing each person. Relations in which each member knows the other are represented by lines connecting alters. Source: elaborated by first author.

jokes about the fact that I could actually enter all their answers in a computer, which makes them curious. Some ask me to show them the program. I show them the questions, the program and the resulting network. Sometimes they are interested, which declines a little with the passing of time, especially after all the questions have been asked about their alters' characteristics. Using the computer, I ask all the questions that refer to their networks. I ask them to nominate people who give them seven dimensions of social support, then to nominate people to whom they give those same dimensions. Finally, I ask many questions about the characteristics of those relationships and their alters.

After each interview, I come back to them with a visualization of the network to ask their opinions about it. Also, I give them an opportunity to give me their thoughts, say whether they agree or not, and point out what they would change to make it clear. Of the thirty people I interviewed, 21 agreed with the visualization and did not want to make any alterations. First, they seem surprised at the results, commenting on the colors and expressing curiosity about their meanings. Secondly, they seem satisfied by the results. Of the other nine people, they made suggestions that changed the organization of the network. Most of these suggestions can be divided into three groups: moving one alter to a position closer to ego, adding more dimensions given by the partner, and adding a link between alters that was not mentioned before. Having an opportunity to talk to the interviewees about the visualization of their networks benefits the research greatly, allowing a more detailed and accurate representation of their social-support networks. This part of the research serves to validate the data collected.

During the fieldwork, using the computer was not always easy. In interviews conducted in a lower-class district, carrying a computer around entailed some risk, especially for me, as it brought me unnecessary attention, though after entering the house of the interviewee that changed. Also, taking the computer out of the bag tended to create a gulf (a feeling of distance) between the interviewee and myself. The solution to that was a lot of eye contact with the informant and paying them a lot of attention. Another tactic that helped break the ice was conducting the life-history interview(s) before constructing the networks. In these ways, the interviewee already feels confident with me, making the gulf easier to bridge.

After the fieldwork, the first task was to start transcribing the life-history interviews. Every time I completed one case, I exported the visualization of the interviewee's social-support network to the

desk's PC outside Vennmaker (one per direction of the relationship) and the Excel document with all the answers in the interviewee's survey. Afterwards, I ran all the analyses using UCINET and R Studio. As I asked for the social-support network for each of the most important events in their lives, I had longitudinal data that were interesting from a comparative perspective. The visualization of the networks in Vennmaker allowed me to compare easily all the events and networks in the interviewee's life. This was possible because the software uses one standardized image, which helps visualize different networks as another layer of the same image. This visualization was also helpful not only for purposes of comparison, but also in making presentations and as an outcome of the research. I used the template with concentric circles, making it more user-friendly, as can be seen in Figure 3.

The main results of this research show how older people construct their social support networks during their life-course and how the structural aspects intervene through them, thereby increasing some of the basic inequalities that intersected with others, like gender, age, and socioeconomical level. Furthermore, it shows the social support networks as multilevel, multidimensional and longitudinal. Among the main results was the fact that the visualization of each represented network (as in Figure 3) helped the actors' understanding and enabled them to give more support dimensions to ego, as well as the other way around. These graphs were complemented by the narratives behind each life history.

Final remarks: advantages and disadvantages of using Vennmaker

The quality of any empirical research lies not in the sophistication of the software it uses, nor in the number of people interviewed, but in the coherence between objectives, tools and samples. More is not always better, even though Vennmaker narrows the gap between researchers and research participants, thereby allowing the joint construction of personal networks. It helps to connect the personal network with other qualitative methodologies, allows quantitative data to be collected, and is also aligned with most contemporary ethical concerns regarding research extractives and anonymization issues. It is not only a very suitable software for beginners in personal network analysis, for reasons given in the introduction; it is also, we argue, useful for teams of researchers, including the more experienced ones, who want user-friendly software to interview research participants, to make more inclusive research and

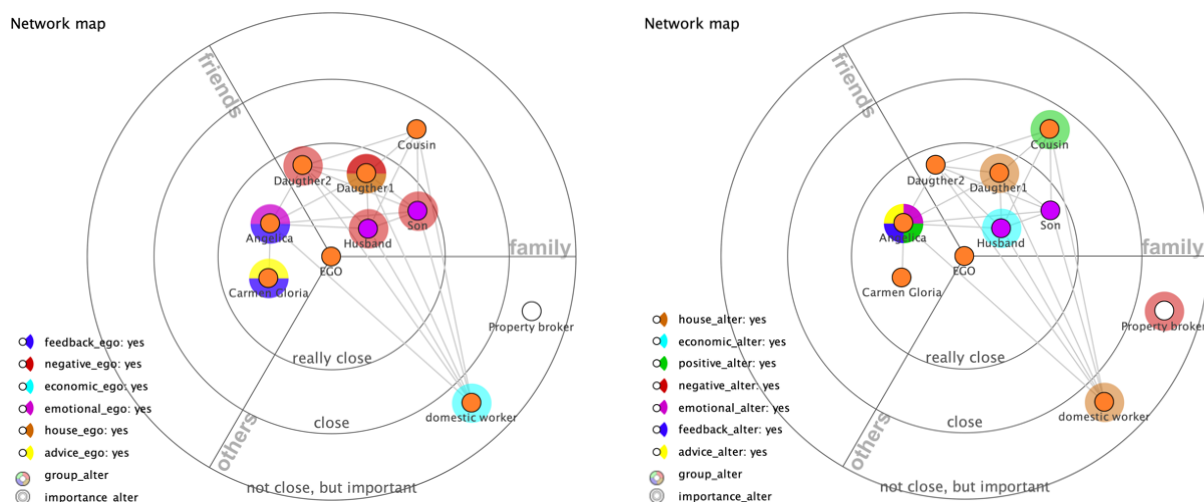


Figure 3: Social-support networks in Javiera in 2019. The left-hand network is the support from ego to alter, the right-hand one the support from alter to ego. I measured the material aid, level of intimacy, advice, physical assistance, feedback, positive social interaction, and negative social interactions. Each type of support is represented using one color (in the same order): light blue, pink, yellow, brown, blue, green, and red. Source: elaborated by the second author.

to include qualitative data (or mixed methods). The novelty of this article is therefore the lessons it provided from the field using Vennmaker software to collect personal networks, some of which can be useful for other similar programs.

As a tool, Vennmaker can be combined with other tools and participatory techniques, especially for interviewing individuals, but also in groups, as well as for longitudinal research. It allows the researcher to obtain quantitative data in a less demanding way than structured and (semi)structured questionnaires, which also facilitates the interviews and the quality of the responses. The use of Vennmaker helps to avoid research fatigue in eliciting alters, though this advantage can become a disadvantage when eliciting the alters' characteristics, which might cause some distress if there are many alters and many characteristics to ask for. So it is better to keep a balance.

Vennmaker is a ready-to-use software for many research and fieldwork situations. It is, of course, easier for those who are used to working with computers, but interviewees without this background can quickly learn how the program functions, which favors its use with a broad range of populations. However, recent experience shows that these software tools are not well suited in contexts where "the scarcity of electricity, non-existent technical support in remote areas, and low computer literacy could compound suspicion and mistrust, making these unviable options" (Stys et al., 2022: 241).

The program's learning curve does not get too steep, although network visualizations and questionnaire designs require some practice and knowledge in using the program. However, it can be self-taught, which benefits those researchers without the funding, time or opportunities to attend courses in it. Indeed, Vennmaker is useful not only for social scientists looking to collect and/or visualize networks, but also for others such as public officers or small companies needing to construct and visualize their networks. For example, the first author taught a course on Vennmaker to managers of public community centers in Barcelona with the aim of giving them a tool with which to generate and visualize networks of collaboration with other facilities and entities to spot structural holes and weak ties, and thus improve their relationships. Thus, we believe that, because of its capacity to be used in many ways and contexts and by different people, not only researchers, the uses of this software have not yet been exhausted. Its potential for new applications should therefore be highlighted.

Like any other software used to work with networks, Vennmaker has its setbacks. First, we cannot use it to analyze large networks. As a rule of thumb, it works well with approximately thirty alters in the same visualization. More than that would be difficult to manage, especially if concentric circles are used, as in the second case study shown here. Second, in other software (e.g. R Studio) it is possible to add, create and change formulas for the

applied measures, which as Vennmaker users we cannot do. Having the option to add new measures to the software as developers may also be useful in increasing the community around it, as with R Studio. Third, it does not allow deeper analyses of the data to be made using the same software, though this can be solved by using other software. Knowing these limitations allows them to be kept in mind when conducting data collection or analysis, causing other strategies to be considered in order to solve them.

In sum, the community of social-network analysts around the world is very keen to learn about new and old software and online options to use in their research. Vennmaker has demonstrated its usefulness as a tool for this purpose, especially for data-collection and the interactive mapping and visualization of networks. For future developments of the software, a more active role might be given to the researcher, for example, by proposing analytical tools and measures.

Acknowledgements

Without the support of the participants, this research would have not been possible. We would like to thank them all. This research was supported by the ANID Millennium Science Initiative Program (ICS2019_024).

Statement of funding

The National Commission for Scientific and Technological Research in Chile supported the thesis reported in this article (ANID PFCHA/DOCTORADO BECAS CHILE/2018, grant number: 72190281). This research was also supported by the ANID Millennium Science Initiative Program (ICS2019_024).

References

Bilecen, B. (2013). Analyzing informal social protection across borders: synthesizing social network analysis with qualitative interviews. *SFB 882 Working Paper Series*, (19), 1-28.

Birkett, M., J. Melville, P. Janulis, G. Phillips, N. Contractor, and Hogan, B. (2021). Network Canvas: Key Decisions in the Design of an Interviewer-Assisted Network Data Collection Software Suite. *Social Networks*, 66(July), 114–24.

Borucki, I. (2017). A Visual Data Collection Method: German Local Parties and Associations. *Connections*, 37(1–2), 45–52.

Cachia, R., Maya Jariego, I., (2017). Mobility types, transnational ties and personal networks in four highly

skilled immigrant communities in Seville (Spain). *Social Networks*, 1-14.

Düring, M., Bixier, M., Kronenwett, M. and Stark, M. (2011). Vennmaker for historians: sources, social networks and software. *REDES*, 21(8), 421-452.

Eddens, K. and Fagan, JM. (2018). Comparing Nascent Approaches for Gathering Alter-Tie Data for Egocentric Studies. *Social Networks*, 55(October), 130–41.

Fradejas-García, I. (2019). Humanitarian remoteness: Aid work practices from ‘little Aleppo.’ *Social Anthropology*, 27(2), 286–303.

Fradejas-García, I., and Mülli, LM. (2019). (Im)mobile Workers: Entangled Regimes of (Im)mobility Within the United Nations System. *Mobilities*, 14(6), 906–922.

Gamper, M., Schünhuth, M. and Kronenwett, M. (2012). Bringing qualitative and quantitative data together: collecting network data with the help of the software tool Vennmaker. In Safar, M. and Mahdi, K. (eds.) *Social networking and community behavior modeling: qualitative and quantitative measures*. Information Science Reference, United States.

Hâncean, M., Molina, JL and Lubbers, MJ. (2016). Recent advancements, developments and applications of personal network analysis. *International Review of Social Research*, 6(4), 137-145.

Halgin, D. and Borgatti, S. (2012). An introduction to personal network analysis and tie churn statistics using E-NET. *Connections*, 32(1), 37-48.

Herz, A. and Oliver, C. (2012). Transnational social network analysis. *Transnational Social Review*, 11-29.

Hollstein, B., Töpfer, T., and Pfeffer, J. (2020). Collecting egocentric network data with visual tools: A comparative study. *Network Science*, 8(2), 223–250.

Kahn R. L. and Antonucci T. C. (1980). Convoys over the life course: Attachment, roles, and social support. In Baltes P. B. Brim O. (Eds.), *Life-Span Development and Behavior*. New York, Academic Press., 253-286.

Kronenwett, M. and Schönhuth, M. (2011). *Vennmaker 1.2 Manual*. https://www.vennmaker.com/files/VennMaker_1_2_Manual.pdf

Lelong, B., Stark, M., Hauck, J., Leuenberger, T., and Thronicker, I. (2016). A visual network perspective on social interaction and space: using net-map and Vennmaker in participatory social-spatial research. *Europa Regional*, 23.2015(2), 5-19.

Lippe, H.V.D. and Gamper, M. (2016): Drawing or tabulating ego-centered networks? A mixed-methods comparison of questionnaire vs. visualization-based data collection. *International Journal of Social Research Methodology*, 1-17.

Maya-Jariego, I. and Cachia, R. (2019). What the Eye Does Not See: Visualizations Strategies for the Data Collection of Personal Networks. *Connections*, 39(1): 1–18.

McCarty, C., Lubbers, M., Vacca, R. and Molina, J.L. (2019). *Conducting Personal Network Research: A Practical Guide*. Guilford Press, London.

McCarty, C., Molina, J. L., Aguilar, C., and Rota, L. (2007). A Comparison of Social Network Mapping and Personal Network Visualization. *Field Methods*, 19(2), 145–162.

Ortiz, F. (2021). Cómo usar QCA y SNA desde los métodos mixtos: una ilustración usando las redes de soporte en jubilados. *REDES. Revista Hispana para el Análisis de Redes Sociales*, 32(2), 201-212.

Ortiz, F. and Bellotti, E. (2021). The impact of life trajectories on retirement: socioeconomic differences in social support networks. *Social Inclusion*, 9(4): 327-338.

Ryan, L., Mulholland, J., and Agoston, A. (2014). Talking Ties: Reflecting on Network Visualisation and Qualitative Interviewing, 19(2), 1–12.

Sántha, K. (2017). Network cards as a way of discovering the reflective thinking of teacher trainees: the relevancies of a qualitative analysis. *PedActa*, 7(1), 13-18.

Sommer, E. and Gamper, M. (2021). Beyond Structural Determinism: Advantages and Challenges of Qualitative Social Network Analysis for Studying Social Capital of Migrants. *Global Networks*, 21(3), 608–25.

Stevenson, B. (2003). Focus groups with minority ethnic communities. The Scottish government research, United Kingdom.

Stys, P., Muhindo, S., N'simire, S., Tchumisi, I., Muzuri, P., Balume, B., and Koskinen, J. (2022). Trust, quality, and the network collection experience: A tale of two studies on the Democratic Republic of the Congo. *Social Networks*, 68, 237–255.

Venn, J. (1881) *Symbolic Logic*. McMillan, London.

Wagner, K.D., Syvertsen, J., Verdugo, SR., Molina, JL. and Strathdee, S.A. (2018). A Mixed Methods Study of the Social Support Networks of Female Sex Workers and Their Primary Noncommercial Male Partners in Tijuana, Mexico. *Journal of Mixed Methods Research*, 12(4), 437–57.