Social Networks Reflections

Reflexiones sobre Redes Sociales

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Abstract

In this article, a formal exposition of concepts associated with social networks is presented, using discrete mathematics theory. Conceptual maps with logical structure are also used to clarify the arguments of some points. This document makes a review of works related with this subject and exposes a reflection on the fragility of the speeches to justify social, economic, political and/or cultural phenomena through evidence that are based on social networks. Being social networks a complex, dynamic and subjective phenomenon, the insertion of formalities in their description, allows expanding the analysis, simulation, forecasting, and control of specific situations that are based on data from portals where are formed, modified and/or interact social networks. Finally, a series of research questions are shown that are extracted from the approaches mentioned throughout the document and that makes it easier to extends the research that allows assertively to respond to the change in social dynamics caused by the use of information technologies and communication.

Social networks, Social research, and Social theory

Resumen

En este artículo, se presenta una exposición formal de los conceptos asociados con las redes sociales, utilizando la teoría de las matemáticas discretas. Los mapas conceptuales con estructura lógica también se utilizan para aclarar los argumentos de algunos puntos. Este documento hace una revisión de trabajos relacionados con este tema y expone una reflexión sobre la fragilidad de los discursos para justificar fenómenos sociales, económicos, políticos y/o culturales a través de evidencias basadas en redes sociales. Siendo las redes sociales un fenómeno complejo, dinámico y subjetivo, la inserción de formalidades en su descripción, permite ampliar el análisis, la simulación, la previsión y el control de situaciones específicas que se basan en datos de portales donde se forman, modifican y/o interactúan redes. Finalmente, se muestran una serie de preguntas de investigación que se extraen de los enfoques mencionados a lo largo del documento y que hacen más sencillo ampliar la investigación que permite responder con firmeza al cambio en la dinámica social provocado por el uso de las tecnologías de la información y la comunicación.

Redes sociales, Investigación social, Teoría social

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Introduction

In everyday expressions of people, it becomes clear that exist a confusion and/or inaccuracies in discourse managing on issues related to *social networks (SN)*, for example when someone talking about dialogue in the **WEB** and/or sites like Facebook and/or Twitter (Tapia Frade, Gómez Nieto, Herranz de la Casa, & Matellanes Lazo, 2010). There is mismanagement on the same *SN* concept that is notorious in the dissemination of news. The error is introduced in numerous formal media with the persistence force of the speeches in communication media (Campos Cortés, 2010).

In many statements that are based on so-called analysis of *SN* activity, it is unclear how the information is extracted and what kind of data treatment was made to obtain the evidence that it present (González de Alba, 2012). There are absurd fundaments when someone uses one or two comments on Twitter or another **WEB** site to say a chronicle of social tendency (Antonakaki, Polakis, Athanasopoulos, Ioannidis, & Fragopoulou, 2016).

This is no clear distinction between a particular opinion and a general tendency (Antón Crespo & Alonso del Barrio, 2015). The critical point is that the misconceptions pervade the community that overlooked their understanding because they are feel supported with sufficient knowledge because they live in the *information and communication technologies (ICT)* world (Flores Vivar, 2009).

In counterpoint, the use of *internet portal for SN (IP4sn)* as Facebook and/or Twitter makes clear the change of paradigms about ways of relating because the physical distances between two or more people to establish a communication have been overcome (Upegui Mejía, 2010). In this sense, it has an increase of exchanged messages that a person can have in series and/or parallel with other people (González Rivera, 2011).

Now is notorious that the written form of communication is superior to others (López Get, 2011). With this, *WEB* portals have a large quantity of data flowing through them and than they are interesting for phenomenon's analysis in educational, political, economic and social issues. The data analysis from the *IP4sn* is important for the decision-making of many organizations and/or persons because the information can display operating strategies, planning and/or negotiation's forms of people, institutions and/or businesses (Criado & Rojas-Martín, 2015).

This paper is organized as follow: In the next section the theoretical framework is presented, followed by the review of *SN*. Then the SN reflections are made and some concepts are also included. Next, the research questions extracted from this exposition are presented. Finally, the conclusions are given.

Background

A concept map is a tool of knowledge representation that resembles a bi-graph where each concept is a node. Arc labels are used to relate concepts. The concept must be connected with arc labels and arc labels must be connected with concepts. The tree of concepts starts and ends with concepts that are organized from up to down. The distribution of the conceptual map follows a logical link. Figure 1 shows that the concept $A*B$ is justified if concepts A, B are given previously and is read into as *if A and B then A*B*. Concepts A, B, and C justify a concept that is explained by two backgrounds, and this is interpreted as *if A and B or C then $(A * B) + T1C$*.

Summarizing, if a concept has two or more input arcs then is interpreted as the concept is grounded with two or more options. If a label arc has two or more input arcs then is interpreted that the previous concepts are necessary to justify the next output concept (González García, 2008).
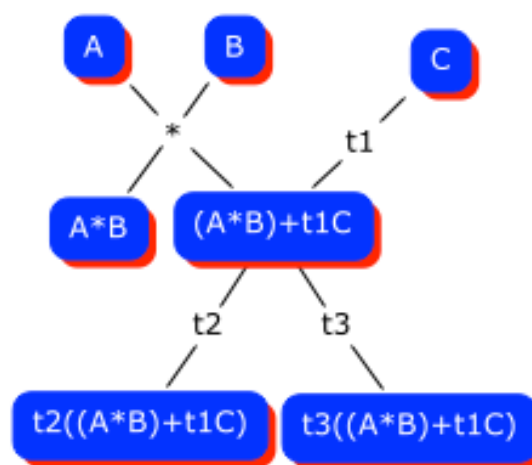

Figure 1 The logic of the conceptual map.
(González-Castolo, Ramos-Cabral, & Hérnandez-Gallardo, 2016)

Review of social networks' Works

It is a fact that the *SN* modifies the behavior of people (Tamayo Pérez, García Mendoza, Quijano León, Corrales Pérez, & Moo Estrella, 2012) (García Ojeda & Fonseca Prieto, 2011). Like the multiplier effect is present here, then the association to make generous or evil acts are enriched.

It is recalled that the concept of multiplier effect is used in economics and it refers that commercial movement is magnified from a purchase-sale (Parkin, 2014). Also, it is known that people attitude affects others and this influence is manifested in three degrees primarily. The last mention means that a subject is influenced with friends, and friends of friends (López Chegne, 2012). It has also been found that a person influences others; fifteen percent of happiness and seven percent of sadness, indicating that happiness is more contagious than sadness (Anaya, 2008).

Studies reveal that the happiest people are those who have more friends and it not crucial that these friends have a superficial relationship (Anaya, 2008). It is known that the maximum number of meaningful relationships that each person can have is one hundred fifty and this amount is known as Dunbar number (Tello & De la Peña, 2013). Further, it turns out that only six levels of connections are necessary to send a message from one person to any in the world (Goth, 2012).

The serious study of *SN* emerged at early of last century (Benton, Pérez-Raya, Fernández-Fernández, & González-Jurado, 2015), with several episodes of absence. The study of *SN* is particularly useful to understand the implications of changes in the political, social, economic and educational life of people. Currently, the *SN* is a concept linked with technology and it is integrated into the contemporary argot although it is fair to point out that it is more proper call as ***Internet Social Networks (iSN)***. Some authors use the concept as *SN* on the *WEB*, *SN* On-Line, virtual *SN*, i-*SN*. The use of digital technology (computers, phones, tablets, etc) is incorporated into the urban lifestyle increasingly (Castells, 2012) (Musiał & Kazienko, 2013)(Castells, 2012).

The smartphone is the leader among the gadgets. Thus, these are positioned as indispensable communication devices and it is true because it is a fact that people access the *iSN*s watching *TV*, eating, driving and taking a bath even. Likewise, the uses of ***IP4sn*** are more common forms of communication between people (Boyd & Ellison, 2007). The arise transformations in the ways of relating to people arouses interest and concern in the scientific community because the rapid technological change has far outstripped the advancement of the political, social, economic and educational, study (Carniero, Toscano, & Díaz, 2009).

Humans cannot ignore the primary heritage of mammals, live in groups. For that, they need the relationships with other persons and these are increased with the *iSN* (Díaz Pérez, 2007). The importance of the *iSN* is because the first time can be seen through a relational representation (charts, lists, etc) that subjects are not alone (Lorenzo-Romero, Gómez-Borja, & Alarcón-del-Amo, 2011). The *iSN* makes noticeable the relationships that in the physical world are not visible. In the *iSN* the subjects can see the friends and also the friends of the friends; then they can know the social opportunities that have remained hidden (Lorenzo-Romero, Gómez-Borja, & Alarcón-del-Amo, 2011).

The *iSN* exhibit part of what already exists in the physical world but not only remains there, also improves the skills abilities to relate. It is established that in the *iSN* there is an opportunity to obtain both good and bad things and with this last point, is pointed out that the use of *iSN* entails associated difficulties, such as cyber bullying (Oliveros, et al., 2012). Some studies in the *iSN* confirm some obscure characteristics of people's behavior, for example, that a high percentage of homicides occur among people who know each other, and more than fifty percent of people exchange sexual content, etc. (Echeburúa & de Corral, 2010).

The *iSN* is changing the lifestyle where the love proof was changed by the personal access code to the *IP4sn* (Boderman, 2017). Currently, most people use *iSN* to express their social discontent, sell things, find partners, gather friends, share experiences, exchange content, search and/or promote jobs (Sánchez Medero, 2012). The *iSN* has become the number one activity on the *WEB* comparable to a twenty-first-century revolution (Musiał & Kazienko, 2013). The phenomenon does not pass imperceptibly for many companies that are looking to capitalize on the *iSN* in their business model.

The logistics infrastructure for a non-local market is basic and much more important than the physical which reveals the need to set up businesses through the internet (Erragcha & Romdhane, 2014). Also, the study of the *iSN* is an area of opportunity for companies and some of them are already relying on the data generated there to obtain the information that helps in the decision-making process, (Icha & Agwu, 2015). It seems certain that companies whose business model may change to the use of technology will survive.

Social networks reflection

The *SN*s are almost as old as the history of life and they are manifested as the *Relationship (R)* that is generated between animate entities that form a *Community (C)*. It should be mentioned that the C refers to live units of one or more species of some organisms, (1) (Rosé, 2011). The R is anti-reflective and symmetrical, (2).

$$C = \{units\}|units \subset some\ species \subset organisms \tag{2}$$

$$R(x,y)|x,y \in C; x \neq y; (x,y) \in R \Longrightarrow (y,x) \in R \tag{3}$$

Human beings are those who on planet earth hold the first place as eminently social units (Braje, 2015). The R is referring to a certain *degree of communication and cooperation (w)* among *individuals (*I*)*. The w strictly represents **magnitudes' average of** I **disposition (**→**)** to do something from (x,y) and (y,x), (3).

$$w = \frac{\overrightarrow{w_1} + \overrightarrow{w_2}}{2} \left| \overrightarrow{w_1} = \left| \overrightarrow{(x,y)} \right| ; \right. \tag{3}$$

$$\overrightarrow{w_2} = \left| \overrightarrow{(y,x)} \right| ; x,y \in I$$

For example, people socialize with other people and also involve pets in the support and social development (dogs, cats, mice, rabbits, etc), (4).

$$SN = f(r,w)|r \in R; w \in (0,1]; \tag{4}$$
$$w \in (0,1]; \forall x,y \in R \Longrightarrow x,y \in I; I \subset units$$

In the **strict scope of people (**I^p**)**, it adds that $\forall x \in I^p$ create **complex social structures** (O) that they are interrelated such as organizations of business, government, educational and/or assistance, (5) (Dillehay, Williams, & Santoro, 2006).

$$O = \{\{I^p\}\}|I^p \subset I \tag{5}$$

At this point, each O can be considered as a *macro unit*. The **SN** *in the context of the* **populations of people** (^pSN) is composed of a set of I^p and/or O called **entities** (E**)** and their R (Sanz Menéndez, 2003), (6).

$$^pSN = f(r,w)|r \in R; r = (x,y); x \neq y; \tag{6}$$
$$x,y \neq \emptyset; x,y \in E;$$
$$E = \{I^p\} \vee \{O\} \vee \{\{I^p\} \wedge \{O\}\}, |E| \geq 2; w \in (0,1]$$

Social networks types

A necessary condition to form a ^pSN is with R between two or more E, then $\#E \geq 2$. It should be added that the study and/or treatment of ^pSN is not done through the study of the parts but rather as a system (Rivoir, 1999). The R can be appreciated as different types, (7).

$$
\begin{aligned}
R^e &: emotional\_relation \\
R^b &: brotherly\_relation \\
R^o &: occupational\_relation \\
R^t &: relative\_relation \\
R^c &: religious\_relation \\
R^h &: fleeting\_relation \\
R^s &: single\_relation \\
R^g &: gobernance\_relation \\
R^d &: educational\_relation
\end{aligned}
\tag{7}
$$

Just to cite an example of each type of R. The **emotional** is between friends and/or enemies; the **brotherly** is present among the fans of a football team; the **occupational** is typical in companies; the **relative** is with respect to parents and children, the **religious** is evident in the churches; the **fleeting** is manifested in the spontaneous, fleeting and impersonal interaction between buyer and dependent in a supermarket because they share an event in the exchange of goods and/or services; the **single** is given between an artist and his audience; the **governance** appears with reciprocity between institutions and citizens; the **educational** that occurs in a bidirectional way between teachers and students, Fig.2. Without loss of generality, the discussion below of the *SN* excludes O, (8). Thus, it is established that ^qSN are people and the relationships between them, (9).

$$^qSN \subset {}^pSN \subset SN \tag{8}$$

$$^qSN = f(r,w)|r \in R; r = (x,y); x \neq y; \tag{9}$$
$$x,y \in E; E = \{I^p\}, \#E \geq 2; w \in (0,1]$$

Relationships between people are an essential ingredient in the normal life development of them self (Martínez-Priego, Anaya-Hamue, & Salgado, 2014). The development of daily life involves, among other things, the economic, social, educational and transcendental aspects (Gómez-Serrudo, 2008). It should be noted that I^p belongs to several ^qSN. The type of ^qSN is associated whit the type of relationship that exist between the members, so we will say that if I^p have a relation of the type R^t then both belong to ^q_tSN that identifies the ^qSN of *relative type*, (10).

$$SN = \left\{ {}_{k}^{q}SN \right\} \big| k \in \{e, b, o, t, c, h, s, g, d\} \qquad (10)$$
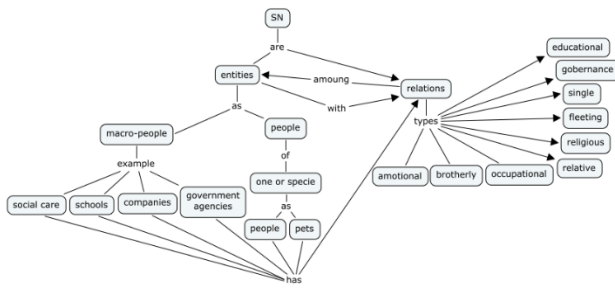

Figure 2 Conceptual diagram of SN
Sourse: Own Elaboration

Role and social position

Within the ${}^{q}SN$ each I^p has a ***social position (SP)*** and plays a social ***role*** (Z). The ***SP is what awaits and/or demands the social environment*** $(\neg)$ that I^p is willing to communicate and/or to make before a fact and whose magnitude is expressed as $\breve{v}$. The magnitude $\breve{v}$ is due to the sum of magnitudes of the relationships involving to $x \in I^p$ in the *SN*, (11).

$$\breve{v} = |SP| = \sum_{1}^{\#\,{}^{q}SN-1} \left| \overleftarrow{(x,y)} \right| \Big| x \in {}^{q}SN; \qquad (11)$$

$$\forall y \in \left\{ {}^{q}SN - x \right\}; \breve{v} \in (0,1]$$

It should be understood the Z, is the willingness of $x \in I^p$ to communicate and/or do something with $y \in I^p$ and therefore its magnitude is expressed by $\overrightarrow{w}$, (12).

$$\overrightarrow{w} = |Z| = \sum_{1}^{\#\,{}^{q}SN-1} \left| \overrightarrow{(x,y)} \right| \Big| x \in {}^{q}SN; \qquad (12)$$

$$\forall y \in \left\{ {}^{q}SN - x \right\}; \overrightarrow{w} \in (0,1]$$

For example, in ${}_{r}^{q}SN$ an I^p can have the ***SP of father*** $\big(SP(father) \big)$ and therefore plays a Z as food provider for his wife and children; this is the ***father role*** $\big(Z(father) \big)$, precisely. The ***social articulation (SA)*** par excellence is given if Z is in correspondence with the ***SP***. The above means that the willingness of $x \in I^p$ to do something is of equal magnitude to the answer demanded by ${}^{q}SN$, (13).

$$\begin{aligned} SA = 100\% &\Rightarrow |\overrightarrow{w} - \breve{v}| = 0 \qquad (13) \\ SA = 0\% &\Rightarrow |\overrightarrow{w} - \breve{v}| = 1 \end{aligned}$$

Social break

The social demand refers to the I^p's response of the social requirements. For example, a teacher has a social requirement to give the example of liking for the study of his students. When there is sufficiency or insufficiency to provide the social demand $(\overrightarrow{w} \gg \breve{v}) \lor (\overrightarrow{w} \ll \breve{v})$, then an ***internal or external social break*** occurs, respectively. The ***social break*** implies an alteration of ${}^{q}SN$ and therefore the ***absences*** and/or ***swaps*** are involved as events. The ***social break*** has associated the creation and/or elimination of social links and/or modification of the magnitudes of existing links.

Consequently, when a ***social break*** occurs, it is readjusted, creating new links and/or modifying the existing ones. For example, ***internals' social break*** occurs if a worker gains an improvement in the industrial process and is promoted. ***Externals' social break*** would occur if this worker does not fulfill the tasks of the company's position and then he is dismissed. Swaps are contained in ***internal*** or ***external social break*** and ***absences*** in ***internal*** **and** ***external social breaks***. A ***massive social break*** is ***external*** and occurs for example in a rebellion towards the rulers.

The ***social break*** of government is not necessarily ***external***. The magnitude of $\overrightarrow{w}$ to obtain an ***internal social break*** is equal to $\breve{v}$, that it is necessary to have an ***external social break***. It turns out that the collective can make a ***social break*** more easily than a single $x \in I^p$.

Social network implications

In general, the Z is dependent on *SP*. In correspondence with the *SP*, $x \in I^p$ tends to fulfill the Z. For example, the *SP*s are the previous set in the games. In this sense, the psychological assistance of some mental problems relies on the change of Z (Labrador, Estupiña, & García Vera, 2010).

The *SP* can be ***implicit*** or ***explicit***. For example, ***implicit SP*** has presented if a ***child*** in a family has a responsibility of being a provider because of the ***father's*** absence, i.e. the role of the family's leader is accentuated in the ***child***, $Z(father(son))$. ***Explicit SP*** is the one given with collective recognition in the ${}^{q}SN$, so the ***father*** who attends the needs of his family has the $Z(father(father))$. A conflict in the *SA* is given when $x \in I^p$ exists in an ***implicit SP*** that should have the corresponding Z. For example, if a ***child*** attends the role of provider in his family that includes his ***father*** who is limited only by his inaction.

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It is stated that in general people are emotional and not rational. This indicates that ^qSN is dynamic and changing.

The Functional and Structural Social Network

From the functional point of view, ^qSN resembles an organism that has an instinct of conservation and that tries to maintain integrity to alterations such as *absences* and/or *swaps* for any *SP*. For example, an *absence* occurs if the person dies and the *swap* becomes evident when a manager is removed.

From the structural point of view, ^qSN resembles a graph with a hyperstructure. The *SP* and Z are nodes that try to have the same spatial location; relationships are weighted to the temporal space links. If *SP* is embedded with the Z then alterations on that node are accentuated. This is notorious when ^qSN is *centralized* and this alteration occurs in the central node. Examples of this are with social, political and/or religious leaders.

When it talks about the position of $x \in I^p$ it has alluded to the ^qSN have a *structure* ($\llcorner$) and that structure can be *centralized* (Fig.3.i), *decentralized* (Fig.3.ii), *distributed* (Fig.3.iii) and/or a *combination* of them (Fig.3.iv) (Soria Murillo, 2004). It is added that $\llcorner$ are usually combined. It should be added that in some texts the structure is called topology. Thus, in the same ^qSN it is possible that a *father* has a centralized position in $\llcorner$ of the direct family and a distributed position when he is linked with indirect relatives likes the cousins.

The Λ reveals the strength and capacities of the ^qSN. It is inferred then that the strength of the people in the ^qSN is also a function of the disposition of the group of people with whom it is interrelated in a specific area. This explains the $\llcorner$ of government and/or business, where ideas about social development order the behavior of people. The feeling of power is based on the group of people who communicate with a concept that identifies it to some magnitude and they are willing to defend and/or promote to some level. For example, an empire has a central figure on which decisions are made, Fig.3.i. A democracy could be considered to have a decentralized $\llcorner$, Fig.3.ii. Finally, a socialist regime would tend to a distributed $\llcorner$, Fig.3.iii. The Fig.3.iv shows a hybrid structure.

Depending on the characteristics of the individuals and the benefits they expect, it will be the type of W that favors their collective and/or individual development.
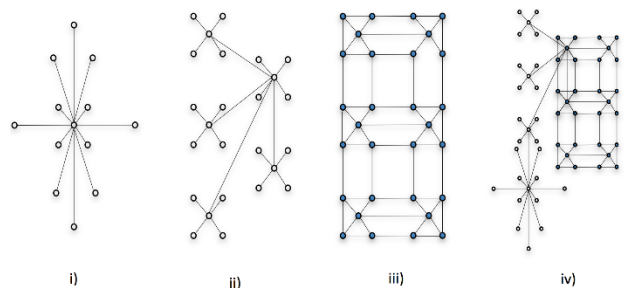

Figure 3 SN's structures
Source: Own Elaboration

Social Networks overlay

The ^qSN is not mutually exclusive even though they have similar characteristics. For example, a $x \in I^p$ can belong to two ^qSN when someone has two jobs and/or two $^qSN, R^t$ if he has children with more than one partner. It may also happen that somebody relates to some other person who also belongs in the same ^qSN. It is also not necessarily that in each ^qSN of the same type, and the person plays the same Z.

If the $x \in I^p$ had the same position within the ^qSN, the behavior in each ^qSN may be different. This discrepancy should be since Z is multifactorial. On the other hand, it may be that people are in the structure of more than one ^qSN and this becomes evident in family businesses. The Fig.4 shows the general cases of participation of the individuals in the ^qSN and where the different variants that can characterize a particular situation are obtained.
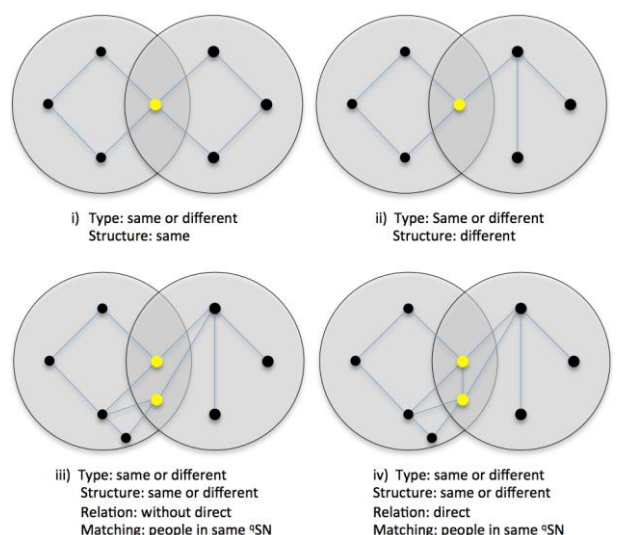

Figure 4 Characteristics of people relations in SN
Source: Own Elaboration

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Characteristics of social networks

The ^qSN is **dynamic** and/or **changing**. The first one is because entities are moved between social positions due to the reinforcement or decrease of links and the second is because these entities can grow or diminish social structures. Fig.5.i illustrates the fact that between three people there exist a friendly relationship and then this is modified because two of them, being friends, become a couple. The link that relates to them has been reinforced. Here we also have the condition on which the links in ^qSN are increased and/or decreased. If ^qSN increases or decreases the links, due to the increase and/or decrease of the members without altering the links between the other members, then it is a change ^qSN, Fig.5.ii. Finally, a combination of the above-described facts is illustrated in Fig.5.iii. Time is the implicit variable that accounts for the transformations.
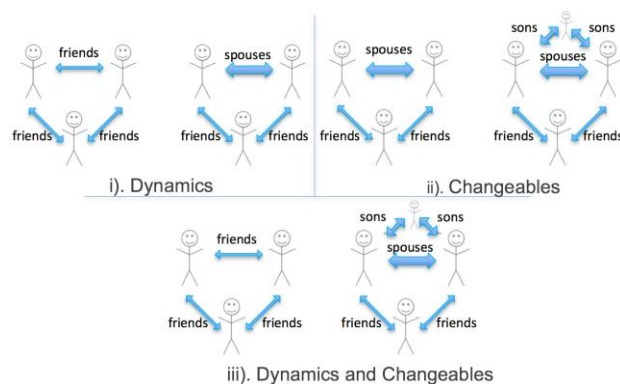

Figure 5 Examples of dynamics and changeable concepts in SN
Sourse: Own Elaboration

Research questions extracted

Some research questions that are generated by this exposition, are shown.

- How is the brain stimulated with the use of online *SN*s platforms?
- What effects are trigged by the use of platforms for *SN*s in people?
- In what proportion occur the internal and/or external social break and what are the triggers?
- What conditions and what characteristics present the cases in which the *SP* follows the Z?
- What is modified of the behavior of $x \in I^p$ to cover the *SP* with a Z?
- What elements make up the agreement between SP and Z?
- What are the rational elements that are integrated into the ^qSN articulation?

- What conditions are necessary for the *SA* to maintain without modification the structure of the ^qSN?
- Which is the best $\llcorner$ of ^qSN?
- The answer to the last question needs to attend first the following two questions.
- What is the historical moment for any best $\llcorner$ of ^qSN?
- What are the cultural characteristics of $x \in I^p$ for the best $\llcorner$ of ^qSN?
- Next questions are,
- How is political power sustained in ^qSN?
- To what extent do people to have a pre-established behavior?
- To what degree do ^qSN overcome someone's absence or how are they restructured?
- What are the structures of the ^qSN canonical**?**

Knowing that an individual plays a role within ^qSN and suddenly he leaves his Z or disappears from W of ^qSN than it has new questions.

- To what degree ^qSN over come someone's absence or have are they restructured?
- How does ^qSN operate with or without some elements in their structure?
- Under what conditions do ^qSN become stronger or weaker?
- How do ^qSN influences the private conditions of their I^p?

Conclusions

In the present work, a formal dissertation was made of the *SN* concept and some associated themes. New concepts exposition is made using formal theory as discrete mathematics and logic conceptual maps. The dynamics and structure of *SN* were exposed and some equations were added for their representation, explanation and/or extension. Many research questions have been proposed with this approach and have been added to expose the horizon of what is to be achieved with *SN*'s research work.

References

Anaya, R. (21 de 12 de 2008). *¿Qué hace feliz a la gente? Más que un deseo: sin la pretensión de formular recetas para lograr la felicidad, científicos sociales han encontrado características comunes de las personas que se sienten felices.* Recuperado el 23 de 06 de 2017, de Informe Académico: http://go.galegroup.com/ps/i.do?p=IFME&sw=w&u=pu&v=2.1&it=r&id=GALE%7CA192257564&sid=summon&asid=6c2ec9276b0eb53bf2c9a7c1089638a7

Antonakaki, D., Polakis, I., Athanasopoulos, E., Ioannidis, S., & Fragopoulou, P. (2016). Exploiting abused trending topics to identify spam campaigns in Twitter. *Social Network Analysis and Mining, 6*(1), 48.

Antón Crespo, M., & Alonso del Barrio, E. (12 de 2015). El 'trending topic' frente a la 'agenda setting'. *Estudios sobre el Mensaje Periodístico. ISSN: 1134-1629, 21*(Especial), 23-34.

Benton, D., Pérez-Raya, F., Fernández-Fernández, M., & González-Jurado, M. (09 de 2015). A systematic review of nurse-related social network analysis studies. *International Nursing Review. ISSN: 1466-7657, 62*(3), 321-339.

Boderman, U. (17 de 04 de 2017). *Compartir el password en pareja, nueva prueba del amor.* Recuperado el 23 de 06 de 2017, de Tendencias MAG: http://www.tendenciasmag.com/compartir-el-password-en-pareja-es-la-nueva-prueba-de-amor/

Boyd, D. M., & Ellison, N. B. (10 de 2007). Social Network Sites: Definition, History, and Scholarship. *Journal fo Computer-Mediated Communication. ISSN: 1083-6101, 13*(1), 210-230.

Braje, T. J. (2015). Earth Systems, Human Agency, and the Anthropocene: Planet Earth in the Human Age. *Journal of Archaeological Research, 23*(4), 369-396.

Campos Cortés, M. A. (Jul de 2010). *Pueden las Redes Sociales Cambiar un País?* Recuperado el 23 de Jun de 2017, de Academic OneFile: http://go.galegroup.com/ps/i.do?p=AONE&u=pu&id=GALE%7CA309791893&v=2.1&it=r&sid=summon&userGroup=pu&authCount=1

Carniero, R., Toscano, J. C., & Díaz, T. (2009). *Los desafios de las TIC para el cambio educativo.* España: OEI - Fundación Santillana.

Castells, M. (Sep de 2012). *El poder en la era de las redes sociales.* Recuperado el 26 de Jun de 2017, de NEXOS: http://www.nexos.com.mx/?p=14970

Criado, J. I., & Rojas-Martín, F. (Jul-Sep de 2015). Estrategias y realidades en la difusión de las redes sociales en las administraciones públicas. Análisis desde una perspectiva institucionalista. *Innovar. ISSN: 0121-5051, 25*(57), 45-62.

Díaz Pérez, M. (Jun de 2007). Redes sociales en Internet: aplicación FOAF (Friend-of-Friend). *ACIMED. ISSN: 1024-9435, 15*(6).

Dillehay, T. D., Williams, V. I., & Santoro, C. M. (Dic de 2006). Áreas periféricas y Nucleares. Contextos de Interacciones Sociales Complejas y Multidireccionales. *Chungara, Revista de Antropología Chilena. ISSN: 0717-7356, 38*(2), 249-256.

Echeburúa, E., & de Corral, P. (2010). Adicción a las nuevas tecnologías y a las redes sociales en jóvenes: un nuevo reto. *Revista Adicciones. ISSN: 0214-4840, 22*(2), 91-95.

Erragcha, N., & Romdhane, R. (Abr de 2014). Social Networks as Marketing Tools. *Journal of Internet Banking and Commerce. ISSN: 1204-5357, 19*(1), 1-12.

Flores Vivar, J. M. (1 de 10 de 2009). Nuevos modelos de comunicación, perfiles y tendencias en las redes sociales. *Revista Científica de Educomunicación. ISSN: 1134-3478, XVII*(33), 73-81.

García Ojeda, M., & Fonseca Prieto, F. (2011). Redes Sociales, Instituciones y Acción Colectiva Frente a Problemas Ambientales. *Revista Lider. ISSN: 0171-0165, 19*(13), 91-117.

González de Alba, L. (Abr de 2012). Fronteras: Las Redes Sociales son Puentes Ideológicos. *Nexos: Sociedad, Ciencia, Literatura, 34*(412), 99+.

González García, F. M. (2008). *El Mapa Conceptual y el Diagrama V. Recursos para la Enseñanza Superior en el Siglo XXI.* Madrid, España: NARCEA, S.A. de Ediciones.

González Rivera, C. D. (2011). Facebook, Twiteer, Youtube y My Space: Autenticación y admisibilidad de la evidencia electrónica obtenida de perfiles de redes sociales, correos electrónicos y "SMS" mensajes de texto, ante un nuevo alcance del descubrimiento de prueba (cambio sustancial en las Nuevas Reglas de Evidencia y Procedimiento Civil). *Revista De Derecho Puertorriqueño, 51*(1), 133-186.

González-Castolo, J. C., Ramos-Cabral, S., & Hérnandez-Gallardo, S. C. (Jul-Dic de 2016). Reflections of relationship in Information and Communication Technology by Small and Medium Enterprises of Pottery Industry in Jalisco, Mexico. *Revista Iberoamericana de Contaduría, Economía y Administración. ISSN 2007-9907, 5*, 1-19.

Goth, G. (Jul de 2012). Degrees of Separation. *Magazine Communications of the ACM, 55*(7), 13-15.

Gómez-Serrudo, N. (Jul-Dic de 2008). La vida cotidiana y el juego en la formación ciudadana de los niños. *Universitas Humanística. ISSN: 0120-4807*(66), 179-198.

Icha, O., & Agwu, E. (03 de 12 de 2015). Effectiveness of Social Media Networks as a Strategic Tool for Organizational Marketing Management. *Journal of Internet Banking and Commerce. ISSN: 1204-5357, 2*(6).

Labrador, F. J., Estupiña, F. J., & García Vera, M. P. (2010). Demanda de atención psicológica en la práctica clínica: tratamientos y resultados. *Psicothema. ISSN: 0214-9915, 22*(4), 619-626.

Lorenzo-Romero, C., Gómez-Borja, M. Á., & Alarcón-del-Amo, M. d. (Jul-Sep de 2011). Redes sociales virtuales, ¿de qué depende su uso en España? *INNOVAR. Revista de Ciencias Administrativas y Sociales. ISSN: 0121-5051, 21*(41), 145-157.

López Chegne, N. (Sep de 2012). Influencia de la escuela en la formacion de los factores psicosociales de la desigualdad y los procesos de transformacion social. *Educación, 21*(41), 7+.

López Get, A. (2011). Individuación y Lenguaje no Verbal en la CMC. *Revista de Ciencias Sociales (Cr). ISSN: 0482-5276, I-II*(131-132), 169-182.

Martínez-Priego, C., Anaya-Hamue, M. E., & Salgado, D. (Sep-Dic de 2014). Desarrollo de la personalidad y virtudes sociales: relaciones en el contexto educativo familiar. *Educ. Educ. ISSN: 0123-1294, 17*(3), 447-467.

Musiał, K., & Kazienko, P. (2013). Social networks on the Internet. *World Wide Web, 16*(1), 31-72.

Oliveros, M., Amemiya, I., Condorimay, Y., Oliveros, R., Barrientos, A., & Rivas, B. E. (2012). Ciberbullying - Nueva tecnologia electrónica al servicio del acoso escolar en alumnos de dos distritos de Lima, Perú. *Anales de la facultad de medicina, 73*(1), 13+.

Parkin, M. (2014). *Economía. 11va edición.* Addison-Wesley.

Rivoir, A. L. (1999). Redes Sociales: Instrumento Metodológico o Categoría Sociológica? *Revista de Ciencias Sociales*(15), 49-58.

Rosé, I. (12 de 2011). Reconstrucción, representación gráfica y análisis de las redes de poder en la alta edad media. Aproximación a las prácticas sociales de la aristocracia a partir del ejemplo de Odón de Cluny († 942). *REDES-Revista hispana para el análisis de redes sociales. ISSN: 1579-0185, 21*(5), 139-272.

Sánchez Medero, G. (22 de 06 de 2012). Ciberespacio y el Crimen Organizado. Los Nuevos Desafíos del Siglo XXI. *Revista Enfoques, X*(16), 71-87.

Sanz Menéndez, L. (Jul de 2003). Análisis de redes sociales: o cómo representar las estructuras sociales subyacentes. *Apuntes de Ciencia y Tecnología*(7), 21-29.

Soria Murillo, V. M. (2004). *Relaciones Humanas.* México DF, México: Grupo Noriega Editores.

Tamayo Pérez, W. A., García Mendoza, F., Quijano León, N. K., Corrales Pérez, A., & Moo Estrella, J. A. (Jul-Dic de 2012). Redes sociales en internet, patrones de sueño y depresión. *Revista Enseñanza e investigación en psicología. ISSN: 0185-1594, 17*(2), 427-436.

Tapia Frade, A., Gómez Nieto, B., Herranz de la Casa, J. M., & Matellanes Lazo, M. (12 de 2010). Los Estudiantes Universitarios ante las Redes Sociales: Cuestiones de Uso y Agrupación en Estructuras Elitistas o Pluralistas. *Revista de Comunicación Vivat Academia. ISSN: 1575-2844*(113), 44-56. Obtenido de http://www.ucm.es/info/vivataca/numeros/n113/DATOSS.htm

Tello, N., & De la Peña, J. A. (Jun de 2013). Modelos matemáticos de la sociedad y aplicaciones. Crecimiento de las redes sociales. *REDES - Revista hispana para el análisis de redes sociales, 24*(1).

Upegui Mejía, J. C. (12 de 2010). Libertad de expresión, redes sociales y derecho penal. Estudio del caso Nicolás Castro. *Revista Derecho del Estado. ISSN: 0122-9893*(25), 159-192.