

# Citizens' Representations of Traffic Accidents According to the Relational Network Technique.

تمثيلات المواطنين لحوادث المرور باستخدام تقنية الشبكة الترابطية

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## Abstract :

*This study aimed to identify the social representations of traffic accidents. The sample consisted of 4 citizens from both rural and urban areas in the state of Skikda. The researchers used semi-structured interviews to collect data on social perceptions. The study employed the descriptive method and revealed the following findings:*

- *No significant difference was found in social perceptions about traffic accidents.*
- *There was no variation in social representations based on gender (male-female).*
- *Likewise, social representations about traffic accidents did not differ based on geographical area (rural-urban).*

**Keywords:** *Social représentation-perception-traffic accidents-network technology- citizens.*

## الملخص :

هدفت هذه الدراسة إلى معرفة طبيعة التمثيلات الاجتماعية حول ظاهرة حوادث المرور لدى المواطنين، وتم إجراء هذه الدراسة على عينة مكونة من (4 مواطنين) بمتوسطين (الريف-الحضر) بولاية سكيكدة. من خلال تطبيق المقابلة الشبه موجهة كأداة لجمع محتوى التمثيلات الاجتماعية معتمدين على تقنية الشبكة الترابطية، وذلك باستخدام المنهج الوصفي، وتوصلت الدراسة إلى النتائج التالية :

- لا تختلف التمثيلات الاجتماعية لضاهرة حوادث المرور لدى المواطنين بختلاف الجنس (ذكر-أنثى).
- لا تختلف التمثيلات الاجتماعية حول ظاهرة حوادث المرور لدى المواطنين بختلاف المنطقة الجغرافية (ريف-حضر).
- الكلمات المفتاحية : التمثيلات الاجتماعية، التمثل، حوادث المرور، تقنية الشبكة الترابطية .

### **1. Introduction**

Traffic accidents are not just a local issue, but a global concern. They have been a problem since the invention of the automobile, but it was not until the second half of the twentieth century that developed countries began using the scientific method to reduce this problem. This led to a decrease in the rate of accidents in those countries, while the situation in developing countries deteriorated as road accidents increased, resulting in material and moral losses. The World Health Organization has attributed much of this deterioration to the level of road safety in developing countries and the lack of allocated resources for scientific research in the field of traffic accidents.

In recent times, traffic accidents have become a prominent issue in Arab societies, particularly in Algerian societies. Algeria ranks third in the Arab world for high numbers and severity of traffic accidents. The number of deaths and serious injuries has become a significant concern, threatening the human element in the social environment. Traffic accidents are frequently discussed, as the number of deaths and injuries is high, and the degrees of injuries vary from minor to severe. Unfortunately, many victims are psychologically traumatized as a result of exposure to traffic accidents. The psychological effects of traffic accidents are often associated with material losses, pain, and physical disabilities, perhaps because they are not immediately observable.

Globally, traffic accidents have become a serious concern due to the resulting human and economic losses. This issue is particularly acute in developing countries, where both the World Health Organization (WHO) and the World Bank confirm that traffic accidents are the second leading cause of death among the population. They are also the third leading cause of death among the world's population between the ages of 30 and 44. Traffic accidents kill more than 1.2 million people every year, with an average of 3,300 deaths every day, leading to 20 million to 50 million people being injured and disabled globally.

Social perceptions are a social construction of ordinary knowledge conditioned by values and beliefs, shared by members of a particular group, and revolving around different subjects (individuals, events, social groups) that lead to the unification of their outlook. (Gustave, 2005)

Please make note of the following text:

Social perceptions play a role in shaping, organizing, and adapting our understanding of reality by reflecting our everyday experiences through information and social communication. Our conducted a study to examine the social representations of traffic accidents among a sample of citizens.

The study employed a web-based approach to address the following questions:

- What are the prevailing social representations of traffic accidents among citizens?
- Do social representations of traffic accidents differ according to gender (male vs. female)?
- Do social representations of traffic accidents vary based on geographical location (rural vs. urban)?
  
- Main hypotheses:
- Social representations of traffic accidents do not differ among citizens.
- Sub-hypotheses:
- Social representations of traffic accidents do not differ based on gender (male vs. female).
- Social representations of traffic accidents do not differ based on geographical area (rural vs. urban) .

## ***2. Define the Terminology of the Study***

### ***2.1 Representations***

Representation is defined in Le Petit Larousse dictionary as follows:

Representation can be the act of enacting or reenacting something, such as a play. It can also refer to a graphic image, or a mental image of a subject. Representations can reflect reality and serve as a tool for categorizing people's behaviours and subjects, playing a mediating role between the ideological and the empirical, and forming knowledge (La Rousse dictionary, 2006, p. 34), especially in establishing governing rule

In the "Petit Larousse" dictionary, representation is defined as follows:

Representation can mean the act of performing or reenacting. It can also refer to the depiction of a play or any other graphic image. Additionally, representation can signify a mental image of a subject. Overall, representations serve as a reflection of reality and are a tool for categorizing people's behaviours and subjects. They play the role of a mediator between the ideological and the

empirical, helping to form knowledge especially by governing rules. (Larousse dictionary in 2 volumes edited by Claude Augé, 2006)

## ***2.2 Definition of Traffic Accidents***

Traffic accidents are incidents that happen on roads when a vehicle collides with another vehicle, humans, animals, structures, or other objects. These accidents result in physical damage, injuries, and fatalities. The term also encompasses "all collisions occurring on roads or roadways open to public traffic, and that may result in one or more victims, either dead or injured, involving at least one vehicle." The history of traffic accidents dates back to 1896, when the world's first traffic accident occurred. A London newspaper at the time declared that such incidents must not be repeated. This event prompted the World Health Organization (WHO) to urge all governments and civil society organizations to work together to prevent further tragedies on the road and address the issue (Al-Mutair, 2006).

## ***3. Central Nucleus Theory***

The central core theory focuses on the emergence, formation, and maintenance of social representations. Social representations are defined as a set of elements organized into a structure to be analysed. To understand how representations work, we need to analyze their content and structure. Content includes information, opinions, beliefs, memories, and images organized into a central system (central core) and a peripheral system (peripheral elements).

The central nucleus of a representation has a dual function in regulating the meaning of the representation and determining the quality of associations with the other elements. It is the most stable element and resistant to variations, serving as the fulcrum of the organization of representations (Abric, 2005). Any change in the representation must affect the central core.

The central elements have an axiomatic status and provide an interpretive and categorizing framework for new information. J. Abric identified two main types of representations: independent representations, where the central core is located in the subject itself, and non-autonomous representations, where the central nucleus is located outside the subject of the representation.

Peripheral elements act as a barrier between the central core and the situations in which social representations are developed and activated. They add flexibility, making representations adaptable to change and modification. The centralization

of representation is influenced by the ideological and historical scope of the group and individuals, as well as by collective memory and the system of norms. The mechanisms of localization and consolidation influence the stability of representations. The positioning mechanism involves organizing knowledge about the subject, while the anchoring mechanism integrates this organization into the life of the individual, forming a frame of reference for shaping behaviours. These daily practices have a significant impact on how individuals interpret and organize reality (Benmellouka , 2015).

#### ***4. Methodological Procedures***

##### ***4.1 Methodology***

The descriptive approach was adopted because it helps to describe the phenomenon by building a representative picture of reality.

##### ***4.2 Methodology***

This study was conducted in the state of Skikda.

##### ***4.3 Temporal Domain***

The study sample was randomly selected from the citizens numbering 4 (2 males and 2 females).

##### ***4.4 Study Techniques***

In our study, we relied on two tools. One of these tools was the directed interview technique, which is used to gather information in a semi-directed manner. This involves obtaining information directly from its sources to understand facts, attitudes, behaviours, beliefs, and opinions related to the research objectives. The purpose is to comprehend the phenomenon being studied in all its dimensions and indicators (Mansour, 2016, p. 215). This technique is commonly used in the study of social perceptions and aims to detect the structure, features, and indicators of polarity, neutrality, and modularity within the semantic field associated with social perceptions.

###### ***4.4.1 Characteristics of Hyperlink Technology***

- 1- The examiner should be able to understand the technique easily and spontaneously.
- 2- The technique should be adaptable to different research objectives.
- 3- The instructions should be easy to understand and applicable to all age groups, beginning from the student age, and for all cultural backgrounds and nationalities.
- 4- The technique should be applicable in all social circumstances and cultural backgrounds.

5- It should be commonly used in diverse research projects, including those involving immigrant researchers.

6- The technique can be used independently or in combination with other techniques, especially in a multi-curricular approach.

**5. Categorised as a Projective Method**

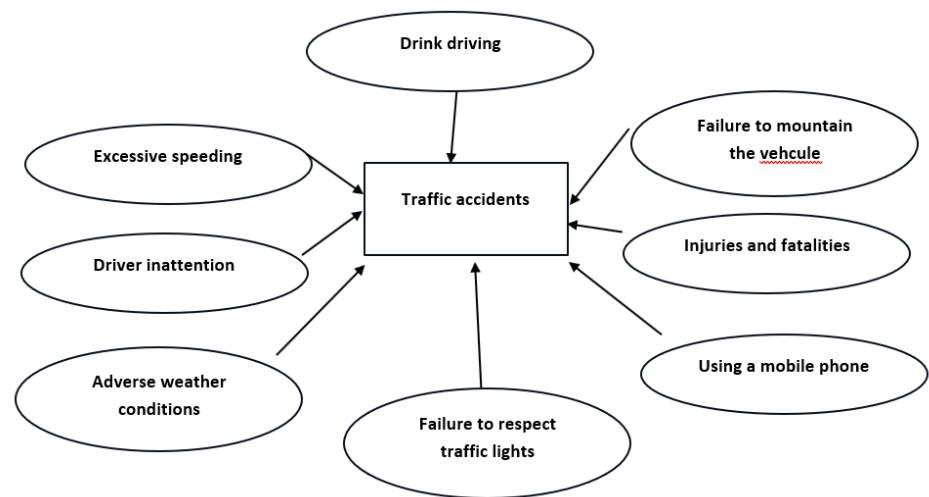
Please memorize the following text:

Applied individually or in small groups (Hosni, 2017, p. 38)

Stages of the implementation of LAN technology through the subject of our study as a field example:

Phase 1: We ask the citizens (the study sample) to quickly and freely write down all the words that come to their minds when they are trying to do so. These are the words that come to our minds quickly and freely when we read all the words in the textbooks related to the subject of our studies - "Traffic accidents". This is done by placing the clusters or sub-clusters within the clusters using the entire space surrounding the words written in the centre of the paper, and each time a word is listed, its number is added according to the order in which it was written in the mind's eye.

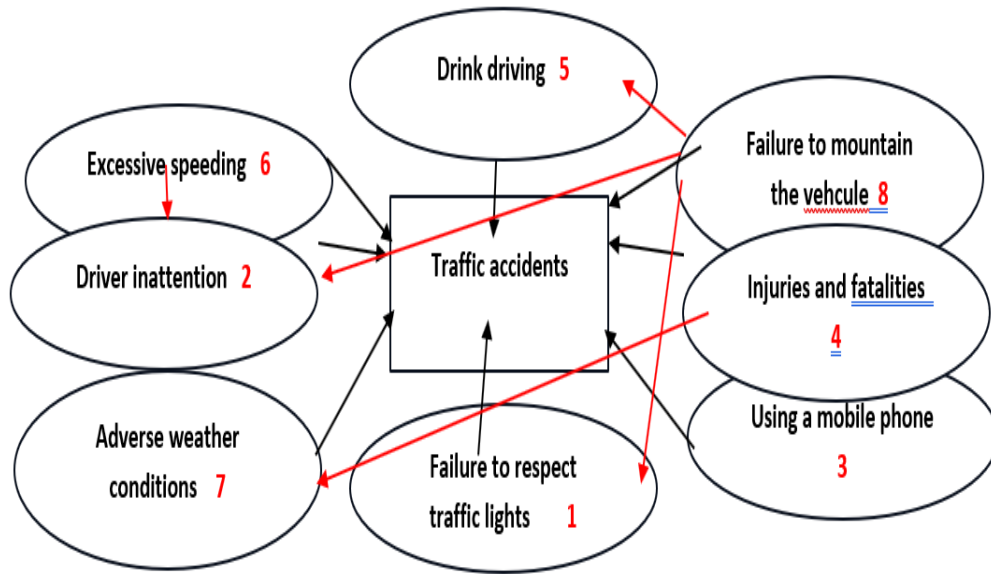
**Fig.2. Represents the First Stage of Building a Network.**



Source: Achievements of the Two Researchers in Light of the Results of the Application of the Network.

2-Phase 2: We ask each citizen to look at the grid that was created in the first phase and make associations between words using arrows if necessary.

**Fig.2. Shows the Eighth Stage of the Connectivity Network.**



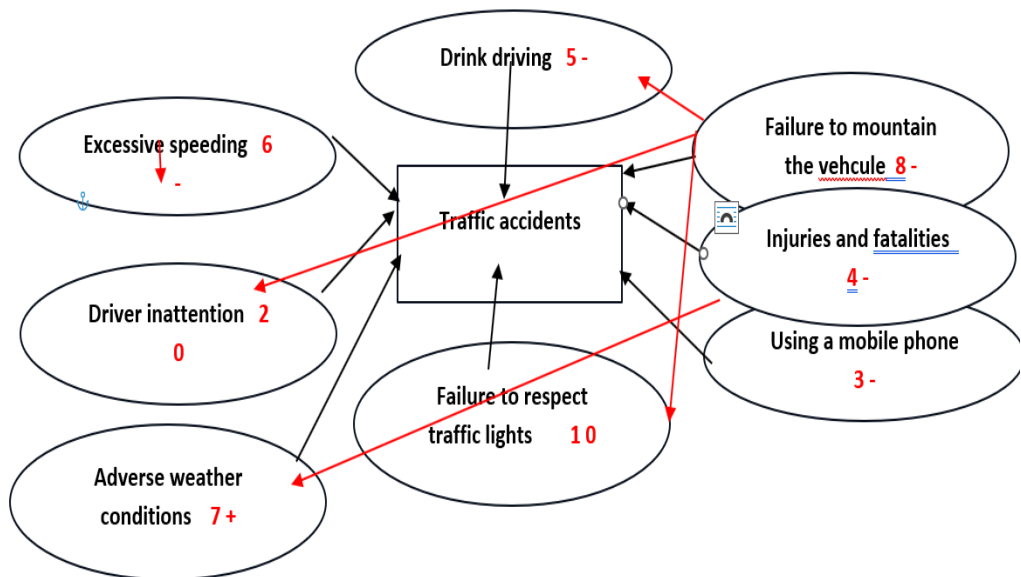
**Source: Achievements of the Two Researchers in Light of the Results of the Application of the Network.**

Stage 3: We ask a citizen to go back to the words he/she has written and give each word a

- (-) If it has a positive connotation
- (-) If it has a negative connotation
- (0) If it has a benign connotation

Depending on the meaning you give to the word in this context.

**Fig.3. Illustration of the Third Phase of the Network.**



**Source: Achievements of the Two Researchers in Light of the Results of the Application of the Network.**

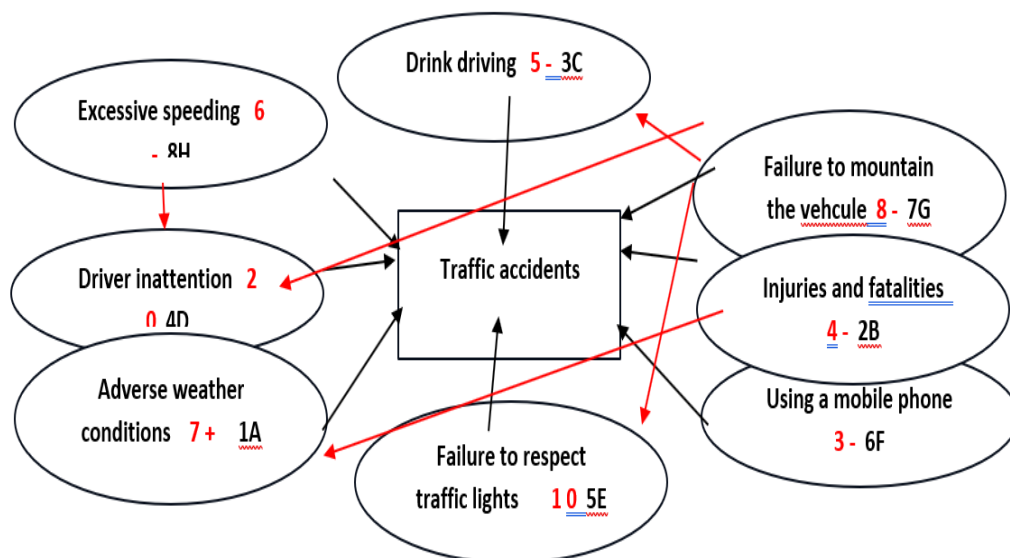
Phase 4: Lastly, we instruct the students to consider the entire network and organize the words based on their importance in a preferential order.

Each word should be assigned a number indicating its priority level. For example, (1) signifies the most important phrase, (2) indicates the second priority, and so on.

To carry out this task, use a lighter fluid and ensure that no word is overlooked.

Note: The first number in a word indicates the number of times it comes to mind initially, the second number indicates its subsequent occurrence, and the colour at the end of the word signifies its level of preference..

**Fig.4. The Fourth Stage of the Connectivity Network**



**Source: Achievements of the Two Researchers in Light of the Results of the Application of the Network.**

**Source: Figure No. 5 - The Fourth Stage of the Linkage Network is Shown in Figure 5 - The fourth Stage of the Linkage Network**

Sure, below is the revised version of the text:

Title: Calculation of Polarity and Neutrality Indices for Estimating Implicit Orientation in Visualization Field

Polarity Index (p):

Citizens are asked to associate each polarity with a way of experiencing the world (positive, negative, or neutral) based on the specific context and subject matter. The Polarity Index (p) is calculated using the following formula:

$$p = (\text{Number of positive words} - \text{Number of negative words}) / \text{Total number of associated words}$$

The resulting value of p ranges from -1 to 1. Interpretation of the p-value:

- If p is between -1 and -5.0, it indicates that most of the words have negative connotations.
- If p is between -4.0 and 4.0, it suggests that the positive and negative words are nearly equal in number.
- If p is between 4.0 and 1, it signifies that most of the words have positive connotations.

# Neutrality Index (N):

The Neutrality Index (N) is calculated as follows:

$$N = (\text{Number of neutral words} - (\text{number of positive words} + \text{number of negative words})) / \text{Total number of associated words}$$

The value of N ranges from -1 to 1. Interpretation of the N-value:

- If N is between -1 and -5.0, it indicates a low presence of neutral words.
- If N is between -4.0 and 4.0, it suggests a moderate neutrality, where the number of neutral words is similar to the combined number of positive and negative words.

# Presentation of Results:

After conducting interviews with the study sample and applying the relational network technique, statistical analysis was performed to determine the social perception of middle school students. The results are presented in the correlation network table..

**Table 1. Methil, "The Social Representation of Traffic Accidents**

| Situation | Total number for words Related | Number of words Positive(+) | Number of words e(-) | Number of neutral words (0) | Polarity Index (p) | Neutrality Index (N) |
|-----------|--------------------------------|-----------------------------|----------------------|-----------------------------|--------------------|----------------------|
| 1         | 08                             | 01                          | 05                   | 02                          | 0,5-               | 0,5-                 |
| 2         | 07                             | 02                          | 03                   | 02                          | 0,1-               | 0,4-                 |
| 3         | 06                             | 01                          | 04                   | 01                          | 0,5-               | 0,6-                 |
| 4         | 07                             | 02                          | 03                   | 02                          | 0,1-               | 0,4-                 |
| Total     | 28                             | 06                          | 15                   | 70                          | 1,2-               | 1,9-                 |

**Source:** By the researchers in light of the results of the correlational network.

In order to calculate the polarity (p) and neutrality (n) indices, we determined the total number of words for each condition, the number of positive words (+), the number of negative words (-), and the number of neutral words (0). This process allowed us to summarize the qualitative data and convert it into quantitative data, which provides a clearer and more accurate understanding of the conceptualization. We identified a total of 28 words for the cases, with the following distribution:

- Total positive words: 06 (42.21%)
- Total negative words: 15 (57.51%)
- Total neutral words: 07 (25%)

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By analyzing the percentages, we observed that the number of negative words exceeds the number of positive words. This indicates that the implications of the citizens regarding traffic accident phenomena are negatively portrayed.

Discussing the results in relation to the hypotheses, the data collected through the network technique revealed various terms. The study illustrated a difference in the perceptions of the study sample citizens, with some words conveying a positive concept and others conveying a negative concept, categorized by gender:

**Table 2. Represents the Final Results of the Polarity and Neutrality Index According to the Gender Variable (Male-Female)**

| Gender |      | Indicator Variable |
|--------|------|--------------------|
| Female | Male |                    |
| 0,1-   | 0,1- | Polarity P         |
| 0,8-   | 0,2- | Neutrality N       |

**Source:** By the researchers in light of the results of the correlational network.

The table shows that the polarity index for both genders ranges between -1 and -5.0. This suggests that most of the words have negative connotations, which can be coded as 1. The neutrality index for males indicates that there are a few neutral words compared to the sum of positive and negative words, suggesting medium neutrality. On the other hand, the neutrality index for females indicates that there are few words with neutral connotations, confirming the presence of weak neutrality. This suggests that the study sample has similar negative representations about traffic accidents. This confirms the validity of the first hypothesis, which states that social representations about the phenomenon of traffic accidents among citizens do not differ according to gender (male-female).

**Table 3. Representing the final results of the polarity and neutrality index according to the geographical area variable (rural-urban) Representing the final results of the polarity and neutrality index according to the geographical area variable (rural-urban)**

| Indicators variable |       | Geographical area |
|---------------------|-------|-------------------|
| urban               | Rural |                   |
| 0,9-                | 0,6-  | Polarity P        |
| 1-                  | 0,6-  | Neutral N         |

**Source:** By the researchers in light of the results of the correlational network

The table shows that both genders have a polarity index ranging from -1 to -5.0, indicating that most of the words have negative connotations. The neutrality index for males suggests that a few neutral words are equal to the sum of positive and negative words, showing medium neutrality. On the other hand, the neutrality index for females indicates that only a few words have neutral connotations, which implies weak neutrality. This suggests that the study sample has similar negative representations about traffic accidents. These findings confirm the validity of the hypothesis that social representations about traffic accidents do not differ according to gender.

**Table 3. Representing the final results of the polarity and neutrality index according to the geographical area variable (rural-urban)**

| Indicators variable |       | Geographical area |
|---------------------|-------|-------------------|
| urban               | Rural |                   |
| 0,9-                | 0,6-  | Polarity P        |
| 1-                  | 0,6-  | Neutral N         |

**Source:** By the researchers in light of the results of the correlational network.

Upon reviewing the data presented in Table 2, it is evident that the polarity index for both rural and urban areas falls within the range of -1 to -5.0. This range can be represented as 1, indicating that the majority of words convey negative connotations. This suggests that citizens hold negative perceptions

regarding traffic accidents, attributed to factors such as mobile phone usage, lack of car maintenance, failure to respect traffic signs, distracted driving, and drunk driving.

Additionally, the neutrality index for both rural and urban samples is low, signifying that a small number of words have neutral connotations. This implies a convergence in the representations of citizens, confirming the second hypothesis that social representations of road traffic incidents do not significantly differ between citizens based on their geographical location.

Furthermore, the correlational network depicted in Table 2 reveals that the polarity index falls within the range of -4.0 to 4.0, which can be translated as 2. This indicates that most positive and negative words are closely aligned. Moreover, the neutrality index can be coded as 1, demonstrating that there are few words with neutral connotations, indicative of weak neutrality.

In accordance with Moscovici's framework for analyzing social representations, the information dimension within the network technology reveals a wealth of data imparted by citizens concerning traffic accidents. The words used in their representations span from the most prominent to the least significant elements, with the majority carrying negative meanings. Despite gender and geographical differences, the way citizens share social representations of traffic accidents remains notably similar. Thus, the general hypothesis that there is no significant difference in social representations of traffic accidents among citizens in the study sample is validated.

#### **4. CONCLUSION**

In our study, we aimed to explore how people perceive traffic accidents, focusing on their views and ideas, whether positive or negative, based on gender and geographical location. We used network technology to gather responses and found that participants generally held negative views about traffic accidents, citing reasons such as bad driving behavior, mobile phone use, lack of law enforcement, and reckless driving. These negative perceptions are consistent with the central core theory, which suggests that social representations consist of both central and peripheral elements. Our results did not show significant differences in social perceptions based on gender or geographical area, indicating that common ideas and beliefs exist among the sample population. This validates our hypothesis.

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#### **7. Appendices**

The relational network for the sample of citizens in the study

**Fig.6. shows the relational network for the first case**