
Document 10.1.2.

Generating a Million Questions from UIA Databases: illustrations

The examples included here are intended only as illustrations. Dynamic examples can be viewed in the on-line version of the UIA's "Questions" database at <http://www.diversitas.org/db/x.php?dbcode=qu>. For further discussion, see document 10.1.1. in this volume.

Visualization of patterns of questions

The visualization possibilities for networks of interrelated Questions were first envisaged as a contribution to the media project associated with the launch of the Living Library by Dropping Knowledge (see *Complementary Knowledge Analysis / Mapping Process*, April 2006), notably with respect to the use of *NetMap*. (See document 10.1.4. in this volume.)

The visualization facilities implemented by Tomáš J. Fülöpp for online exploration of the Questions database form part of the set of options developed for exploration of the wider set of databases: Problems, Strategies, Values, Organizations, etc. (*Information visualization and sonorification: displaying complexes of problems, strategies, values and organizations*). Some examples are given below. The on-line facilities include:

- **Circular metaphor:** Representation of questions as nodes on the circumference of a circle, with relationships expressed as lines linking across the circle. Question titles are presented radially from each node, outside the circle (and may be clickable to offer access to the question entry). This representation takes several forms:
 - PNG (Portable Network Graphics), namely a bitmap image that is quickly generated and not subject to any patent restrictions
 - SVG (Scalable Vector Graphics), namely an XML markup language enabling description of two-dimensional vector graphics, both static and animated. This is an open standard created by the World Wide Web Consortium. It has the considerable advantage of being susceptible to being edited as a text file. As its name implies this format has the advantage of allowing the image to be scaled to any size without loss of resolution. As implemented it allows the image to be used as an index to individual questions.
 - SWF (Small Web Format or Shockwave Flash), is a widely used proprietary format for displaying animated vector graphics on the web.
- **Hierarchical metaphor:**
 - **Hyperbolic metaphor:** Representation of the network of relationships between questions (as nodes) on a hypergraph, namely projected onto a hypersphere using the open source HyperGraph application. This is a java applet that offers a means to visualize

hyperbolic geometry, to handle graphs and to layout hyperbolic trees. It is especially useful for exploring large volumes of data that have a degree of hierarchical structure. See

<http://hypergraph.sourceforge.net/>

- **FreeMind:** This is a mind mapping application written in java, typically providing extensive export capabilities. FreeMind has numerous features, especially the ability to unfold and fold branches of deep hierarchical structures, allowing for links between different branches. See http://freemind.sourceforge.net/wiki/index.php/Main_Page
- **Spring map metaphor:** Representation of the questions (as nodes) linked by "springs" whose length adjusts to represent the network of relationships in an optimal manner – effectively in three dimensions. This is done in a java applet developed by Gerald de Jong. Any such spring map is inherently dynamic in its constant search for a better equilibrium. The position of its elements can be adjusted and fixed by the user for greatest clarity.
- **Scatter graph metaphor:** Representation of questions and links using a more common scatter plot technique, whether in PNG, SVG or SWF formats (as described above)

All of these options allow the user to apply them to particular topic searches and to adjust the complexity of the visualization. Various facilities are also enabled to allow the user to colour features of the image.

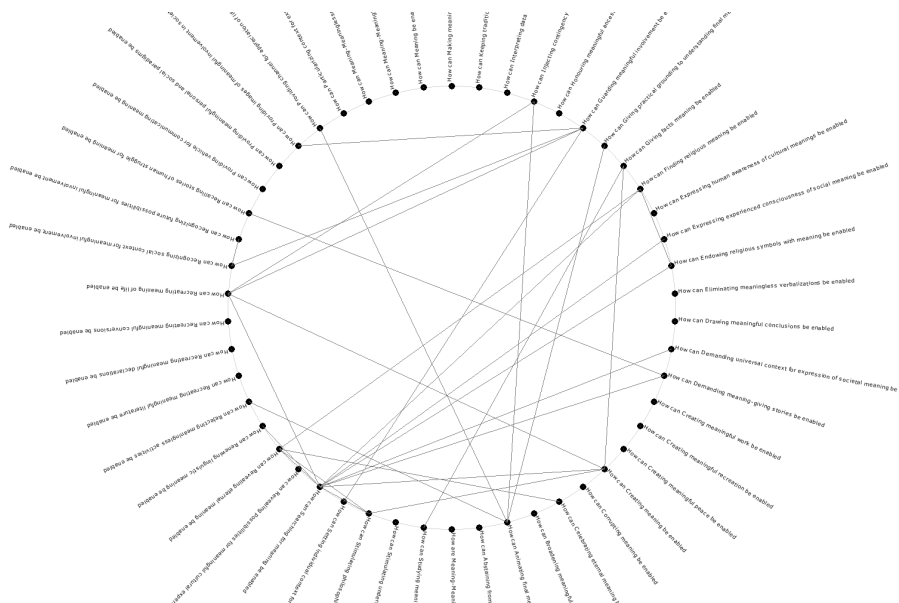
Experiments have also been made with the online use of virtual reality (VRML) displays in three dimensions for these datasets (*Using VRML for an Overview of World Problems*), but these have not yet been enabled for the Questions data. Experiments have been made with the online export of such data into third party packages such as *Decision Explorer* – a proven tool for managing "soft" issues, namely the qualitative information that surrounds complex or uncertain situations. Again this has not yet been enabled for Questions data, for which it could be very appropriate. As suggested above, however, some offline experiments with the proprietary *NetMap* package have been successfully used in a preliminary exploration and visualization of portions of the Questions dataset.

The following 5 visualizations are examples of what can be produced from the “Questions” database located at <http://www.diversitas.org/db/x.php?dbcode=qu>

These samples were made using the advanced search options with the keyword “meaning”, qualified by “how”. This gave a result of 75 entries. All of these visualizations are based on the results of this search. The option “visual” was then selected and the various possibilities explored. Due to the various limits of the different visualization methods, the samples encompass varying numbers of nodes.

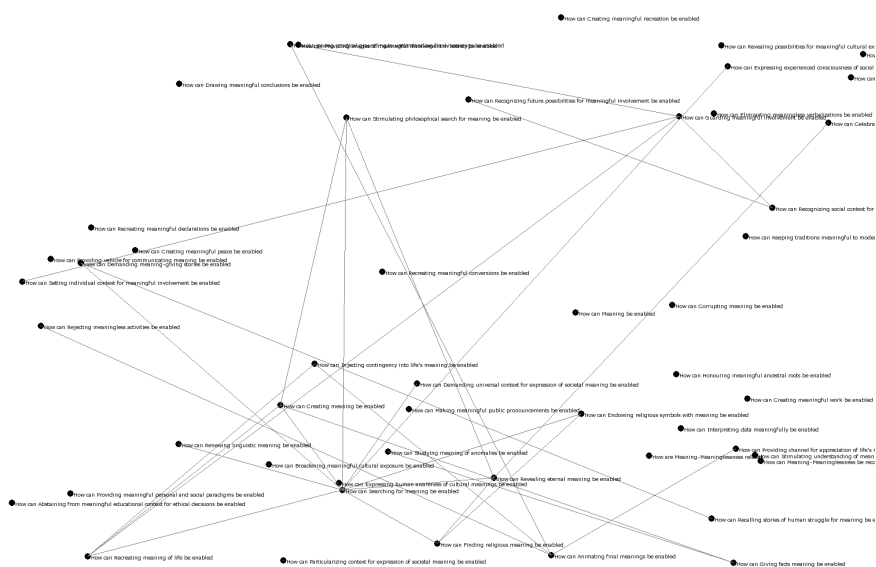
Circular metaphor

PNG (Portable Network Graphics)



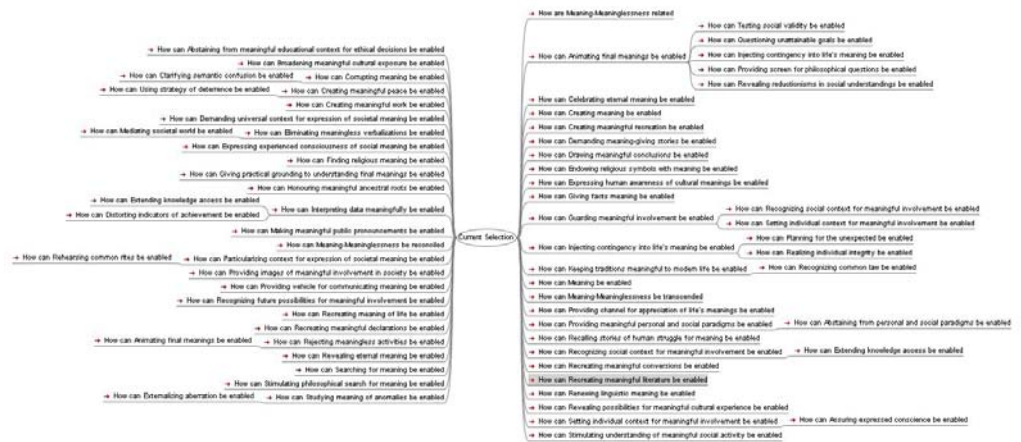
Scatter graph metaphor

PNG (Portable Network Graphics)

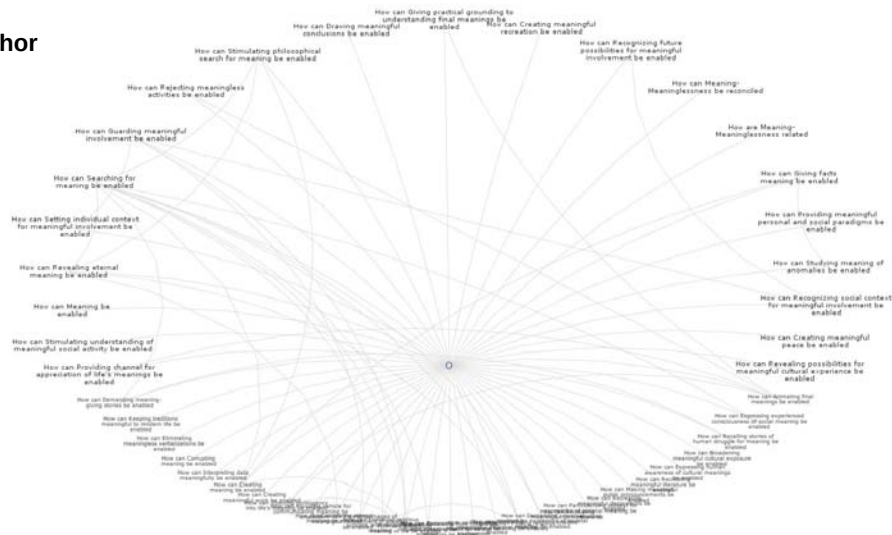


Hierarchical metaphor

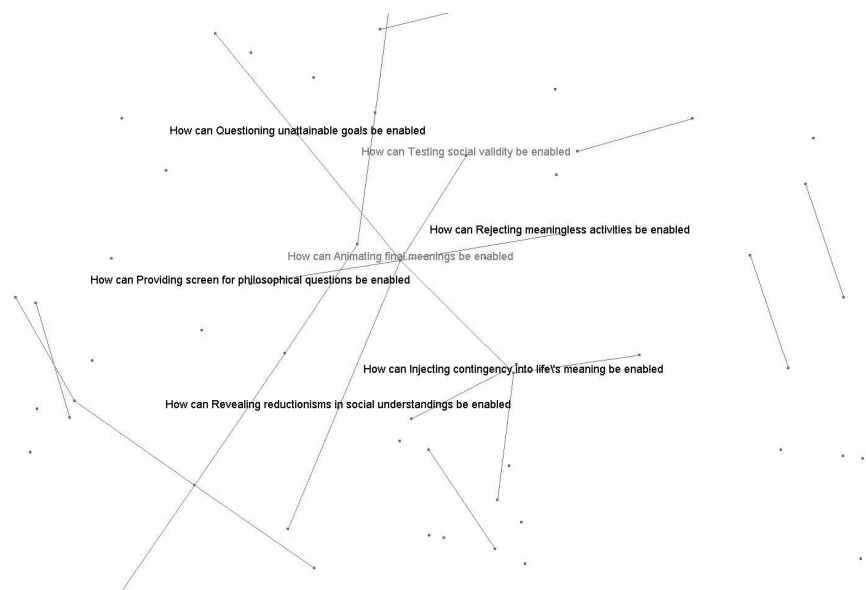
FreeMind



Hierarchical metaphor: Hyperbolic metaphor
Hypergraph



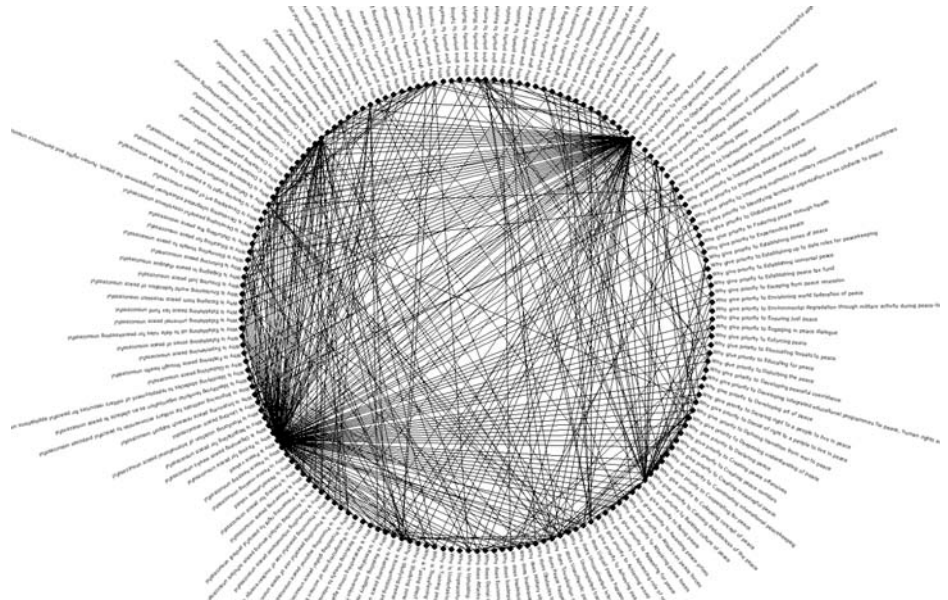
Spring map metaphor



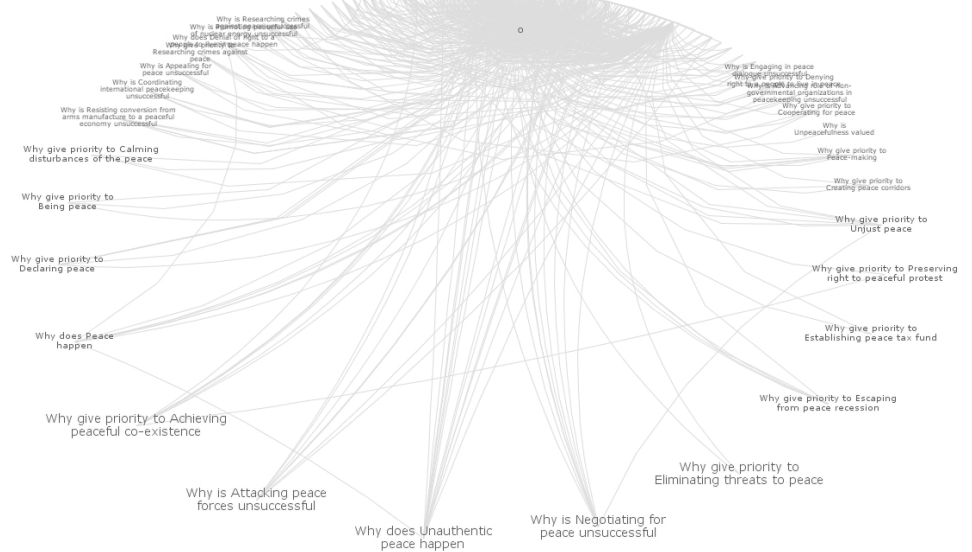
These samples were made using various keywords and qualifiers and visualization methods. The options used are indicated beside each illustration.

[illegible]

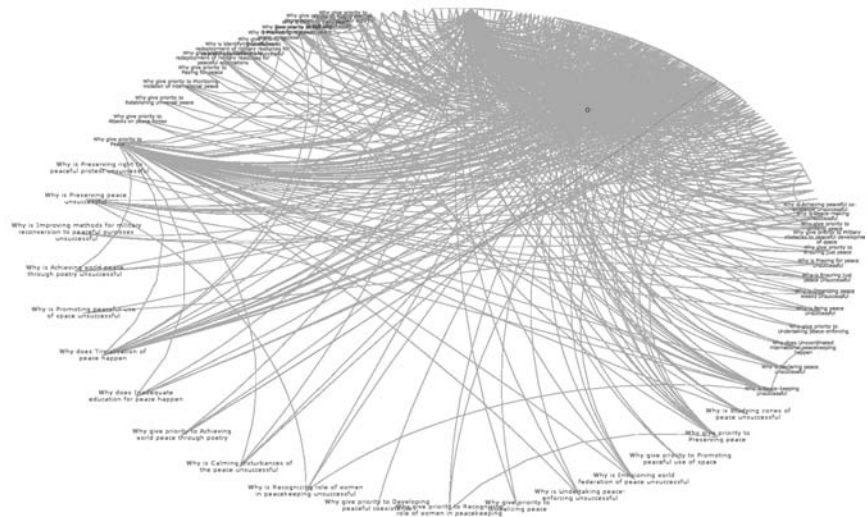
peace / Hypergraph (1)
(174 selected items)



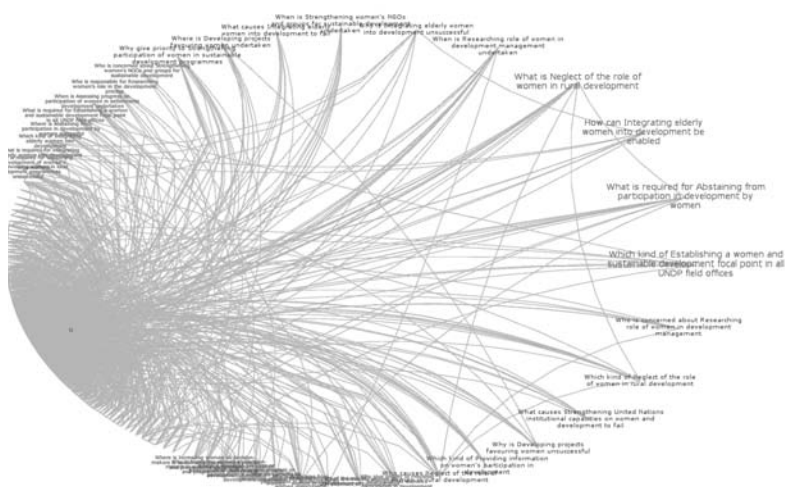
peace / Hypergraph (2)
(174 selected items)



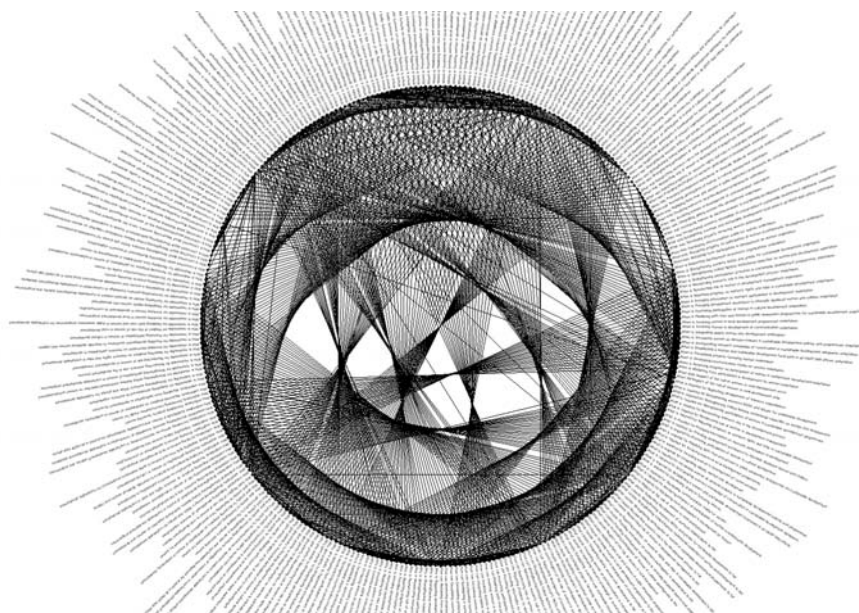
peace / why / PNG
(174 selected items)



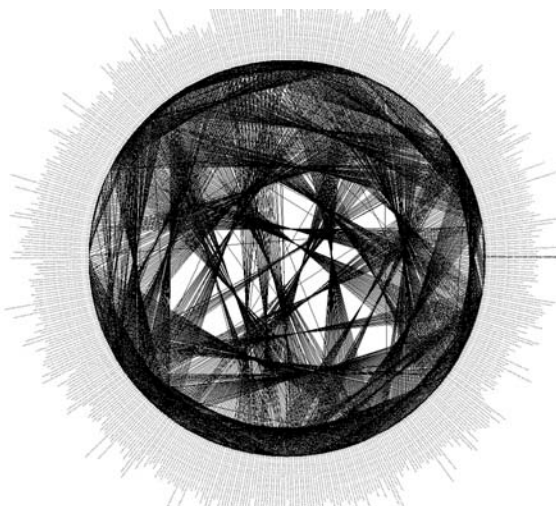
women + development / Hypergraph
(306 selected items)



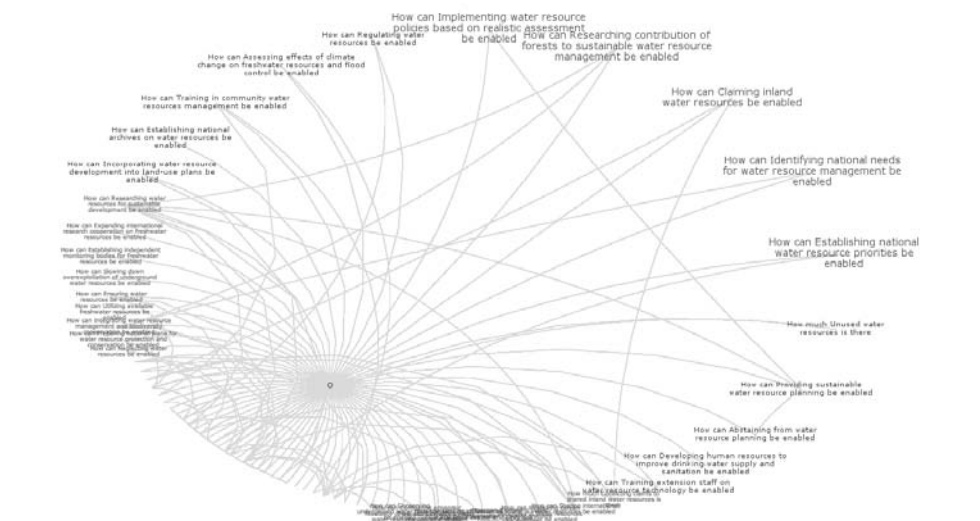
women + development / PNG
(306 selected items)



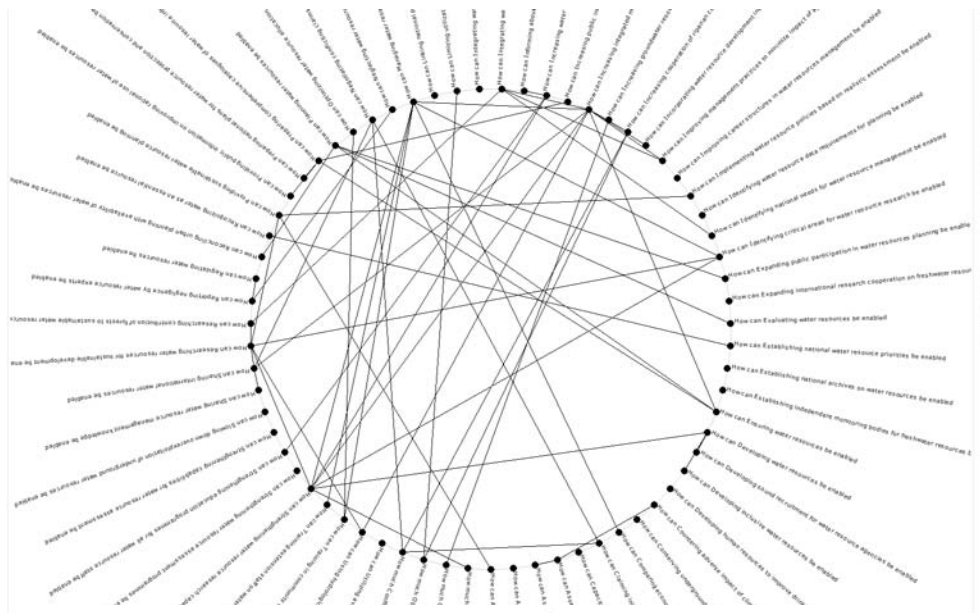
women + discrimination / PNG
(552 selected items)



water resources / how / Hypergraph
(67 select items)



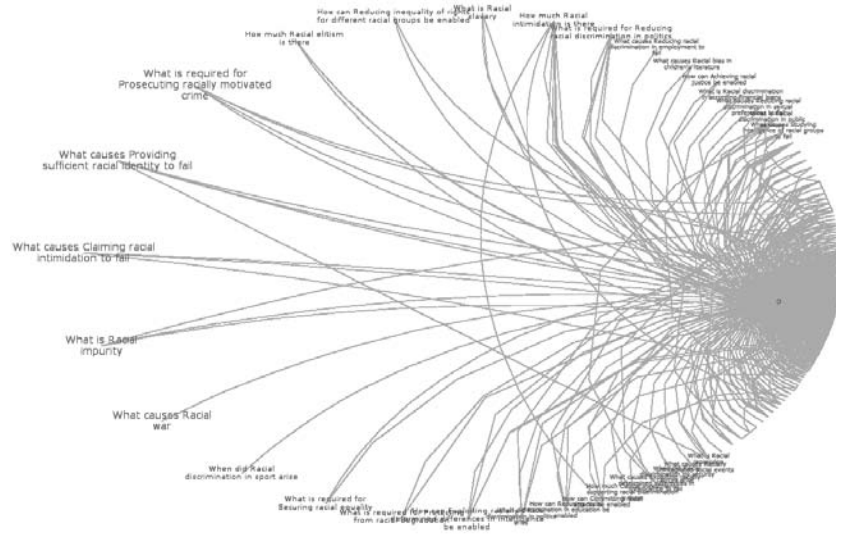
water resources / how / PNG
(67 select items)



imagining / PNG
(803 selected items)



racial / Hypergraph
(795 selected items)



racial / PNG
(795 selected items)

