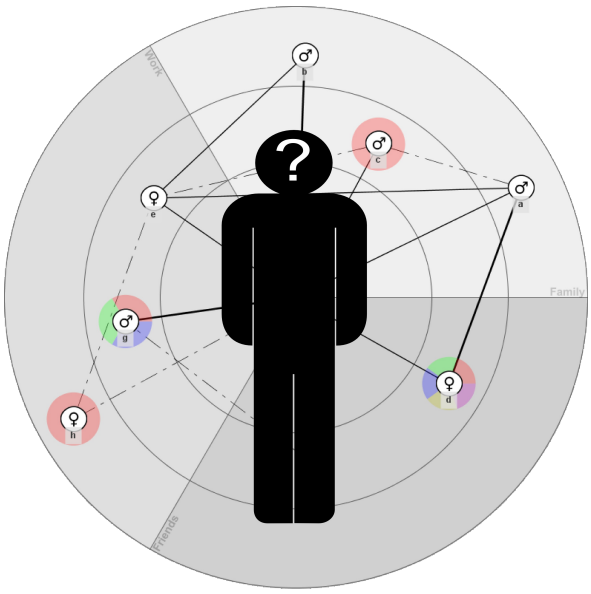
Michael Kronenwett / Michael Schönhuth

VennMaker



VennMaker 1.2

Manual

Michael Kronenwett, Michael Schönhuth

Title: VennMaker 1.2 Manual

Trier, 2011

Content

Foreword to Version 1.1.2

Since version 1.0 in May 2010, exactly a year has gone by and we have worked to adapt VennMaker to the needs of our growing user community, both in academics and praxis, and to implement new features. Numerous small and not-so-small suggestions for optimizing the program were noted and turned into new, user-friendly solutions. We would like to thank all the users who contributed to continually improving this program.

VennMaker has been presented at a number of conferences (Nacht der Wissenschaft 2010 (Long Night of Sciences 2010), Sunbelt 2010, 2011) and trade fairs (Didacta 2010, CeBIT 2010, 2011). It has also been demonstrated during workshops in Europe and the USA. VennMaker has even become part of the curriculum of the annual “Summer School Social Network Analysis” in Trier. A milestone, however, was the network conference INSNA in Riva del Garda (Italy) in June 2010 where VennMaker was presented for the first time by colleagues who had used the software for their research independently from our project and without our previous knowledge. This means that VennMaker has learned to walk and has passed beyond the first phase of growing pains, and so we are confident of future developments.

A further highlight was the international conference on the state of development of qualitative and participative network visualization processes in autumn 2010 in Trier. In addition to other network programs (e.g. EgoNet.QF and Egonet) and interesting “paper-and-pencil” solutions, various VennMaker uses were presented. These ranged from historical research and processes relevant to migration issues to successful implementation of VennMaker in international manager training and in the financial services sector. The conference transcript is set to be published in 2011 (Schönhuth et al. 2011: Vom Papier zum Laptop / From Paper to Laptop. Transcript-Verlag).

In addition to optimizing usability, as mentioned above, VennMaker 1.1.2 has many new features, especially in the free network drawing mode. Here some of the most important:

1. Spring Embedder: re-positions the nodes (+ edges) on the network map based on objective mathematical specifications.

2. Actors and relations can be tagged with attributes: This allows not only actors but also relationships between actors to be described better both qualitatively and quantitatively.
3. Interviews (+ audio files) within a project are saved and compressed in a common project file (“project container”). This saves disk space and facilitates data exchange between project members.
4. The export capabilities have been expanded. The resolution of pictures generated can be specified. This is especially interesting for publications where high-quality pictures are important.

Moreover – and we are a bit proud of this - the languages VennMaker can be used in have been increased: in addition to German and English, users can now communicate with VennMaker in Russian, Spanish and Chinese. Thus the advantages of participative network software for communicative validation with subjects can be used in more and more languages. Our intermediate goal is to offer our software in all major UN languages.

Many thanks to all co-developers and, of course, to the members of the creation team, who advanced the development and spread of VennMaker through inspiration, untiring dedication and creative thinking. Special thanks to the Cluster of Excellence Social Dependencies and Social Networks at the University of Trier and of Mainz, which has significantly encouraged the development of VennMaker, and has ensured this support, which includes both the allocation of personnel resources and equipment, will continue in the coming years.

Trier May 1, 2011

Michael Schönhuth

1 VennMaker: Roots, Context and Fields of Application

In recent decades, the concept of social networks has gained wider currency among various academic disciplines and areas of inquiry. Social network research generally involves collecting data which describe patterns of relationships and support among individuals, then analyzing them by employing concepts drawn from graph theory. Generally, data involving contact partners within a personal (ego) network are collected with the help of network questionnaires and then evaluated by means of quantitative analytical software.

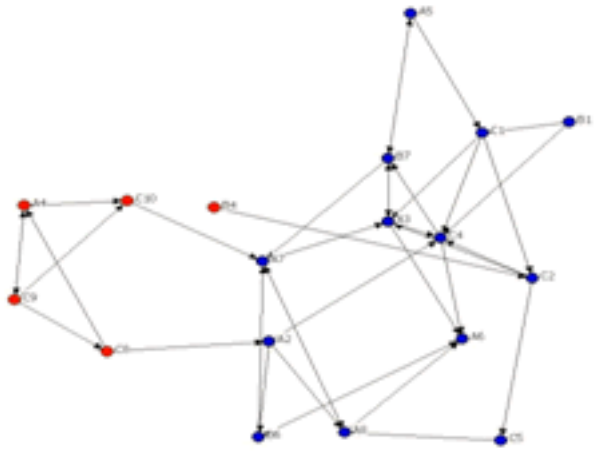


Figure 1: Network of advisors at an academic research center; based on a questionnaire survey, visualized with the software program UCINET ([Schönhuth 2007a])

Collecting and analyzing these data (number, density, centrality measures) has so far been carried out using highly standardized methodologies requiring considerable effort from qualified research staff. Consequently, these methods have their highest value in the processing of very large datasets. Owing to their complex quantitative character, they remain inaccessible to users in more action-oriented areas of network analysis, remaining ultimately bound to the perspective of the detached researcher on the outside looking in.

As of late, there have been endeavors to develop methods that come "closer to the actors, their perceptions, interpretations and structures of relevance" ([Hollstein and Straus 2005], translated from the German). Almost all of these approaches are towards a qualitative or "actor-centered network analysis", a recently established frame which draws on the "social convoy" model as developed by Robert Kahn and Toni Antonucci in 1980 for displaying social support

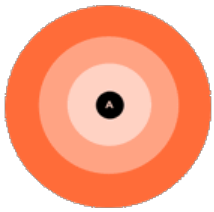


Figure 2: Method of concentric circles ("social convoy") support persons can be placed into different sections, according to their emotional importance as seen by the interviewed persons ([Kahn and Antonucci 1980])

structures. Because of their simple structure and the selective way in which the data are collected, these models are limited in terms of informative value and empirical validity, and therefore not without controversy ([Diaz-Bone 2007]).

Within organizational research and consulting, a branch has emerged in recent years which visualizes organization members as involved in a common process suitable as a template for analysis and interpretation. While these techniques are successfully applied in consulting and development/aid processes both nationally and internationally, they either come under criticism from academic circles due to their being neither replicable nor representative, or they simply go unnoticed.

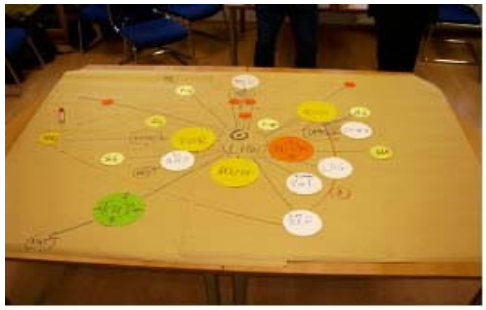


Figure 3: "Venn-diagram": network of social actors in a medium-sized business company in East Germany from a management perspective; size of circle = informal decision-making power; distance =co-operational density / grade of actor- accessibility for the institution ([Schönhuth 2007b])

In a joint interdisciplinary project of members of a cluster of excellence at Trier and Mainz Universities in Germany, we have tried to overcome this gap.[1] Our team has developed software 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 a intuitive graphical user interface. While complex questionnaire procedures and specially trained staff have dominated thus far, VennMaker allows lay users to map actors and their relationships in an intuitive way and generate easily interpretable quantitative and qualitative data out of it. The major benefit of this approach is that interviewees are able to visualize and qualitatively evaluate their networks themselves while simultaneously reflecting on the network structure and genesis together with the researcher, perhaps even considering desirable alterations or the potential for transformation.

Our goal was to develop a tool that is efficiently in these kinds of participatory use

[1] The development of VennMaker draws on long standing experience in the development and application of participatory research methodology ([Schönhuth and Kievelitz 1995], [Schönhuth et al. 1998], [Schönhuth 2003], [2007]), in visual data mining and graph drawing ([Pohl et al. 2004], [Pohl et al. 2006], [Pohl 2007]) as well as on the professional experience of various other disciplines within the participating universities Trier and Mainz, thereby broadening classical social network research with an innovative and unique methodological tool.

scenarios, while at the same time achieving scientific standards in generating and processing social network data. Not only is the entire process of generating the network map documented digitally (the choice, positioning, and spatial distribution of actor nodes, as well as the drawing of different relation categories, and the strength of ties between them), but the statements regarding content and importance of social relationships can be audio recorded during the interview and evaluated later via content analysis methods. VennMaker also addresses the structure-agency problem in social network analysis, as questions about the structural potential of a network (i.e. social capital that could be drawn out of the structure) and the actual use of existing ties by an actor can be posed and discussed on the spot.

From the vantage point of the social sciences, this has the potential to narrow the gap between quantitative and qualitative network research. There have been many developments in the area of “qualitative network analysis”, or “mixed methods-methodology” (for Germany see Hollstein/Straus 2006), however, to our knowledge no project has solved either the complexity problem in qualitative network maps or the issue of interlacing qualitative and quantitative data in a satisfying way. Hopefully, given some practical application, time will tell whether we succeeded in going one step further with VennMaker.

Fields of Application

VennMaker holds an advantage in at least four different settings of network generation and analysis:

First, VennMaker allows for participatory, process-oriented interviews, where the client/interviewee and researcher/coach develop and discuss the network map together in a communicative process. A classic field of application would be a research or coaching situation, where the researcher/coach would like to learn more about the socio-strategic setting in which a person (or a group) acts, and the reasoning from the point of view of the client(s). This “mental” network map then may act as a starting point for any kind of probing on histories, current situations, or future prospects of this network.

Second, the software allows for the realization of self interviews without the researcher being present. An assistant system can guide the interviewee through all stages of the mapping process step by step, with the help of preconfigured wizards. This function makes sense when a multitude of digital network maps with the same research question must be processed, or in a series of computer-based interviews via long distances. Picture a scenario involving the preparation of a conflict-workshop. Here, stakeholders or experts could be requested to produce their personal map of the actor constellation beforehand while being electronically guided from the preconfigured VennMaker. Having evaluated the different personal views, the researcher could then begin the workshop with the edited results, illustrating where there is common ground and where there are perceived differences which will have to be negotiated.

Third, VennMaker is suitable for jointly generating strategic network maps of organizational branches or projects ("strategic actor mapping") in a group process. This form of application fits nicely in situations where the elicitation and merging of different actor views for joint action is a goal. An example would be the actor constellation and network developed by the executive board of a medium–sized business company as shown in Figure 3 – only that now it would be processed with VennMaker – either using a Beamer (allowing everyone to take part in the visualized discussion), or using a more cutting-edge interactive whiteboard like Hitachi's Interactive Board FX Duo.[2]

Fourth, VennMaker allows for the user-defined amplification of graphical representations, which can also be applied as a user friendly drawing instrument to visualize network data that have been surveyed with other analytical methods beforehand. This form of using VennMaker as a pure visualizing tool makes sense in all forms of visual presentation of data analyses, be it as a basis for discussion or reflection in working groups, or as visualized representations in lectures and publications.

"*Venn" – what's in a name*

What does the name "VennMaker" mean? In Norwegian "Venn" means "brother", but this pun, though it makes sense, has not been the inspiration for our name. "Venn", first of is in reverence for the "Venn Diagram", a tool used with much success in the

[2] Currently we are launching a project together with Hitachi Software Engineering Europe AG to implement a multi-touch option into their whiteboard-series for VennMaker.

participatory appraisal of stakeholders in development contexts for the last 20 years. Its originator was the English mathematician and philosopher John Venn (1834-1923).

To make sense of “Venn” in the way we use it with our software, you might read it also as an acronym for “**V**ery **E**nergetic **N**ice **N**etworks”. As developers. we wish all our users this sort of experience when creating networks with VennMaker. In the end, this tool derives from the pleasure and gratification that people get when they see their own social networks mapped out in such a way that they are able to “visit” it in a beneficial communicative process together with the researcher/interviewer. This manual is designed to guide you on this path as a competent, yet easy to read companion.

Michael Schoenhuth, Trier 5th of June 2009

2 Introduction

The present manual serves as an introduction to the software VennMaker (Version 1.2). All available features of VennMaker are presented here step by step. The text is divided into three big parts. Free network drawing, configuration and processing of network interviews and exporting of generated data. At the end of this manual you should be able to draw social networks, to configure and execute/perform interviews and to export the obtained data with VennMaker. This manual is especially addressed to readers who are acquainted with the fundamental terms of social network analysis. However, that knowledge is not a prerequisite, especially for the free network drawing mode.

2.1 Starting VennMaker

To be able to execute VennMaker, you need Java (Version 1.6.12 and later). You can obtain Java free of charge, visiting http://www.java.com/de/download/.

You can download a free demoversion of VennMaker from http://www.vennmaker.com

Before you start surveying social networks, you have to install VennMaker. To do so, unzip the *VennMaker-Windows.zip* file and open the newly created VennMaker folder.

VennMaker cannot be run directly from the ZIP archive!

If you use Windows 7 / XP / Vista, you can open VennMaker via “VennMaker-Windows.exe”. If you have not installed Java on your computer, you will be asked to do so after launching VennMaker-Windows.exe.

If you use another operating system (Linux or Mac OS X for example), then you can execute VennMaker directly starting VennMaker.jar.

Having started VennMaker the following window will open on your computer display:

Figure 4: Start dialog

The features that are hidden behind the three buttons “Free Network Drawing”, “Configure Interview” and “Perform Interview” will be explained to you in the following chapters.

All windows in VennMaker are by default in English. You can change the language from English to German, Russian, Spanish or Chinese using the selection menu in the top right corner. All windows in the “*Free Network Drawing*” and “*Perform Interview*” mode will then be in the language selected.

In the following chapter we will concentrate on the “Free Network Drawing” mode.

3 Free Drawing of Digital Social Network Maps

Free drawing of digital network maps means that you are not subject to any restrictions from the program concerning the design and generation of the network. So, you may not only choose actors and relations freely from a range of default designs, but may also configure and add new actor types and relations during a VennMaker interview session if the situation demands it.

This mode makes most sense in exploratory interview situations, where the field situation is yet unfamiliar or if maximum flexibility and responsiveness vis-a-vis the proband / client's peculiarities and a minimum of comparability is requested. Typical for the first scenario are hypotheses-generating research situations; typical for the second would be consulting, counseling or coaching situations.

This chapter deals with those functions which are available in the “Free Network Drawing” mode. First, the different areas depicted in Figure 5 will be explained in more detail.

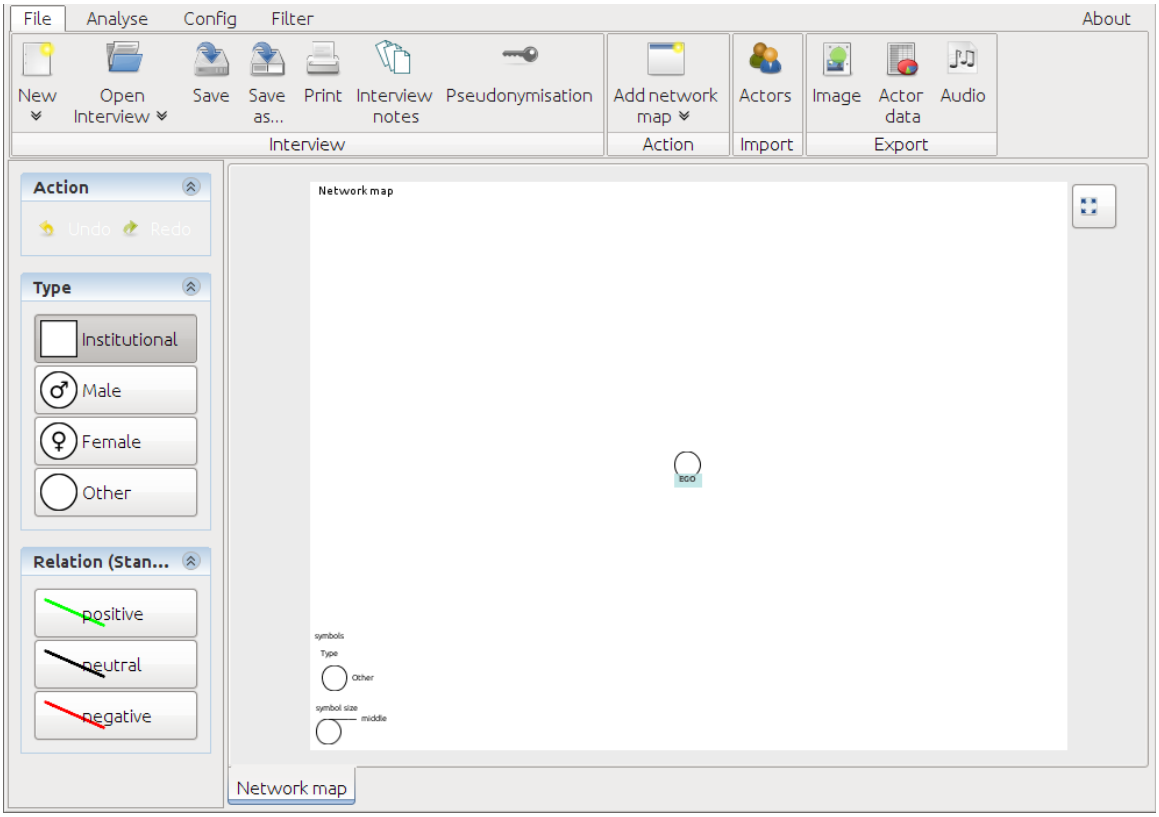


Figure 5: The „Free Network Drawing“ mode of VennMaker

3.1 The VennMaker Drawing Area

The large white space in the middle of the figure below is called the “digital network map”. All visual depictions appear here.

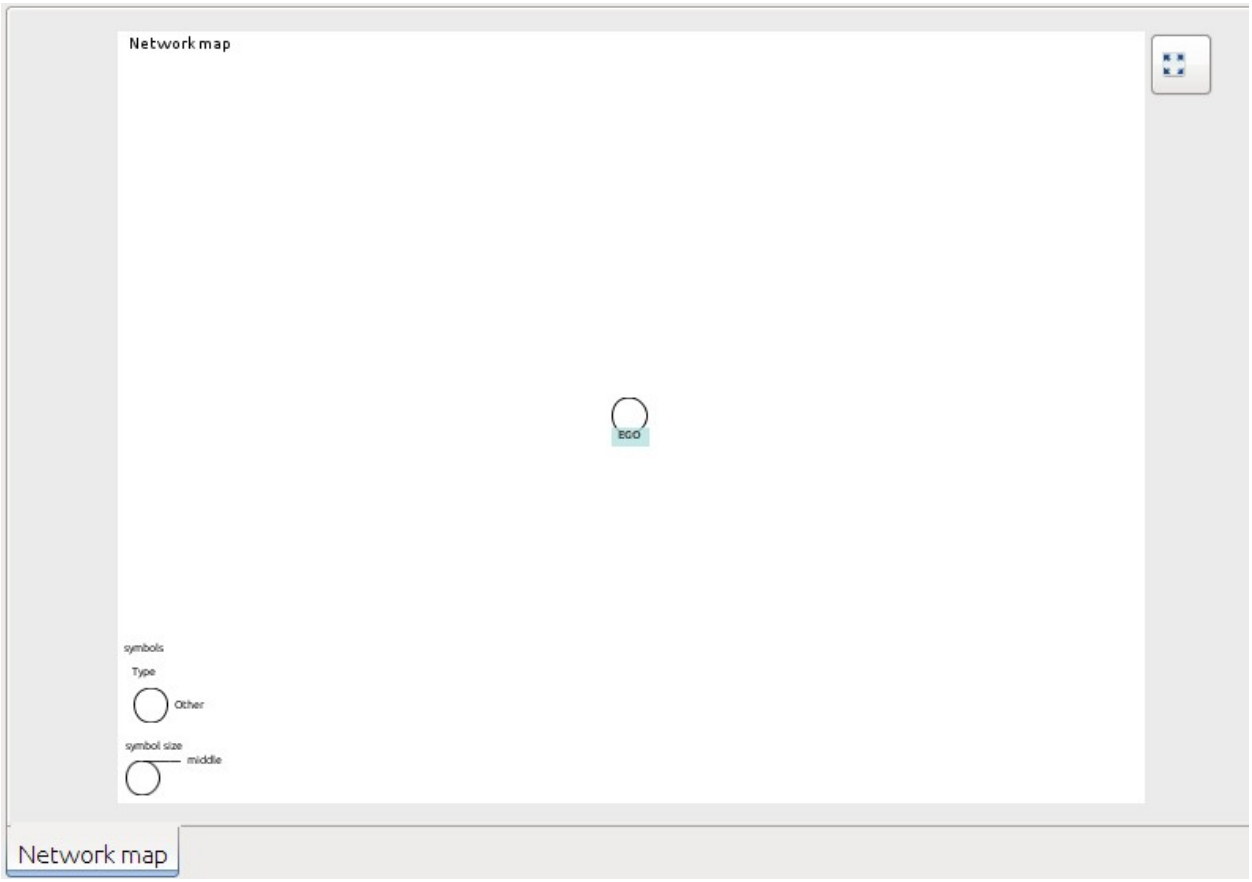


Figure 6: Digital network map

In this area, actors, relations, sectors and concentric circles can be plotted. Every digital network map can have different colors and backgrounds, which will be explained in more detail later.

Ego

In the default setting you will find the symbol of a human being in the center of the empty map, which is labelled “EGO”. Ego by default stands for the person interviewed - we deal with “ego-centered networks”. Renaming the center can also signify the project or group out of whose point of view the network is designed. The Ego can also be moved out of the center to become part of the whole network).

Figure 7: The ego symbol

In Figure 7 you see the ego symbol and its caption and colored background. In this case, ego is named “*Ego*”. If you move the cursor over the ego symbol and right click, you will see the following menu:

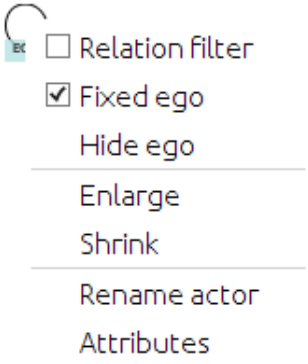


Figure 8: Context menu of Ego

If “Fixed ego” is activated, then the Ego-symbol can't be removed. If you choose “Hide ego”, then the Ego-symbol will be suppressed. All relations leading from and to Ego are also invisible and removed temporarily from the map then.

This operation is helpful, if Ego is part of a whole network, meaning, that there is no center, from which a network is set up and seen, but any actor has his or her place within the net. It also fits for Ego-centered interviews when for setting a stimulus you want to visualize only alteri-alteri relations, that means the relations between the network partners of Ego (“how would the network look like without Ego and his/her relations/ties?“).

If you want to uncover Ego again, just right-click anywhere on the map. You will get a drop-down menu where you can click on “Show Ego”. After that Ego with all his/her relations will reappear.

By means of the “*Relation Filter*” you can hide all relations that are not directly connected (adjacent) to ego. This function is useful when many actors are drawn on the network map, making it hard to have a clear overview.

“Enlarge” boosts the Ego-Symbol, “Shrink” downsizes it, with every click one step further. You can also use the mouse wheel for this action. Try which of the functionalities fits you better.

Ego’s name is changed by clicking “*Rename Actor*” in the context menu. An input field opens where you can enter a new name.

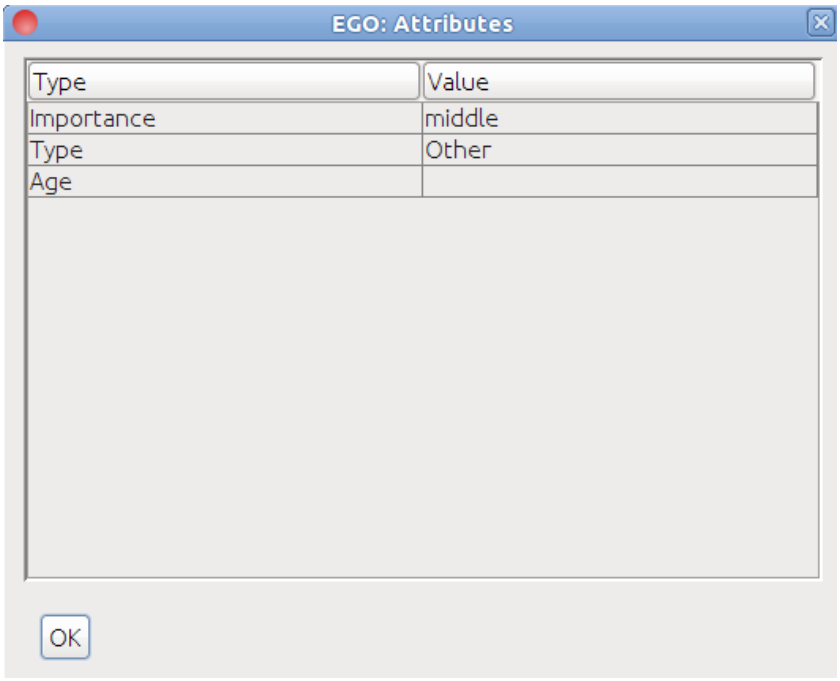


Figure 9: Attribute dialog

Every actor including ego can be tagged with additional attributes. You can change the respective attribute values of an actor via "*Attributes*".

Figure 9 shows ego's attributes. The attribute values are changed by clicking the appropriate cell. In the case of categorical attributes, a selection list with the respective categories opens. In the case of freeform answers, you can type the attribute value in a text box. Changes are applied to the actor immediately.

How you define or edit new attributes is explained in the chapter 3.4.

Legend

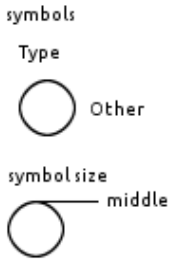


Figure 10: Legend with default values

A legend is shown by default in the bottom left corner of the digital network map (see Figure 10).

The legend contains all attributes and attribute values used in the network map and which are linked to visualizations. These could be symbol size, symbol type, relation lines, sectors or concentric circles. In Figure 10 you can see the default legend. If a symbol or relation line is deleted, altered or added, the key is automatically updated.

The legend will be hidden by clicking on an unused space of the digital network map with the right mouse button. A menu will open (see Figure 11) where you can choose “Hide Legend”. Thereafter, the legend will be hidden.

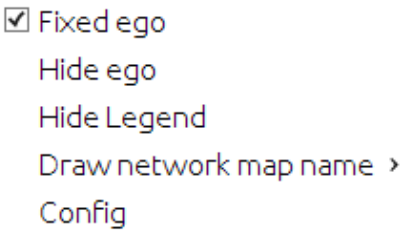


Figure 11: Context menu of the digital network map

This also applies for displaying the legend. There is only one difference referring to the menu. Now it contains a new menu item named “Show Legend”.

In this chapter you have learned to change some parameters of Ego as well as hiding the legend of the digital network map. The following chapter will explain how to draw other actors (resp. alteri / nodes) on the one hand and how to draw relations (respectively ties) between the actors on the other hand.

3.2 Akteure und Beziehungen einzeichnen

The following default menu is found on the left side next to the digital network map:

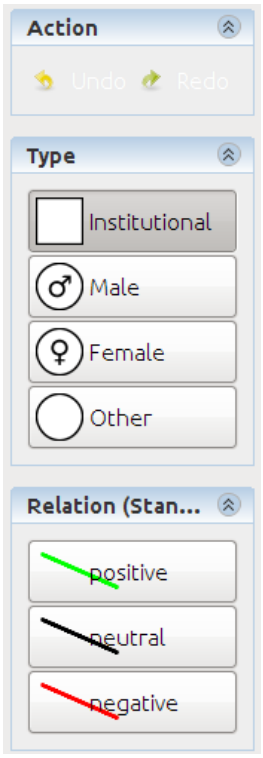


Figure 12: Menu for Undo/Redo and for drawing actors and relations

In Figure 12 you can see three areas: “*Action*”, “*Actor Type*” and “*Conflict (standard relation)*”. The last item is abbreviated. If you move the mouse over these items, a small text box (called Tooltip) with the full text appears.

Undo / Redo

The upper "*Action*" field contains an "*Undo*" and a "*Redo*" button. If you notice, for example while drawing a network, that you have made a mistake, you can use the "*Undo*" button to undo all actions step by step. Using the "*Redo*" button, you can restore an action that has been undone.

Actor Type

When launched, VennMaker creates the attributes "*Importance*", "*Actor Type*" and "*Age*". Additionally, the attribute values of the "*Actor Type*" attribute are represented by symbols. In Figure 12 you see the attribute "*Actor Type*" with its attribute values "*Institution*", "*Male*", "*Female*" and "*Other*" along with their respective symbols.

If you click on one of the symbols and then click on the digital network map, VennMaker will ask you to enter a name, and then the symbol selected along with the name will be displayed on the network map. You have created an actor whose attribute "actor type" has been given an appropriate attribute value. This value is represented by its symbol.

An example: You would like to add the actor Peter to the network map. First, you choose "Male" on the left under "Actor Type". Then you click on the desired position on the network map and enter the name Peter. Afterwards, the male actor Peter is shown on the network map (see Figure 13).

Figure 13: Actor name and the actor value is visualized by a symbol

How you set which attribute value is represented by a symbol is explained in chapter 3.4.4.1.

An actor that has already been added to the network map can be re-positioned by left clicking the symbol on the network map and, while keeping the mouse button pressed, moving it.

If you right click on the symbol on the network map, the following context menu appears:

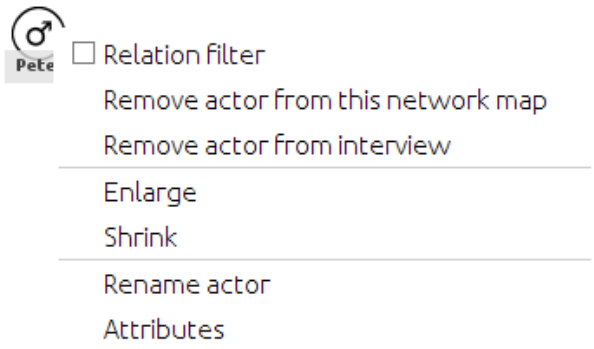


Figure 14: Context menu of an actor

Use "*Remove Actor from this Network Map*" to remove that actor from the current digital network map. The actor will appear in the left section under "*Available Actors*". The actor is for all intents and purposes 'parked' on the edge of the network map.

You can completely delete an actor from the interview by using "*Remove Actor from Interview*".

Use "*Enlarge*" and "*Shrink*" to change the size of the actor symbol.

You can also change the size of a symbol by moving the mouse over it and then using the scroll wheel on the mouse.

However, to be exact, you are not actually enlarging or shrinking the actor symbol, but rather the value of the attribute. VennMaker correlates the relative value of an attribute with a pre-defined symbol size. If the attribute value is changed, the symbol size changes accordingly.

How this correlation can be changed is explained in the Triggers chapter 3.4.4.5.

Use “*Rename Actor*” to change the actor name.

Via “*Attributes*” you can open another window where you can change the attribute values of the actor:

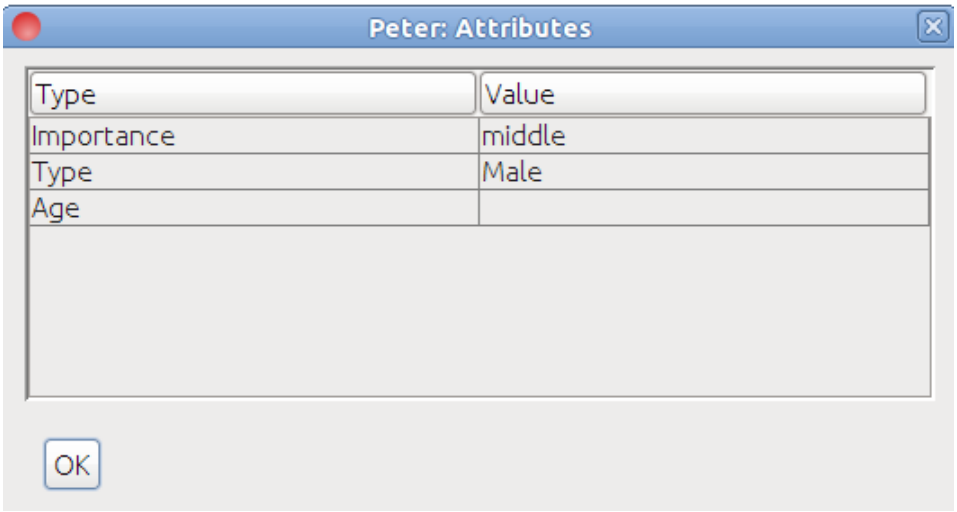


Figure 15: Attribute dialog of an actor

You can also open this window by double clicking on one of the symbols. You can change the attribute values by clicking the appropriate cell in the “*Value*” column.

Drawing Relations

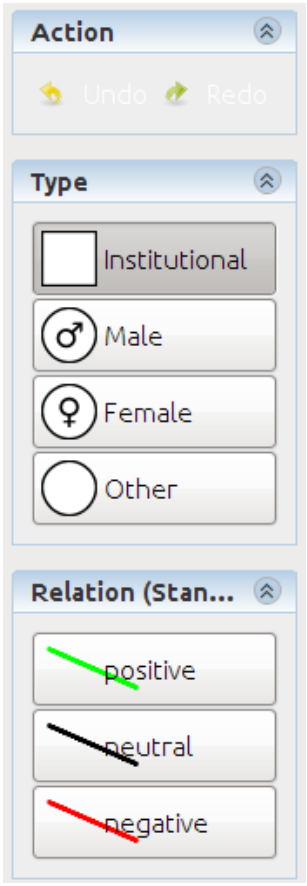


Figure 16: Menu for the default relation

In Figure 16 you see the “Relation (Stand...)” field and its three characteristics: “positive”, “*neutral*” and “*negative*”. Every relation characteristic is represented by a different type of line. To see the full text of the various labels, move the mouse over them.

By default VennMaker uses relations that run in both directions. The same relation runs between Actor A and B as between Actor B and A. To ensure clarity, no arrows are used. In the relational attribute chapter 3.4.5 you will learn how to set up directed relations.

Relations are plotted on the digital network map by clicking the appropriate button (e.g. “*neutral*”). Then click the actor from whom the relation should start on the digital network map and, keeping the left mouse button pressed, drag the line to the second actor (for best results, drag the line to the middle of the symbol) and then let the mouse button go.

Now both actors are connected by a line. By right clicking on the relation, a selection menu appears (see Figure 17).

"*Delete Relation*" deletes the relation drawn on the map.

The function "*Reverse relation direction*" is deactivated here because no directed relation is used. If a directed relation is set up, then "*Reverse Relation Direction*" changes the direction of the line and arrow.

Use "*Attributes*" to open a window for changing relation attribute values:

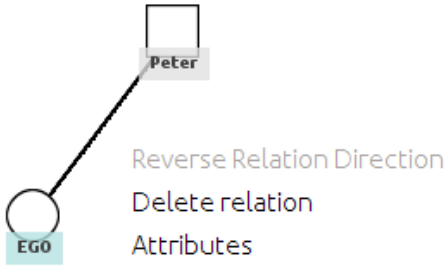


Figure 17: Context menu for the relation

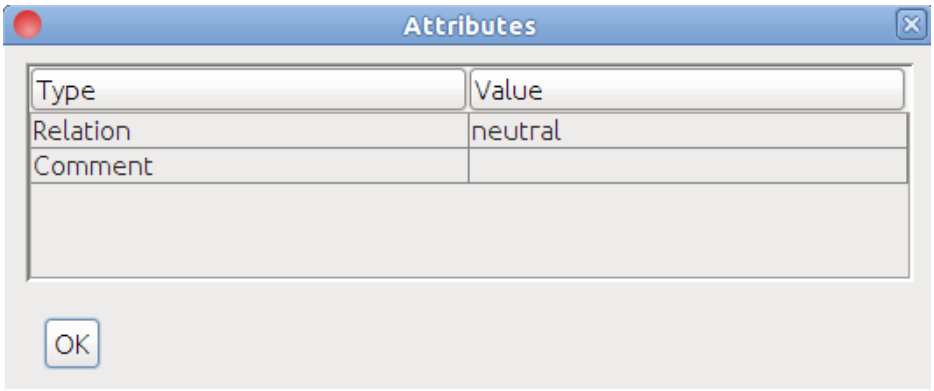


Figure 18: Dialog for the relation attributes

If you add multiple relation lines of different types between the actors, then these lines are automatically displayed next to each other.

3.3 Digital Network Map

The digital network map is the drawing area in VennMaker. The following chapters explain how you customize the digital network map, clone or add additional maps.

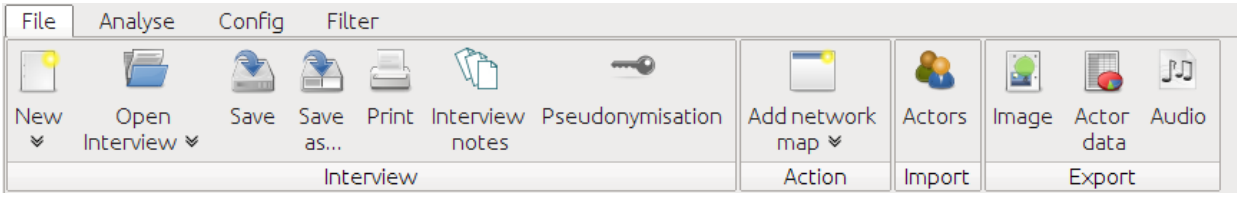


Figure 19: The menu bar

When you click on "*File*" in VennMaker's upper menu bar, a toolbar (also called a *ribbon*) opens (see Figure 19).

The toolbar is divided into four functional areas: "Interview", "Action", "Import" and "Export".

3.3.1 Project, Interview and Network Map

First the concepts project, interview and network map will be explained. Then you will be shown how network maps and interviews are saved in project files and then loaded again from the project files.

The following diagram illustrates the relationship between project, interview and network map:

<table>
<tr><td>Project „Migration“</td><td colspan="2"></td></tr>
<tr><td></td><td>Interview „Person A“</td><td></td></tr>
<tr><td></td><td></td><td>Netzwerk Map 1</td></tr>
<tr><td></td><td></td><td>Netzwerk Map 2</td></tr>
<tr><td></td><td>Interview „Person B“</td><td></td></tr>
<tr><td></td><td></td><td>Netzwerk Map 1</td></tr>
<tr><td></td><td></td><td>Netzwerk Map 2</td></tr>
</table>

Figure 20: Relationship between project, interview and digital network map

A project, in this example a project on the inter-relation of migrants in rural areas, contains two ego-centric interviews (Person A, Person B). Each interview uses two digital network maps (in each case Network Map 1 and Network Map 2).

In general, each interview contains at least one network map. Network maps are always a part of an interview. An interview is always part of a project.

VennMaker uses this division when saving projects. All interviews from the project are saved in the project file. This means that all images and symbols, the network map creation log and the recorded audio files are all saved in this project file. This ensures that all interview data are centrally collected in one project file.

3.3.2 Saving an Interview

The “*Interview*” function allows you to create a new interview, open an existing interview and save an interview.

All interviews are saved in a project file. The project file ends in ".vmp" (*VennMaker Project*).

An interview can be saved via "*Save*" or "*Save As…*" The difference between "*Save*" and "*Save as…*" is that "*Save*" only opens the save window (see Figure 21) if you have not yet selected a project and interview where the network data should be saved. "*Save as…*" always opens the save window:

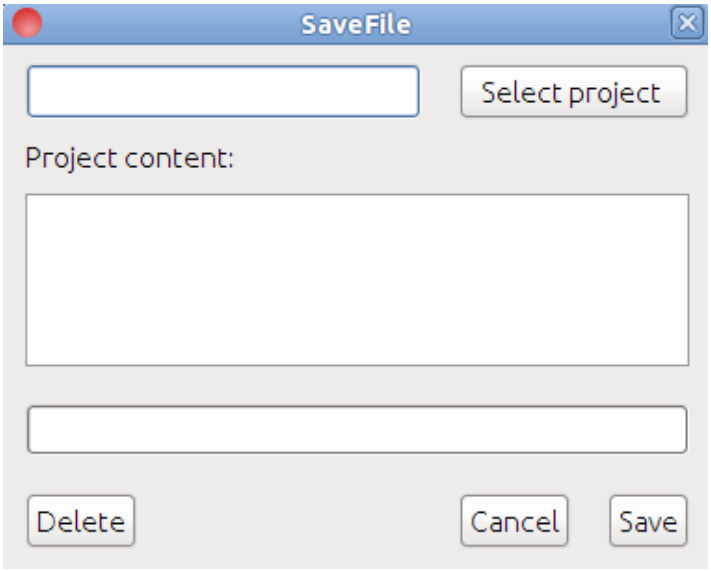


Figure 21: Save dialog

When you save your interview for the first time, you first must select a directory where the project that contains the interview should be saved and give the project a name:

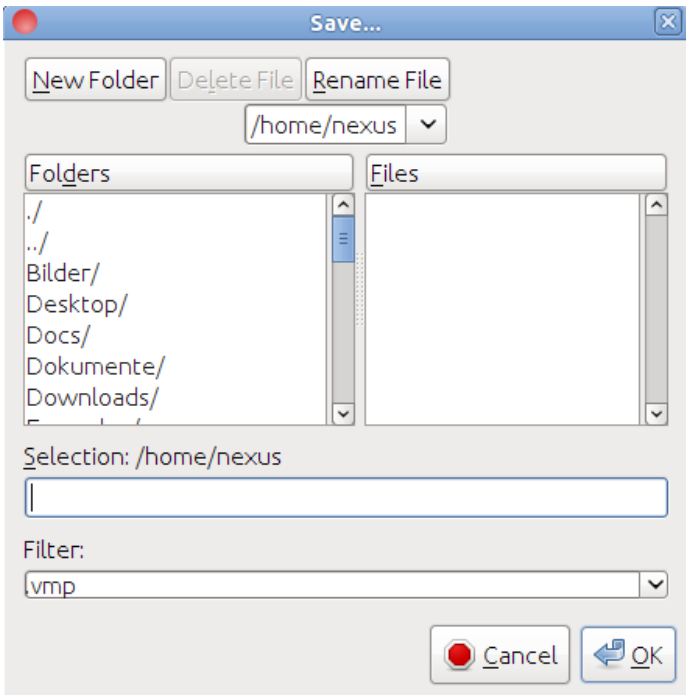


Figure 22: File browser for saving projects

You can either create a new project by entering a new project name or select an existing project file.

Finally, click "*OK*".

The name of the project file now appears in the first line of the save window (cf. Figure 23). If the project already contains further interviews, the interview names will be listed in the "*Project Contents*" section.

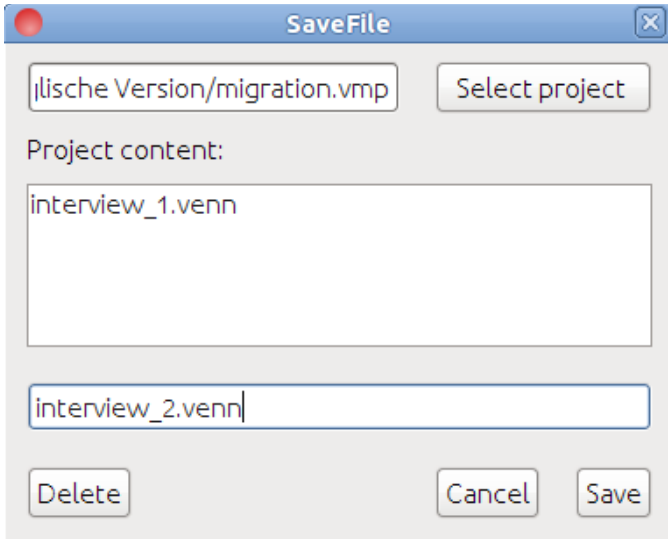


Figure 23: The project content dialog

You can also enter a new name for your interview in the lower input box and then click "*Save*". Your interview will then be saved as a new interview in the project file.

After you have saved your interview, the project path and name, and the name of the interview will appear in the VennMaker menu bar (cf. Figure 24):

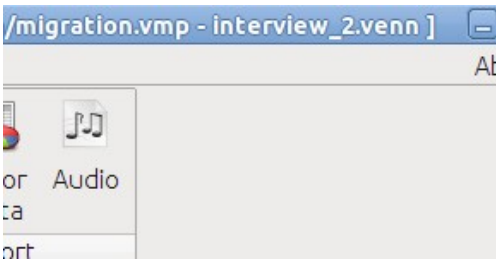


Figure 24: Project path, project name and interview name

3.3.3 Deleting an Interview

You can delete an interview via the save window (cf. Figure 21).

The "*Delete*" button removes the interview from the project. First click on the interview in the "*Project Contents*" section and then click "*Delete*". VennMaker will then ask if you are sure you wish to delete the selected interview. After you have confirmed this, the interview will be removed from the project.

3.3.4 Creating a New Project and Interview

A new project and interview are created as follows:

Click "*New*" once and the following menu opens:

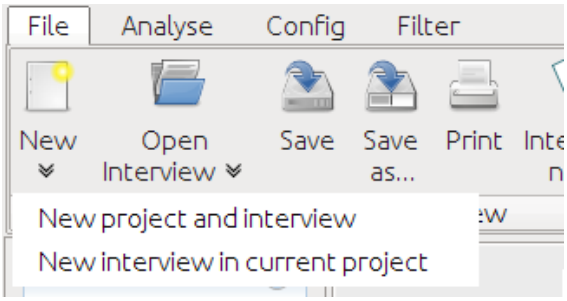


Figure 25: Create a new project and interview

Here you can choose between "*New Project and Interview*" and "*New Interview in Current Project*". If an interview is still open, VennMaker will ask whether you are sure you want to start a new project and whether you want to close any open digital network maps. Once you have confirmed, a new project will be created.

If you have not yet opened a project, the second function "*New Interview in Current Project*" will not appear.

The difference between these two functions is that "*New Project and Interview*" will not

allow you access to the current project's attribute symbols and only the VennMaker symbols will be available. With "*New Interview in Current Project*" you still have access to the attribute symbols of the project.

How you can add your own attribute symbols to your interview and project is explained in chapter 3.4.4.1.

3.3.5 Opening a Project and Interview

You can open a project by clicking "*Open*". A menu with two functions will appear: "… *from current project*" and "…*from another project*" (cf. Figure 26). The second function "… *from another project*" will only appear if an interview is open.

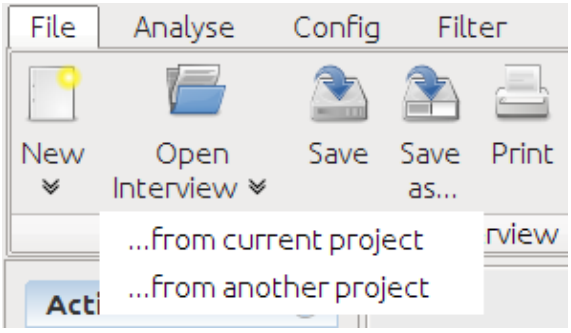


Figure 26: Open an interview

If you choose "… *from current project*", the following window opens:

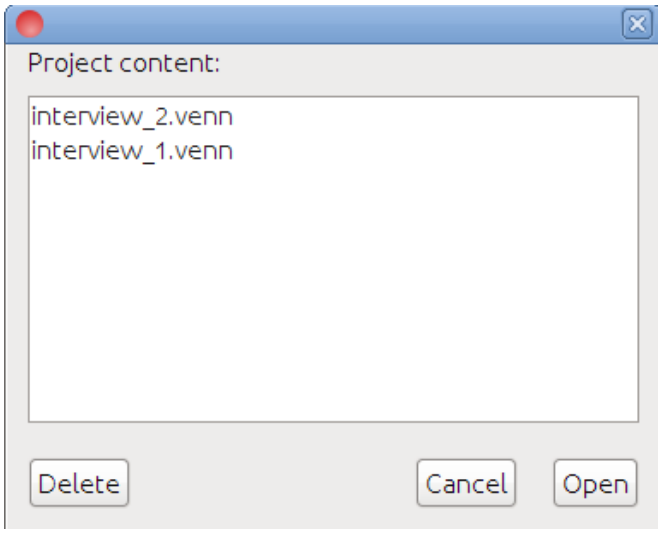


Figure 27: Open an interview from current project

All interviews that have been saved in the project are listed in the field labeled "*Project contents*". You can open an interview by clicking one of the entries and then clicking "*Open*".

You can delete an interview by clicking the interview in the list and then pressing "*Delete*".

If you select "*… from another project*", the following window opens:

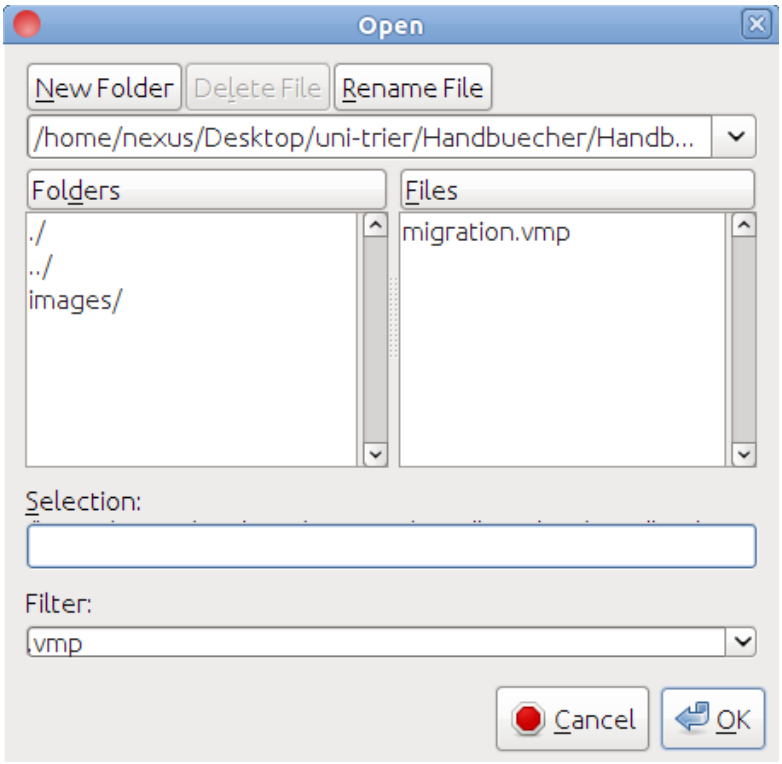


Figure 28: Open an interview from an other project

Here you can select the desired project and click "*OK*" to open. The project files all have the file extension ".vmp".

You can open older venn files (VennMaker Version 1.1.1 and earlier) by selecting ".venn" from "*Filter*". All files ending with "*.venn*" will then appear and can be opened by clicking "*OK*".

3.3.6 Add and Clone Network Maps

In the menu bar (see Figure 19) there is a button labeled "*Add Network Map*" in the "*Action*" section. If you click this button, VennMaker opens a selection menu for creating ("*Add Blank Network Map*") a new network map as well as for cloning ("*Clone Network Map*") the current network map (see Figure 29).

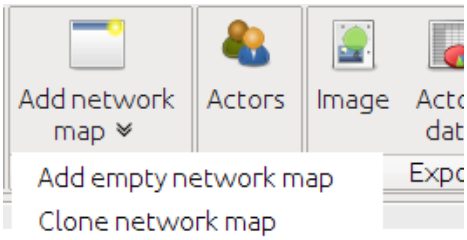


Figure 29: Create or clone a network map

"*Add Blank Network Map*" adds a new digital network map to the interview.

"*Clone Network Map*" generates an exact copy of the current network map.

If you click either of the menu buttons, VennMaker will ask you to name the digital network map to be created. Only then will VennMaker create the map. A new tab will appear on the border at the bottom of VennMaker (see Figure 30).

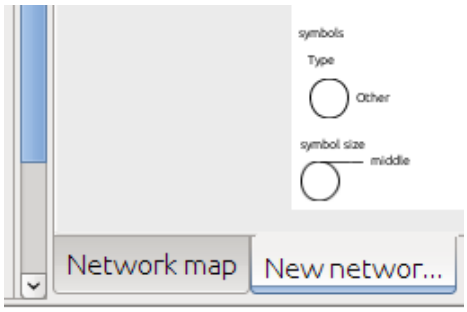


Figure 30: Digital network map tab

You can switch between the digital network maps by clicking the tabs.

You can change the tab order via drag & drop: click on a tab and, while keeping the mouse button pressed, drag it to the desired tab position.

If you wish to re-name a network map then right click on the appropriate tab and select "*Rename Network Map*" (cf. Figure 31).

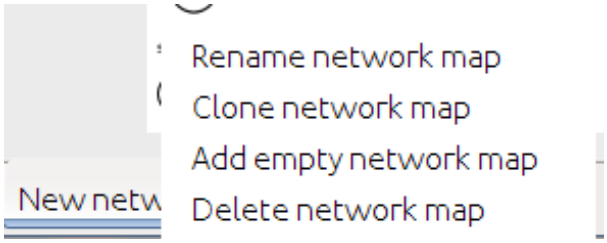


Figure 31: Context menu of the network map tab

If you would like to remove a network map from the project, right click on the appropriate tab on the bottom border of VennMaker and select "*Delete Network Map*" from the context menu (cf. Figure 31).

Now that you have learned how to create, save, delete and duplicate digital network maps, the following chapters will explain how you can configure a digital network map.

3.4 Attributes

Non-relational and relational features are compiled in every classical survey. This is also possible using VennMaker, although here the term "*Attribute*" is used instead of feature. Actors in VennMaker can have various attributes, which can be configured individually. Examples of such attributes are age, sex of a person or type of institution, etc.

3.4.1 Edit Attributes

Attributes can be set via the configuration window as follows: Use the right mouse button to click on an open area of the network map and select "*Configuration*". Then select the function "*Attributes*" under "*Project*" in the configuration window:

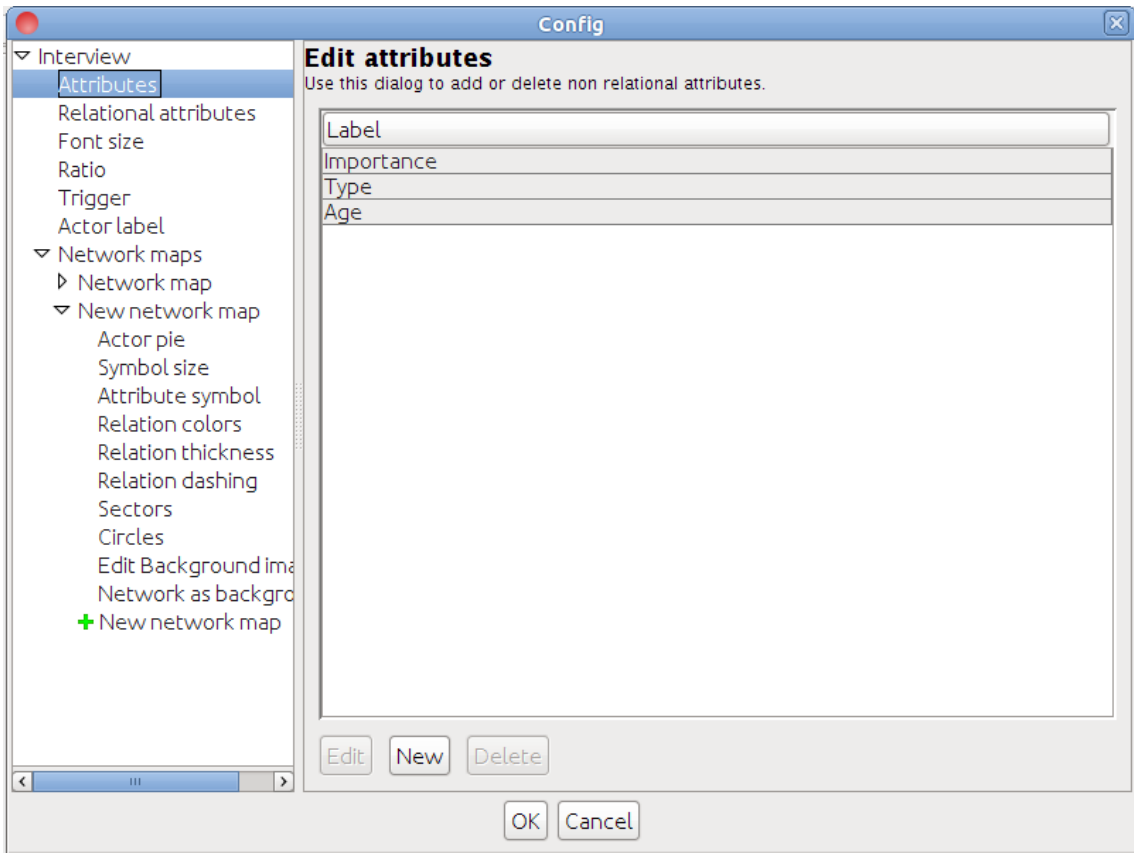


Figure 32: List of the non-relational attributes

All available attributes are listed in the open window and there are three functions: "*Edit*", "*New*" and "*Delete*".

However, the functions "*Edit*" and "*Delete*" are only available once an attribute from the list "*Label*" has been clicked.

A new attribute is created by pressing "*New*" and then entering an attribute label:

Figure 33: Input a new attribute label

Delete an attribute as follows: select the appropriate attribute from the list and then click "*Delete*". You will not be asked whether you want to delete the attribute!

An attribute can be changed by selecting it from the list and then clicking "*Edit*". This window will open:

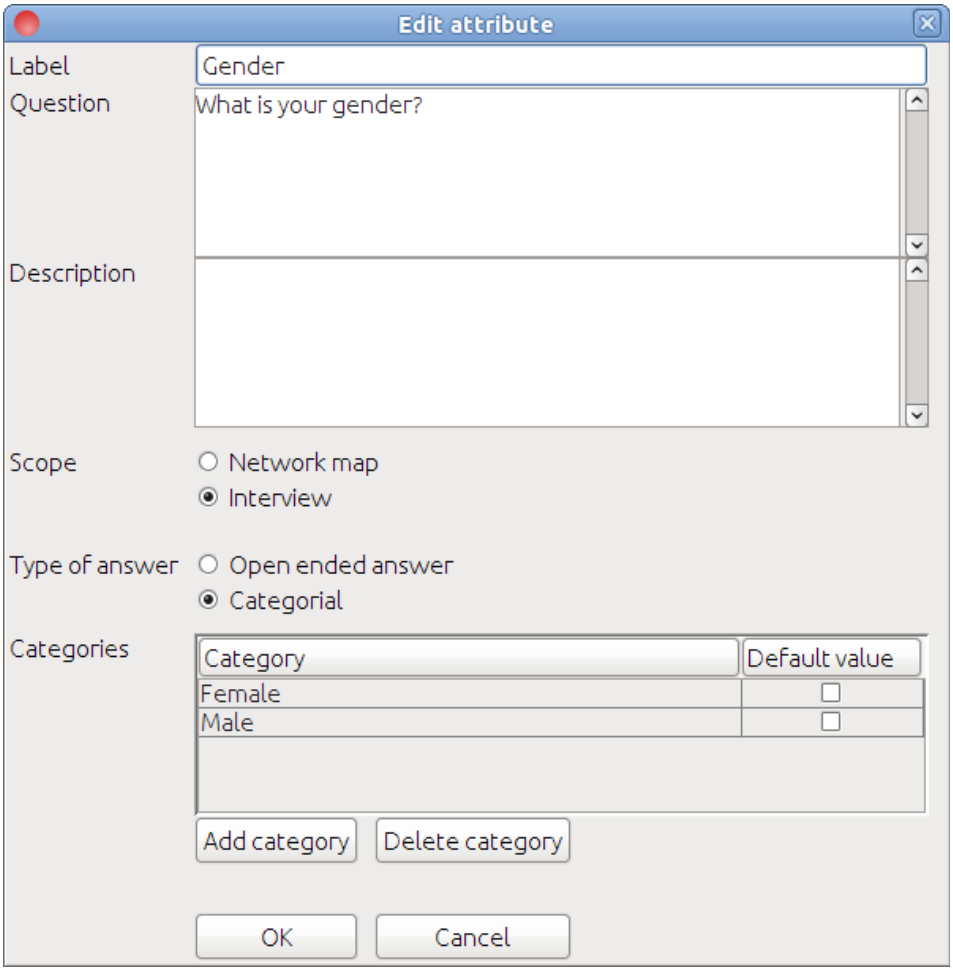


Figure 34: Dialog for configuring an non-relational attribute

In VennMaker, every attribute is composed of a *relation*, an *issue*, a *description* of the attribute, the *scope* and an *answer*.

The attribute *relation* allows the attributes to be differentiated from one another.

Every attribute can be given a question. *Open ended answer* and *Categorical* are the two answer possibilities. *Open ended answer* allows any open answer to be entered, whereas with *Categorical* only pre-formulated answers can be selected.

For the quality of the survey it is important that researchers can store further information about the attributes. For this, you can use the *description* of the attribute.

The scope specifies whether the answers given apply to all network maps within the same interview or whether every individual network map should be given different answers. The latter is attractive, for example, when collecting data at different times as actor characteristics can vary between different time periods (e.g. income, status).

New categories can be added using “*New*” and existing categories can be removed using “*Delete*”.

The *Default Value* specifies whether a particular category should be set up automatically when a new actor is created.

The order of the attribute values can be changed using drag & drop. Click on the desired entry in the “category” column. Keep the mouse button pressed and drag the entry to a new position within the column and then release the mouse button. The selected entry has now switched positions with the other entry.

3.4.2 Configuring Relational Attributes

A social network contains, in addition to actors, social relations that exist between these actors. Relations are represented by relational attributes in VennMaker. For example, the relation “money borrowed” is a relational, categorical attribute with, for instance, three response categories: “€0-1000”, “€1001-2000” and “€2001-3000”. In addition to relational, categorical attributes, relational attributes allowing text input can also be defined. This enables, for example, every relation to be tagged with commentary.

Relations can be combined to form relation groups as well. An example: The relation group “Social Support” contains two relations: “money borrowed” and “tools borrowed”. In VennMaker, you can define and change certain relations via “*Configuration*” > “*Relations*”:

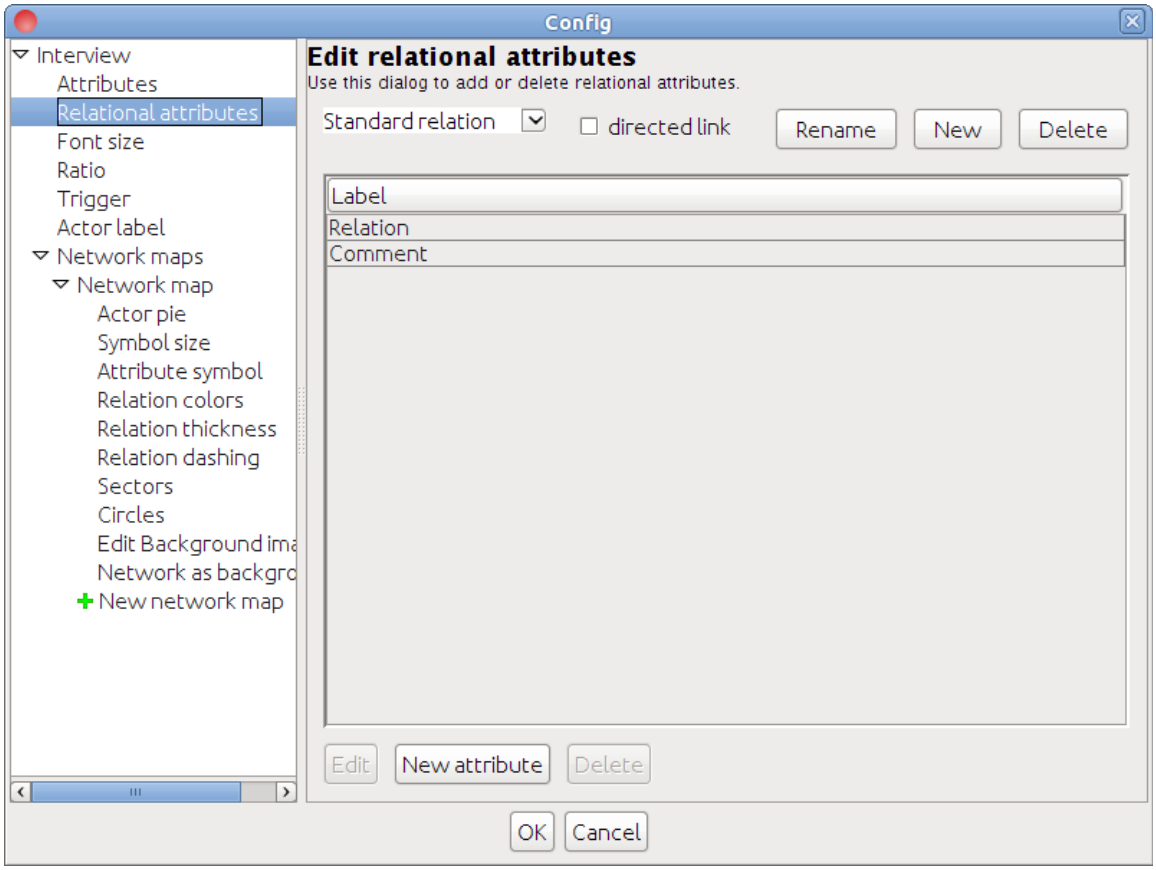


Figure 35: Dialog for configuring a relational attribute

In the configuration window for the relation attributes there is a selection menu below the information text which can be used to define relation groups.

Relation Groups

A relation group combines multiple relational attributes. This enables, for example, a relation with a categorical attribute and an annotated attribute to be created. In this case, the relation group stands for a relation that can additionally be annotated.

If you wish to create a new relation group, click "*New*". VennMaker will prompt you to name the relation group and then to name the first attribute. After you have done this, a configuration window for the attribute will open. This window is nearly the same as that for non-relational attributes, with the difference that you can configure relational attributes (cf. chapter 3.4.1). After you have configured a non-relational attribute and clicked "*OK*", this attribute will be listed in the new relation group.

VennMaker allows you to use directed and undirected relations. Undirected relations run in both directions between two actors. Directed relations, on the other hand, run in only one direction, from one actor to another. Directed relations can be depicted with an arrow. Undirected relations are depicted with a simple line instead. If you would like a relation group containing only directed relations, then click the box to the left of "*Directed Relation*". A check will appear in the box. If you click the box again, the checkmark will disappear and you have switched the relation group back to undirected relations.

If you would like to delete a relation group, select the desired group in the selection menu and click "*Delete*". Once you have confirmed that you wish to delete it, the relation group and all the attributes in it will be removed.

VennMaker prevents you from being able to delete all relation groups; therefore, you can only delete a relation group if at least one other exists.

Relational Attributes

A relation group contains one or more relational attributes. These attributes are displayed in a table in the configuration field.

You can create a new attribute using the button "*New Attribute*". The window is similar to the one for non-relational attributes (cf. chapter 3.4.1).

3.4.3 Inputting and Editing Attribute Values

In the previous chapter you learned how non-relational and relational attributes can be created. This chapter shows you how to input attribute values.

3.4.3.1 Inputting Non-Relational Attribute Values

If an attribute has been defined, a user can then enter attribute values, or rather answers in one of two ways: either for each actor individually or by using an actor table which contains all actors and their attributes and attribute values.

To begin with, the first input option will be dealt with, which proceeds using the following steps: Right-click on an actor and then select "*Attributes*" from the context menu.

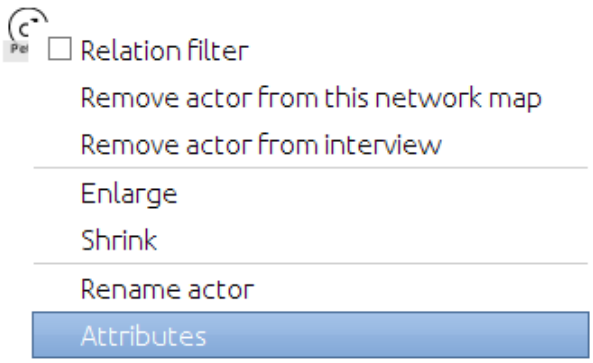


Figure 36: Context menu and attributes

Then a table opens which contains all attributes and their actor-specific attribute values. (You can also open the table by double-clicking on the actor.)

All actor attribute values can be changed in this table:

If the attribute was previously tagged with a question, this question will appear in the table, otherwise the attribute labels will be used (e.g. "*Importance*").

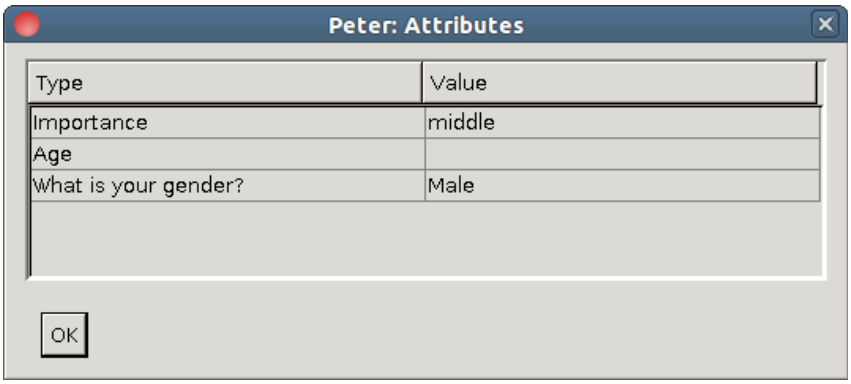


Figure 37: Attribute dialog of an actor

You can change an attribute value by clicking the appropriate cell in the column "*Value*". If it is a categorical attribute, then a list with response categories will appear. If it is a non-categorical attribute, an input box will appear.

Actor Table

The second possibility of changing attribute values is to use the actor table. This can be accessed via the menu item *Analyse* > *Actor Table*.

The first row contains the attribute labels. All the actor names are listed in the far left column. The columns to the right of that contain all the attribute values for that actor. By clicking the appropriate cell in the table, you can change the attribute values.

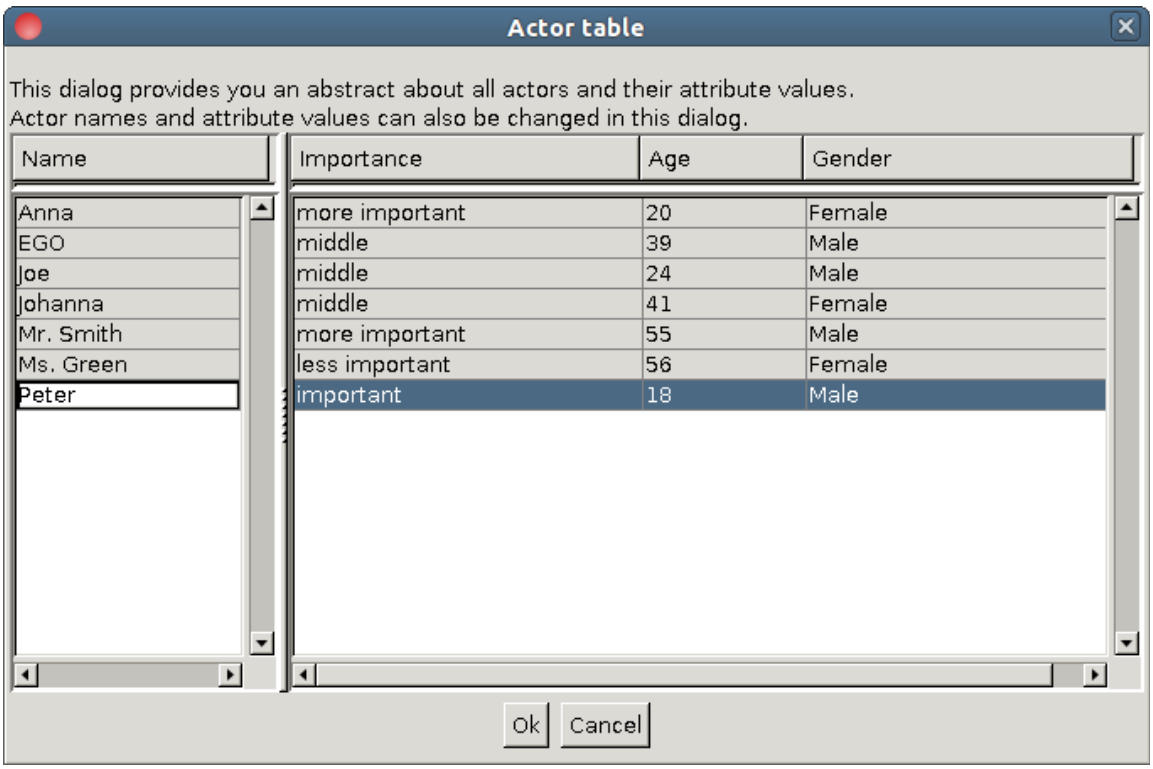


Figure 38: The actor and attributes table

The advantages of using the actor table are the clear overview and the ability to quickly input many attribute values.

3.4.3.2 Inputting Relational Attribute Values

Relational attribute values such as the extent of financial support can be input in two ways: by selecting the appropriate relation line while drawing a line or by using the attribute window for each relation line that is drawn on the digital network map.

Setting Attribute Value by Selecting the Appropriate Relation Line

Relational, categorical attribute values can be set by selecting the appropriate line in the menu on the left:

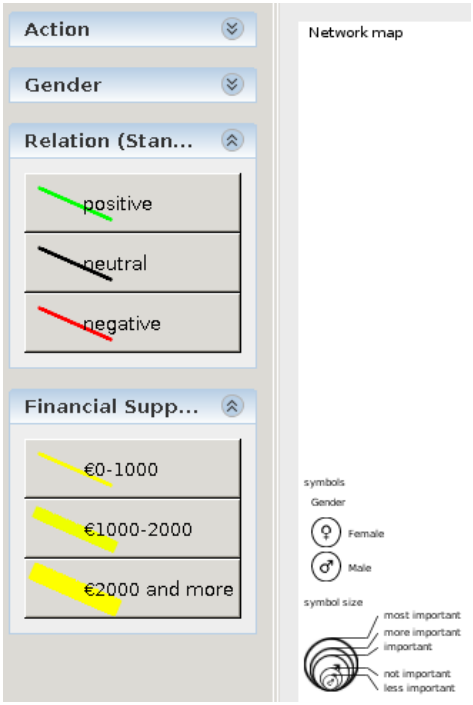


Figure 39: Menu for the relational attributes

For example, if you select “€1000-2000” under “Financial support” (cf. Figure 39) and then draw a relation line between two actors, the attribute value of the relational attribute will be set as “€1000-2000”.

Attribute Window

The attribute window for a relationship's relational attribute values can be opened by right-clicking on the desired relation line.

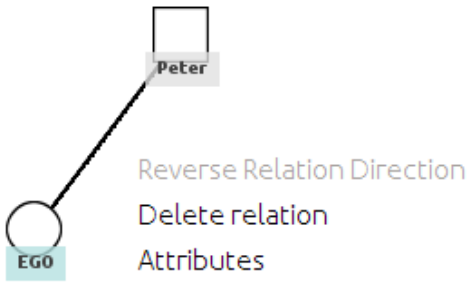


Figure 40: Context meu and relational attributes

A context menu will open. Click on "*Attributes*".

The attribute window had two columns, "*Attribute*" and "*Value*". The first column contains the attribute names and the questions formulated, and the second column has the attribute values and answers. You can click on a cell in the "*Value*" column to change its value.

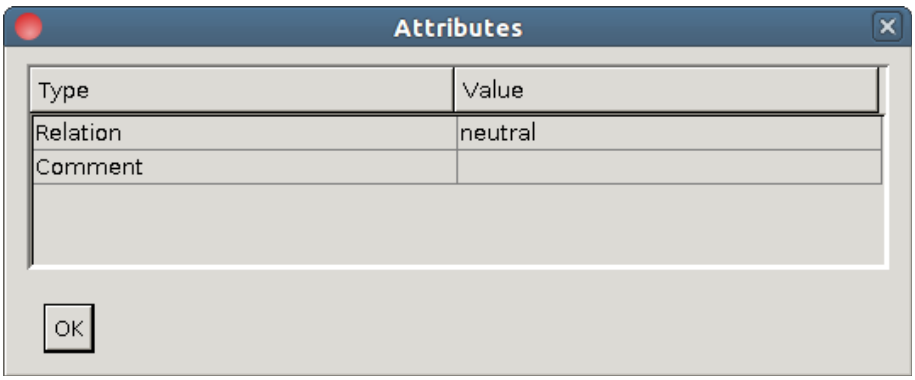


Figure 41: Dialog for editing relational attribute values

3.4.4 Visualizing Attributes

Sometimes it is important to integrate non-relational attribute values into the network picture as visual information, for example to use them as a stimulus for further surveys.

In Figure 42, four actor attributes are displayed: name, emotional importance, sex and role (family member, friend, co-worker).

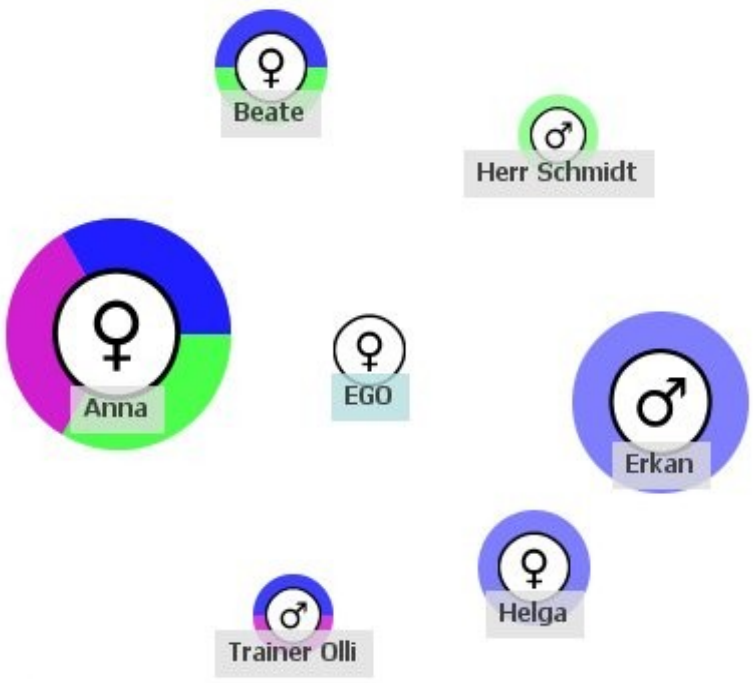
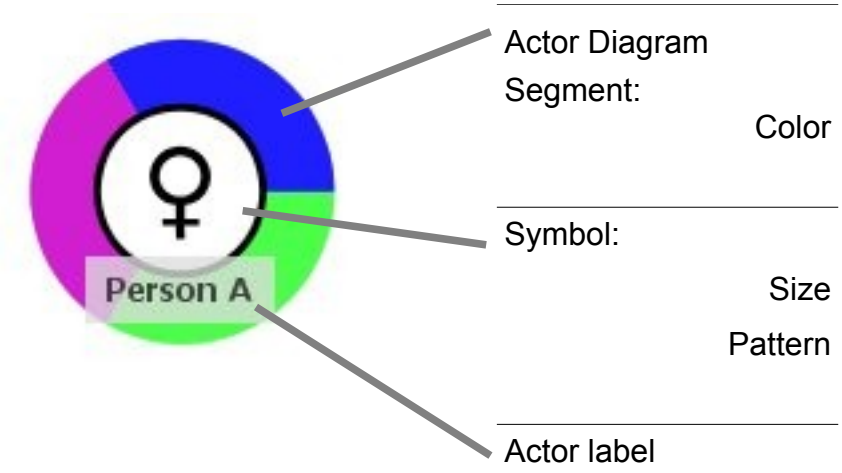


Figure 42: Example for visualizing non-relational attribute values

The attributes (with the exception of actor name) are visualized using symbols (= sex), symbol size (the larger the symbol, the larger the emotional importance) and sectors (blue= family member, purple= friend, green= co-worker). The viewer can easily interpret which actor is emotionally important (Anna), which actors fill multiple roles and which sex the actors are.

Below you will find instructions for visualizing non-relational attributes in VennMaker.

An actor and its attributes can be displayed with various visual components:



First we will look at the attribute symbol. This is the only visual component in VennMaker that is mandatory and not optional.

3.4.4.1 Attribute symbol

An actor can be described by one or more attributes, whereby categorical attribute values can be represented by additional symbols on the network map. An example is the sex of the actor, which is represented by the corresponding symbol. Attribute symbols can be individually set for every digital network map. To do so, open the configuration window for attribute symbols by right-clicking on an open area of the digital network map and selecting "*Configuration*" from the selection menu. Then in the configuration window, click on the sub-menu function "*Attribute Symbol*":

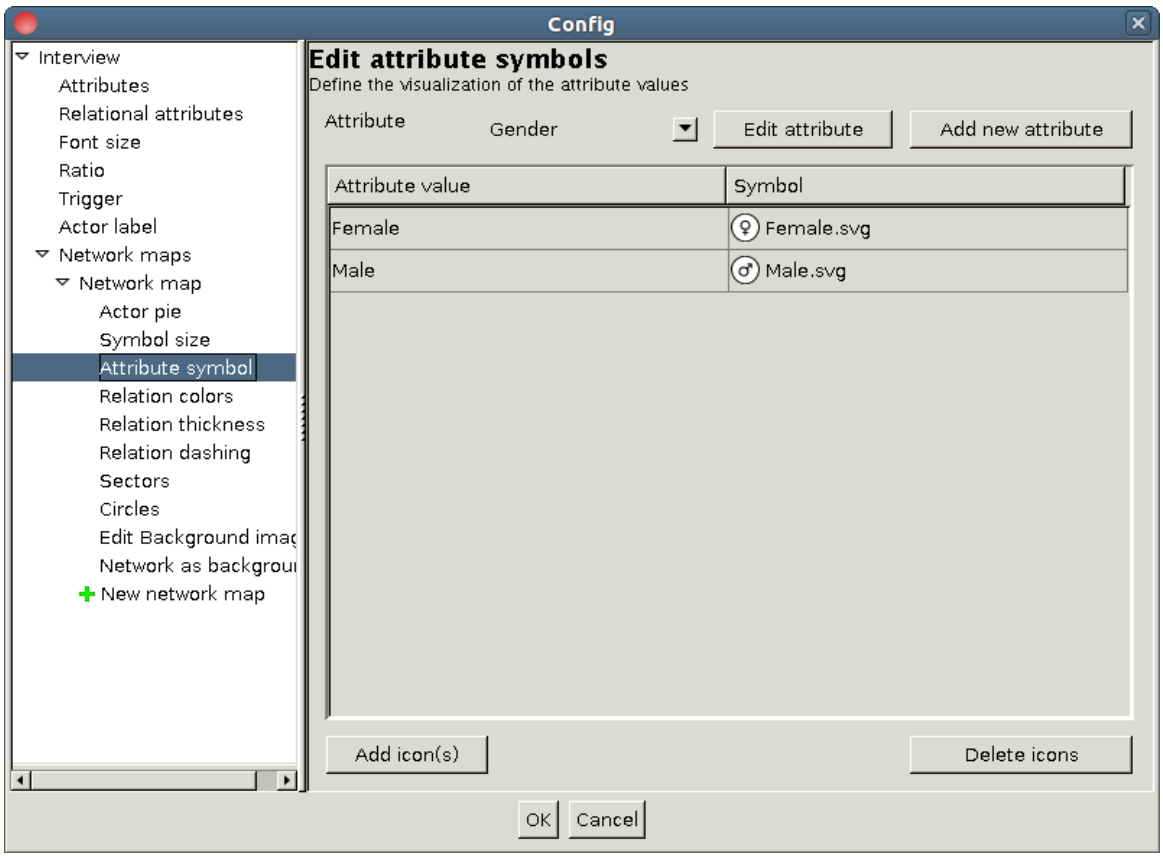


Figure 43: Config dialog for editing the attribute symbols

In the right section of the configuration window, you will see, under the information text, the attribute (in this case "*Actor Type*") and two buttons for editing the attribute selected and for adding a new attribute.

You can choose another categorical attribute by clicking on the dropdown list to the right of "*Attribute*".

You can create a new categorical attribute with "*Add New Attribute*"; you can edit the attribute selected with "*Edit Attribute*" (cf. chapter 3.4.1).

Below this there is a table that contains the attribute value of the selected attribute (here "*Actor Type*") in the first column. The second column has the corresponding symbols. You can change a symbol by clicking the appropriate cell. You will then be able to preview all available symbols. Click on the desired symbol. It will then be shown in the respective cell and is now associated with this attribute value.

If no symbols have been selected, VennMaker uses a standard symbol (a white circle

with a black border).

You can use your own symbols by clicking the button "*Add Icon(s)*". You will then be prompted to select the desired file. You can only add image files that have been saved in SVG format.

The website http://www.openclipart.org/ offers a large collection of various images in SVG format. You can create your own images using the graphic program Inkscape (http://inkscape.org).

Use "*Delete Icon*" to remove symbols. Select the symbol to be deleted and then click "*Delete*".

Once you have made your changes, you can apply them by clicking "*OK*".

3.4.4.2 Linking Symbol Size to Attribute Value

An actor's categorical attributes can be visualized using the size of the attribute symbol.

An example is the emotional importance of an actor, displayed using the corresponding symbol size. If an actor is "very important" to ego, then this attribute value "very important" can be shown using a large symbol. However, if an actor is "hardly important", this value can be shown using a small symbol.

The symbol size can be set separately for every digital network map. To do so, open the configuration window by right-clicking on an open area of the digital network map and select "*Configuration*" from the menu. Then click the sub-menu function "*Symbol Size*" in the newly-opened configuration window:

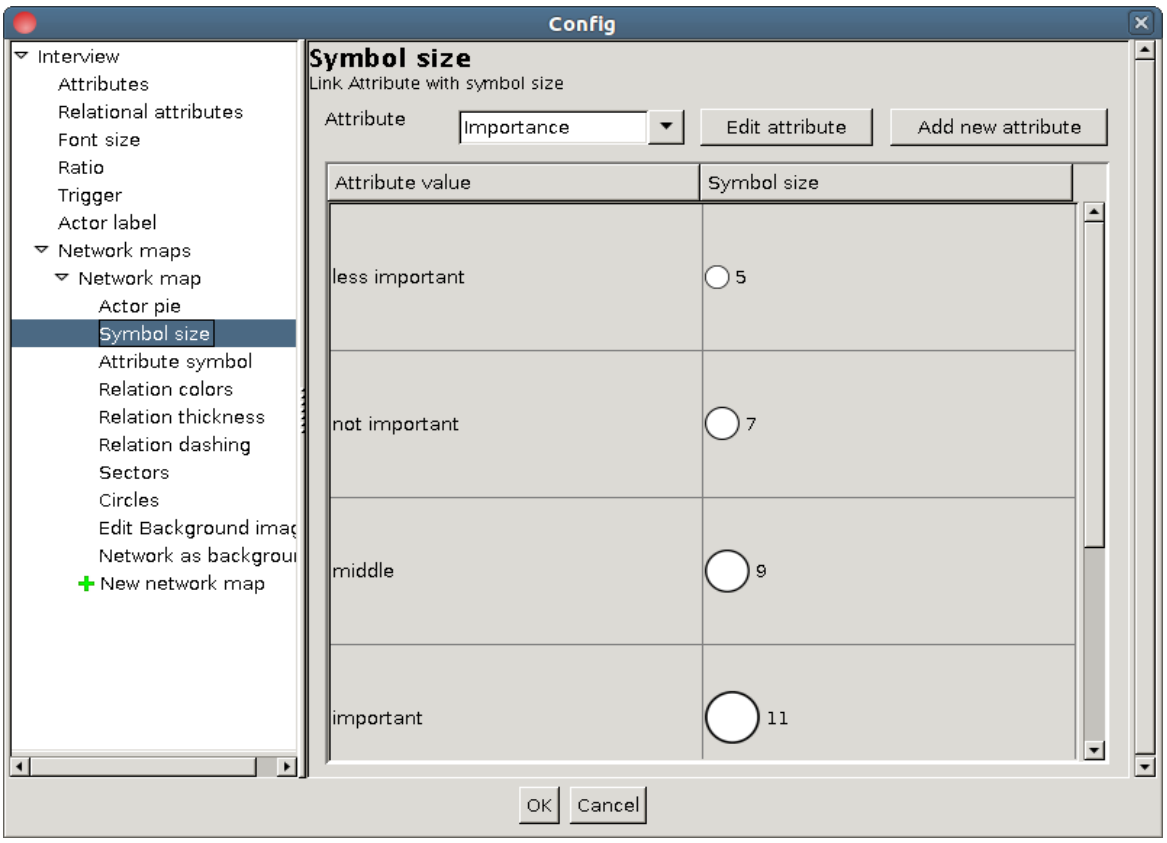


Figure 44: Config dialog for changing the symbol size

In the right section of the configuration window below in the information text you can see the selected attribute (here "*Importance*") and two buttons for editing this attribute and adding a new attribute.

You can select another categorical attribute by clicking on the dropdown list to the right of "*Attribute*".

Create a new categorical attribute using "*Add New Attribute*"; edit the selected attribute using "*Edit Attribute*" (cf. chapter 3.4.1).

The window includes a dropdown list with the respective categorical attributes.

The available response categories and attribute values of the selected attribute are displayed in the two columns of the table below. Every row contains an response category with the corresponding example symbol in the appropriate size. By clicking the symbol, you can open a selection list with all available symbol sizes.

If another attribute is selected, the symbol size is then set to the standard size.

The settings are applied by clicking “*OK*” in the configuration window.

Which sizes make sense depends on the research question. You should keep in mind that a symbol, depending on its size, may overlap with the concentric circles. Then it is no longer possible to see which concentric circles belong to which symbol.

The example in Figure 45 illustrates the problems that can appear when using different symbol sizes with the maximum number of sectors and concentric circles. Depending on the size, the symbol size can exceed the concentric circle. When using concentric circles and sectors, please note that the space available for text in a sector decreases the closer it is to ego. Furthermore, the difference between symbol sizes can be difficult to see when only small size differences are used. There should always be a balance between the intervals in size not being too small and the final size not being too big. Figure 45 can help you with a sensible selection:

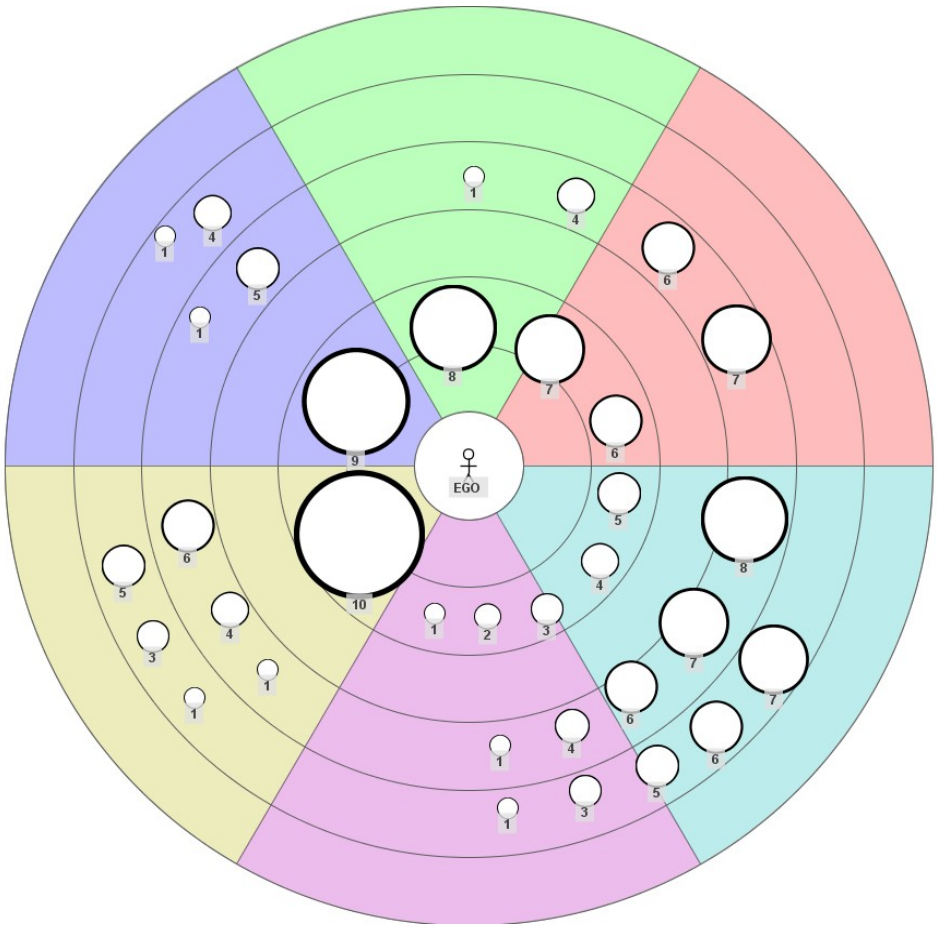


Figure 45: Maximum range (1-10) and "practical" actor sizes for different number of actor categories (2 to 5)

3.4.4.3 Actor Diagram

The actor diagrams can show whether certain attribute values have been selected or not.

An example: The actor diagrams allow you to easily display whether an actor has multiple roles. For this you can set, for example, three categorical attributes: family member, co-worker, friend. Each of these attributes contains two answers: "true" and "not true".

An actor diagram sector can be connected to each "true" attribute for these three attributes. If "true" is selected for this attribute value in an interview, then the relevant segment will appear for the actor.

The actor diagrams can be set up individually for every digital network map. To do so,

open the configuration window by right-clicking an open section of the digital network map and then select "*Configuration*" from the selection menu. Then select "*Actor Diagram*" from the submenu in the configuration window.

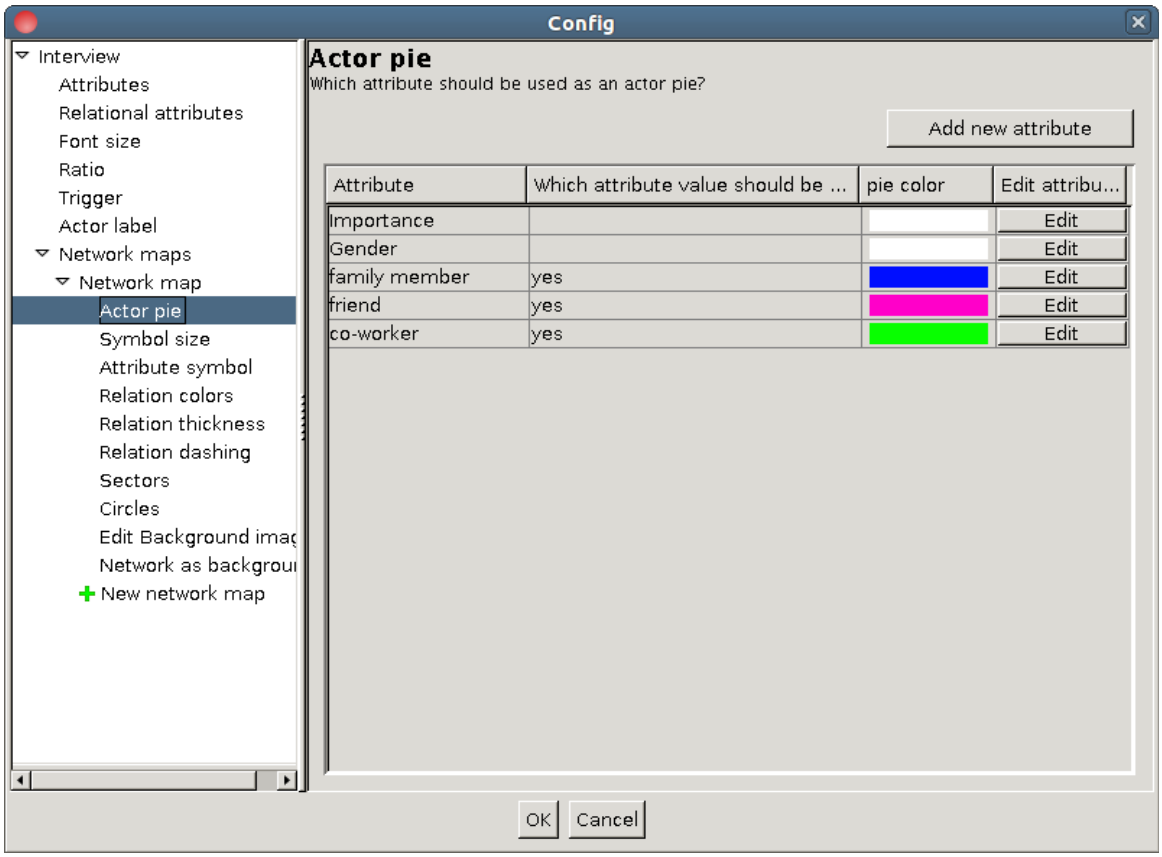


Figure 46: Config dialog for editing the actor pie

The window in Figure 46 contains a button for adding a new categorical attribute (cf. chapter 3.4.1) and a table with four columns: "*Attribute*", "*Display which value?*", "*Segment Color*" and "*Edit Attribute*".

The first column shows the available categorical attributes.

In the second column you can select an attribute value which, when given as an answer in an interview, should be displayed as an actor diagram segment. An attribute value can be set using the selection menu that opens when you click on the appropriate cell in the second column. If no attribute values should be displayed as diagram segments, then choose the first entry on the selection list, which is a blank line.

If an attribute value has been selected in the second column, then the segment color

can be selected in the third column. When the relevant attribute value is later given as an answer in an interview, then the corresponding actor diagram segment will be displayed.

You can edit the attribute values using the "*Edit*" button in the fourth column (cf. chapter 3.4.1).

3.4.4.4 Actor name

You can change an actor's name by right-clicking the relevant actor and then selecting "*Rename Actor*" from the menu and entering a new name. Additionally, you can position the actor name by choosing "*Configuration*" in the above menu and then "*Label Behavior*". The configuration window for the alignment of the actor's name will open:

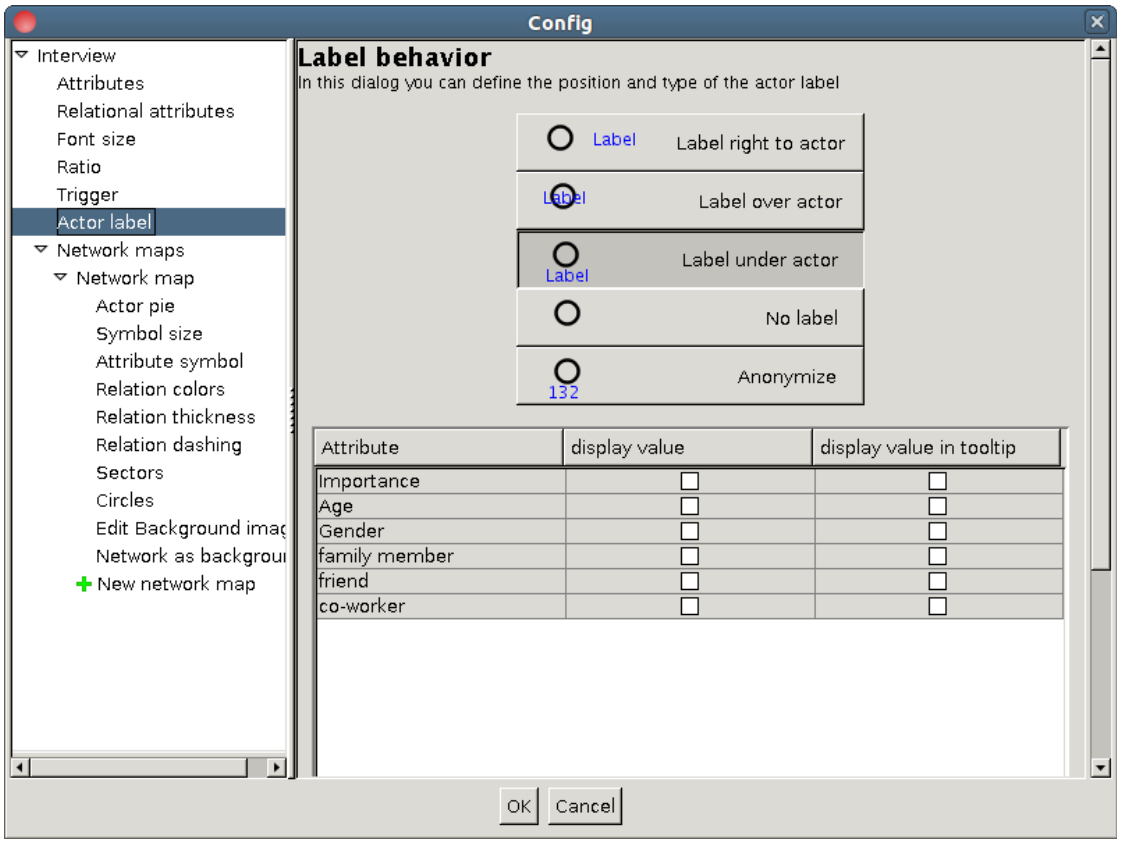


Figure 47: Config dialog for changing the actor label

Here you have five possibilities for aligning the actor name (also called *label*). The

changes are applied to all network maps for that interview.

Actor names can also be encrypted. You can learn more about that in chapter 3.12.

You will also find a table in the configuration window with the columns “*Attribute*”, “*Display Value*”, “*Display Value in Tooltip*”.

Every cell contains an attribute. In the second column you can set whether the attribute and its entered attribute value should be displayed in the actor label.

In the third column you can set whether the attribute and attribute value should be displayed in the tooltip.

Figure 48 shows the results of the settings in the second column and Figure 49 shows the tooltip that opens when you move the mouse over an actor (in this case ego).

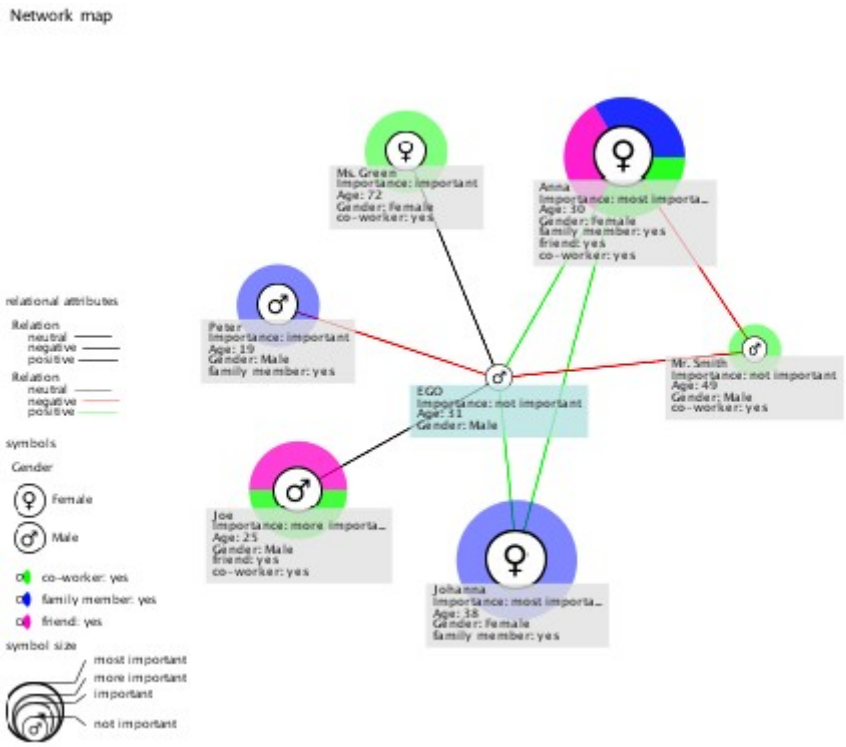


Figure 48: Attributes und attribute values displayed below the actor symbols

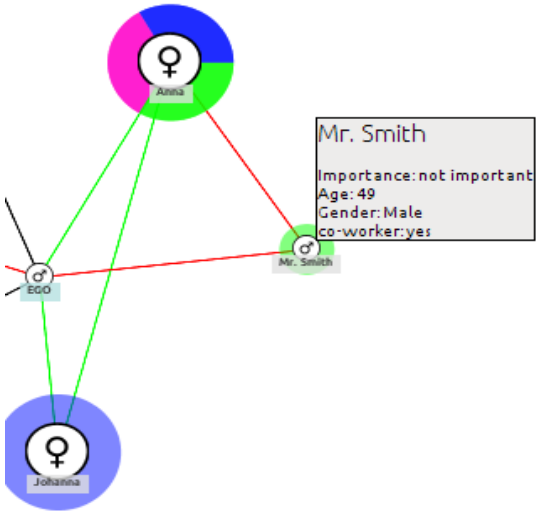


Figure 49: Attributes und attribute values displayed in the tooltip

3.4.4.5 Trigger

Attribute values in VennMaker can be set not only by using the input table, but also indirectly by using the mouse wheel or VennMaker's symbol menu.

These two input methods (mouse wheel / symbol menu) are called triggers; when the mouse wheel is used or a symbol is selected, they trigger a change in the corresponding attribute value.

Triggers can only be used for categorical attributes, they are set as follows:

First open the configuration window by right-clicking an open area in the digital network map and then selecting the "*Configuration*" function. The configuration window will open and you can select the area labeled "*Trigger*".

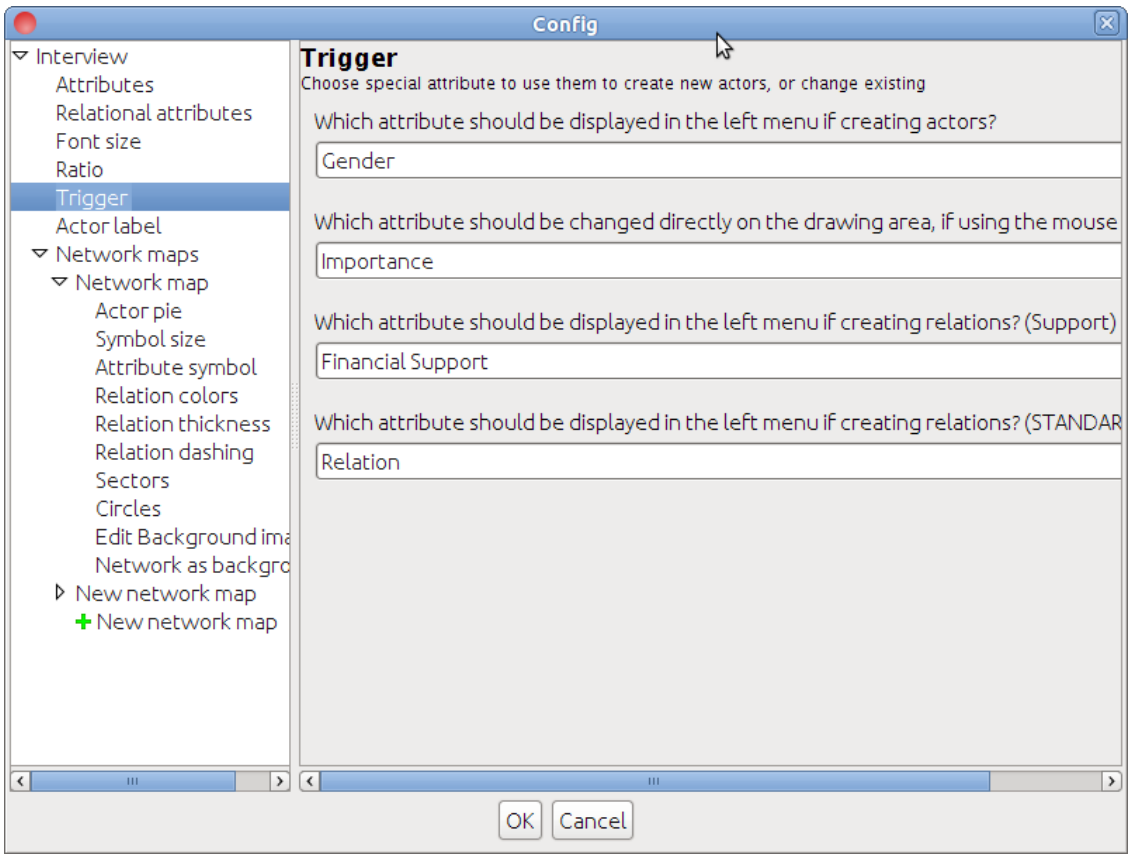


Figure 50: Config dialog for editing the Trigger

The window contains various selection menus:

The first two menus apply to non-relational attributes. The other menus contain relational attributes.

In the first selection menu, you can configure which attributes you would like to set using the symbol menu.

In VennMaker, the attribute "*Actor Type*" is set by default for use with the symbol menu. The attribute values "Organization", "Male", "Female" and "Other" are available and can be displayed using the respective symbols. How you can create a link between an attribute value and a symbol is shown in the Attribute Symbol chapter 3.4.4.1.

In the second selection menu, you can assign the mouse wheel an attribute. In VennMaker, the attribute "Importance" with the attribute values "less important" to "very

important” is set by default. If you roll the mouse wheel upwards during an interview, then the next attribute value above “less important” is selected. If the mouse wheel is rolled in the other direction, then the next attribute value below “very important” is selected. You can set the order of the attribute values in the configuration window in the “*Attribute*” section (see chapter 3.4.1).

This default setting is particularly convenient because the symbol size is linked to this attribute. Thus the symbol size changes when the mouse wheel is used. This happens as follows: the mouse wheel is moved, the attribute is set to the next attribute value and the symbol is shown in the appropriate size. How you can link symbol size to a categorical attribute is shown in chapter 3.4.4.2.

Use the other menus to set which relational attribute should be displayed in the side menu on the left. Every attribute value is then represented by its own button, on which a line and the attribute value are shown.

3.4.5 Visualizing Relational Attributes

There are three ways to visualize relational attributes: line color, line weight and line pattern.

To change the appearance of a line, use the three configuration sections: "*Relation Color*", "*Relation Thickness*", "*Relation Dashing*" in the configuration window for every network map.

All three sections are set up similarly (cf. Figures 51, 52 and 53)). You can configure the relation groups and the corresponding relational categorical attribute. There is also a table with two columns. The first column contains the attribute values; the second column contains the settings for visualizing these (color, line width, dash style). The respective entries can be changed by clicking the cell.

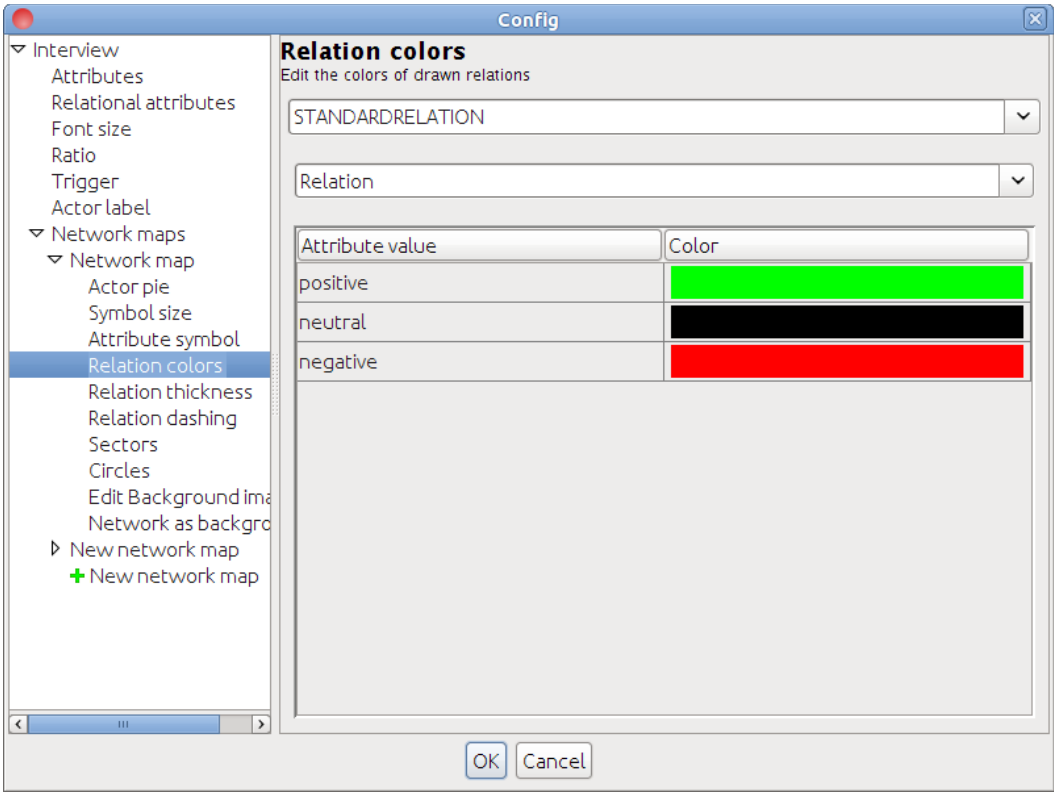


Figure 51: Config dialog for changing the relation colors

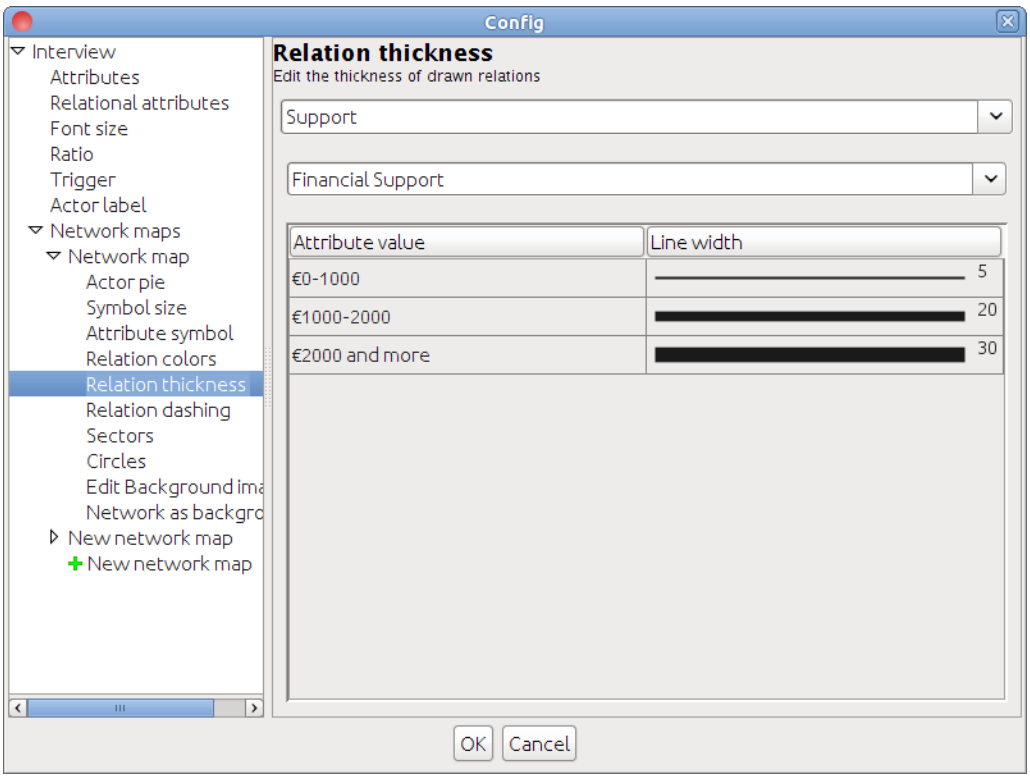


Figure 52: Config dialog for changing the relation thickness

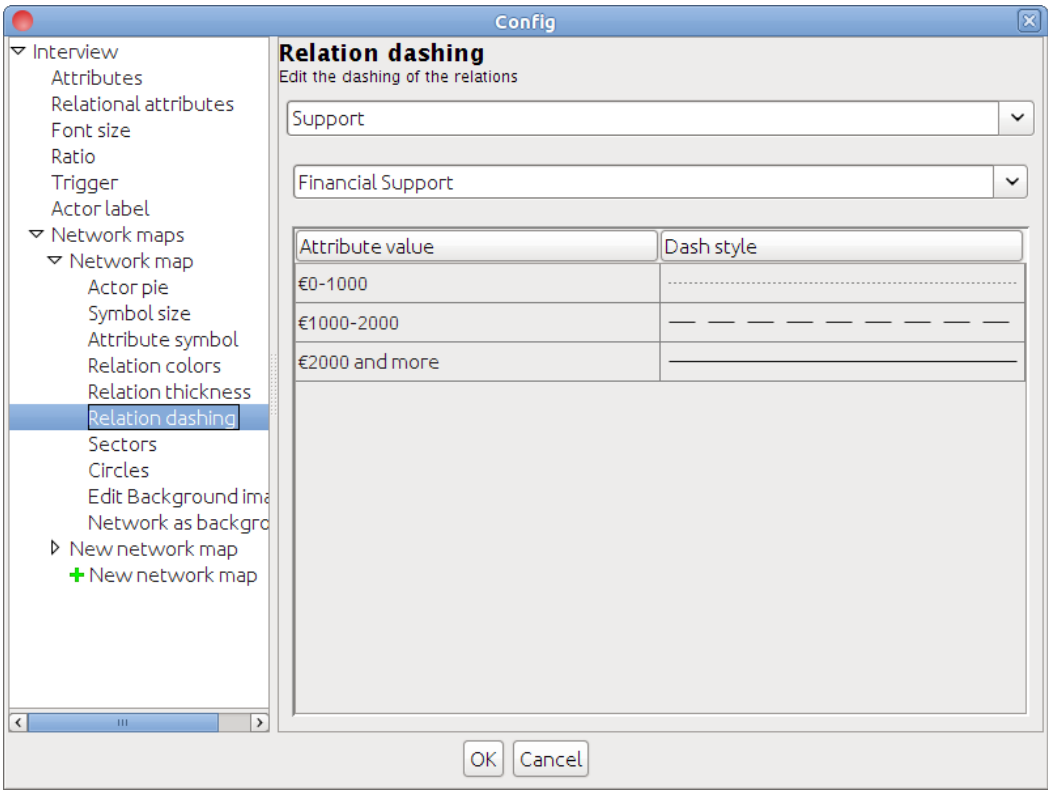


Figure 53: Config dialog for changing the relation dashing

3.4.6 Customizing the Digital Network Map

This chapter shows how you change the title, background color, background image and size of a digital network map and how you can add a network map as the background image within an interview.

Changing the Title of a Network Map

First, you will learn how to show the name of a network map as a title. Every digital network map is given a title by default:

The title is the name of the digital network map, in Figure 54, for example, the title of the network map is "*Network 2006*".

Figure 54: The network map title

You can align the title by right-clicking:

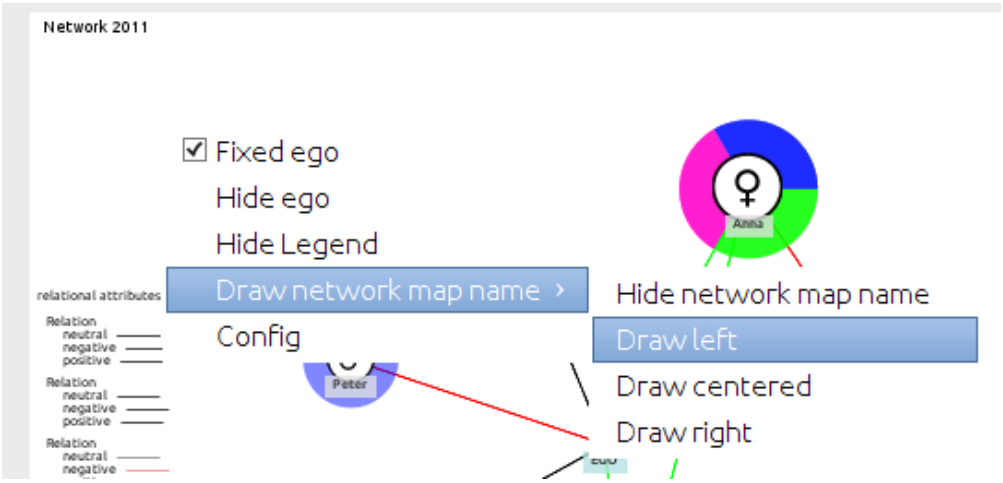


Figure 55: Changing the network map title position

The title can either be hidden ("*Hide Network Map Name*") or be shown in either at top left ("*Draw Left*") or at the top right ("*Draw Right*") of the network map, or centered ("*Draw Centered*").

Changing Background Color, Image and Size of the Digital Network Map

The background color, background image and size of a digital network map can be set in two ways: either right-click on an open section of the digital network map, choose "*Configuration*" and then "*Set background*" or select "*Configuration*" > "*Background Image*" from VennMaker's menu bar.

No matter which method you use, you will see this window:

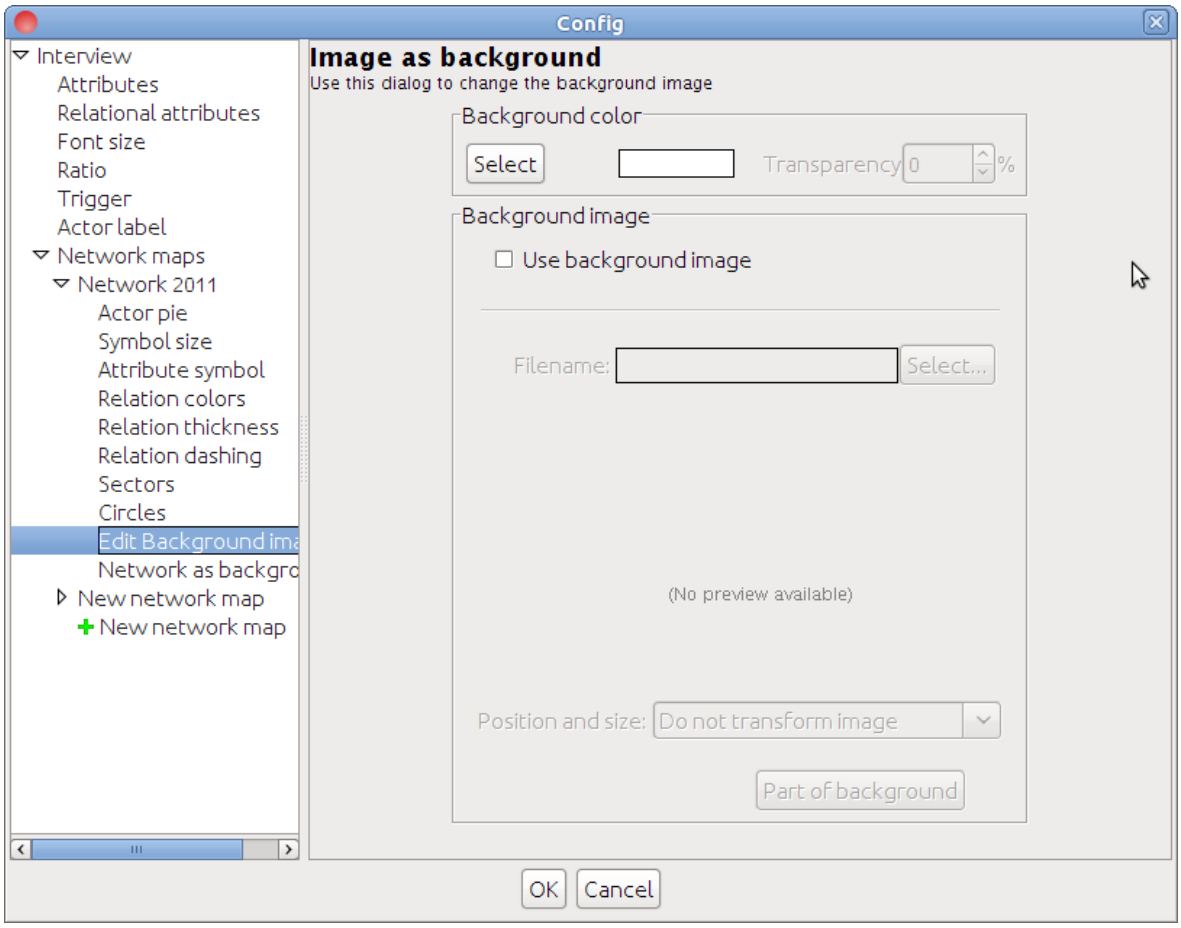


Figure 56: Config dialog for changing the background color and background image

In the "*Background Color*" section you can set the background color using the "*Select*" button. You can select the transparency of the background color using "*Color*". The higher the value, the less transparent the background is.

If you would like to use a background image, then click the box labeled "*Use Background Image*". Then select an image file using "*Select*". The image file must be in either pmg or jpg format.

Once an image has been selected, you will be able to preview it.

Using the "*Size and Proportion*" selection menu you can set whether the background image's size needs to be adjusted or not. Selecting "*Retain Image Size*" keeps the image in its original form. Its size will not be adjusted. "*Adjust Image (height & width)*" adjusts the height and width of the image to fit the size of the network map. "*Retain Aspect Ratio (height)*" adjusts the background image to fit the network map while

keeping the original ratio between height and width. Using this setting, the background image will have the same height as the network map. "*Retain Aspect Ratio (width)*" adjusts the background image to fit the network map while keeping the original ratio between height and width. Using this setting, the background image will have the same width as the network map.

The background image is only applied to the current digital network map.

If you wish to use only a portion of the image as a background, you can do so using "*Select Section*".

Changes are applied after the "*OK*" button has been clicked.

Using a Network Map as a Background Image

If you have multiple network maps in an interview, then you can use on or more of these network maps as an additional background to another network map. Network maps from different interview files cannot be used!

For example: you have a network from the year 2010 and one from 2011 in your interview and you want to be able to visualize the differences between the two.

First choose the network map you would like to insert in the other network map. In this example, the network map from 2010 will be inserted as the background image in the network map from 2011. To do so, the network map "*2011*" is selected:

After that, right-click on an open section of the network map and open the configuration window under "*Configuration*". Then go to "2011" in the "*Network Map*" section and open the "*Background Network*" window. Finally, click on the "*Insert*" button. VennMaker automatically adds all other network maps to the "*Network Map as Background*" list:

In this case, the network map “*2010*” is added to the list.

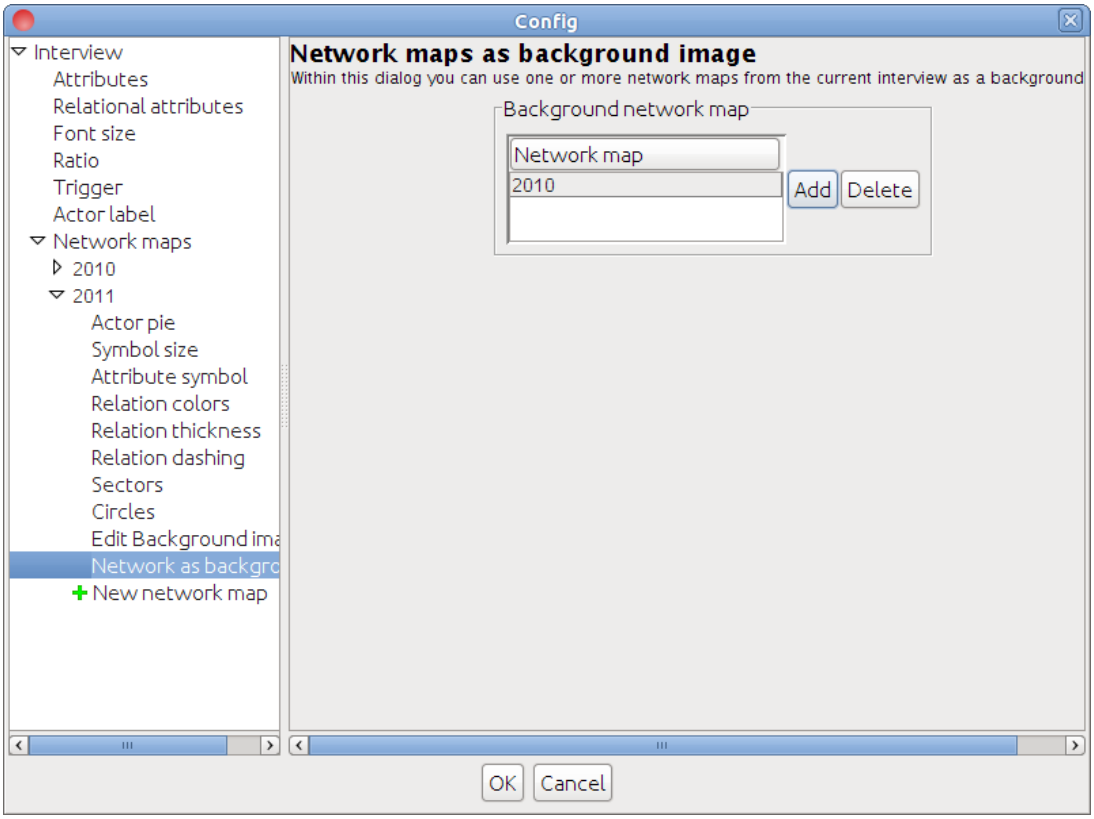


Figure 57: Insert an other network map as a background image

Click “*OK*”.

VennMaker now displays the inserted network map as the background image in the network map “*2011*”:

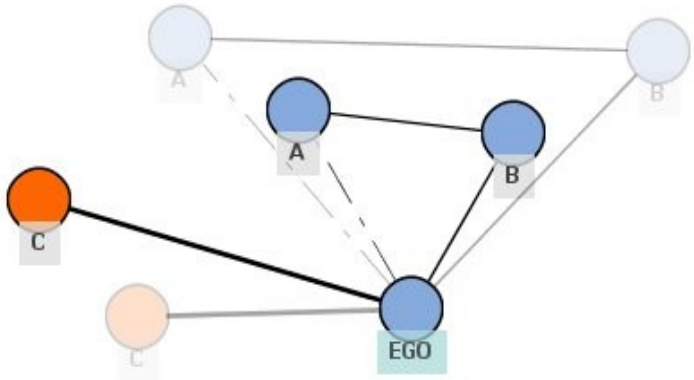


Figure 58: Two network maps in one network map

Changing the Network Map's Aspect Ratio

Via "*Configuration*" > "*Aspect Ratio*", the height and width of the network map in use can be changed (see Figure 59).

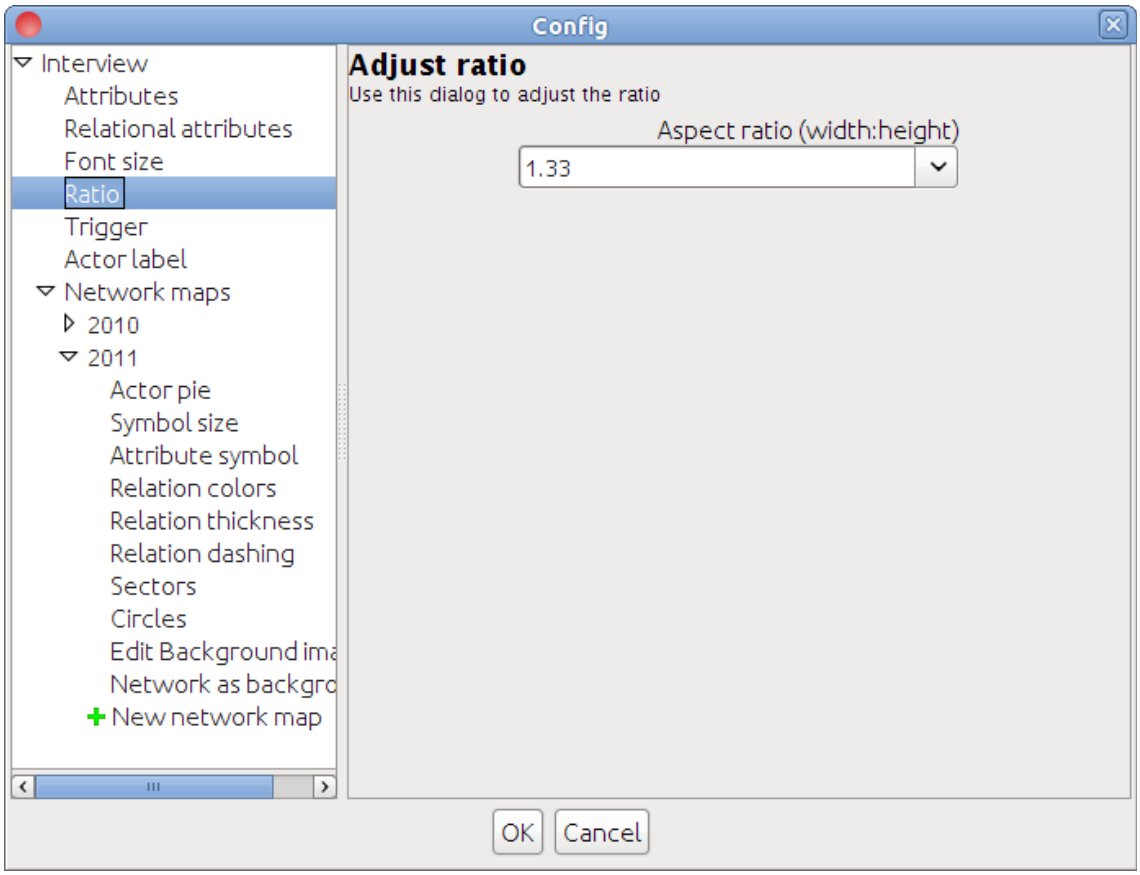


Figure 59: Changing the height and width of a network map

While drawing on the digital network map, it is possible to hide the toolbar.

Figure 60: Button for switching off and on the menu

To do so, click on the button in the top right corner of the network map (see Figure 60).

Click again to show the toolbar.

3.5 Using Concentric Circles and Sectors

With VennMaker, actor attributes can also be queried using sectors and concentric circles. These functions are accessible via VennMaker's menu item "*Configuration*" (see Figure 61).

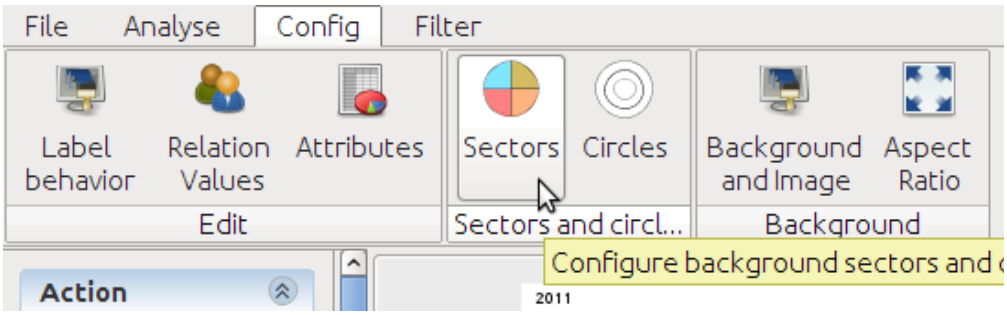


Figure 61: Config menu

The number of concentric circles and sectors can be set via "*Sectors*" or "*Circles*" or via the configuration window, which is opened by right-clicking on an open area of the network map.

In the right area of the configuration window below the information text you will see the preset attribute (here "*Role*") and two buttons for editing the selected attribute and for adding a new attribute.

You can select another categorical attribute by clicking the dropdown list to the right of "*Attribute*". After you have selected an attribute, VennMaker will show you a preview of the sectors.

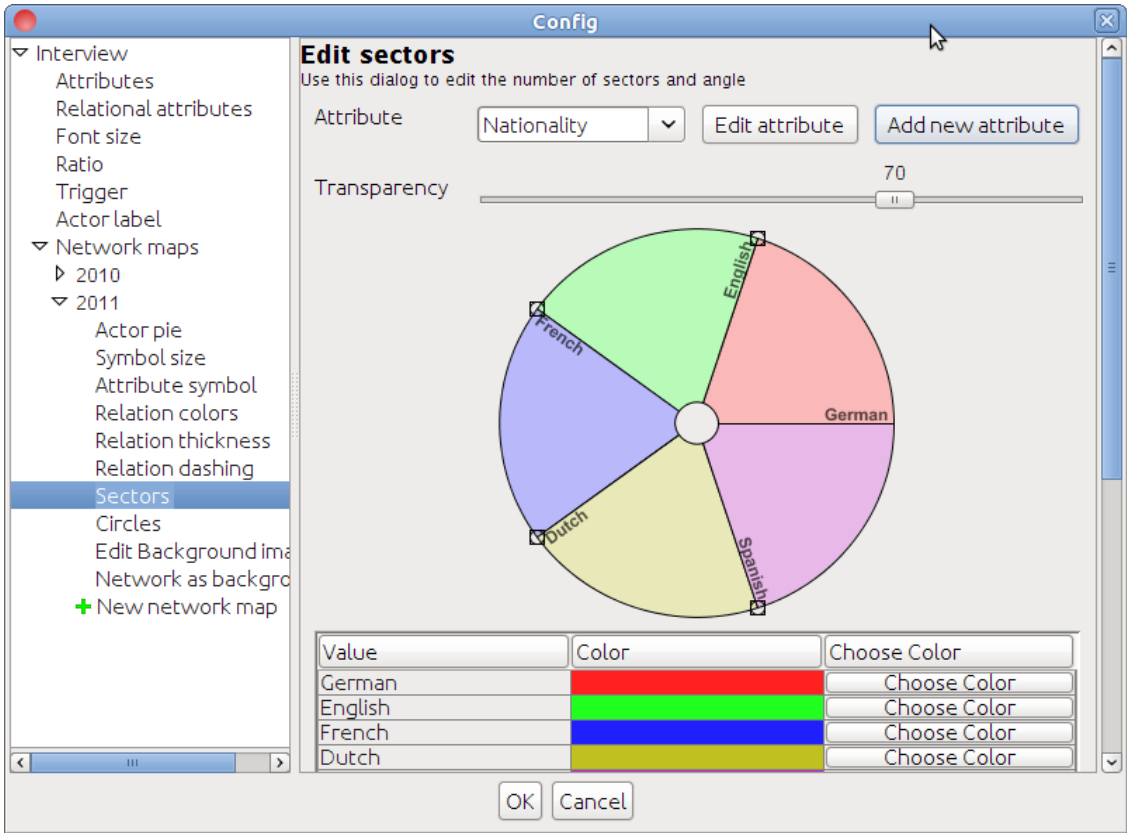


Figure 62: Config dialog for changing the sectors

You can create a new categorical attribute via "*Add New Attribute*"; you can edit a selected attribute via "*Edit Attribute*" (cf. chapter 3.4.1).

"*Transparency*": If you are using a background image, it is often better when the sectors do not completely cover the image. Using the scroll bar you can set the transparency. The farther to the right, the more transparent the sectors are.

In the lower area of the configuration window there is a table with three columns "*Value*", *"Color*" and "*Select Color*".

The attribute values of the selected attribute are shown in the "*Value*" column.

The second column "*Color*" contains the respective sector colors that are associated with the attribute values. The colors can be changed using the button that is in the same row, in the "*Select Color*" column.

You can change the sector size directly using the sector diagram pictured in the window.

At the edge of the circle, move the lines dividing the sectors.

The order of the sector labels can be changed using drag & drop within the column "*Value*" in the table. Click an entry and keep the mouse button pressed. Then drag the entry to another position in the column and let the mouse button go. This change has no influence on the actual order of attribute values; it only applies to how the sectors are displayed.

Configuring Concentric Circles

Figure 63 shows the configuration window for concentric circles:

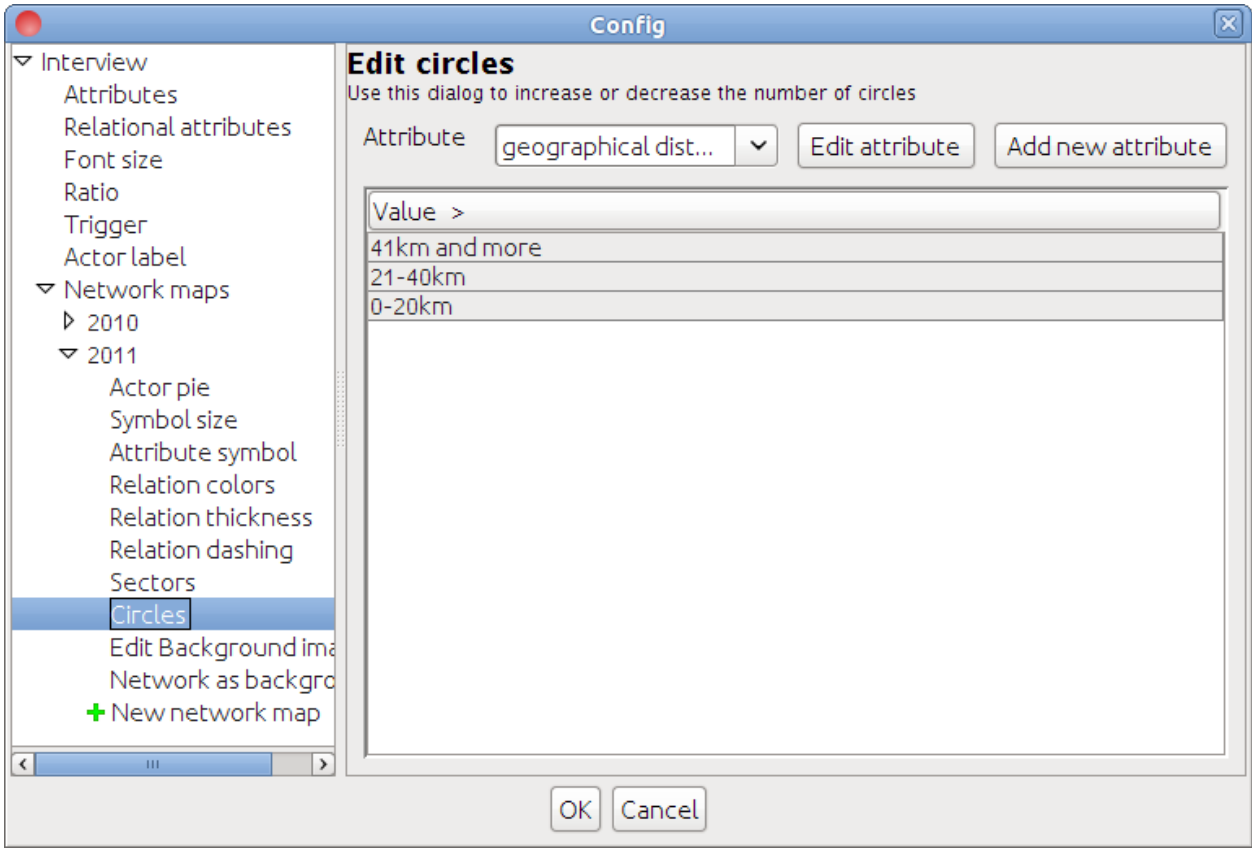


Figure 63: Concentric circles

In the right section of the configuration window below the information text you can the preset attribute (here "*Distance*") and two buttons for editing the selected attribute and for adding a new attribute.

You can select another categorical attribute by clicking the dropdown list to the right of "*Attribute*". After you have selected an attribute, VennMaker will display its attribute values in the "*Value*" column in the table at the bottom

A new categorical attribute can be set using "*Add New Attribute*"; you can edit the selected attribute using "*Edit Attribute*" (cf. chapter 3.4.1).

If you click on the column caption "*Value*", the order of the attribute values changes.

This change applies to the order of circle labels. The first table entry is the outer circle, the last entry the inner-most circle (cf. Figure 63 and 64). The actual order of attribute values for that attribute is not changed.

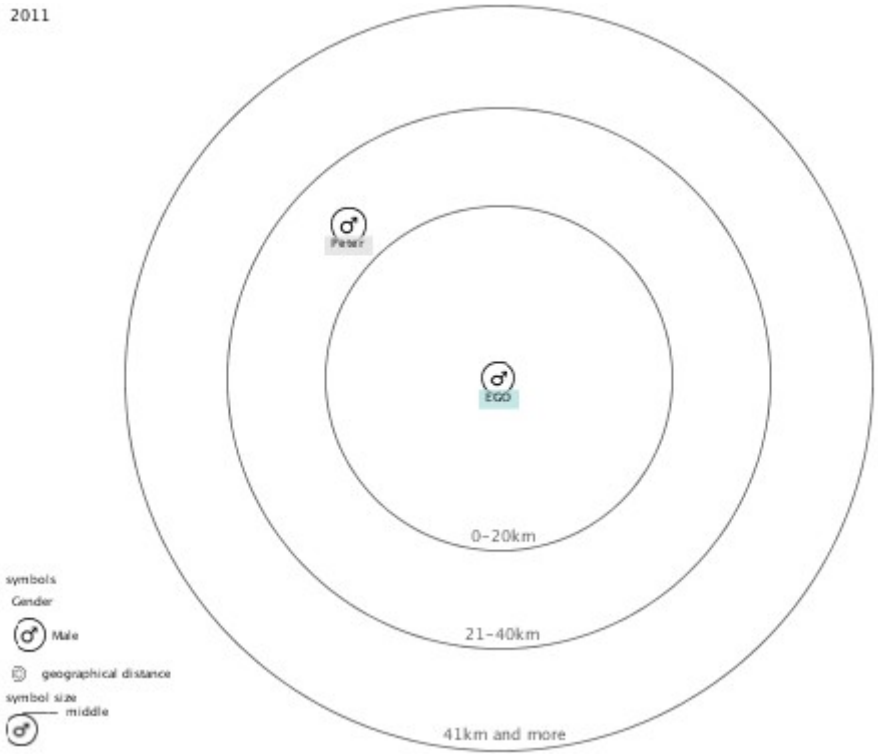


Figure 64: Concentric circles and spatial distances

3.6 Filters

Graphic querying of social relations can quickly become confusing and error-prone when there are an increasing number of actors. To avoid this problem, VennMaker offers filter functions so you can selectively hide and show actors and relations.

3.6.1 Attribute Filter

The attribute filter allows network nodes and network relations to be hidden or shown. Using non-relational attributes and relational operations (less, less equal, equal, unequal, greater, greater equal), you can define conditions that can be combined using logical operators (AND, OR).

This allows, for example, the following filter conditions to be defined: show all female actors who are older than 45.

If an actor fulfills all conditions defined in the filter, then the actor will be displayed in the digital network map. If an actor does not, then he/she and all connected relations will be hidden.

You can open the filter window via "*Filter*" > "*Set New Filter*":

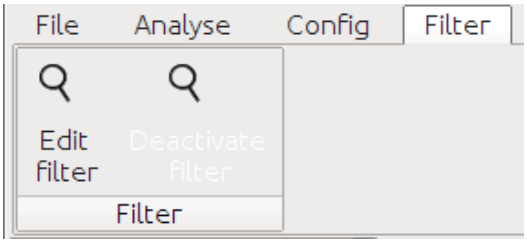


Figure 65: The filter menu

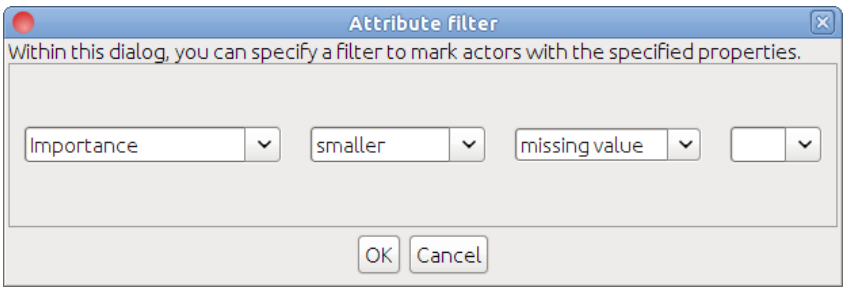


Figure 66: Dialog for editing the attribute filter

In this example, the window contains four selection menus. Going from left to right, the first menu contains the attributes, the second the relational operators (less, less equal, equal, unequal, greater, greater equal), the third menu contains the attribute values for the attribute selected in the first menu. Additionally, there is also an entry "*Missing Value*" that represents all attribute values not entered. In the case of non-categorical attributes, a value can be entered into the third field. If you would like to add additional conditions, then you should select a logical operator from the fourth menu. Then another row with four menus will appear.

The example above (cf. Figure 66) can be read as follows: "Show all actors whose attribute 'Gender' contains attribute values that are equal 'Female'".

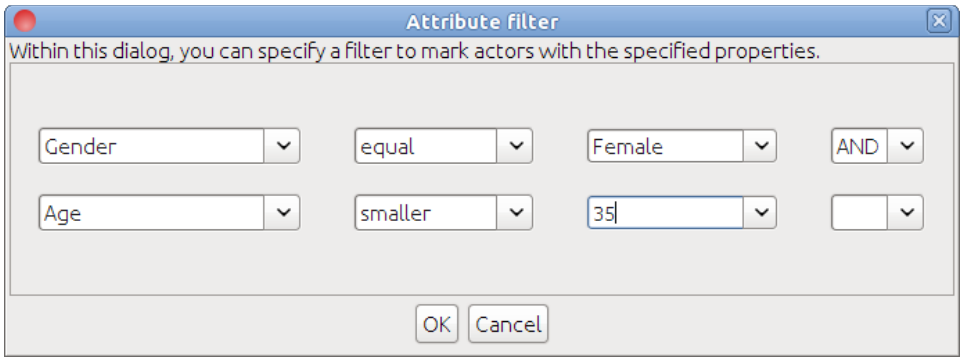


Figure 67: Attribute filter with multiple conditions

If multiple conditions should be used, then these can be logically combined in the fourth menu. "AND" means that both conditions must apply, whereas "OR" means at least one

must apply for the actor to be shown.

The second example shown in Figure 67 contains two rows and one condition is defined in each. Both conditions are connected using “AND”. The attribute filter, formulated in words, says: “Show all actors who are female and younger than 35.”

The second row is special because a non-categorical attribute is used. Therefore, the age can be entered manually in the third field.

The two conditions end when no logical operator is selected in the fourth menu. However, if a logical operator is set, then a third row automatically appears.

Clicking “OK” closes the window and the digital network map shows all actors who fulfill the filter conditions and their relations to other actors who also fulfill the conditions.

The attribute filter can be deactivated via “*Filter*” > “*Deactivate Filter*” and can be reactivated via “*Filter*” > “*Activate Filter*”. The filter settings can be changed via “*Filter*” > “*Set New Filter*”.

When you have activated a filter and then clone the digital network map, only the actors and relations that fulfill the filter conditions will be cloned. If you would like to clone all actors and relations, then deactivate the filter before cloning.

3.6.2 Relation Filter

The relation filter shows all direct relations of an actor to other actors and hides all other relations that are not directly connected to the actor selected (see Figure 68, 69 and 70).

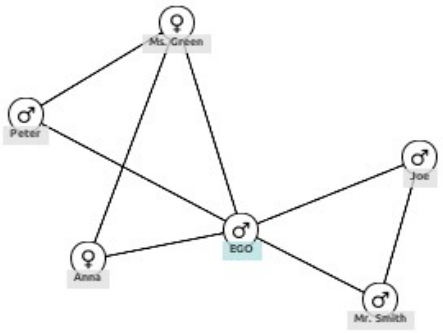


Figure 68: Network without relation filter

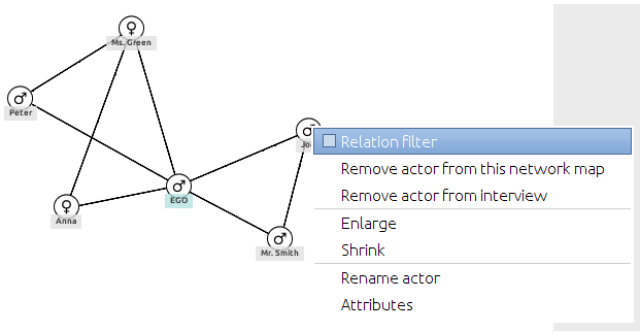


Figure 69: Activating the relation filter for actor „B“

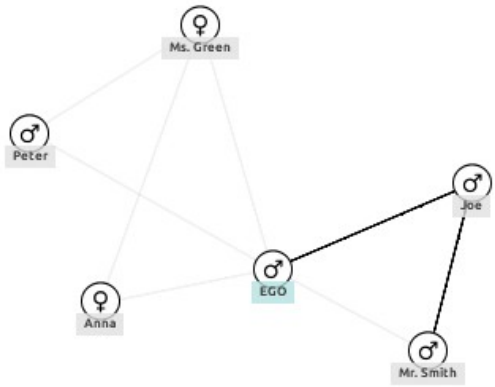


Figure 70: Network with relation filter

A relation filter is activated by right-clicking on the desired actor and then activating “*Relation Filter*”. You can set a relation filter for every actor individually. The relation filter only applies to what is displayed; calculations are disregarded. A relation filter can be deactivated by right-clicking the actor and selecting “*Relation Filter*” again.

3.7 Audio

3.7.1 Starting an Audio Recording

Using VennMaker you can also record interviews with a microphone. Start a recording via *Analyse* > *Start Recording*.

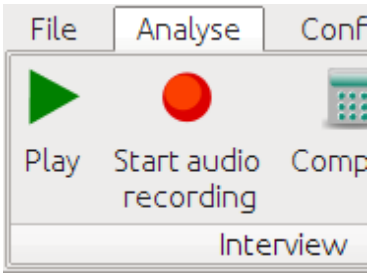


Figure 71: Audio recording button

After a recording has been started, the appearance and labels of the buttons changes:

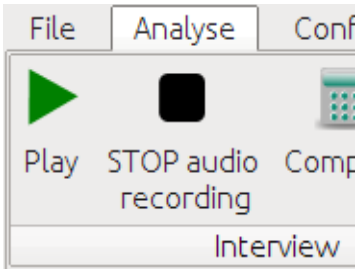


Figure 72: The stop button

End a recording by clicking "*End Recording*".

Important: before starting a recording, please make sure that the audio settings of your operating system are set appropriately!

3.7.2 Exporting Audio Files

You can export recorded audio files from your interview. Click on "*File*" > "*Audio*".

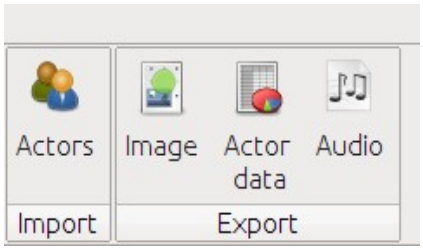


Figure 73: Audio export button

The following window will open:

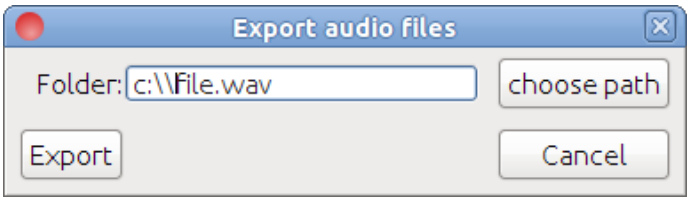


Figure 74: Audio export dialogue

VennMaker exports all audio files to the target directory. The audio files are saved in wav format and can be opened by most common audio program (e.g. f4[3]).

If you click on "*File*" > "*Audio*" and do not yet have any audio files in your interview, VennMaker will point this out to you.

[3] F4 is a program for audio transcription. It can be downloaded free of charge at the following website: http://www.audiotranskription.de/english

3.8 Network Player

VennMaker tracks all actions that take place on the digital network map. For example, if an actor is moved or a new relation drawn, then these activities can be re-played at a later date. The network player is used for this.

Open the network player via “*Analyse*” > “*Play*” (see Figure 75).

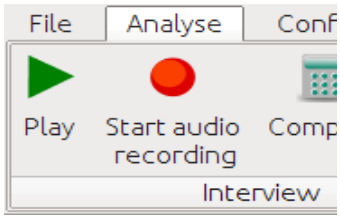


Figure 75: Network player button

VennMaker then calculates all individual images, which depending on the number of actions can take some time. Then the network player window opens:

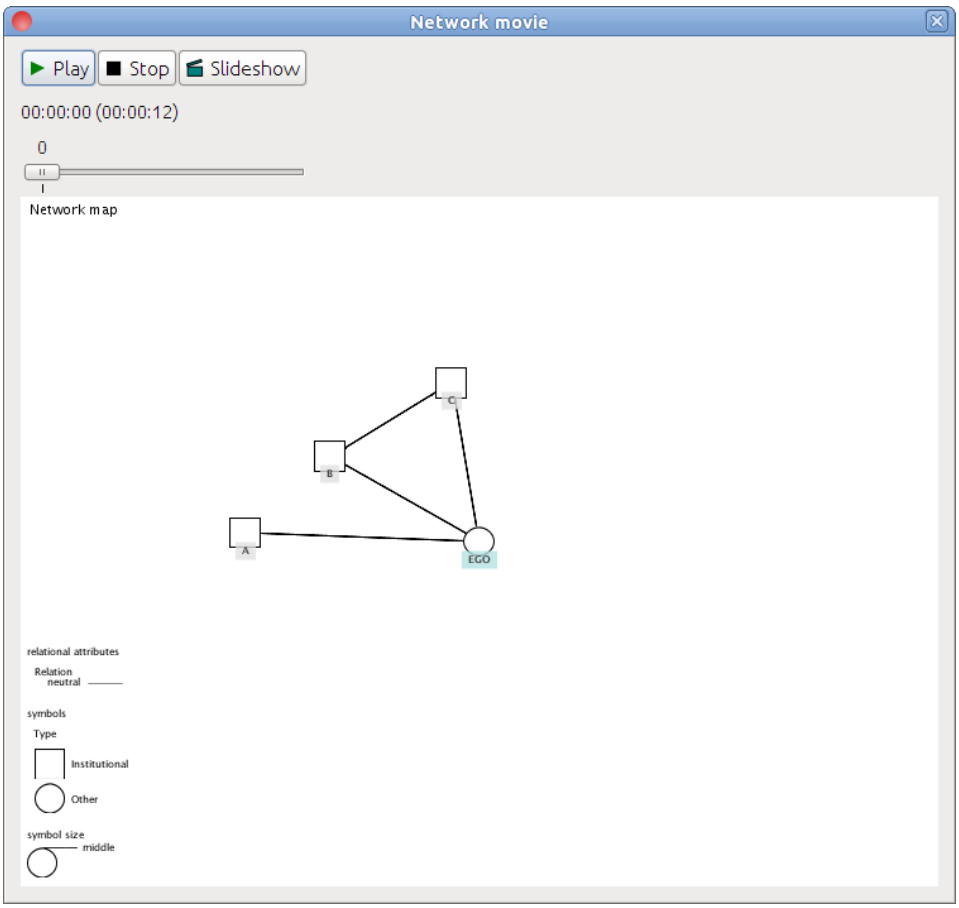


Figure 76: The network player

The network player contains three control buttons "*Play*", "*Stop*", "*Slideshow*" and a scroll bar. Below the control buttons you will find the time specification of your current position within the actions and in parenthesis the total time of the survey. Below the scroll bar is a picture of the digital network map. Moving the scroll bar allows you to move between the individual actions and you will see the respective illustration of the digital network map.

Pressing "*Play*" causes all actions to run in real time and the respective network maps to be shown. Pressing "*Slideshow*" shows all actions using the same interval. Stop the play back by clicking the "*Stop*" button.

The network player plays all available audio recording simultaneously with the actions. You can start an audio recording via "*Analyse*" > "*Start recoding*". VennMaker will then record until you click "*Analyse*" > "*Stop recording"*.

Before you start recording, please check whether the audio mixer settings of your operating system are properly set and whether the speech quality when using an internal microphone (which is integrated into most laptops now) is satisfactory. You may need to use an external microphone.

Important: Audio files are saved in uncompressed form, i.e. the files can be large (100-400 MB), especially with long interviews. Make sure there is enough free disk space! For later versions of VennMaker, we hope to be able to offer the option of compressed audio files.

3.9 Compute: Carrying Out Initial Calculations

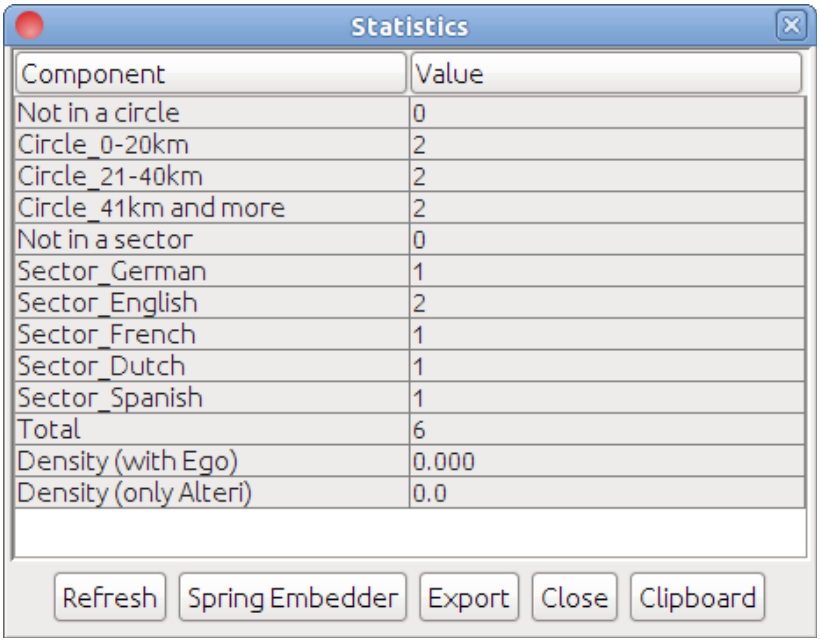


Figure 77: The compute dialogue

Calculating individual frequency and density for a network can be carried out via "*Analyse*" > *"Calculate*", the results are presented in a separate window (see Figure 77).

The results always pertain to only the active network map.

The frequency shown contains the number of actors per concentric circle and sector as well as the total number of actors drawn on the map (without ego).

The “*Density*” of the network map indicates the ratio of relations present to the possible number of relations. The density can have a value between 0 and 1. 0 means that there are no relations between the actors. If, however, all actors are fully connected with each other, the density of the network is 1. The density is a measurement that applies to the whole network.

VennMaker differentiates between density with ego and density where ego is not part of the calculation. In the first case, ego is included in the calculations, in the second, only relations between others are considered. The density that includes ego tends to be higher because the subject only names people that he/she knows and has less knowledge of alter-alter relations. A more precise explanation of the structural measures used can be found in chapter 6.1.2

The results can be saved as a CSV file using the button “*Export*” or, using copy and paste, can be copied into other applications.

Using the “Spring Embedder” button you can create a new digital network map which arranges actors using a spring embedder layout logarithm. Here, actors with many relations running both to and from them are displayed closer to the center of the network map and actors with fewer relations are displayed closer to the outside. With this function, you can see which actors are more isolated and whether, for example, there are groups within the network that are more strongly connected to each other.

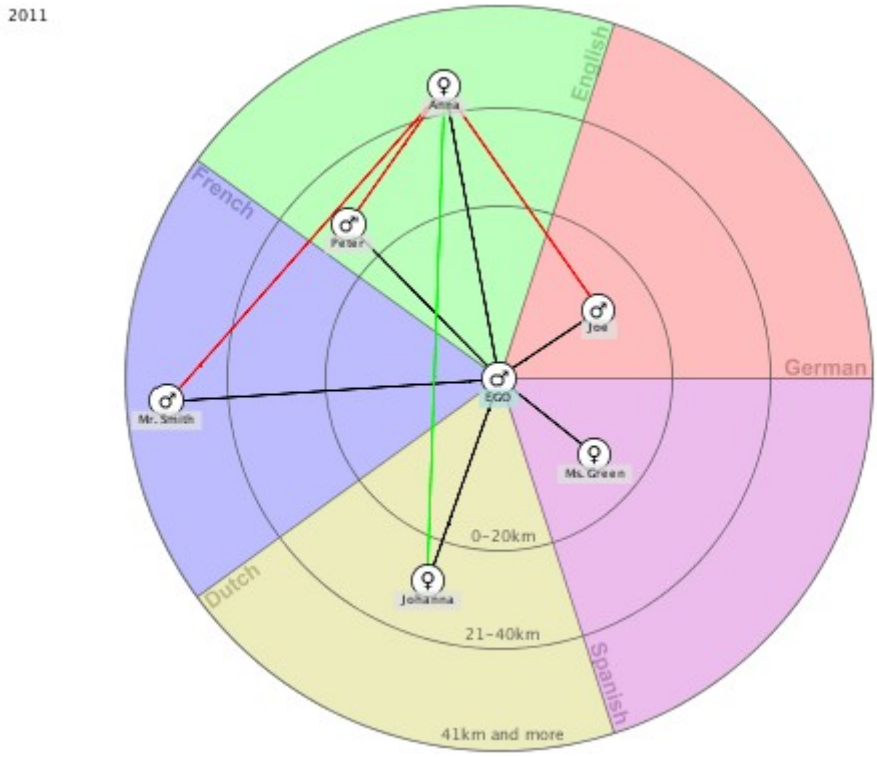


Figure 78: The network drawn by the interviewee

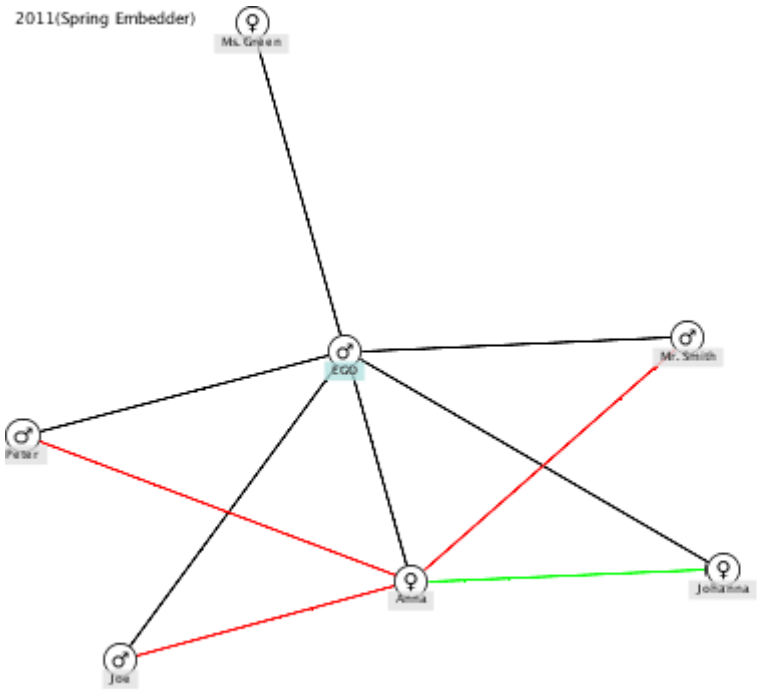
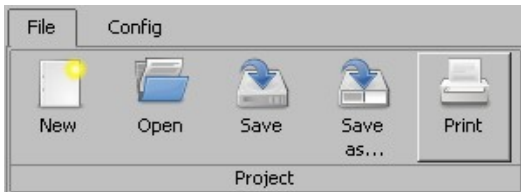


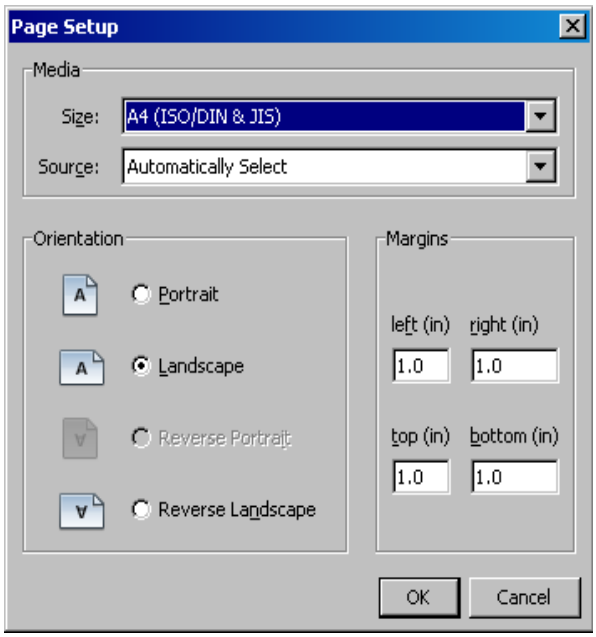
Figure 79: The network after using the spring embedder layout algorithm

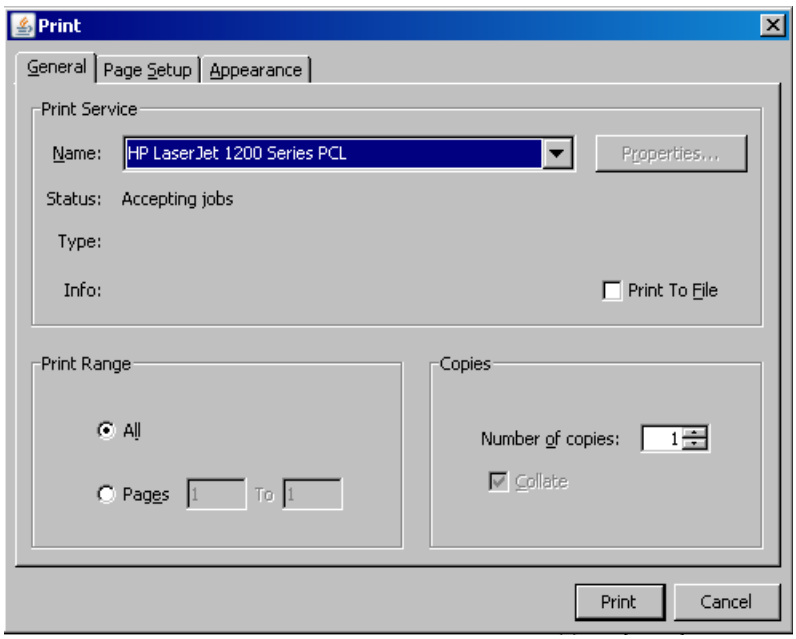
3.10 Drucken

To print the current network map, go to “File” and press the “Print” button:



In the print dialog you can choose the paper size and the paper orientation:





If you press the “OK” button you can select the printer and the number of copies.

Click “Print” and the printing will start.

3.11 Interview Notes

Every interview can be tagged with notes. If you wish to save theoretical concepts, references or interview instructions in addition to your digital network map, you can do so via “*File*” > “*Interview Notes*”.

3.12 Pseudonymisation

In order to ensure privacy, VennMaker allows you to protect actor names with a password. You can open this window via “*File*” > “*Pseudonymisation* “:

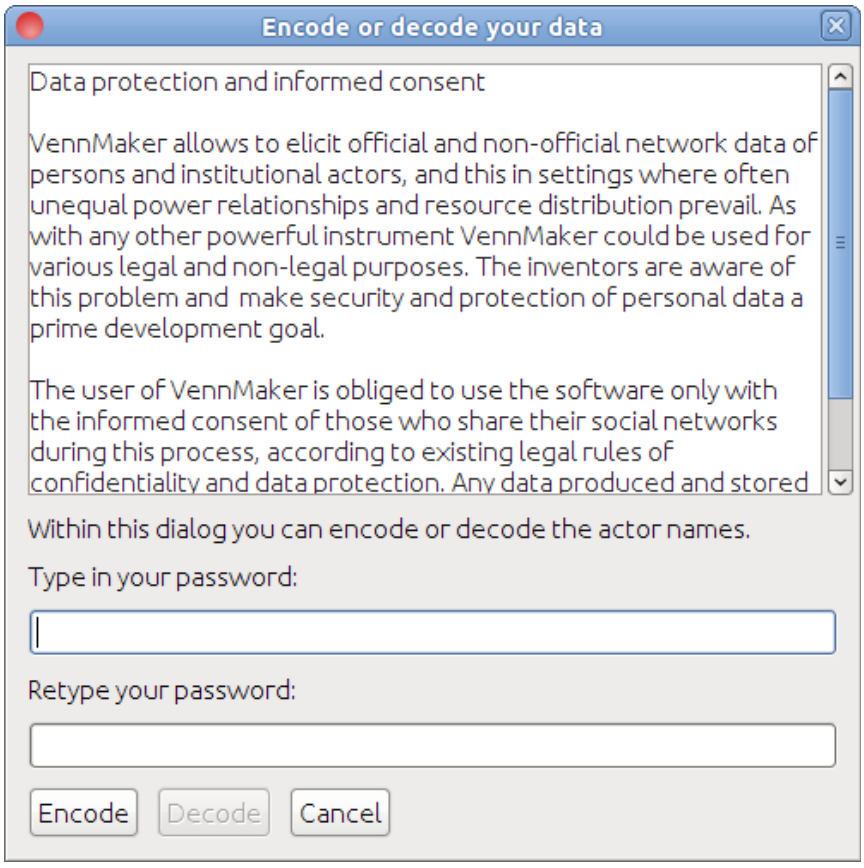


Figure 80: The password protection dialog

In addition to general information on privacy protection and good scientific practice, the window contains two input fields. There either you or your interview partner can enter the same password twice. Entering the password twice ensures that the password was

typed correctly. If one entry was inaccurate, VennMaker will prompt you and you can correct the password.

This encryption is carried out after the "*Encrypt*" button has been clicked. Then all actor names in the digital network map for the interview are encoded and will be represented by numbers on the map.

You can remove the password protection by following "*File*" > "*Pseudonymisation*" and then entering the password. You can start the decryption process by clicking the "*Decrypt*" button. All actor names will then appear on the map. If you enter the wrong password, VennMaker will prompt you.

Privacy Protection and Informed Consent

Data collected via social network analysis are often sensitive personal data. VennMaker allows the collection of official and unofficial network data from persons and institutional actors; this often occurs in situations where there is an uneven balance of power and resources. As with other high-capacity tools, VennMaker can be used for both legal and illegal purposes. The creators are aware of this problem and see the security and protection of personal data as an important development aim. As a license holder/user of VennMaker, you are liable – however VennMaker is used – to comply with the regulations for safeguarding good scientific practice (cf. e.g. [Universität Trier, 2002]) and in particular to obtain the informed consent of subjects (cf. [Bortu and Döring 2006], p. 44).

4 Configure and Performing an Interview

Due to comparative reasons a standardization of the interview framework is of an advantage. First, interviews can be configured in advance. Second, performance of an interview can be optimized according to test hypothesis using focused questionnaires. Moreover, wizards will support an autonomous but guided interview mode.

4.1 Configure an Interview

VennMaker offers the “Configure Interview” mode, which will help to select the item, type, order and time sequence of organizing an interview.

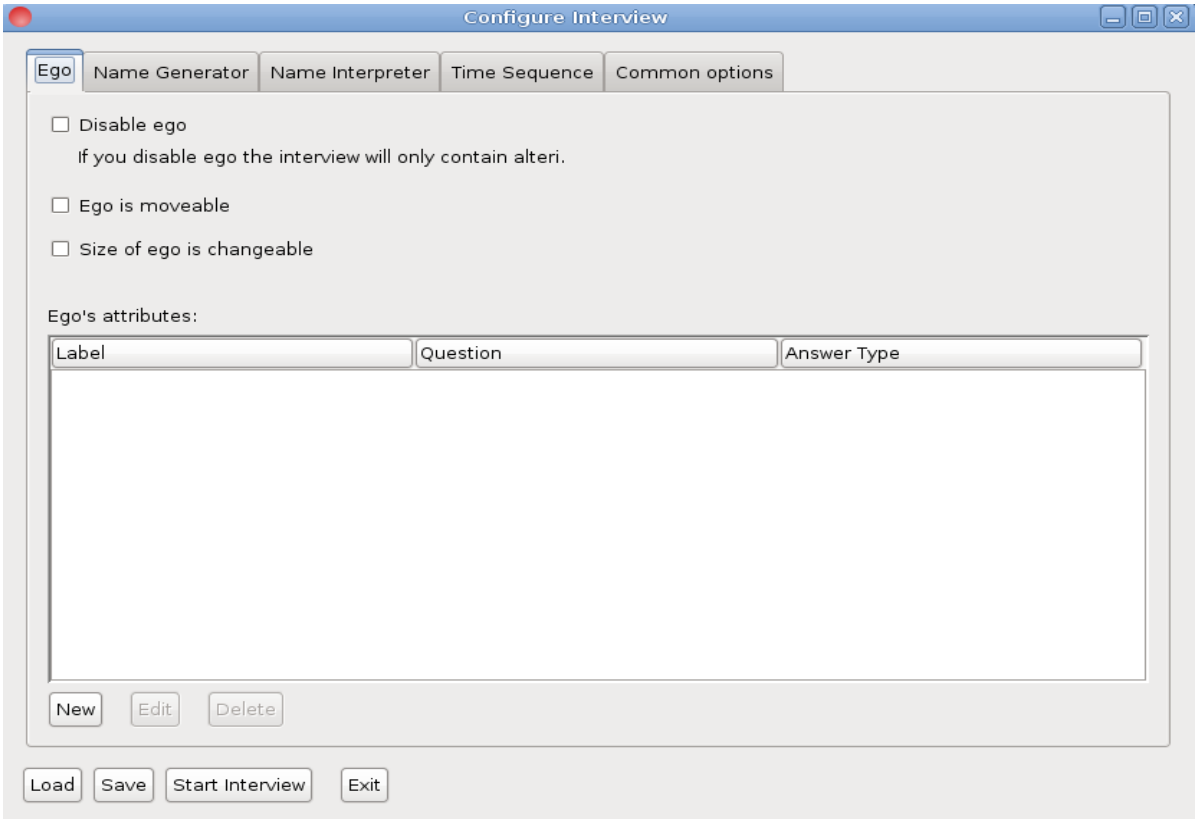


Figure 81: Main options to configure interviews

The “Configure Interview”-screen (Figure 81) is programmed to optimize the performance of the designated interviews. In order to meet the need of a required research design, there are certain ways for adjustment. Starting with entering items for Ego, then the Alter name generators and the name interpreters can be described and the time sequence can be specified.

Finally, the design of the questionnaire can be customized using the common options screen.

In Figure 81 you can seee the *„Configure Interview“* dialog. The four main sections are based on these questions, represented by the tabs: “*Ego*”, “*Name Generator*”, “*Name Interpreter*” and “*Time Sequence*” (see Figure 81).

4.1.1 Configuring Items of Ego

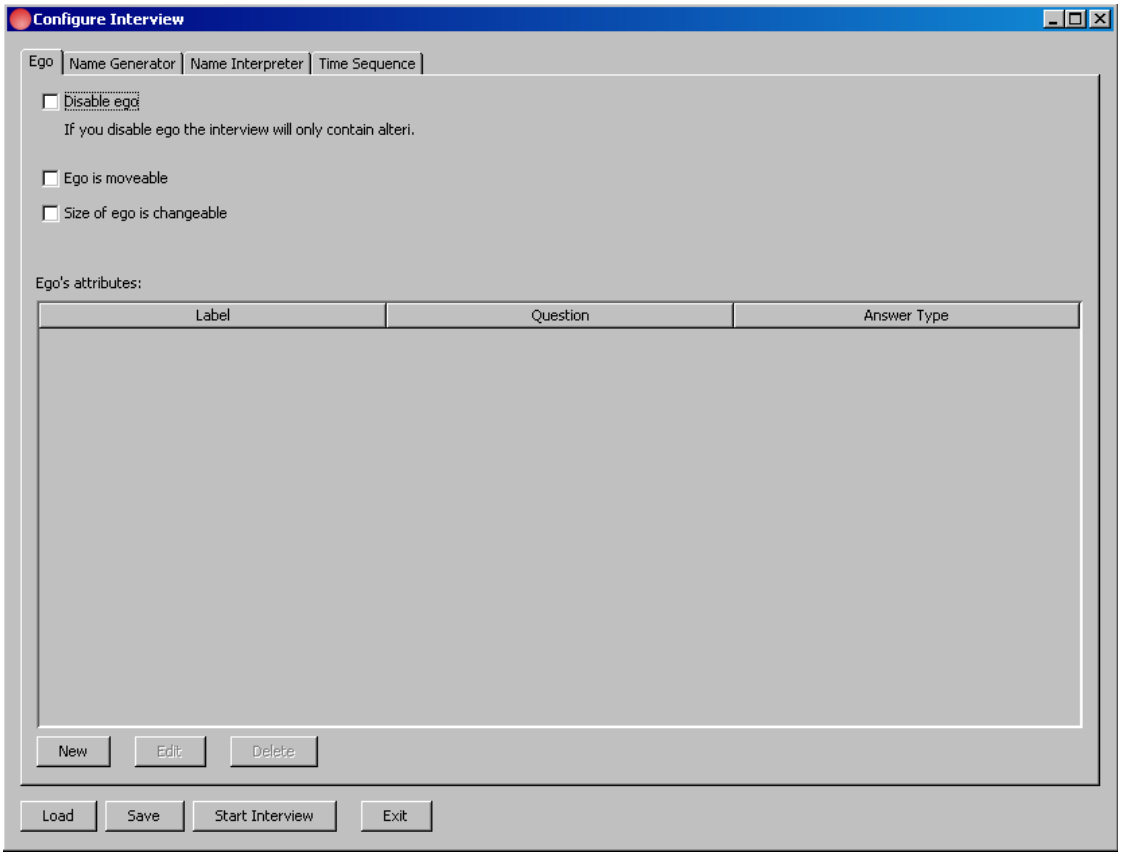


Figure 82: Data entry to select attributes and items of Ego

Figure 82 shows the options to configure the items of Ego, such as location, symbols and attributes. Set “Ego is moveable” and the usually center fixed Ego can be placed on the VennMaker-screen freely. “Disable Ego” leads to the remove of Ego on the VennMaker- screen. Even the “Size of ego is changeable” to resize Ego during an interview. Within the “Ego's attribute”, “New” items can be configured using “Edit” and existing items can be erased with the function “Delete”.

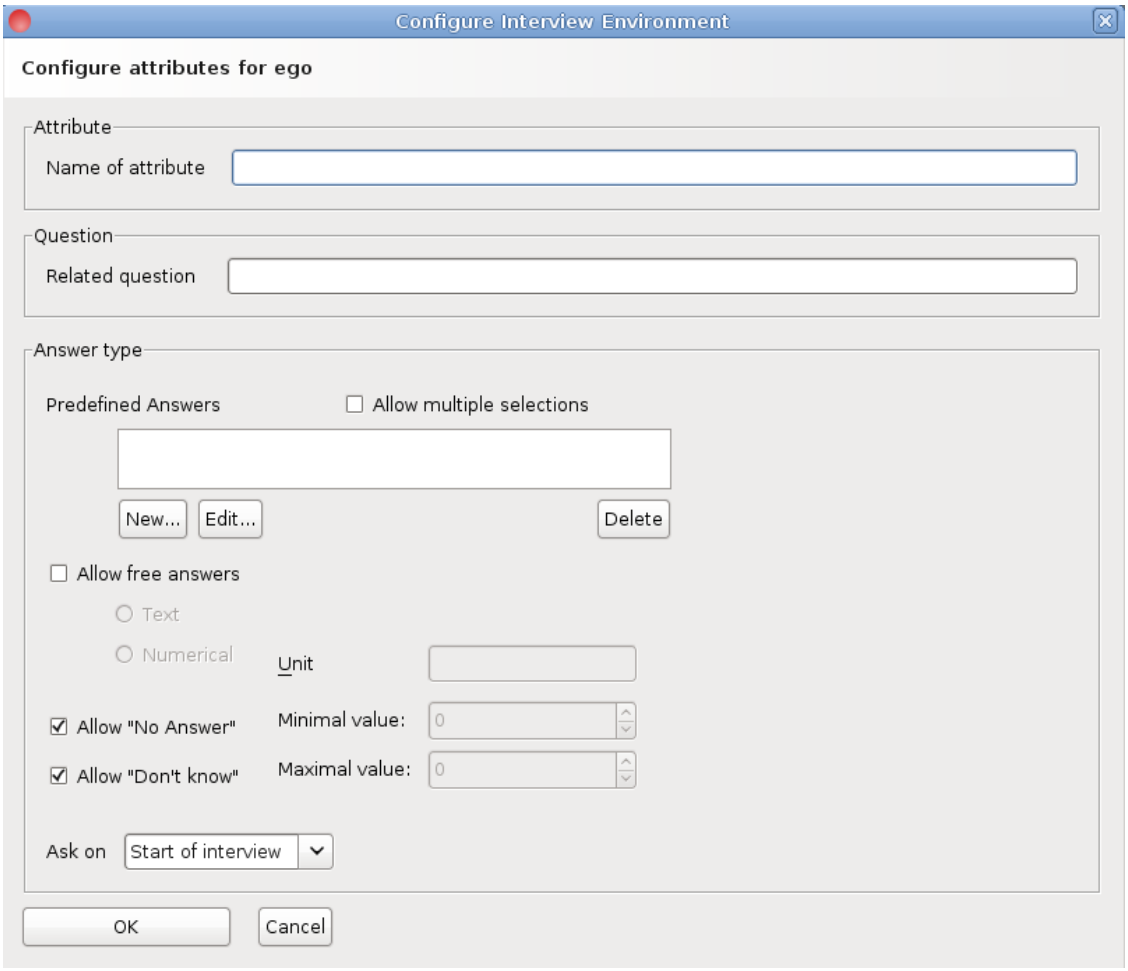


Figure 83: Data entry to configure items of Ego

Choosing “New” leads to a data entry screen (see Figure 83) to configure the items. Insert the name of the item into the “Name of attribute”-field. Formulate the interview question using the field extensions of “Related question”-field . Select given answer types regarding the “Answer type” part of the screen. “Predefined Answers” helps you to prepare categories of supporting questions. “New...” creates new answers, “Edit...” corrects predefined answers, and “Delete” removes existing answers from the list. If your test person shall not choose from predefined categories but answer freely instead, you can select “allow free answers”. If your test person shall not choose from predefined categories but answer freely instead, you can select “allow free answers”.

Afterwards you can choose between “text” and “numerical”. “Text” permits to enter any characters while “numerical” permits to enter numbers only. Furthermore, you can determine the type of numbers (“Units” as meters, pounds, dollars or number of persons). Via “minimal value” or “maximal value”, you can restrict the range of numbers.

You can determine two kinds of answer denial via the options “allow ‘no answer’” and “allow ‘don’t know’”.

The time position for asking a question in the interview is determined via the drop-down menu “ask on”:

“Start of interview”: The question is posed at the beginning of the interview before the digital network map will be drawn.

“Adding to network”: The Question is posed as soon as the Ego is shown on the digital network map.

”End of interview”: The question is posed after network drawing at the end of the interview.

The setting will be assumed by clicking on “OK”. The question will be displayed in the “Ego’s attributes” list. You can edit the question via “edit”.

4.1.2 Configure the Name Generator

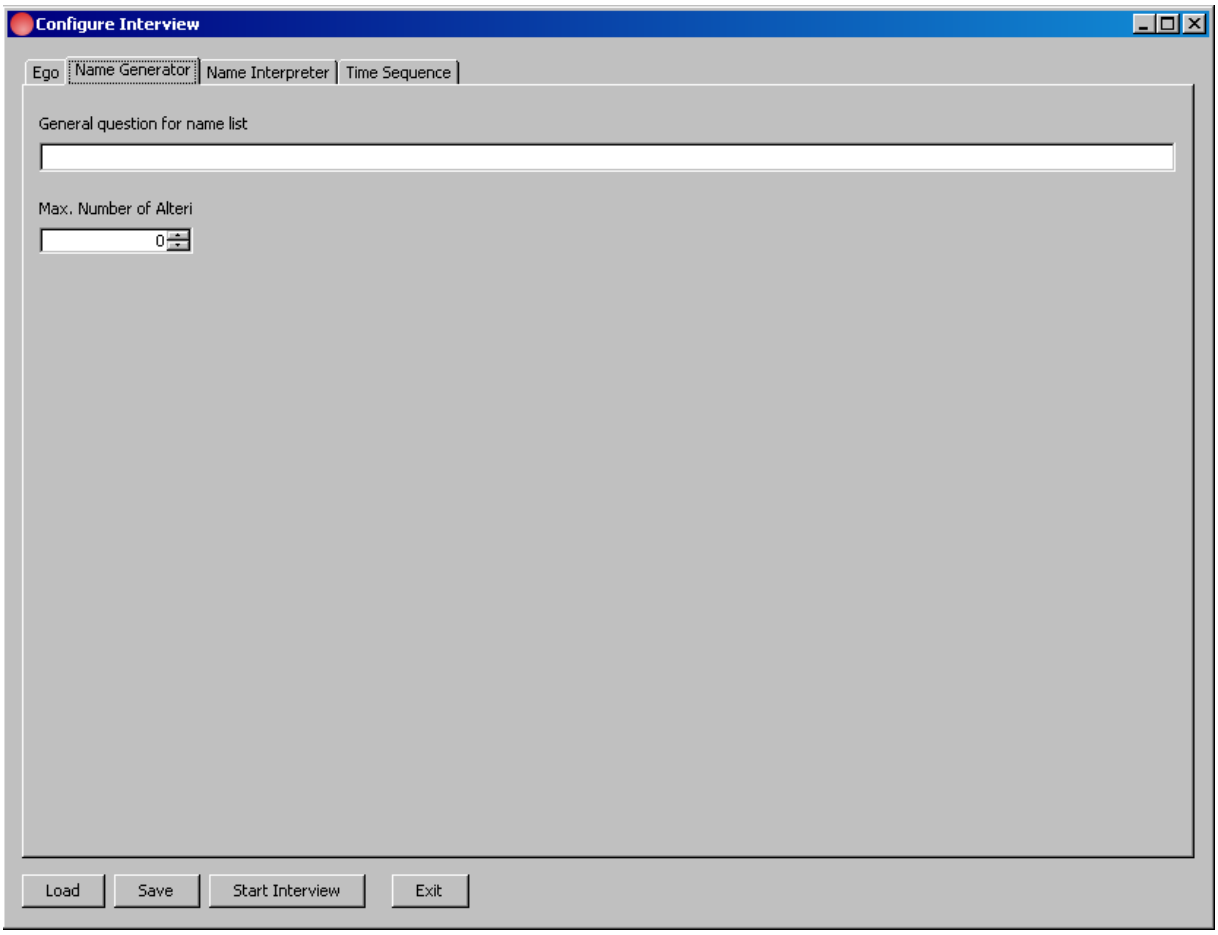


Figure 84: Input fields for the name generator

If you choose the tab “name generator”, the input mask for the name generator will be opened by itself (see Figure 84).

The primary function of the name generator is to frame the social network. You can define further questions for all persons (alteri) surveyed with the name generator via “name interpreter” (see Chapter 4.1.3).

“Max. number of alteri” specifies the maximum amount of Alteri the test person can enter. “0” signifies no restrictions. The test person can enter Alteri as many as she or he likes in the name generator list.

4.1.3 Configure the Name Interpreter

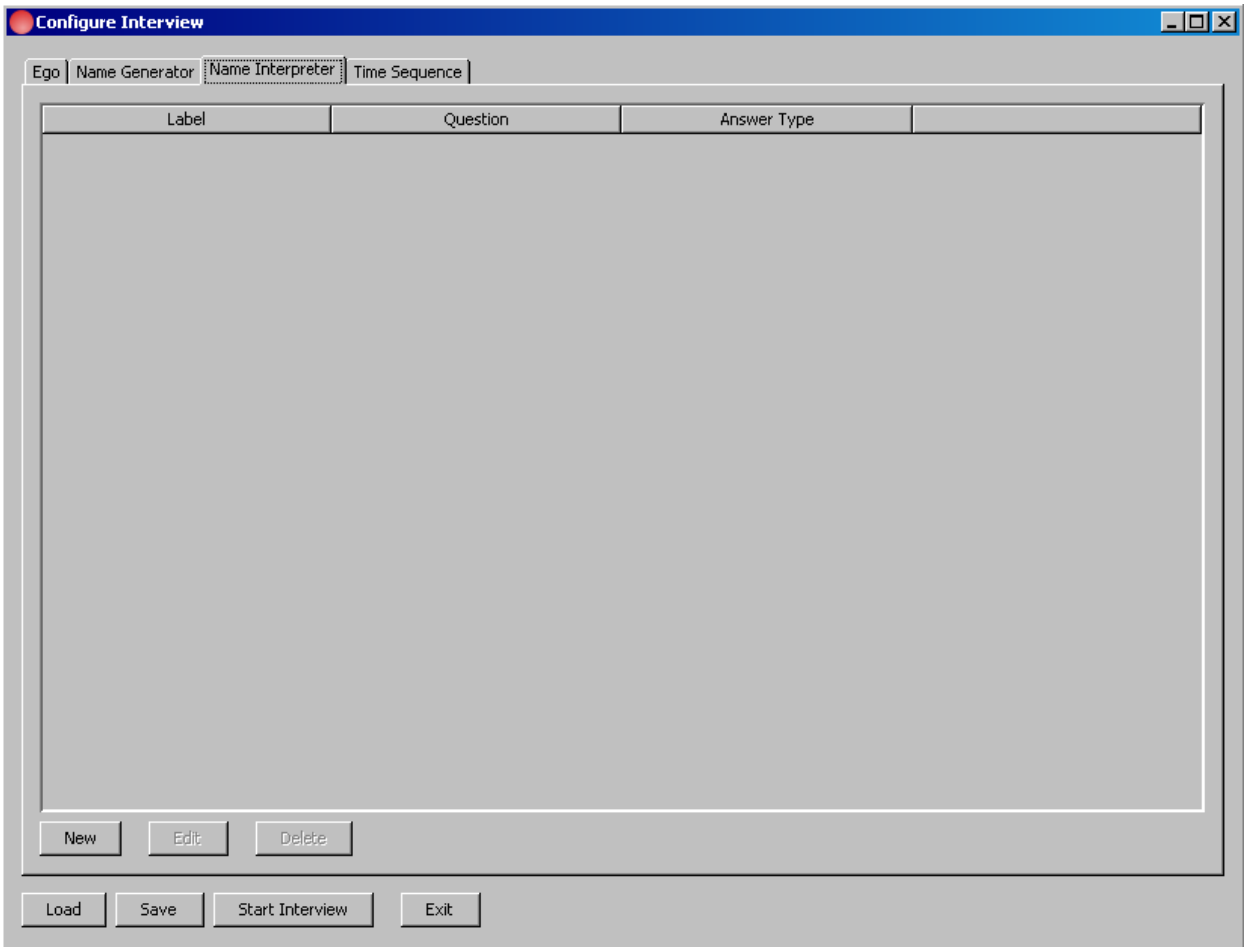


Figure 85: Input fields for determination of different name interpreters

The tab "*Name Interpreter*" opens an input mask in which you can enter, edit and delete name interpretators (see Figure 85).

Name interpretators are questions about the characteristics of alteri that were compiled using the name generator. Non-relational and relational attributes can be queried.If you would like to define attributes, click the "*New*" button. A new input mask will open (see Figure 86). In the field "*Name of Attribute*" you can enter any item label you wish. This label is hidden during the interview and merely serves to identify items.

In the input field "*Related Question*" you can formulate a specific question for this item. The subject will see this question during the interview.

In the section "*Answer Type*" it is possible to set the various types of answer for the question. You can allow the subject to choose from a list of pre-defined response categories or to enter his/her answer 86).

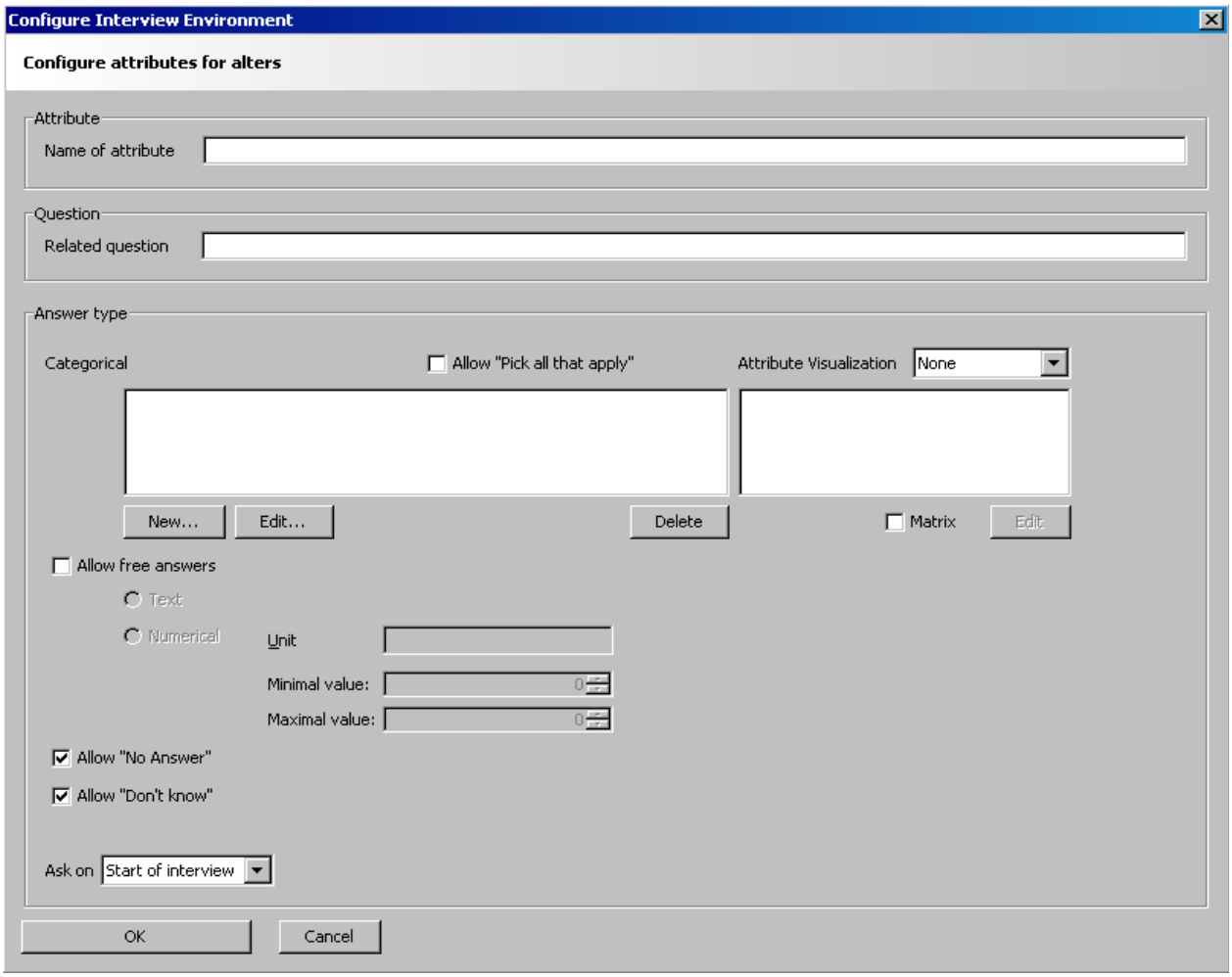


Figure 86: Input fields for Alter attributes

New response categories can be added via "*New…*", "*Edit…*"allows response categories to be edited and "*Delete*" deletes response categories from the response category list.

By choosing "*Allow Multiple Selections*" the subject will be able to select multiple response categories during the interview. If this option is not selected, then only one response category can be chosen.

Using "*Attribute Visualization*", response categories can be represented by visual elements:

The subject selects the appropriate response category. VennMaker then links the response category with its visual element. If, for example, a question about alteri's sex is asked, then depending on the answer the appropriate symbol will be assigned to this person. When the subject then draws his/her network, the other person will already have the appropriate symbol for their sex.

In this way, response categories can be linked not only to symbol type but also to symbol size. Relation lines, sectors and concentric circles can also be linked to pre-defined answers. The respective menu items under "*Attribute Visualization*" are "*Actor Type*", "*Actor Size*", "*Relation Type*", "*Sector*" and "*Circle*".

Pre-defined answers can be linked to different actor symbols using "*Actor Type*". "*Edit*" enables you to change the actor type: select the appropriate response category and then click "*Edit*". A window with a selection menu will open. Select the desired symbol and then click "*OK*". The file name for the symbol in the actor symbol list has now changed.

The image files for attribute symbols have svg format (svg= scalable vector graphics). If you wish to create your own symbols, simply use a graphic program that supports svg. (You can find further information on free native svg editors at: http://www.svgi.org/). Save svg files in the "icons" subfolder in VennMaker. Only then will the new image files also appear on the list.

"*Actor Size*" allows individual response categories to be linked to different symbol sizes. You can also define these sizes (in pixels) in the list under "*Attribute Visualization*". Every line in the size list is linked to the respective response category in the field on the left.

"*Relation Type*": When an item measures a relational attribute, then this menu item can be used to link pre-defined response categories with different line styles. These lines are then displayed in the list under "*Attribute Visualization*". Use "*Edit*" to change the line styles.

“*Sector*”: individual sectors of the digital network map can be linked to response categories using this menu item. The answers are assigned clockwise to the sector. During an interview, the subject will see the respective pre-defined answer in the corresponding sector.

“*Circle*”: individual concentric circles in the digital network map can be linked to response categories using this menu item. The subject will see the respective pre-defined answer in the corresponding concentric circle on the digital network map. The answers are assigned to circles starting at the center and moving out.

Surveying using pre-defined answers can be done in various ways in the question window.

When you, for example, activate “*Matrix*”, then the subject will see a table during the interview (see Figure 87).

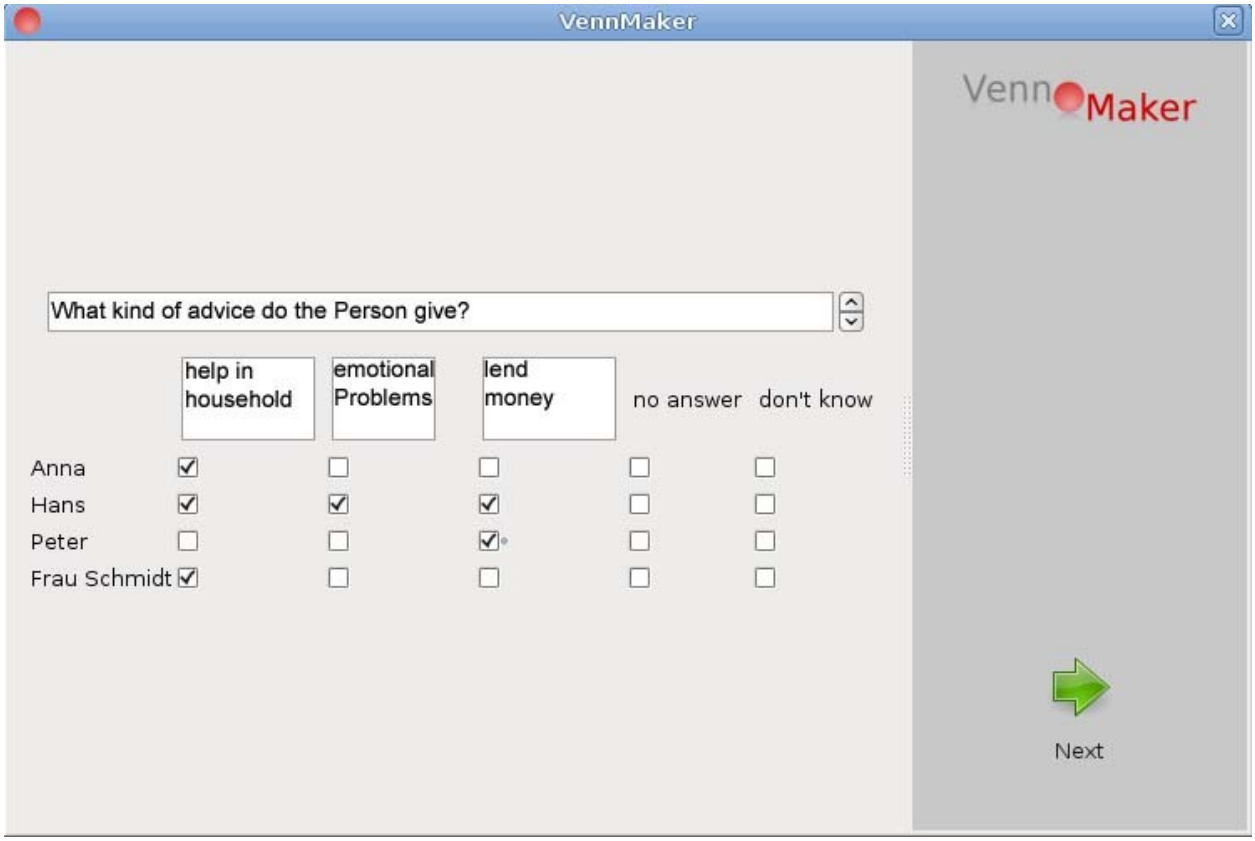


Figure 87: Input matrix in the Interview mode

In the first column all Alteri and in the first row the given answers are listed. In the other cells there are small clickable boxes. If the proband clicks one of these boxes, he or she chooses the respective answer category for the respective Alter. The advantage of this kind of questioning is that the proband can see all Alteri with the response spectrum and is able to select the answer category quickly.

Another design of the interrogative dialogue uses so-called "Buckets". Here, the interviewee can pull the Alteri in Buckets / fields (see Figure 88).

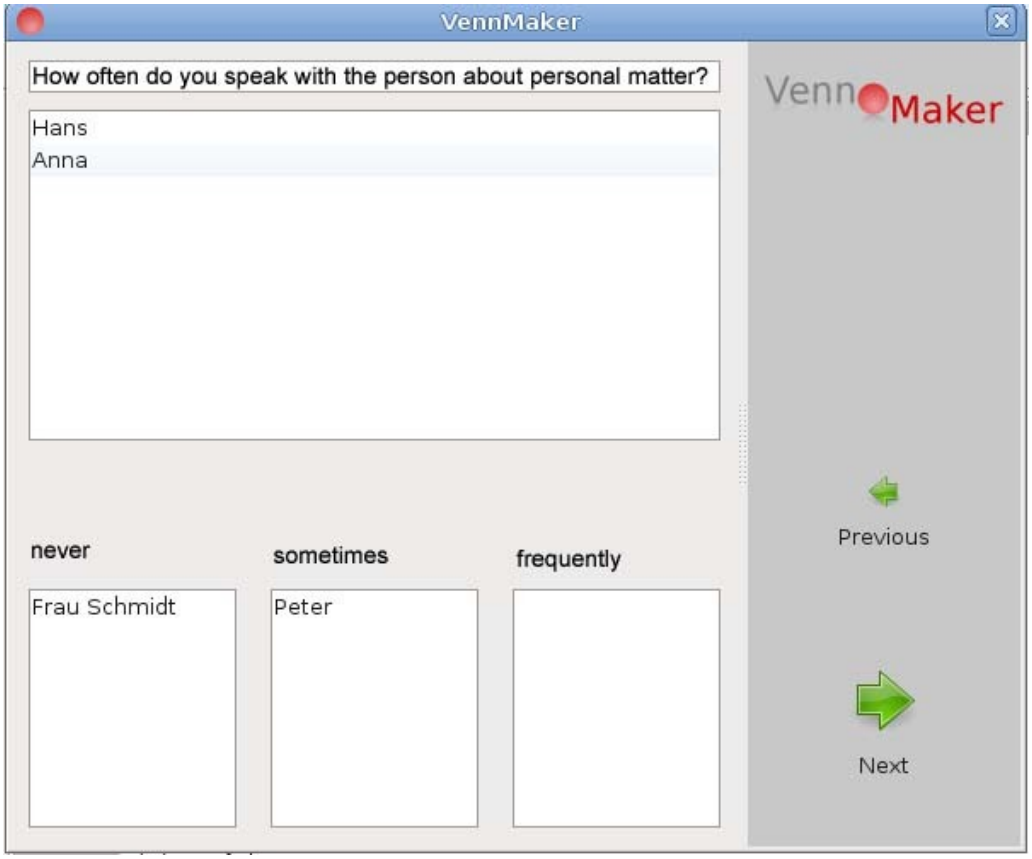


Figure 88: Buckets in the Interview mode

Each bucket represents one given answer category. If you have chosen "Visual Mapping"> "Actor Size", then buckets are used in the interrogative dialog.

If you like to get the question answered independently – meaning, without predetermined categories – then activate "Allow free answers". Here, one can choose between "text" and "numerical".

"Text" permits the input of any character, while "numerical" permits only numerics. "Unit" predefines the unit (for example, dollar, and liter) and "Maximal value" and "Minimal value" predefine the upper limit and lower limit of the numeric.

Via "Allow No answer"“ and "Allow Don't know"“ the proband can refuse the answer and give the reason of this refusal at the same time.

4.1.4 Setting the Time Sequence of the Interview

If you choose the tab "Time Sequence", the following template will open:

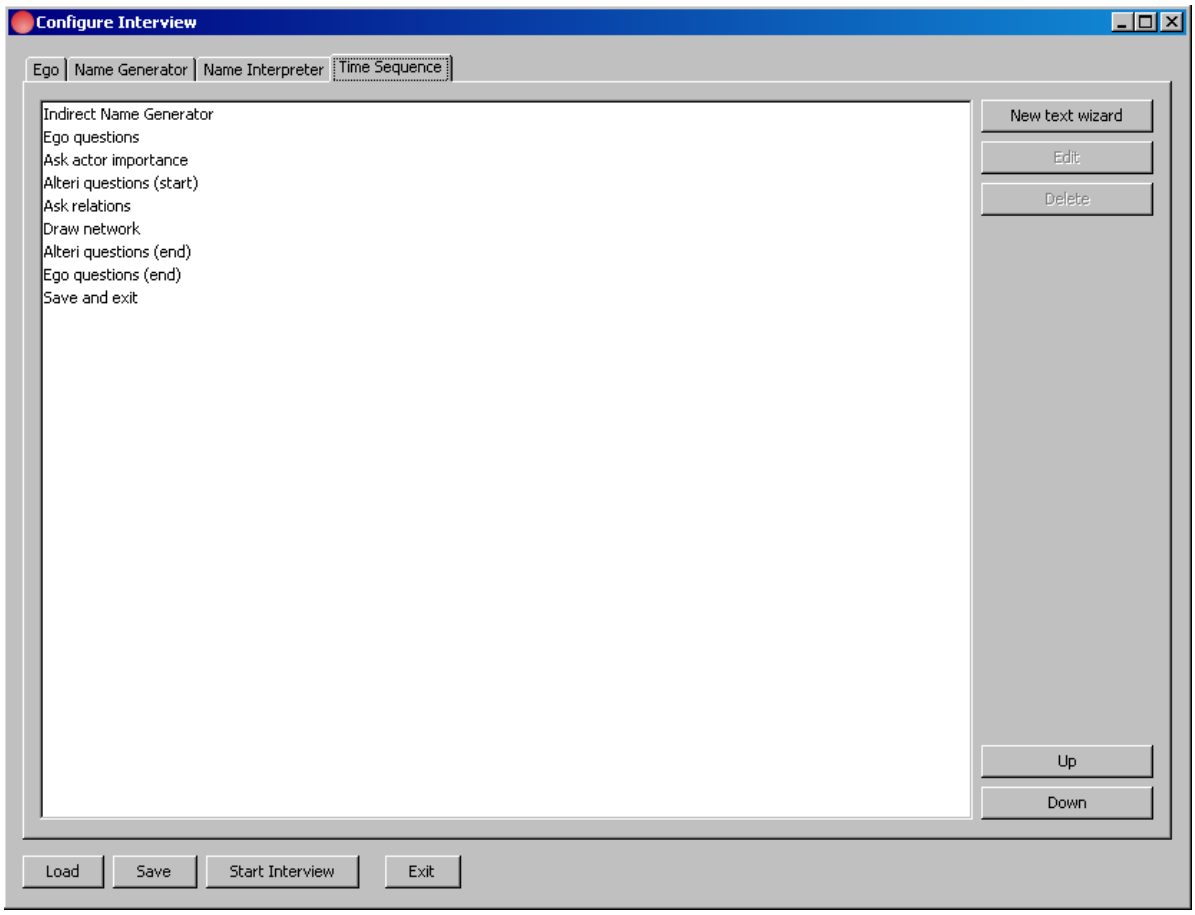


Figure 89: Time Sequence Template

In the left section the respective actions are listed following chronological order. The order can be changed, while clicking the respective entry and afterwards clicking on "Up" or "Down". "Up" will shift the entry one row upward. This means, that the respective action in the interview takes place earlier. "Down" will shift the entry downward, the action takes places chronologically later.

“New Text Wizard” will create a new text wizard. A text wizard is a simple text window which the interviewee can see during the interview. It is used to create additional information and offers help and guidance for the proband, e.g. giving instructions. At the

beginning of the interview, for example, a text wizard “Welcome to the interview!” could appear or at the end of the interview one can read “Thanks a lot! Please, click on 'next' to stop the interview”.

4.1.5 Loading and Saving of the Interview Configuration

You can load an existing interview in the configuration menu by choosing “Load". Interview-configuration files will have the file extension "vennEn". You can save the settings which you have determined in the interview configuration menu by clicking “Save".

Via “Start Interview” you can switch over to the interview mode and test your settings. “Exit” will finish the configuration mode. The following chapter explains how to conduct a preconfigured interview in the “Perform Interview” mode.

4.2 Conduction an Interview

You can conduct a preconfigured interview by choosing the mode “Perform interview”.

After clicking the button (see Figure 4) you are requested to select a preconfigured interview file. Interview files will have the ending “vennEn”.

Depending on the configuration of the interview the respective interrogative dialogues (see Figure 90) will appear.

By clicking "Next" and “Previous” you are able to navigate between the dialogues -pre and -back. If you change to the digital network map you will see a “Next” button on the left side with the respective question.

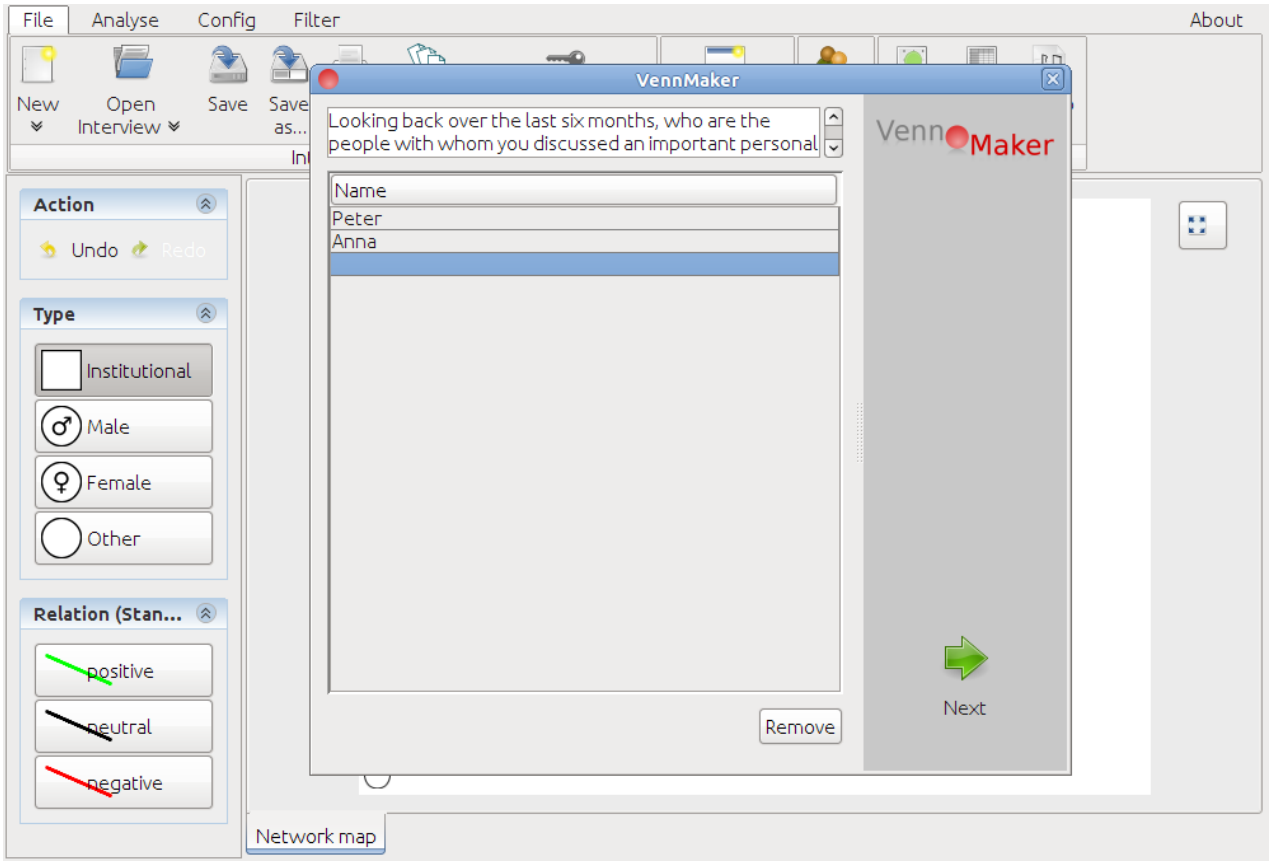


Figure 90: Illustration of the name generator dialogue in the Interview mode

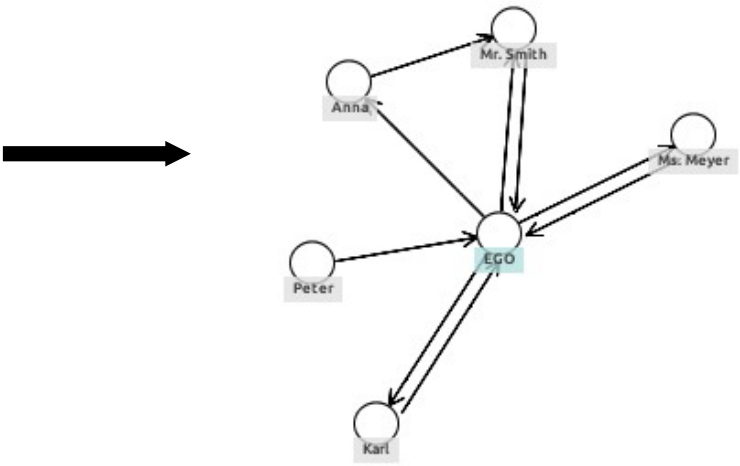
At the end VennMaker stores the interview result in a file in the VennMaker directory.

The file name consists of a random, six-digit number with the file ending “venn”. You can load this file in the “Free Network Drawing” mode for further analyses as well as for exporting.

How to export conducted networks with VennMaker you will learn in the following chapter.

5 Importing Data

	A
1	Mr. Smith
2	Anna
3	Peter
4	Ms. Meyer
5	Karl



If you wish to import to VennMaker a list of actors from another source, you can do so via “*Data*” > “*Actors*”:

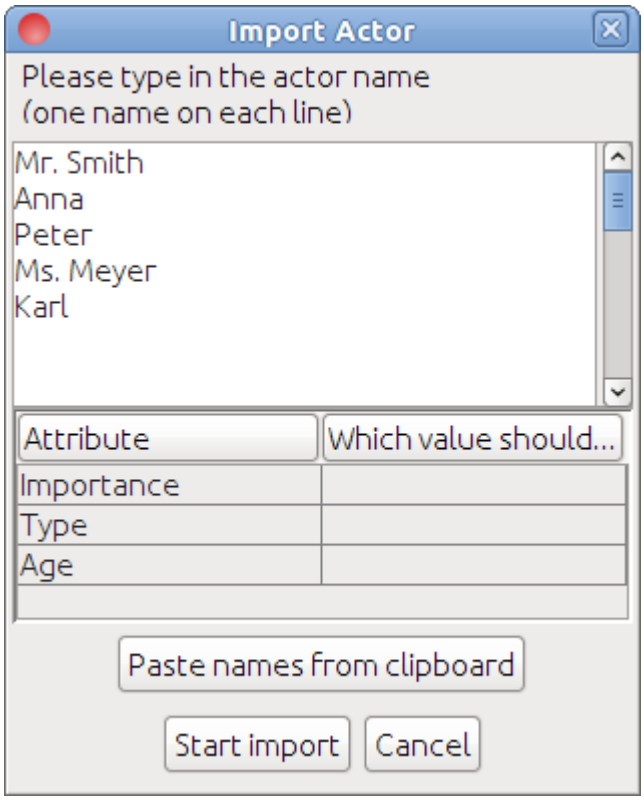


Figure 91: Import actors

There you can type the actor names directly into the text box or use copy & paste.

Every line is a different actor.

If you want to set attribute values for the actors to be imported, you can do so using the list of attributes and attribute values below the input field (cf. Figure 91). VennMaker will then add the actors to the "*Available Actors*" list. Then you can add these actors to the digital network map and draw the relations between them.

6 Export of Data

The following chapters give an outline how to anonymize and export collected data with VennMaker. The chapters imply that you already have recorded a network. How to record a network and to conduct interviews, is shown in chapter 3 and Kapitel 4.

6.1 Export of digital Network Maps

VennMaker offers the possibility to safe digital network maps as picture files as well as CSV files.

6.1.1 Saving Digital Network Maps as Image Files

Start VennMaker either in the "*Free Drawing*" or "*Perform Interview*" mode. In these modes you can save the selected digital network maps via "*File*" > "*Image*" as "png" or "jpg" files.

How you can save your network data in VennMaker so that you can work with it using other programs – such as OpenOffice calc, Excel or SPSS – is explained in the next chapter.

6.1.2 Saving Digital Network Maps as CSV Files

VennMaker allows you to save in CSV format (CSV = "Comma Separated Values") so that you can process and further work with your network data.

This is done via "*File*" > "*Actor Data*". You can also select a name under which the files should be saved.

In Figure 97 you see the input window for exporting. In the field "Name" you can enter a name that all csv files generated will have in their file name. In the "*Directory*" field you see the current export directory. You can select a new location using "*Change Directory*". Using "*Default*", you can return to the default export directory.

In the section “*Export Format*” you can set which format the data in the CSV file will be saved as. In the English language, for example, decimal points are used instead of decimal commas.

To export your digital network map click “*Start Export*”. All digital network maps for that interview will be exported.

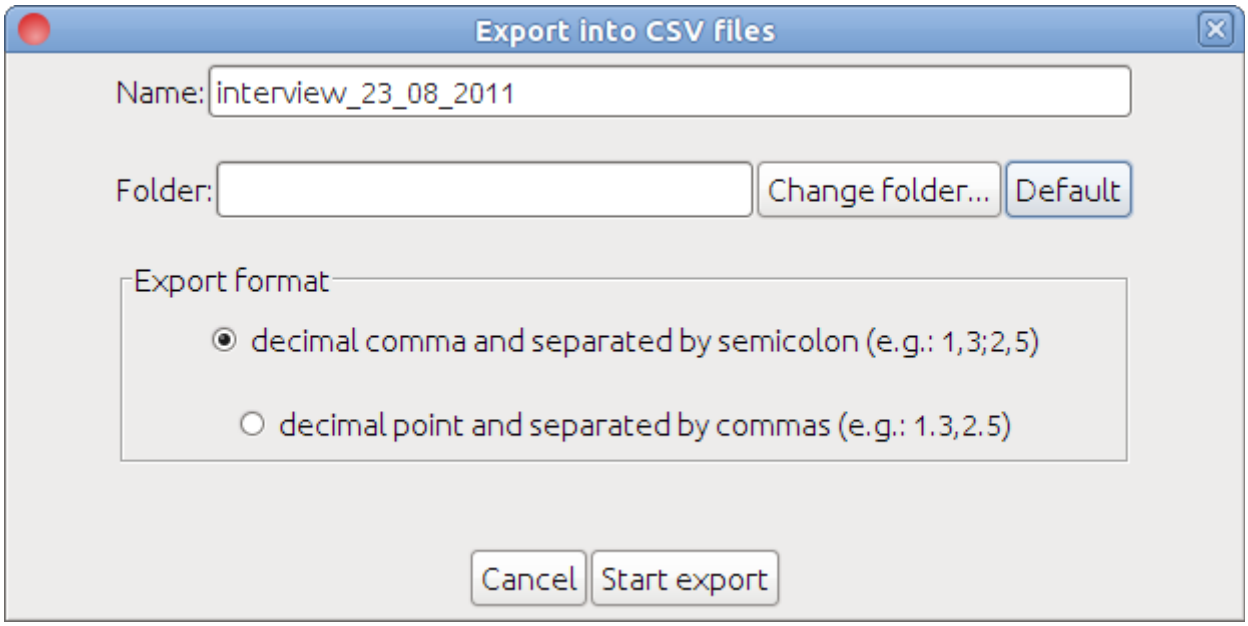


Figure 92: Export dialog for digital network maps

For every network map at least seven CSV files are generated, whose file names begin as follows:

Label	Meaning
EGO	Contains data on ego
ALTER	Contains data on alteri
COMPUTE	Network measured values
ADJACENCY	Adjacency matrix
ADJACENCY_ALTERI	Adjacency matrix without ego
RELATIONGROUPS	Contains the number of relation groups that exist between pairs of actors
MULTIPLEXITY	Contains the number of relation lines that exist between pairs of actors
OVERVIEW	Interview notes and all attributes, attribute values and the attribute value coding

The full name of the **ego** file is then “EGO_*Name*.csv”. *Name* is a placeholder for the name you entered into the “*Name*” field in the export window. The ego file contains for every network map the respective attributes and attribute values of ego and some network measurements which will be explained in this chapter.

Encoding and Interview Notes: The file OVERVIEW_*Name*.txt contains the interview notes and all non-relational and relational attributes. In addition to the questions and descriptions, the attribute values with their respective numerical codes are also saved. This encoding is automatically generated by VennMaker and done according to the order of the attribute value entries.

The **Alter file** “ALTER_*Name*.csv” contains information on the alteri: the actors’ names, the x and y coordinates, the attribute values and several network parameters. The first column contains the unique alteri ID, which is composed using the actor’s name and a number. The second column contains the ego ID so that the alteri can be attributed to an ego.

Overall Network Parameter File: Information about the network map such as the density or number of alteri is saved in the file “Compute_*Name_Networkmapnumber.csv*”.

The **relation group file** “RELATIONGROUPS_*Name_Networkmapnumber.csv*” contains in addition to the name also a number in the file name. This number refers to which network map the file belongs to. 1 is the first network map, 2 the second, etc.

The file contains a matrix with the number of different relation groups between each two actors. The data are shown as a matrix. The first column and the first row contain the actor IDs. The direction of the relation runs from the actor in the row to the actor in the respective column. Not only are the relations considered, but also the respective relation groups. If, for example, two relations exist between the actors (“money borrowed” and “emotional importance”) and if these relations belong to different relation groups (e.g. “Support (money)” and “Support (emotional aid)”), then a 2 will be entered in the matrix. If there is no relation between the actors, then a 0 will be entered in the matrix.

The adjacency matrix is saved in the **adjacency matrix file** “ADJACENCY_*Name*.csv”. Existing relations receive a 1; non-existent relations a 0. Ego is also contained in this matrix.

The adjacency matrix is saved without ego in the **adjacency matrix file** “ADJACENCY_ALTERI_*Name_Networkmapnumber*.csv”.

Name: is the name you entered in the export window.

The following three figures show how VennMaker converts the graph in Figure 93 into two different matrixes.

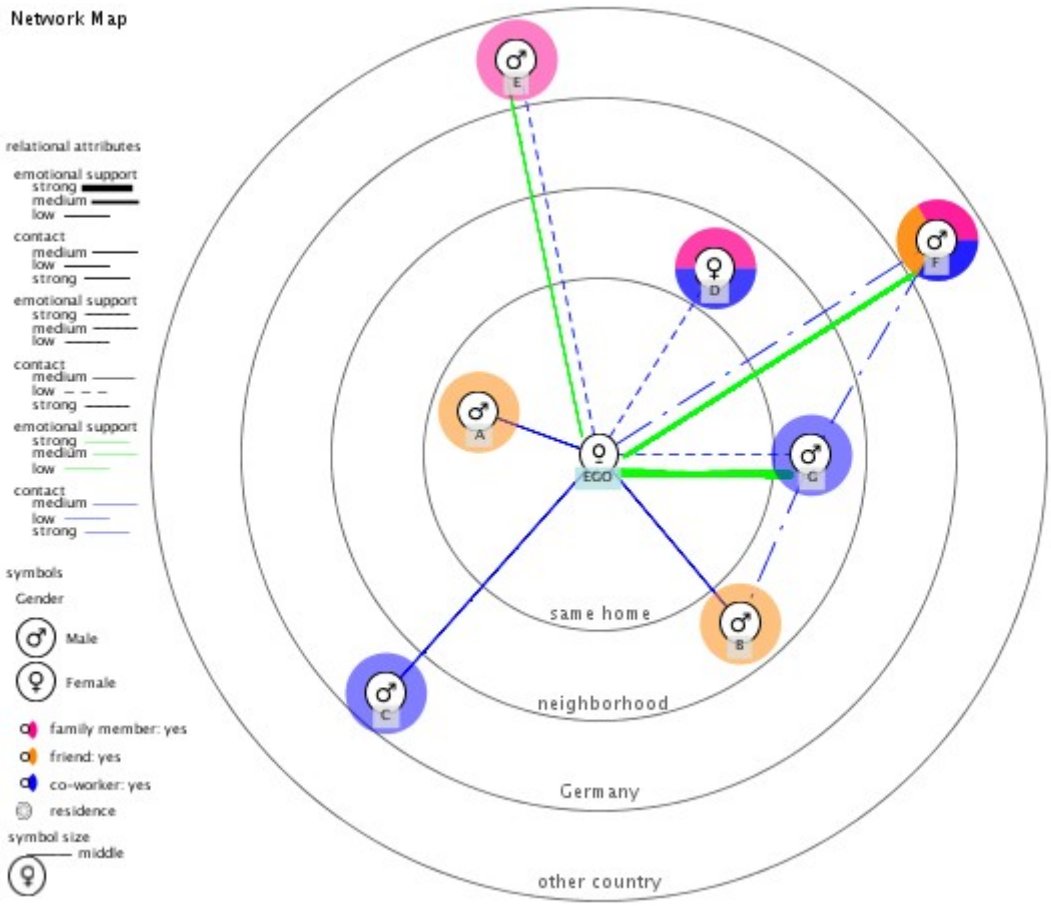


Figure 93: Example of a social network drawn with VennMaker

The digital network map in Figure 93 can be read as follows: Ego is in the middle. The concentric circles in this example represent the spatial proximity of the alteri to ego. The closer the alter to ego on the network map, the closer the alter lives to ego. The actors are differentiated using "*Gender*" and "*Role*". The colored lines visualize the relation types between ego and alteri and between the alteri. On the one hand, the frequency of contact is shown and on the other, one type of support (emotional support).

An example: the male actor A lives in the same apartment as ego. There is a strong contacting relationship between actor B and ego. Actor B is a friend to ego. Between ego and the family member actor E, who lives in another country, there is little contact and little emotional support.

Table 1 shows the relation matrix that was saved in the file RELATIONGROUPS_*.csv. The matrix contains the same number of rows and columns. The first row and the first

column contain the actor IDs. In the first cell of the first column and row is the name of the digital network map, in our example this is "*Network Map*". The matrix can be read as follows: actor G has a relation with actor F. EGO has relations with actor E from two different relation groups. The direction of the relation always runs from the row to the respective column. As we have an undirected graph – which means the relations run in both directions – the matrix is symmetrical, which means that the section above the matrix diagonal running from the top left to the bottom right mirrors the section below the matrix diagonal (cf. [Jansen 2006], p 100). In our example, the cell "Actor B – Actor C" contains the same value as the cell "Actor C – Actor B", which is 0.

Relations that were not drawn are given the value 0 in the matrix. After each name there is a unique number which ensures that actors with the same name are distinguishable from each other.

Network Map	EGO_0	A_1	B_2	C_3	D_4	E_5	F_6	G_7
EGO_0	0	1	1	1	1	2	2	2
A_1	1	0	0	0	0	0	0	0
B_2	1	0	0	0	0	0	0	1
C_3	1	0	0	0	0	0	0	0
D_4	1	0	0	0	0	0	0	0
E_5	2	0	0	0	0	0	0	0
F_6	2	0	0	0	0	0	0	1
G_7	2	0	1	0	0	0	1	0

Table 1: Relation groups as a matrix

In table 2, the adjacency matrix (with ego) can be seen as it is saved in ADJACENCY.csv. An adjacency matrix is a matrix with the same number of columns and rows where existing relations are given a value of 1 and non-existent relation a value of 0.

Network Map	EGO_0	A_1	B_2	C_3	D_4	E_5	F_6	G_7
EGO_0	0	1	1	1	1	1	1	1
A_1	1	0	0	0	0	0	0	0
B_2	1	0	0	0	0	0	0	1
C_3	1	0	0	0	0	0	0	0
D_4	1	0	0	0	0	0	0	0
E_5	1	0	0	0	0	0	0	0
F_6	1	0	0	0	0	0	0	1
G_7	1	0	1	0	0	0	1	0

Table 2: Adjacency matrix of ego

Actor C (5th row) only has a relation with one person, namely with ego (column 2), while ego (1st column, 2nd row) has a relation with all other actors. Actor relations with oneself are not valued; therefore the matrix diagonal running from the top left to the bottom right is valued at 0.

The Compute.csv file is arranged as follows:

Network map	Actors Total	Circle_-1	Circle_0	Circlle_1_same home	Circle_2_neighborhood	Circle_3_Germany	Circle_4_other country	Sector_-1	Density (with Ego)	Density (without Ego)
Netzwerkkarte	7	0	0	1	3	1	2	7	0,321429	0,095238

Table 3: Example of Compute.csv file

The first column represents the name of the network map, in our example "*Network Map"*. The following columns contain the total number of alteri, how many alteri are in the sectors or circles, and the density of the network (with and without ego). The columns which contain "*Circle*" show the frequency of actors per concentric circle. "*Circle_1*" represents the section outside the concentric circles.

The columns which contain "*Sector*" show the frequency of actors per sector. "*Sector_-1*" represents the area outside the sectors or, when no sectors are present, it then contains the number of alteri.

VennMaker provides not only the frequency calculations mentioned here, but also further network analysis measurements: density, degree, in-degree, in-degree (standardized), out-degree, out-degree (standardized), in-closeness, out-closeness and proximity prestige.

Density: the density specifies the degree of connectivity in the network. The network density is defined by the number of existing relations divided by the number of all possible relations (cf. [Jansen 2006], p. 94). VennMaker uses the lines drawn as the relations. The network density figure which factors in ego and his/her relations is in the column "Density *(with ego)*" (Table 3), while the density value in the column "Density *(without ego)*" only factors in the alteri and their relations. Which value is important for

you depends on your research question (cf. [McCarty and Wutich 2005]).

The OVERVIEW.txt file contains all questions, descriptions and attributes with an exact listing of pre-configured attribute values in addition to the interview notes:

```
Interview notes and list of attributes, values and codes
================================================

Notes:
------------------------------------------
List of attributes, values and codes:
------------------------------------------
Actor

Label: Importance
Question:
Describtion:
Code and Value:
  1: less important
  2: not important
  3: middle
  4: important
  5: more important
  6: most important
   :missing
---------------
Actor

Label: Gender
Question:
Describtion:
Code and Value:
  1: Male
  2: Female
   :missing

…
```

Every attribute value of every categorical attribute is automatically tagged with a code. For example: the actor attribute “Sex” has the attribute values “Male” and “Female”. “Male” is coded as “1” and “Female” is coded as “2”, missing values are represented with a missing code.

In Table 4 and Table 5, the attributes of ego and alteri from the example network are shown. The degree values contained in the table can be interpreted as follows: the degree of an actor reveals information on how highly he/she is integrated into a network. If, for example, a direct relation exists between ego and two actors, then ego has a degree of 2.

In-degree and out-degree: in-degree and out-degree are simple measurements of prestige, popularity and social support (cf. [Jansen 2006], p. 96). In-degree expresses the number of direct relations leading to the actor, while out-degree measures the number of direct relations leading from the actor. VennMaker uses the lines drawn on the network map as the relations. Please note that the in-degree and out-degree calculations can only take directed relations into account. If you use undirected relations, the values for in-degree and out-degree will be the same and refer to the degree.

The values are also standardized so that the in-degree and out-degree values in different networks can be compared. Standardizing means that the total number of nodes in the network is taken into account. The standardized degree value (or relative degree value) will have a value between 0 and 1. 0 is a low degree value; the actor is not linked to any other actor, and a degree value of 1 means that the actor is directly linked to all other actors.

id_Ego	x_Network_Map	y_Netzwork_Map	Importance_Network_Map	Gender_Network_Map	Age_Netzwerkkarte	Place_Network_Map	Family member_Network_Map	friend_Network_Map	co-worker__Network_Map	Indegree_Netzwerkkarte	Outdegree_Netzwerkkarte	InCloseness_Netzwerkkarte	OutCloseness_Netzwerkkarte	Size_Netzwerkkarte	InDegreeStd_Netzwerkkarte	OutDegreeStd_Netzwerkkarte	ProximityPrestige_Netzwerkkarte	OutClosenessStd_Netzwerkkarte
EGO_0	0	0	3	2	54					7	7	0	7		1	1	0	1

Table 4: Ego attributes

id_Alter	id_Ego	x_Network Map	y_Network Map	Importance_Network Map	Gender_Network Map	family member_Network Map	friend_Network Map	co-worker_Network Map	residence_Network Map	Indegree_Network Map	Outdegree_Network Map	IndegreeStd_Network Map	OutdegreeStd_Network Map	InCloseness_Network Map	OutCloseness_Network Map	ProximityPrestige_Network M	OutClosenessStd_Network M
A_1	EGO_0	-26,56	-9,34	3	2		1		1	1	1	0,14	0,14	7	0	0,33	0,00
B_2	EGO_0	31,32	37,55	3	2		1		2	2	2	0,29	0,29	6	0	0,38	0,00
C_3	EGO_0	-47,07	52,93	3	2			1	3	1	1	0,14	0,14	7	0	0,33	0,00
D_4	EGO_0	25,82	-41,21	3	1	1		1	2	1	1	0,14	0,14	7	0	0,33	0,00
E_5	EGO_0	-18,13	-87,36	3	2	1			4	1	1	0,14	0,14	5	13	0,26	0,54
F_6	EGO_0	74,91	-47,44	3	2	1	1	1	4	2	2	0,29	0,29	5	12	0,26	0,58
G_7	EGO_0	47,07	0,18	3	2			1	2	3	3	0,43	0,43	4	12	0,32	0,58

Table 5: Alter attributes

Closeness (In-closeness and Out-closeness): Is a proximity-based centrality measurement. Proximity-based means in this case that the lengths of the relation lines for all actors linked directly or indirectly to a particular actor are used in the calculations. All actors not linked are left out of the closeness calculation (cf. [Wasserman and Faust 1994]), p. 184f.).

When using directed relations, in-closeness measures the relations leading to an actor and out-closeness those leading from an actor.

Proximity Prestige: this calculates how close an actor is to the other actors in his/her area of influence. Here closeness is defined solely using the actor's distance to other actors in his/her area of influence. If all actors are adjacent to this actor, then the proximity prestige has a value of 1. If the actor is not linked to any other actor, then the proximity prestige value is 0 (cf. [Wasserman and Faust 1994], p.203f.).

How you can further use exported data is explained in the following chapters.

6.1.3 Import of Data into OpenOffice Calc or Microsoft Excel

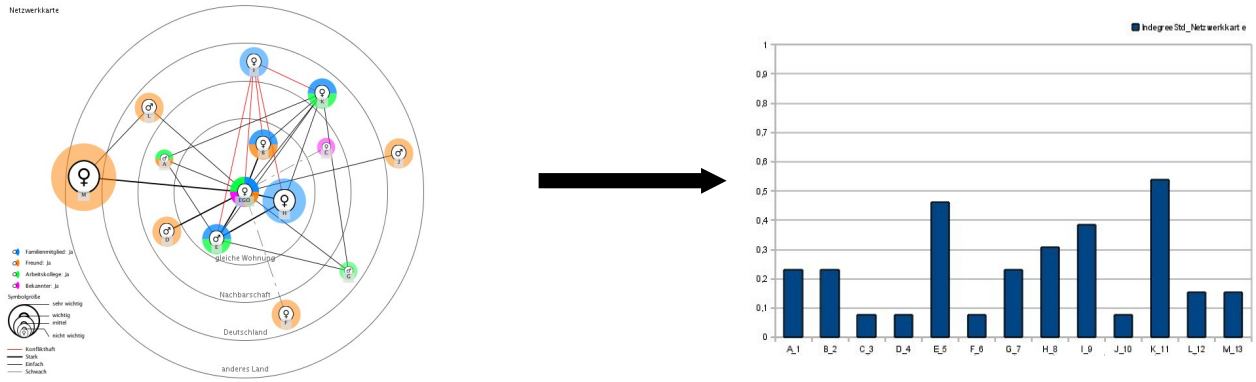


Figure 94: From the digital network map to a diagram

After starting OpenOffice Calc or Excel you can load the respective CSV-file via „New“ > „Open“ or you can open the file via double-click.

In OpenOffice Calc you will be asked to set a separator. Here, you shall choose „Semicolon“ and then click on „OK“.

6.1.4 Import of Data into SPSS

In this subchapter you will learn how to load a CSV file. After starting SPSS (version 15 or greater) you click on “File” > “Open”. Here, you change to the folder in which you have saved the CSV file. After that you choose as data-file “All files (*.*)”. Select the file CSV fuile you want to import.

After that SPSS is starting the Import text wizard:

In step 1 you handle everything like it is set and only click on “Next”.

In step 2 please set the question “How are your variables arranged?“ to “Delimited” and

for “Are variable names included at the top of your file?” click “Yes” and then choose “Next”.

In the step 3 you shall clarify that the first case is located in the second line, that “Each line represents a case” and “All of the cases” shall be imported. After that please click on “Next”.

In step 4 you set the question “Which delimiters appear between variables?” to “Semicolon”. Please deactivate “Space” and activate “None” in “What is the text qualifier?”. In the data preview field of SPSS all data shall be presented correctly.

In step 5 you can set the specification for the variables. Therefore, please click the particular column in the data preview field and choose the respective data format. If you have determined all characteristics of variables please click on “Next”.

In step 6 you will finish the import by clicking the button “Finish”.

SPSS is now loading the data; if necessary you have to determine afterwards, if the respective variable is “numeric” by type. This is possible in the variable view in the column „Type“.

6.1.5 Import of Data into Ucinet

Please start Ucinet (Version 6) and click the button “Matrix spreadsheet”. In the opened window click on “File” >”Open” and go to the particular folder, in which you have exported the digital network map with VennMaker as CSV files. Afterwards you shall choose the file type “CSV files”.

Usually all CSV files are listed. Here, choose the respective adjacency file and click on “OK”. Subsequently please make sure that the number of rows and columns is equal in “Dimensions”. Finally, please safe the data via “File” > “Save as” as “UCINET 4-6 dataset”.

6.1.6 Visualization of Network Graphs with NetDraw

In the next step please start NetDraw (Version 2.0) and load saved dataset-files:

“File” > “Open” > “Ucinet dataset” > “Network”

The following options have to be selected:

File format: Ucinet (*.##h)

Type of data: 1-Mode Network(s)

Ignore reflexive ties: should be activated

Ties have values > 0.0

Please choose the file which you have saved in Ucinet via “...” and click “OK“. Now the network will be drawn and further calculations can be carried out.

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