The Social Representations of the Internet: A Systematic Review of Literature Towards a Groundbreaking Research Agenda

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In this paper, we draw upon the empirical research about the social representations of the Internet in order to propose a theoretically-driven agenda. A systematic review of empirical, peer-reviewed literature was conducted. The *corpus* of analysis consisted of 12 papers which fell into five themes: (i) the Internet and quality of life; (ii) the Internet as a moving representation; (iii) the Internet and ageing; (iv) the Internet and mobile culture; and (v) the Internet and education. The research about the social representations of the Internet is still limited in number, depth and breadth. Notwithstanding, it conveys important insights about the evolving, symbolically-loaded meanings of the Internet as a prosthesis of knowledge and as a means of communication, with consequences for identity and intergroup relations, contributing to expand the theoretical and empirical debates on the field of digital media. The research agenda for studying the Internet from a social representations' perspective includes three major theoretical foci: social cognition; social identity and intergroup relations; and social thinking in times of big data. Social representations can provide the

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field with powerful conceptual tools to learn how people deal with novelty and to navigate through huge quantity of data generated online. In change, digital media can contribute to further social representations theory developments. To learn how communication flows on the Internet and how people make sense of the Internet and Internet-related phenomena (including automatically generated contents, mass and social media accounts) equals to set the clock for the present time schedule.

Keywords: social representations, internet, social cognition, social identity

INTRODUCTION

The appearance of Internet represented a huge turn in the history of mankind. Home of the free for some, a sort of Armageddon for others, the symbolic burden and the influence in everyday life of the Internet are undeniable. The way laypeople deal with and make sense of the Internet, rendering it almost tangible and turning it into something familiar, is thus a fascinating matter of interest for social psychologists and a suitable one for the theory of social representations.

Sarrica (2010) has already observed that information and communications technologies (ICT) are problematic, context-dependent, and relevant, three qualities that may as well apply to the Internet. Consequently, the lenses of social representations might help us to understand how people are making sense of the Internet, which is not without importance when we are now before a new turn towards the Internet of things, which presumably will affect as different fields as marketing (Nguyen & Simkin, 2017) or education (Hwang et al., 2017). Furthermore, the Internet is perceived today as an actual social force that affects the shape and functions of literacies (Leu et al., 2017).

The Internet is undoubtedly a container – a field, if we prefer – of representations, but it is also a symbolic content of social discussion. This two-faced nature only makes the Internet an even more worthy-studying object for social representations scholars. The Internet cannot be reduced to its technological, instrumental face because it needs to be understood and communicated in itself. Contrarily to other technological innovations and systems that remain jargon and confined to

experts, the Internet continuously poses communication challenges. Governments, institutions, companies, families, and individuals need to either seal or justify their investment in goods and facilities to access the Internet. The way we have walked the last 30 years is only understandable if we recognize the entangled nature of the technological, economic and symbolic development of the Internet. People need to understand what the Internet is about, and therefore – in our view – the Internet is simultaneously a container and content.

In this paper, we aim to revise the empirical literature about the social representations of the Internet. To our knowledge no one has yet tried to offer a comprehensive view over the research on this issue. We further want to identify research gaps and opportunities in order to propose a theoretically-driven and socially-relevant agenda. The article is organized in five main sections. We set the context for the current literature review, define the methodology followed, present and discuss the results, and make some final remarks.

SETTING THE CONTEXT

The diffusion of the Internet in the 90's was preceded by the popularization of different information and communication technologies. New devices, such as the personal computer, seemed to come directly from dystopian fiction to challenge common sense. The analysis of how social communication and people struggled to make sense of technological novelty helps to set the context for the analysis of the Internet from a social representations point of view.

In line with the seminal work of Moscovici (1961/1976), Sensales (1994) looked into the way computers and information technology was represented in three general-interest Italian newspapers between 1976 and 1984. Drawing on 2816 articles the analysis depicted the role of mass media in the formation of social representations and the reciprocal communicability between scientific language and common sense (for example, the uses of robot to name an athlete or the word "virus" to name an informatics malfunction). However, until 1984, the newspapers scarcely used the computer in a metaphorical sense indicating that it was still not completely integrated in daily routines neither it was familiar to the readers.

Categorical content analysis revealed that the newspapers used two out of the three communication strategies identified by Moscovici (1961/1976): diffusion, propagation and propaganda. In two of the daily newspapers, it was possible to identify a more or less complex and

coherent system of diffusion. In both cases, the computer was represented from a simplified, technical, and informative viewpoint aimed at turning the device familiar to the reader and to make the reader interested in the device, avoiding to further elaborate on the matter. In the other newspaper, the system underlying the news about the computer was propagation. With a target audience relatively well defined, and financial interests aligned with the information and communication industries, this newspaper fostered positive attitudes towards the well-established features of the device, using now and then negative arguments in order to create an atmosphere of impartiality in the messages conveyed.

Between 1976 and 1984, the analysis of the publications showed an evolution from offering simplified views of the computer to conveying more complex, challenging ones; from a concrete, anthropomorphized image of the computer to a more abstract one.

For Moscovici (1988), "the concept of the computer is shared by our culture and can thus be converted from a specific device to a general model for the brain and nervous system. The computer is referred to as the end product of a sort of biological evolution that began with organic computers and led up to inorganic computers" (p. 222). Through anchoring on previous categories of technological devices like typewriters, once its uniqueness (i.e., programmability) was particularized, the computer became a category on its own right, one where not only computers but, through generalization, other programmable devices, like a washing machine, would fit (Flick, 1995). Ultimately, the metaphorical powers of computers for making sense of reality expanded so much as to apply to mankind itself (Moscovici, 1988).

In order to learn how technological change in everyday life was conceived across different social groups and contexts, Flick (1994) used an innovative technique of inquiry, named episodic interview, to collect participants' narratives about their first encounters with technology (computers, electrical supply, and television). It was possible to organize the recollections of people from different European locations and with different professional careers according to different axes (acting *versus* observing; mastering and failure; family and technology; success *versus* failure; success, activity, failure) (Flick, 1995). Personal biographic narratives do not grant us access to reality itself, but to the way life is experienced, recollected and ascribed meaning. Because it is not always possible to study the anchoring process at the very moment of the formation of the representations, *retrospective anchoring* was added to the theory of social representations.

In 1996, the social representations of the telecommunications were somewhat warmer. The

results of a telephone survey in Italy, using the free association technique, only published 12 years later by Fortunati and Manganelli (2008), give interesting cues about how the telecommunications landscape would look like later on. Noticeably, computer and mobile phone were closely associated. Moreover, the computer was more associated with telecommunication than, for instance, newspapers, television or radio, suggesting that a dichotomy between *reading/listening* and *writing* was central for understanding the bidirectional functionalities expected from telecommunications devices. Fax and telephones were by then familiar devices to the interviewees and provided the categories in which the social representation of the computer and mobile phones could anchor.

Christidou et al. (2004) also conducted a press analysis, in four Greek newspapers and two science magazines, with a particular focus on the usage of active metaphors (*i.e.,* innovative in opposition to conventional and dead metaphors) in dealing with science and technology subject matters. They found that – in sharp contrast with other areas like natural sciences – metaphors used in the articles about engineering and informatics topics were mostly located within a promise-scare axis. Science and technology were represented as a dream, a threat, a battle or through other metaphors with ambivalent uses (e.g., a knife).

The Internet appears within this new and complex ecosystem. It implied the preexistence of computers but it grew greatly with mobile access, namely, via smartphone. This elusive, abstract concept has become more and more present in everyday life. What can we learn from the papers primarily concerned with the social representations of the Internet? And about its relation with devices such as computers and smartphones? How do the papers dialogue among them within the topic and where do they fit in the bigger picture of digital media? In other words, we are interested in resuming the contents, findings and gaps of the investigation as to draw a theoretically-driven chart for the study of the social representations of the Internet.

METHODS

In the first place we describe the search strategies and criteria of inclusion/exclusion that guided the constitution of the corpus of analysis. In the second place, we present a summary overview of the papers and of the connections among them.

Search Strategies and Criteria of Inclusion/Exclusion

In the present study, we originally conducted systematic queries within two major databases – Web of Science (Clarivate Analytics, 2020) and Scopus (Elsevier, 2020) without any restriction on the publication date of the articles. The queries varied according to the database. In Scopus, they were to retrieve papers which included in the title, abstract, or keywords the terms "social representation" or "social representations" within 23 words of either the terms of "Internet", "web" or "www" to narrow the search and increase its relevance. This number was chosen iteratively to retrieve the same number of relevant papers with fewer results than the query without any restrictions. In Web of Science, queries did not include restrictions for the proximity of terms. Details are shown in Table 1.

We retained the papers that addressed the topic of Internet through the lenses of social representations. On the contrary, we excluded all others where Internet was not the focus of the representation (e.g., Internet was the field of data collection), which were the majority, or the ones that only partially looked at the representation of the Internet (e.g., Rasi, 2020). We also searched for relevant articles on a journal exclusively dedicated to the topic of social representations (Papers on Social Representations, 2020) because only since 2016 the journal is indexed in Scopus (SRJ, 2020).

Table 1.
Systematic searches within Web of Science, Scopus, Serviço de Descoberta, and Papers on Social Representations

Source	Query	Last query	Papers retrieved	Papers retained	Cumulative no. of new papers retained
Web of Science	TS=("social representation*" NEAR Internet) OR TS=("social representation*" NEAR web) OR TS=("social representation*" NEAR www) OR AK=("social representation*" AND Internet) OR AK=("social representation*" AND web) OR AK=("social representation*" AND www)	December 10, 2020	28	3	3
Scopus	TITLE-ABS-KEY ("social representation*" AND Internet OR web OR www)	December 10, 2020	117	6	6
	TITLE-ABS-KEY ("social representation*" W/23 Internet OR web OR www)	December 10, 2020	45	6	6
Papers on Social Representations	No search query used. The authors made a comprehensive search within the published papers.	October, 10, 2018	Not applicable	1	6

Serviço de Descoberta	(Any field) "Social representation*" AND Internet	September, 24, 2018	325[*]	6	7
Iterative search process	Not applicable	September, 10, 2020	Not applicable	7	12

*Note. Repeated results marked with an asterisk.*

As one can see on the first three rows of Table 1, the number of papers appropriate for the purposes of the study was not encouraging as only seven papers have been retained, which led us to adopt other two search strategies, in accordance with Webster and Watson (2002). One strategy consisted in conducting new queries in the integrated search service (Serviço de Descoberta) which is supplied by EBSCO. This service was discontinued in October 2018 (Serviço de Descoberta e plataforma AtoZ na U.Porto, 2018). We searched for the phrase ""social representation*" AND Internet" in any field of peer reviewed publications. The other strategy was to list the literature previously known to us on the subject and iteratively search within all the selected papers for relevant literature (empirical papers published in journals or conference proceedings in English, French, Portuguese or Spanish) that might have been cited and for posterior papers that might have cited them in turn according to Google Scholar (2020). We were able to retain seven papers (six new) as indicated on the two last rows of Table 1. It was not possible to include a few studies that were not available in any language familiar to us (e.g., Kipliö cit. in Haikkarainen, 2012). A final note is needed. Although the search was conducted online, the papers did not need to be accessible online according to our criteria. Fortunately, all papers are accessible via the Internet, but sometimes authors were contacted to share their personal copies of the manuscripts.

Corpus of Analysis and Categories

There is a disparity between the number of papers retrieved and the number of papers retained for analysis that would only be possible to reduce at the cost of missing some relevant results. The *corpus* of analysis comprises 12 empirical research papers, published between 2002 and 2020 in different journals (see the entries marked with an asterisk in the reference list). Figure 1 reveals the intertextuality among the papers. It is worth noting that the papers by Salesses (2005a, 2005b), Mamede and Ribeiro (2008), and Karsenti and Kouawo (2015) do not link with any of the other items of the *corpus.*

Figure 1.
Intertextuality in the corpus of analysis (the direction of the connectors indicates the article being cited)
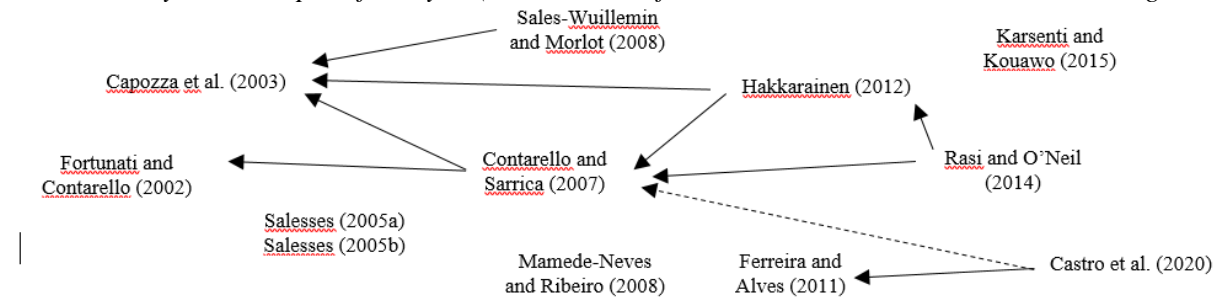
Note. Castro et al. (2020) quote Contarello and Sarrica's work as translated into Portuguese in 2008 (reason why the arrow has a different shape).

In order to accomplish the goals of the present work, we decided to organize the papers according to a set of elements, that range from metadata information (such as year of publication) to theoretical and methodological information (such as conceptual background, research questions, and methodological characteristics). The papers were also categorized according to their content into five thematic categories, as one can see in Table 2. One of the researchers read through the papers and categorized each work and then another author reviewed the arrangement of the information.

Table 2.
Organization of the paper into five categories

Category	Description	Papers included
(i) The Internet and quality of life (two papers)	Focus on the relation between the Internet, beliefs or perceptions about the quality of life or wellbeing	Capozza et al. (2003) Fortunati and Contarello (2002)
(ii) The Internet as a moving representation (three papers)	Focus on the processes of formation and change of the social representation of the Internet	Salesses (2005a) Salesses (2005b) Sales-Wuillemin and Morlot (2008)
(iii) The Internet and aging (four papers)	Focus on elders' representations of the Internet	Ferreira & Alves (2011) Hakkarainen (2012) Rasi and O'Neil (2014) Castro et al. (2020)
(iv) The Internet and mobile culture (one paper)	Focus on the relation between Internet and mobile-phone	Contarello and Sarrica (2007)
(v) The Internet and Education (two papers)	Focus on students' representations of the Internet	Mamede-Neves & Ribeiro (2008) Karsenti & Kouawo (2015)

RESULTS

We start this section with a general view over the characteristics of the papers included in the corpus of analysis and, then, we present the findings and gaps according to each of the four thematic categories.

An Overview of the *Corpus* of Analysis

A small but varied number of papers have been assembled and analyzed. A summary of the main characteristics of the *corpus* of analysis is displayed in Table 3 (papers were assigned a number to make them easier to cite). The complete references are to be found in the reference list marked with an asterisk.

From a conceptual point of view, it is worth observing that the initial tenets of the theory as proposed by Moscovici (1961/1976) – the structural dimensions of the representations (attitude, knowledge and field of representation), processes (anchoring and objectification), and concepts such as the figurative nucleus – are very present and influential. Three papers [3, 4, 12] try to incorporate the central core theory (Abric, 2003a; Moliner & Abric, 2016). As for the range of problems addressed, authors from Italy, Finland, USA, Niger and Brazil are committed with gathering information about the structural issues and contents of the representation [1, 2, 5, 7-9, 10-11] while three authors from France are more focused upon processes of formation and change of the social representation of Internet [3, 4, 6].

From a methodological perspective, investigations adopted non-experimental designs, i.e., designs where independent variables are not manipulated and subjects are not randomly assigned to conditions (Shadish et al., 2002). In five studies [1, 2, 5-7], subjects were college students (*N* ranging between 80 and 973 participants) and in one study subjects were high school students (*N* = 50); in two studies [3, 4], subjects were craftsmen (*N* ranging from 342 to 367); and, finally, in four studies [8-10, 12], subjects were elders (*N* ranging from 40 to 158).

Table 3.
Summary of the papers included in the corpus of analysis order by year of publication

Reference	Framework	Hypothesis/question/objective	Local and year (data collection)	Subjects/ Sources	Data gathering	Data analysis	Results	Gap(s) identified by the authors
[1] Capozza et al. (2003)	Moscovici's three components	To verify the efficacy of the laddering technique to elicit the field of representation, and multiple and stepwise regression to identify the relation between attitude and field of representation	Padova, Italy, 1999	80 college students	Questionnaire: Idiographic matrix; Semantic differential scales	Laddering technique; Multiple and stepwise regression	Internet improves the quality of life enabling: communication; information; knowledge; amusement; self-expression	Explore the belief structure among non-users
[2] Fortunati and Contarello (2002)	Moscovici	To compare the representation of the mobile phone and the Internet	Padova, Italy, 2001	100 college students (Psychology students)	Questionnaire: Free association		Mobile-phone is the driving force of the Internet-mobile convergence. It is associated with familiarity and corporality. Internet is a prosthesis of knowledge. Mobile phone is a prosthesis of body	Not identified
[3] Salesses (2005a)	Moscovici (genetic approach) and Abric (central core theory): Attitude and representation	Before the representation structure becomes stable, attitudes influence the organization of the representational field.	France, n.d.	342 craftsmen (working men)	Questionnaire: Free association Challenging method (*mise en cause*)	Prototypical analysis; Similitude matrix	The social representation of the Internet, at that time, was not structured. A positive attitude plays a structuring role in the process of fabricating a social representation: it accelerates the process.	Not identified
[4] Salesses (2005b)	Moscovici (genetic approach) and Abric (central nucleus): Practique and representation	The knowledge subjects influence, through a progressive and continuous process, in the construction of the representation.	France, n.d.	367 craftsmen (working men)	Questionnaire: Challenging method (*mise en cause*)	Chi Square	The knowledge (considered as continuum of practices) affects the structuring of the representation in a nonlinear way; The figurative nucleus may later become the central nucleus.	Not identified
[5] Contarello and Sarrica (2007)	Moscovici's three components	How is the Internet perceived and constructed by users in relation to different forms and levels of usage and how are representations related to social well-being?	Padova, Italy, 2003	101 college students	Questionnaire: Free association; Semantic differential scales; Social Well-being scale	Correspondence analysis; Aspar procedure; Factor analysis	Internet is a space in which the user acts; the future; fun; information; and work. Improves the perceived well-being, but diminishes trust in people and participants seek their group to support their perceptions	To identify what groups people trust or seek for reassurance, online or offline; Include groups who differ in access, knowledge and use; Monitor use through direct measures.

Table 3.

Summary of the papers included in the corpus of analysis order by year of publication

Reference	Framework	Hypothesis/question/objective	Local and year (data collection)	Subjects/ Sources	Data gathering	Data analysis	Results	Gap(s) identified by the authors
[6] Sales-Wuillemin and Morlot (2008)	Genetic approach (though Moscovici is not referred)	To investigate the change (adaptation) of the representation to include new elements (ADSL, for example)	Bourgogne, France, 2001, 2003, 2005	315 college students (freshmen Psychology students)	Questionnaire: Free association	Content analysis; Prototypical analysis	Internet is a means to communicate through the computer: asynchronous communication opens room to synchronous communication as time passes. The representation is dynamic and adaptable (new developments techniques can affect it)	To shorten the time elapsed between the moments of data gathering.
[7] Mamede-Neves and Ribeiro (2008)	Not identified	To identify the Internet's representation in contrast with the book and television's representation.	Rio de Janeiro, Brazil, 2006	973 college students (freshmen)	Questionnaire	Not identified	The Internet is a mask for one's identity, a fast and infinite medium, with positive connotation but that depends on the use. The book is a symbol of culture and TV of entertainment.	Not identified
[8] Ferreira & Alves (2011)	Moscovici: anchoring and objectifying	To understand the representation of the Internet and how it contributes for the understanding behaviors and feelings	Brasília, Brazil, 2008-2009	100 elderly users	Participant observation Interviews	Content analysis (ALCESTE): Descending hierarchical classification; Factorial analysis	The Internet is represented as a means of social and digital integration, bringing intellectual and social benefits and better life quality, together with feelings of satisfaction, gratitude, joy and empathy	Not identified
[9] Hakkarainen (2012)	Moscovici: anchoring and objectifying	How do respondents represent the computer and the Internet and how do these representations manifest identity and interests, history and culture?	Lapland, North Ostrobothnia, and Kainuu, Finland, 2009	126 elderly non-users	Questionnaire: Open-ended questions	Content analysis (grounded-theory)	Dichotomous thinking: tool-thing; danger; depriver of freedom and marker of differences. Representations are symbolically loaded (anti-computer discourse) Psychological divide between user and non-users: social representations as "self-defensive" standpoint	To study non-users' social representations in other social contexts and with different ages

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Summary of the papers included in the corpus of analysis order by year of publication

Reference	Framework	Hypothesis/question/objective	Local and year (data collection)	Subjects/ Sources	Data gathering	Data analysis	Results	Gap(s) identified by the authors
[10] Rasi and O'Neil (2014)	Moscovici: anchoring and objectifying	To compare the computer- and Internet-related representations of Finnish and American elderly people who deliberately do not use the Internet	Lapland, North Ostrobothnia, and Kainuu, Finland; Upper Peninsula of Michigan, US, 2009, 2011	158 elderly non-users	Questionnaire: Open-ended questions	Content analysis (grounded-theory)	Perceptions of danger and risk to security, simple living and face-to-face interaction; Common metaphors included: infection and disease. Differences for example in the way technology is perceived to affect freedom might depend on pervasive cultural representations	To employ methods to study the construction processes of representations To investigate the causes of variation across groups Analyze the influence of different sources of information (such as mass media).
[11] Karsenti and Kouawo (2015)	Jodelet: content and group	What are the social representations of ICT? Is the content of the representation determined by regular use and training? (In the study, ICT refers to the computer and the Internet)	Niamey, Niger, n.d.	50 high school students from two High Schools	Interview	Content analysis (closed procedure) Chi Square	The Internet is for recreation, communication, and learning. Students are favorable to the integration of ICT in schools, but they do not replace the teacher. No association between training and representations.	Construct and validate a scale
[12] Castro et al. (2020)	Moscovici: anchoring and objectifying	Describe social representation and compare objectification and anchoring of elders with different Internet usage levels	Brazil, n.d.	40 elders (20 with high or medium usage; 20 with low usage)	Indirect observation, associative network, semi-structured interview and questionnaire	Associative network with EVOC2000; Calculation of polarity; Descending Hierarchical Analysis (Iramuteq): Content analysis (Atlas TI); Descriptive statistical analysis (SPSS)	Access mode and perceived usage are central for representing the Internet. Differences between groups: those who do not experience feelings of exclusion and those who use of normality or addiction (loss of time)	Investigate elders representations to promote digital integration workshops

Note. In line with the option for organizing the literature review, papers are listed according to the date of data collection. When papers did not explicitly report the date of data collection, we assumed the date of publication.

In most cases, even if not exclusively, subjects have answered to questionnaires, in the sense that questions were delivered in a written (mediated) form, although in the papers by Hakkarainen [9] and Rasi and O'Neil [10] subjects have been recruited via advertisements in newspapers and free sheets and have been asked to write down their thinking about the issues being investigated. Yet, two papers have drawn exclusively on free association technique [2, 6] and other two on open-ended questions [7, 8]   In one of the studies, Salesses [3] has employed the free association task together with the challenging method or *mise en cause* and in another she has drawn only on the later [4]. Three papers have used more than one technique: idiographic matrix and semantic differential scales [1]; free association, semantic differential scales and a scale on social well-being [5]; indirect observation, associative network, semi-structured interview and questionnaire [9]. In two studies, participants were interviewed [8, 11], although Ferreira and Alves [8] also reported to have conducted participant observation.

Findings and Gaps of the Papers According to Thematic Categories

The papers of the *corpus* of analysis have been organized into five themes, according to Table 2. Themes were not defined a priori but emerged from an iterative reading and discussion of the papers among the authors. The next subsections describe the main findings and research gaps within each category.

The Internet and quality of life

Within this category, we have included two papers. Capozza et al. [1] have used the theory of social representations to explore the beliefs about the Internet among college students. The goal of the authors was explicitly a methodological one: to test the efficacy of methods of elicitation and measurement to apprehend the components of a social representation, and to evaluate the extent to which the field of representation was shared within the elements of the group of respondents.

The laddering technique, originally conceived for assessing schemas, was successfully used to capture the three layers of social representations: information, attitudes, and representational field. Results not only revealed the hierarchical structure of the field of the social representation of the Internet as they also captured two important dimensions of the attitudes anchored in the representation: beliefs and knowledge. Attitudes (to a greater or

smaller extent) were explained by the cognitive elements (goals and linkages between goals). The Internet provided the opportunities to communicate rapidly, get up to date and increase one's knowledge, amusement, social ties, and self-expression. All these goals served a hierarchically superior goal, this is, making life better.

Contarello and Sarrica [5] tried to determine the relationship between the social representations of the Internet and subjective well-being by using a free association task. Based on data collected in 2003, they realized that the field of the social representation of the Internet was ruled by three principles: "inwards versus outwards perspective; space versus time extension; function versus experience" ([5], p. 1029). Such a field revealed a complex experiential tissue underlying practices, attitudes and social well-being. In other words, it was possible to *anchor* practices, attitudes and social well-being in different coordinates of the field of the social representation. As far as well-being is concerned, it seemed that opportunities for greater social participation offered by the Internet were somewhat cooled down by a feeling of looseness and uncertainty.

If trust in other people lessens, and comfort is to be found in one's own group, one question imposes itself: "which groups have this buffering function, if they are online or 'offline' ones and what characteristics they have" ([5], p.1030)?

Another important finding provided by this study, further explored in the category about the Internet and the digital divide, is that "the most powerful metaphors for the device are provided by the participants who declare less familiarity and lower rates of use of this new technology" ([5], p. 1031).

In synthesis, two gaps become evident. It is necessary to (i) better understand which groups seem to help users to resolve the conflicting views generated by the flow of online information and reduce uncertainty. The authors suggest exploring the role of trust – as a psychological mechanism to deal with and reduce situational complexity. It is also necessary (ii) to inquire people belonging to different social groups as the variation in terms of access, knowledge and use seems to affect the formation and structuration of the social representation as we will see in the next section.

The Internet as a moving representation

Salesses [3] looked into the relation between attitudes and social representations. More specifically, she tried to understand the role of attitudes in the genetic process of formation of

a social representation. No matter the level of knowledge about the Internet the participants (342 craftsmen) showed, positive attitudes were positively associated with more structured representations of the Internet. This finding does not mean that knowledge is irrelevant for the process of structuration of the social representations of the Internet. In fact, in the same year, Salesses [4] tried to demonstrate that the level of knowledge about the Internet, which is quite related with the intensity of practice, is associated with the degree of structuration of the social representation. The relation she has found between a knowledge scale with four levels and the structuration of the social representation is not linear, though. Whereas some knowledge about the Internet (level 2) might act as a catalyst of the structuring process of the representation, gaining some practice (level 3) seems to disturb the process. Though the process is not finished at level four, participants with stronger practice seem more capable of telling the essential traces apart from those that, though important, are not essential to the representation in terms of the central core theory.

Through a longitudinal study with three independent groups of users, Sales-Wuillemin and Morlot [6] also investigated the evolution of the social representation of the Internet. In 2001, 2003, and 2005, they presented 105 freshmen Psychology students with a free evocation task (Vergès, 1994) with the stimulus "Internet". The prototypical analysis showed that the words *communication* and *computer* were stably present at the core of the representation in the different stages of the research. However, communication unfolded into two different meanings: synchronous communication and asynchronous communication. While the proportion of concepts linked to the former showed a tendency to increase; those linked to the later on the contrary decreased with time. Furthermore, the social representation changed somehow across time, moving from technical aspects (in 2001), to the presence of ADSL (in 2003) and to search engines and virus (in 2005).

In these studies, social representations have been considered as processes and not merely as products of social thinking. More longitudinal studies with shorter periods of time elapsed between the moments of data gathering would help to better understand the relation between macro-societal phenomena and psychosocial meaning-making. In the next section, we will offer a glimpse on how societal values might help us to understand difference between two identical social groups of elderly non-users in different cultures.

The Internet and aging

The hypothesis that metaphors about the Internet are richer among less digital-skilled people has gained more empirical support at least in one of the studies that investigated the social representations of the Internet and the computer among elderly non-users [9].

Hakkaranein [9] advertised in newspapers for written statements about questions related with the non-use of computers. Based on 126 written accounts sent by elderly Finish non-users, which were analyzed according to the grounded-theory approach (e.g., Corbin & Strauss, 2015), she found evidence of the use of dichotomous thinking by the respondents for making sense of computer and Internet. The verbal expressions collected from the respondents were organized according to four categories and pairs of antonyms: *tool and thing* (useful-useless); *danger* (risky-non-risky); *depriver of freedom* (free-dependent); *marker of differences* (similar-different). The computer and the Internet are represented as useful tools to others but not useful to the participants themselves; as threats to very different things like simple way of living, traditional skills, health, security and personal contact; as addictive, enslaver devices, that deprive oneself of freedom; and as symbols of a gap between users and non-users.

Imagery is provided by familiar social areas to the respondents, anchored to well-known realities and objectified in meaningful metaphors. Indeed, powerful metaphors, as predicted [5] that were to be found among non-users, of which "overgrown pathways between neighbors" ([9], p. 1221) is an example, were very present in the respondents' accounts. In a nutshell, social representations were symbolically loaded and essentially conveyed a negative discourse about computers and the Internet.

Later on, the elderly Finnish accounts were compared with those of American elderly non-users [10]. In spite of its limitations, namely, the reduced number of American respondents, the study suggested that there were similitudes and differences between groups. Similar representations of computer and the Internet were found within the categories *tool and thing* (useful-useless); *danger* (risky-non-risky) while differences were found within the categories *depriver of freedom* (free-dependent) *marker of differences* (similar-different). Contrarily to Finnish respondents [9], Americans do not feel that computers and the Internet have threatened their freedom. According to the authors this fact has two alternative or, perhaps, complementary explanations: (i) American's hegemonic representation of freedom makes them less sensitive to social constraints and/or (ii) social pressure towards the use of a computer and the Internet is greater (or perceived as greater) by Finnish than by American elderly respondents. In spite of the accounts on the *marker of differences* suggested that a non-user identity was shared by

American and Finnish elderlies, Americans' refusal to use computers and the Internet was not related with the desire of having a simple living.

More recently, in Brazil, Castro et al. [12] studied the social representations of the Internet among 40 elders (with low and medium or high levels of usage). Access mode and perceived usage showed to be central for representing the Internet. More important, those who do not use the Internet experienced feelings of exclusion and those who use reported feelings of normality or addiction (loss of time). The results of the study by Ferreira & Alves [8] seem to support that the representation and feelings of the Internet among elderly people are associated with the use. The authors interviewed 100 elderly users and reported that the Internet was a means of social and digital integration, improving life quality, and associated with positive feelings.

Hakkaranein [9] and Rasi and O'Neil [10] propose – in line with the conclusions of the studies of the previous categories - diversifying the contexts and characteristics of the participants, studying the processes of construction of the representation and investigating the causes of variations of the social representations across groups. Castro et al. [12], in spite of the small, non-representative sample, showed how generative the comparison of difference groups is. The authors not only stress that other variables, such as health status and dependence level, might be related to the representations but also argue for studies in "context of social practice" ([12], p. 234).

Furthermore, as it seems likely that mass media – and other sources of information - influence the content of the social representations, it is of particular relevance to explore how is the Internet being addressed in newspapers, television, social networks and so on, not to say in official policy documents. As we will see in the next category, this assumes greater importance in a mobile culture of facilitated access to a constant flow of messages.

The Internet and mobile culture

In the beginning of 2000, one may say that the Internet and the mobile phone were at their early stages of social penetration and, in turn, representations at their early stages of formation. In 2001, Fortunati and Contarello [2] asked 100 Psychology students to associate words to the Internet and mobile phone. They observe that many answers were of a tautological kind, especially in the case of the Internet (*i.e.,* web for Internet). More abstract in its nature, the social representation of Internet was less sophisticated than that of the mobile phone. On the

contrary, in spite of being a more recent technology, mobile phone was associated with more words, suggesting that the route for the formation of its social representation was somewhat simpler, anchored as it was in the telephone. Mobile phone was perceived as a communication prosthesis of the human body (see also Contarello et al., 2003; Contarello et al., 2016) while the Internet was a prosthesis of knowledge. This representation is in line with digital culture ideas on collective intelligence (Jenkins et al., 2009). Still, it also helps us to understand why the integration of the Internet did not bring significant changes to the representation of public libraries (Sequeiros, 2014).

The Internet, although accepted as a communication technology, as it was also the case of the computer (Fortunati & Manganelli, 2008), was represented as a place to gain knowledge, though complicated and even dangerous (see also [5, 7]). Interestingly enough, respondents expressed their concerns with the costs of mobile phone access (and not with those of the Internet). Retrospectively, it is possible to see in this concern an indication of the faster penetration of the mobile phone. The authors stress that mobile phone would most likely be the drive for convergence, the effects of which would be felt more quickly and extensively. Indeed, the increasing penetration of communication devices can affect the very own way we represent communication itself (for a theoretical discussion of the body-to-body prototype in communication, see Fortunati, 2005).

The Internet and education

Two studies focused on the social representations of the Internet in educational settings, namely high school [11] and college [7] in non-European contexts. Karsenti and Kouawo [11] interviewed 50 students of two High Schools in Niger (Africa). They showed that students represented the Internet as a means to communicate, especially with people abroad, to connect with the world (and the European culture) and to amuse themselves. Students favor the integration of the Internet into schools, considering that the Internet might support learning. Students claimed that they were less ashamed to ask questions on the Internet than in classroom, but in their view the Internet does not replace the role of teachers. Previous training on information and communication technologies was not associated with students' representations.

In Brazil, Mamede-Neves and Ribeiro [7] surveyed almost 1000 freshmen college students. The participants claimed that the Internet masked their identity and offered fast and limitless search and communication possibilities. Although positively connoted, the Internet's

benefits depended on the use. Interestingly, the authors also surveyed participants about their representations on the book and television. Whereas the former is connected to culture, knowledge, and reliability, the latter is connected to entertainment and news broadcasting.

DISCUSSION

Firstly, we will discuss the conceptual and methodological contributions and gaps of the papers revised above and then we will propose a theoretically-driven research agenda for the study of the social representations of the Internet.

Conceptual and Methodological Contributions

New technologies usually generate feelings and attitudes that range from enthusiasm to fear not only among laypeople (Contarello & Fortunati, 2006) or in the press (Christidou, et al., 2004; Ricci, 2010), but also among scholars and practitioners themselves (Livingstone, 2010; Livingston & Sefton-Green, 2016), this often leading to various forms of moral panic (e.g., Bennett, Maton, & Kervin, 2008) nested in oversimplified views of intergenerational changes (Livingstone & Sefton-Green, 2016).

To the best of our knowledge, not until the early 2000 have the scholars approached the theme from a social representations point of view. The Internet – in this light – appears as a means to communicate, gain knowledge, have fun and express oneself (e.g., [1]); on the other side, it is also represented as a dangerous and scary environment that threatens liberty or simple living [9, 10] and increases the need to rely on one's group to resolve the uncertainty generated by the flow of information [5]. The resulting picture is not black and white because the way the elements are combined and their relative weight in the representations varies across groups [1, 12], time [6], and contexts [10]. As a side note, we also observed that papers are geographically dispersed. We know that the theory of social representations seems to flourish in South America whereas in Europe it seems to be losing its attractiveness (Valentim, 2013). Regrettably, it is outside the scope of the paper a detailed analysis of this situation, but the purpose of charting the geography of social representations theory is, in our view, a worthy-studying avenue. Such an approach would not only allow us to test the hypothesis of different research traditions but also to adjust our perspective on what we know about different contexts concerning the Internet.

The structure of the representation evolved as time passed and new technological affordances entered the scene, as it was the case of ADSL [6]. Furthermore, the representation seems to be genetically interrelated with the knowledge, practices and attitudes of people, even if correlations are not linear [3, 4]. The formation, maintenance or change of the social representation of the Internet cannot be understood as a top-down, technologically-driven process. The use of metaphors by different groups clearly shows that a creative struggle to make sense of the Internet takes place. Metaphors depict not only the Internet but also its users (Rasi, 2020). As the many studies of social representations about very different subjects have shown, people in their endeavor to make sense of novelty create, rearrange and modify images and relations in a way that is far from passive acceptance. In fact, it is not a mere matter of acceptance as thought by the models of technology acceptance (Davis, 1985) and subsequent models, such as the unified theory of acceptance and use of technology (Venkatesh & Zhang, 2014), but rather of domestication, as "a way of thinking about the incorporation of technology into everyday life" (Silverstone, 2005, p. 229), as well as of premediation and remediation, since past and future are being mediated (Grusin, 2010). In other words, we are before a complex and culturally embedded psychosocial process of turning familiar what is unknown and of rearranging the media ecology. As social groups ascribe meaning to and engage with the Internet, they also – even if in a limited way – shape it. The social representations as action (Wagner, 2016) entail, thus, a debate with the digital culture, online participation and exclusion (Jenkins, 2006; Jenkins et al., 2009). For example, children's uncertainty about who is listening to them online (Livingstone, 2010) echoes the feeling of looseness and uncertainty reported by Contarello and Sarrica [5]. Thus, social representations of the Internet might very well be preventing people to fully take up opportunities for greater participation.

Moreover, as we gain some evidence that online and offline activities are being psychologically bridged (Livingstone, 2010), the more it seems that the social representations of the Internet are likely to rely on and combine a range of opposite categories: virtual vs. real, artificial vs. natural, human vs. machine. The mobile phone, for example, was rapidly represented as a prosthesis of the human body and foreseen as the device that would popularize the Internet [5], as it is actually happening nowadays. At what costs, we might ask? For example, if the Internet is still represented in terms of access to knowledge, we might also ask the meaning of knowledge and for whom is it targeted.

In fact, there is a debate going on among scholars between the mobilization theory (according to which digital tools increase cultural participation) and the normalization theory

(according to which digital tools crystallize old practices) (Chen, 2015). Sarrica et al. (2010), investigated the relationship between social media usage and citizenship representations, via free association, among secondary education students. The results indicated that those who relied on Internet, friends and colleagues to get and share news "seem to share a conservative representation of citizenship" (Sarrica et al. 2010, p.55). Moreover, whereas most respondents relied daily on the television to be up to date, one third of them did not use the Internet to get information. Whether these results provide empirical support to the *normalization hypothesis* or "that media is secondary to other forms of knowledge sharing" (Sarrica et al. 2010, p. 55) is impossible to say, but at least one should be more prudent about advocating the intrinsic transformative features of the Internet.

Turning briefly to the methodological and conceptual discussion, it seems evident that free association tasks, semantic differentiator scales and questionnaires are the most used techniques/instruments of inquiry. Notwithstanding, a great avenue can be found in the paper by Capozza et al. [1] not only about methods but also about theory in that the authors bridge social representations and cognitive schemas, without neglecting what makes the concepts different. If in both concepts one can find an underlying hierarchy of ends to accomplish, schemas are the product of individual reasoning while social representations are the product of iterative communication exchanges. Coherent with this idea, the field of the social representation of the Internet was homogeneous within the boundaries of the group of respondents of the study.

Experimental or quasi-experimental designs, where independent variables are manipulated (Shadish et al., 2002) could be introduced within this line of studies following central core approach (Abric, 2003a) or matrix nucleus theory (Moliner, 2016) and theoretically-driven hypotheses could be formulated and tested.

As Abric (2003b) or Flick, Foster and Caillaud (2016) highlight, there is not a methodological paradigm in the studies within the theory of social representations. On the contrary, one can say that heterodoxy is the rule rather than the exception. Notwithstanding, all the articles reported the use of questionnaires and, for example, Flick's (1994) methodological contributions do not seem to have had an enthusiastic reception among digital media scholars. Indeed, the episodic interview might be a very useful way to articulate personal narratives and social anchoring within actual social representations.

Also studies among non-users should be extended to excluded populations wherever one can observe the effects of the digital divide that are not only felt by elderlies or in less

developed societies (Watkins, 2012; Chen, 2015). Moreover, among young generations, digital practices do not seem to be the same at school and at home which has led Levin and Arafeh (2002) to talk about a digital disconnection (see also Greenhow et al., 2009). Despite of the fact that discourses about the transformative effects of Internet penetration are widely available and salient, empirical support for them is still scarce or far from conclusive (Chen, 2015; Sarrica et al., 2010). Moreover, expectations on the role of digital media in school seem to vary greatly among students (e.g, Kolikant, 2012, [11]).

Taking into account what we have discussed so far and what has been left out by the scholars of social representations, it is now time to propose a theoretically-driven agenda for the study of the social representations of the Internet. As Webster and Watson (2002) wrote "writing a review not only requires an examination of past research but means making a chart for future research" (p. xix).

Towards a Theoretically-Driven Research Agenda

The theoretically-driven agenda for the study of the Internet from a social representations perspective agenda can be divided into three main areas: (i) social cognition; (ii) social identity and intergroup relations; (iii) and social thinking in times of big data. This agenda should explore not only intra but also inter-representational relations.

Social cognition

Doise (2003) had already foreseen the affinity between social representations and social cognition. Indeed, he argued for a dialogue to be intertwined: "research on social representations (…) show thus a way to integrate within the studies about individual systems of attitudes those about social relations" (p. 243, our own translation from the French original). As for the social representations of the Internet, this dialogue can occur in relation not only to the field of the domestication of new technologies (*e.g.,* Fortunati, 2005; Fortunati & Manganelli, 2008; Silverstone, 2005), but also to technology acceptance models and subsequent expanded models (e.g., Davis, 1985; Venkatesh & Zhang, 2014). Drawing on our own research,

it seems, for example, that normative beliefs play an important role in the adoption of technologies in the educational setting (Paiva et al., 2016).

Social identity and intergroup relations

Studies can evolve to address social identity and intergroup relations more effectively. Exploratory studies have revealed that digital media tools can mark the difference between social groups [9]. Deschamps and Doise (1978) have long ago emphasized the need to bridge social representation and crossed category identities (for a discussion, see Breakwell, 1993). In fact, the need to combine identity and social representations has been advocated by both supporters of identity process theory (Breakwell, 2016a, 2016b) and social identity approach (Pehrson & Reicher, 2016).

In our point of view, education can become a field *par excellence* to study identities. Both studies that focused on educational settings offered some empirical support to this claim [7, 11]. Identities are ecologically formed, attending to the demands, expectations and constrains that constantly push and challenge its actors (such as students, teachers and parents). We might ask timely, what is the relation between social representations of the Internet and social identity in an age where the digital media are at the center of the debates about the so-called "crisis of education" (Kambouchner, et al., 2012)?

Since the advent of digital technologies and the growth of Internet penetration, there was a growing mixture of scientific and ideological views about what is going on. It is an important task for social representations researchers to analyze the discourses around technology. As Hakkarainen [9] underlines about her own study, we can also say that the very studies about the digital divide can be "participating in constructing 'psychological' divide between users and non-users" (p. 1212). This result is corroborated by Castro et al. [12]. Because they are inquiring about a set of technical skills and behaviors, they implicitly convey the idea that people (elder people or other social groups) are expected to have acquired such skills and behaviors, thus, making the digital divide more socially salient. It would be important to bear in mind the distinction proposed by Moscovici (1988) and often forgotten between hegemonic, emancipated and polemic representations in order to identify the different stages of maturity of the representation of the Internet and understand the more or less intended effects of research, policy and mass media in society and, conversely, how common sense might shape the agenda of scholars, politicians and journalists alike. Recently, Rasi (2020) showed that older

people are still predominantly portrayed as digitally incompetent outcasts in newspapers. If the Internet is consensual among young people (which is still to be determined), it is nonetheless important to know what form the representation took. Again, a social representations approach to hegemonic representations–in Moscovici's (1988) sense–is possible and relevant. Agreeing that the representation defines not only the symbolic field of communicational exchange but also contributes to settle group boundaries (Doise, 2003), then young people's representations must be charted to be compared with other groups' representations. Indeed, people for whom the Internet is familiar often need to communicate the concept to those for whom it is not familiar.

Often researchers have only inquired people from homogeneous groups and, as expected, identified a shared representational field. To take the most out of the social representations approach, different groups must be compared. A simple example would be to compare the variations in the social representation of the Internet between a group of heavy Internet users (perhaps using a test of Internet addiction) and other group of similar age and characteristics.

As Flick (1995) pointed out, often it is simply not possibly to study the formation of the social representations of a given subject in a synchronic way, especially if we are dealing with digital technologies which are protean, unstable and opaque by design (Koehler & Mishra, 2009). Still, it is possible to collect data about devices before using them in order to study the eventual representations to be formed. Such an experimental approach (Abric, 2003a) has been successfully applied in other fields like traffic (Pianelli, Abric, & Saad, 2010). In addition, retrospective strategies, as advanced by Flick (1994), can also be used and provide insights about the way people signify their experiences with technologies. Finally, to draw on the huge quantity of generated and stored data may help us to analyze the formation of contemporary representations.

Social thinking in times of big data

Something has changed in the way people are challenged to act as meaning seekers beings. Whereas human or natural phenomena used to trigger the search for meaning, currently, algorithms – despite the fact of being written by human beings – automatically organize incommensurable quantities of information that are presented to ordinary men as if they were *naturally or humanly* organized. Social representations must tackle the challenge of

understating how this automatic deliverables of information are absorbed by groups. Big data studies currently provide researchers with tools to process huge amounts of information. But big data research "includes a strong need for theoretical reflection, in clear contrast to the alleged 'end of theory'" (Mahrt & Scharkow, 2013, p. 30).

The agenda here is, thus, two-fold: on the one hand scholars must investigate how social groups make sense of new Internet-related concepts, such as big data, data mining, deep learning and the Internet of things, just to name a few, as well as the information they convey. But on the other hand, scholars must prepare the theory itself to act as theoretical lens in the analysis of online data (including automatically generated contents, mass and social media accounts). This implies, of course, an analysis of the way how the Internet itself is represented in the Internet by cybernauts but not only. As the Internet evolves into a complex ecosystem where human and non-human agents interact often in anonymous forms, one can ask if the theory of social representations is suitable to understand how social thinking emerges and changes and what relation might be established with the actor-network theory (e.g., Latour, 1996), which is concerned "with the creation and maintenance of coextensive networks of human and non-human elements" (Walsham, 1997, pp. 466-467).

CONCLUSIONS

In this paper, we have conducted a systematic revision of the empirical literature about the social representations of the Internet. A set of twelve papers have been organized in five thematic categories: (i) the Internet and quality of life; (ii) the Internet as a moving representation; (iii) the Internet and the digital divide; (iv) the Internet and mobile culture; and the Internet and education. Though still limited in number, depth and breadth, as one might hope to find a sounder body of research, it contributes to expand the theoretical and empirical debates of the field of the Internet and led us to propose a challenging chart.

The theoretically-driven research agenda for studying the Internet from a social representations perspective includes three major foci: social cognition; social identity and intergroup relations; and social thinking in times of big data. The chart draws on previous research but also launches new challenges. In our view, the social representations theory can provide the field with conceptual tools to deal with novelty and quantity (two key features of digital media scenario). In exchange, the study of the ever-evolving, complex system of the

Internet can contribute to further theory development, as it demands scholars to combine different theories and try new methodological approaches.

Though limited, our results are suggestive and inspiring for a theoretically-driven agenda. We do not claim, however, that the agenda is closed. On the contrary if more research is added the agenda will change and evolve. We think this research is the first step to exploring inter and intra-representational relations.

It goes without saying that social representations researchers are in debt with their own historical roots. To learn the ways communication flows within the Internet (including automatically generated contents, mass and social media accounts) equals to set the clock for the present time schedule.

ACKNOWLEDGEMENTS

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