Technological Acceleration, Ageing Process and COVID-19. The Role of Scientific Information Between Opportunities and Limits. Results of an Empirical Research in Central Italy

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Abstract

In this article, the authors present the results of an empirical research regarding people over 65 years old living in Central Italy, that have contracted the Sars-CoV-2 virus. The choice of such target is strictly dependent on the need to investigate, specifically, how this category, in a risky situation, was able to deal with the illness and cope with the whole condition; both in relation to the management of health and governmental information, and in relation to the use of information channels and technological devices.

Through a research carried out with qualitative methodology, a series of analysis emerged around: 1) the idea of promoting and ensuring digital literacy with a view to the social innovation to cope with the risks of 'infodemic'; 2) the urge to reflect on the necessity of keeping active and constant the dialogue between scientific community and user/citizen in the view of a transfer of knowledge and techno-scientific information, especially in periods of health crisis, in order to mitigate the effects due to digital divide; 3) the need to analyze the life of older people in a context of indeterminacy and fear in which social habits and consolidated certainties have been subjected to a totalizing tension.

Keywords: COVID-19, ageing process, technological acceleration, scientific information.

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1. Introduction

During these years of the pandemic and the health systems' crisis, despite the obvious difficulties, all the countries in the world have tried to maintain and ensure some form of continuity in assuring essential services and assistance in the various social areas. Thanks to the internet connection and digital devices, it was possible to cope with such a critical event during which ICT proved to be essential, allowing to keep communication and virtual social contact.

This, however, has not always been possible because digital society is not very inclusive and because of the typical limits of the digital device. Among other things, the pandemic has also shown significant areas of inequality and exclusion in the digital world, particularly for populations at risk (ITU, 2020), leading our society to be more and more dependent on technological devices. In a state of generalized "anomie" and fear of a pandemic risk, "care-providing organizations and policymakers should consider the risk of loneliness while responding to the COVID-19 outbreak, particularly within elderly populations" (Conroy et al., 2020: 257).

Unfortunately, the most fragile and vulnerable categories, such as the old people, the disabled, the chronically ill, were the most affected by the consequences of the pandemic and by the risks connected to loneliness. Lack of direct interaction with other individuals enhanced the sense of social and emotional loneliness leading to a perception of abandonment and fear of the consequences of a possible contagion. Besides, the lack of confidence in technology and digital devices, and the risk of technophobia worsened the possibility of inclusion, with resilient answers not always sufficient.

As stated in the Istat 2020 Annual Report, there are over 4.3 million seniors over eighty, who make up 7.2% of the Italian population, and in fact, Italy ranks among the longest-lived countries in the world, surpassing the other countries of the European Community; this reassuring dimension of longevity is also accompanied by improved health conditions. According to the indicators on the qualitative dimension of survival, the average life span of the elderly in good health has increased significantly (Istat, 2020). Although the data appears reassuring, from this point of view, there seems to be limits in the relationship between elderly people, new digital tools and technology. Even if the use of the network begins to be significant among 65-74 year-olds (among whom the share of Internet users reaches 41.9%), the limit of computer skills and knowledge remains.

The pandemic has drawn attention to the frailty of the old people and the need for a debate regarding the limits and opportunities related to scientific innovations. Digital technology and technological devices are surely an important and immediate response to loneliness and discomfort, calling for

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accelerated time in learning and use. Certainly, technology has proved to be an important support to overcome the interruption of routines and the change of habits, helping in the practice of social interaction, in introducing a 'new normality'. Unfortunately, "none of these technology-based interventions is effective if the elderly do not know how to use them, do not want to use them or are not able to obtain them" (Istat, 2020: 261, *our translation*). These elements lead us to consider not only the fragile condition of this category, but also the dynamics that these people found themselves living in unexpectedly.

Therefore, temporal and spatial conjunctures, in relation to social and health dynamics, have accustomed us to unexpected scenarios, not always comprehensible "in high-speed late-modern contexts" (Rosa, 2015: 116, *our translation*).

Alain Touraine in his essay, *In Defense of Modernity*, focuses his attention on aspects of human creativity in hypermodern society, he argues that, starting from the new millennium, each man has found himself having to deal with a new civilization, in which we entered in an accelerated way. This new arrangement has led the French sociologist to reflect on the social role of each individual and to question why individuals themselves should lose sight of their "experience as creators and liberators", to look at themselves only as "victims", while the world of work itself, continues Touraine, "shifts from repetitiveness towards communication and innovation" (Touraine, 2019: 23, *our translation*).

In Ray Kurzweil's reading, exponential growth is typical to any evolutionary process, and technology represents the primary example (Kurzweil, 2014: 12). The evolution of science and technology itself does not follow a linear process, but an exponential one; through "the law of accelerated rhythms", the author explains the technological acceleration in terms of acceleration of the pace of an evolutionary process and exponential growth of its results (Kurzweil, 2014*:* 35).

Specifically, in this *scenario* of uncertainty and indeterminacy, the pandemic has rapidly advanced technology strategies and new agile ways of working (Mit Technology Review Insights, 2020), while acceleration processes, especially technological ones, have become a mean of evaluating social change in a general sense. More precisely, it has constituted an indicator that allows measuring the interconnection and the possibilities of mutual exchange amongst societies, technological innovation and social innovation.

The same concept of social innovation, considering its multi-faceted nature, integrates quite well in a reflection that aims to understand better the close relationship between technological acceleration and society, especially in a time of pandemic crisis. In fact, "social innovation doesn't have fixed boundaries: it occurs in all sectors, public, non-profit and private" (Murray et al., 2010: 3), and this characteristic should be considered as an opportunity,

especially in this moment of crisis. The Social Innovation Generation, in 2014, defines social innovation as the set of initiatives, products or processes that profoundly change beliefs, behaviors, cultures, the dynamics of power, routines and/or access to the resources of each social system in the direction of greater equity, productivity and resistance. Successful social innovation always has an impact and the precise functional task of increasing the resilience of the social system comparing to crisis factors (Esposito, 2019).

2. Theoretical framework

According to Hartmut Rosa, modern society can be defined as a "society of acceleration", in the sense that it is characterized by the acceleration of the course of life (or shortage of time) despite the remarkable rhythms of technological acceleration (Rosa, 2015: 21).

Peter Conrad does not deny that modernity is centered exactly on the acceleration of time (Conrad, 1999); it is as if the sense of speed and sudden movement have never been disconnected from the actions of modern man. Every day, we say that time is accelerating and that it seems to go by faster; but, after all, an hour always remains an hour and, at the same time, not everything in social life is destined to accelerate.

Hartmut Rosa instead draws his attention on something else: he wonders, in fact, whether it is possible to speak of an acceleration of society itself or only of an acceleration of processes within a more or less stable social order. The author not only laments this dichotomy, but also laments the lack of an acceleration theory that takes into account the different aspects of acceleration processes in different contexts, theorizing three different types of acceleration: technological acceleration, acceleration of social changes, and acceleration of the rhythm of life (see Rosa, 2015).

In Rosa's reading, modern societies are regulated and coordinated by a severe "temporal regime", which is not articulated in ethical terms. This means that man can consider himself free or only slightly conditioned by ethical rules and sanctions. Despite this faint freedom, the modern subject continually suffers the oppression deriving from this invisible, depoliticized temporal regime; a regime that can be read and analyzed through what he defines as the logic of social acceleration. Rosa recognizes a 'totalitarian' guise of social acceleration, capable of leading to severe and empirically observable forms of social alienation (Rosa, 2015: IX).

Regarding innovation, the economist Robert Gordon argues that this is slowing down. According to his techno-pessimistic reading, productivity growth has slowed down considerably over the past decade, and recent

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innovations would have less pervasive power when measured against the innovations that started the great technological revolutions of the industrial age (Gordon, 2016). As to this, Erik Brynjolfsson and Andrew McAfee add a further reading: investigating the trends of growth and productivity in a historical perspective, they determine that the potential of new technologies is very important, but its implementation will probably only take place in the next few years. Indeed, entering the second age of machines, digitization - according to the authors - follows a process in which it continues to spread and accelerate, also increasing the knowledge through which enormous amounts of data are made available immediately. Therefore, every development that is added to the previous one becomes the brick on which to build future innovations. Progress allows us to understand how digital innovation is "recombinant innovation", and it does not end, but accumulates (Brynjolfsson, McAfee, 2017: 88); in this sense, the authors cite the optimistic theory of Paul Romer where the importance of recombinant innovation is emphasized.

The use of external ideas, which combine with the internal knowledge of a series of distant technological domains and disciplinary sectors, makes boundaries become fluid. In this way, there is an improvement that is not fortuitous, but is set in motion because everything advances; this simply happens "because there are more people who as a whole have more good ideas that improve our overall destiny" (Brynjolfsson, McAfee, 2017: 102, *our translation*). The aspect to which we must draw attention is precisely "recombinant innovation": digital network is its incubator; it is the ideal ground for experimenting this type of innovation, or better, to experiment on what already exists, mix and create new solutions, involving an important number of individuals in order to reach forms of "open innovation".

If we reflect on the changes occurred in the last years, important elements support the argument that there was a technological leap in conjunction with the emergency and the spreading world-wide of the pandemic. The need to deal with an important and huge threat triggered a mechanism whereby the massive use of digital technology reconversion strategies and the implementation of digital healthcare system led to improve healthcare and the management and control of the pandemic risk.

In July 2020, a report by John Hopkins University (Agarwal et al., 2020) was published, in which an assessment was made on a number of digital platforms that were presented for some time in low and middle-income countries of the world. It is a report that the researchers drafted to evaluate whether the digital systems used in these countries could be reconverted and reconfigured to meet the management needs of critical issues related to the pandemic, such as tracking data related to COVID-19; and whether subsequently, their reconversion had given the expected results. In the selection

criterion of digital platforms aimed at reconversion, the researchers of the JHU took into account the levels of implementation, flexibility, and adaptability. The need to identify already existing digital solutions (that were to be reconverted in relation to the needs that arose following the pandemic), led to an important step: in the reconversion of a digital system for different purposes and new functions, even in a short period of time, social, but above all, technological innovation was promoted.

At the same time, the process of technological acceleration is evident in the amalgamation process between innovation and the development of new opportunities in relation to the needs, with the possible reduction of costs and energy saving. In this perspective, what could be defined as 'techno-scientific capital' is integrated with a cultural and social capital, restoring opportunities for social and technological innovation in times of pandemic crisis.

Alain Touraine considers innovation as open, he points out the resources inherent to human creativity; current civilizations, defined as "hypermodern", are distinguished by full and direct self-awareness, as, according to the French sociologist, they are creators of themselves and self-transforming, and "this is because their main and direct purpose is to create creativity and not only the technical, political or cultural means of this society" (Touraine, 2019: 19, *our translation*).

In a situation like the present one, the technological acceleration caused by an heterogeneous series of reasons has undermined experiences that were considered as consolidated and solid, especially when we refer to fragile people such as the elderly, the chronically ill, and the disabled. In this situation, adapting the French sociologist's thought to this moment, each social actor should be projected towards the identification of new cultural possibilities that open up to these new experiences and, above all, try to grasp the possibilities that open up to creativity. Despite the risks of new forms of power and control, and despite external pressures that try to convince the individual of his "powerlessness against these catastrophes", man must find in hypermodernity the useful resources to pursue his own "liberation". The French sociologist, in this sense, sees the possibility of resilience and salvation when individuals understand that the forms of inequality can regress by "advancing the plurality of the voices of progress"; in this sense, "communication and exchange skills would increase, together with the sharing of universalistic objectives" (Touraine, 2019: 25, *our translation*).

Now, if we try to shift our observations around the acceleration processes in a moment of pandemic crisis, especially for the older and frail people, it appears obvious that these can undergo re-readings in relation to the contexts and actors involved. In fact, in the light of previous positions, if we try to give a final and exhaustive definition of the concept of 'acceleration' in its various

aspects, we immediately realize how this is a task that leads us to consider more accurately the whole situation, leading to many doubts, given the heterogeneity of the approaches and areas of interest.

We therefore ask ourselves where the idea of acceleration resides, what determines an acceleration in society; and, in what terms it produces measurable social effects, giving opportunities to think in terms of social innovation. From a more specific point of view, many international studies have investigated the impact that digital technologies and the digital health system had during the pandemic and, above all, the advantages they brought, mainly in the health sector (Kapoor et al., 2020). Recent studies show how these resources have proved to be decisive for monitoring the pandemic phases in different countries: and so, for instance, "the key to the Korean government's success in combating COVID-19 lies with the latest digital technologies (DTs)" (Heo et al., 2020: 1). Technological innovation represented an important response to face the pandemic crisis; technological progress and its acceleration allowed reaching conditions far better than what would have been possible without the data science (Kaur et al., 2020). In this *scenario*, it is not possible to think of an innovation process without direct involvement of the ultimate beneficiary of this process.

This evaluation suggested to reflect on the relationship between technological innovation and the community, especially in relation to the pandemic crisis.

If we think of the processes of technological innovation, we usually give a standard reading of this process, keeping the innovation always in a linear dimension that sees innovators separated from society and, above all, from those that will give a meaning to the technological achievement through their commitment or rejection; innovation never arises in contexts or spaces separated from society, but instead it draws inspiration from it.

Thus, the network of relationships that powers the interplay between innovation processes and society becomes very important; a relationship that has become increasingly necessary in order to determine dynamics of the development between society, innovation and user - underlining the process of co-construction as theorized by Oudshoorn and Pinch (2008) - suggesting a reflection on how it evolves and what dynamics are triggered when users get in contact with the innovative product.

Over the years, the iteration and the increasingly active participation of users, defined as agents of the technological change, has meant that the innovative process lost that *aura* of determinism or pre-determinism, becoming a creative process thanks to the involvement and participation of those who choose to bring the technological product into their everyday life. The synthesis of this theoretical background thus represented an opportunity to reflect

precisely on these aspects and on the quality of the relationship between processes of the development between society, innovation and user and between techno-scientific knowledge and the community itself in a moment of criticality.

Starting from these considerations, our empirical study analyzes how communication and the risk of 'infodemic' were managed. In order to draw the attention to any critical issues, limits or resources of the institutional/governmental communication paradigms adopted during the emergency phases, considering above all the useful empirical data derived from the interviews released. Specifically, in this goal we will try to realize the conjuncture between the promotion of a techno-scientific culture/conscience towards the old people and its response, to understand whether this transfer has occurred or has been deficient.

3. Methods and tools

Researchers from the Laboratory of Social Research of the University of Cassino e Lazio Meridionale conducted the research. They intended to carry out a descriptive-exploratory study with the aim of investigating the phenomena and situations inherent to the pandemic event, a 'pilot study' to outline, in general, the phenomenon under analysis, aiming to expand the research and deepen it.

The empirical survey was carried out through a semi-structured interview, asking a series of twenty questions to a sample of 18 people over '65, who contracted COVID in the period between March and July 2020, all resident in Central Italy, and who agreed to collaborate. We adopted a snowball sampling. Some of these people were able to manage their disease from home, while others had to be hospitalized, needing more specific health care. Of the people interviewed, eleven were women, and seven were men; hospitalization involved five women and two men. Regarding the way the interviews were carried out, considering the critical period, they were done through digital and video platforms.

Researchers considered social and emotional experience of old people at a critical moment of their life of primary importance. Through their responses it was quite clear what impressions they had in relation to the management of communication, what kind of relationship they had with the information channels and, above all, their feelings and impressions regarding the management of the National Health System.

The questions proposed, in total 20, were related to specific areas: 1) questions from 1 to 5: the subject's emotional experience; 2) from 6 to 10: the

relationship with digital and technological devices; 3) from 11 to 15: the opinion on the communication media and scientific-health information; 4) from 16 to 20: the work of the government. In summary, a question is reported for each area of investigation:

1) "During lockdown periods, did you experience particular fears and anxieties?"
2) "Since the introduction of government restrictions, has the frequency with which you use new technologies changed?"
3) "Have you received adequate information on prophylaxis and the risk caused by COVID-19?"
4) "How do you assess the overall actions of the Italian government aiming at stopping the spread of COVID-19?"

The interviews were recorded and then transcribed *verbatim*, i.e. entirely in their narrative form, with no additions or omissions. Before their transcription, recordings were heatedly listened to in order to be able to grasp also the linguistic aspects of prosodic type, which would have been lost if they had been only read.

The approach was bottom-up: the narrative voices do not just cover events related to the disease, but they 'build' them exactly in the moment when they give them that particular meaning that the disease assumes in that specific cultural context. As Mallinson, Popay and Williams remind us: "using a range of qualitative research methods, social scientists explore the meanings people attach to their experiences and how these are shaped by different context" (2013: 90).

As to the methods used for the processing of data and the methodology of analysis of the text, a thematic analysis was applied. For the implementation, CAQDAS procedure was used (*Computer Assisted Qualitative Data Analysis*), through the software R-Text Mining Package.

Thus, a single *corpus* of contents was created, and, starting from the text, themes were isolated, up to the labelling of the same within the text. For each theme or category tracked, further analysis were carried out in relation to what one wanted to extrapolate from the text.

4. Data analysis and research findings. Communicative asymmetries and skepticism towards the scientific information

In this section of the article, the results will be illustrated in relation to the hypotheses and goals that the research group had set and that were summarized previously.

To isolate the most frequent categories and organize their frequency in order of percentage of presence within the unified and labelled text, was quite an important operation through which we were able to extract the information we needed. In addition, to isolate the words mostly used by the respondents, creating so "word association", allowing us to elaborate significant and relevant correlations, as to specific experiences and feelings experienced by respondents with greater intensity (see fig. 1). This allowed us to correlate the words most used by respondents relating to their moods and impressions, pointing out the most important aspects of their experience in terms of discomfort, fear, uncertainty.
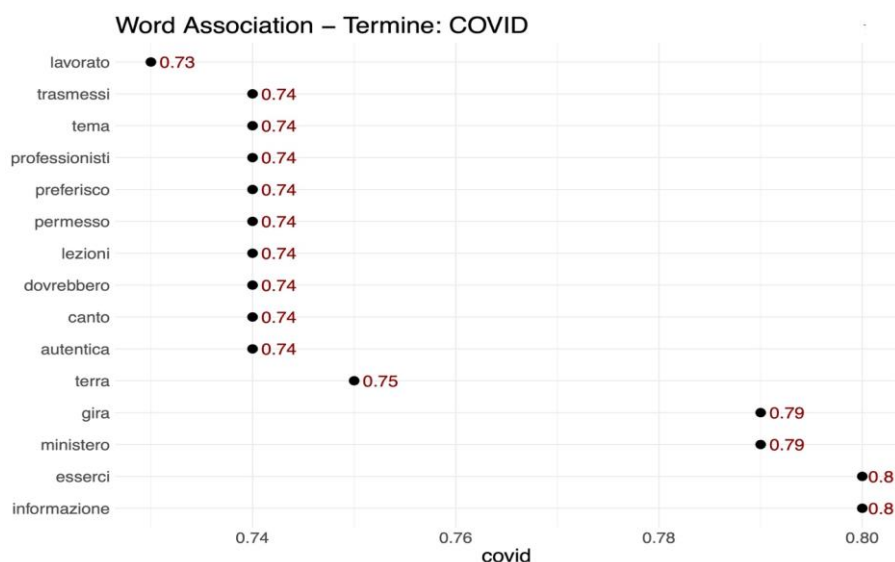
FIGURE 1. Word Association COVID-Information.

Figure 1 demonstrates, through an analysis of the correlation between words, the close dependence between the term COVID and the various occurrences attributable to the dimension of information. Specifically, whenever the term COVID appeared in the transcribed text of the interviews, the interviewees, in 80% of cases, associated and correlated this term to the context of the information and the way it was disseminated.

The creation of a histogram of the words mostly used by the interviewees (see fig. 2), led to the first aspect to be considered, so to isolate a series of categories of analysis, organized according to their frequency. The graph on the frequency of the categories of analysis (see fig. 3) illustrated the relevant

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elements that helped to analyze and understand the mechanisms that triggered the social and cultural practices within which the interviewees moved.

FIGURE 2. Word Frequency Histogram.
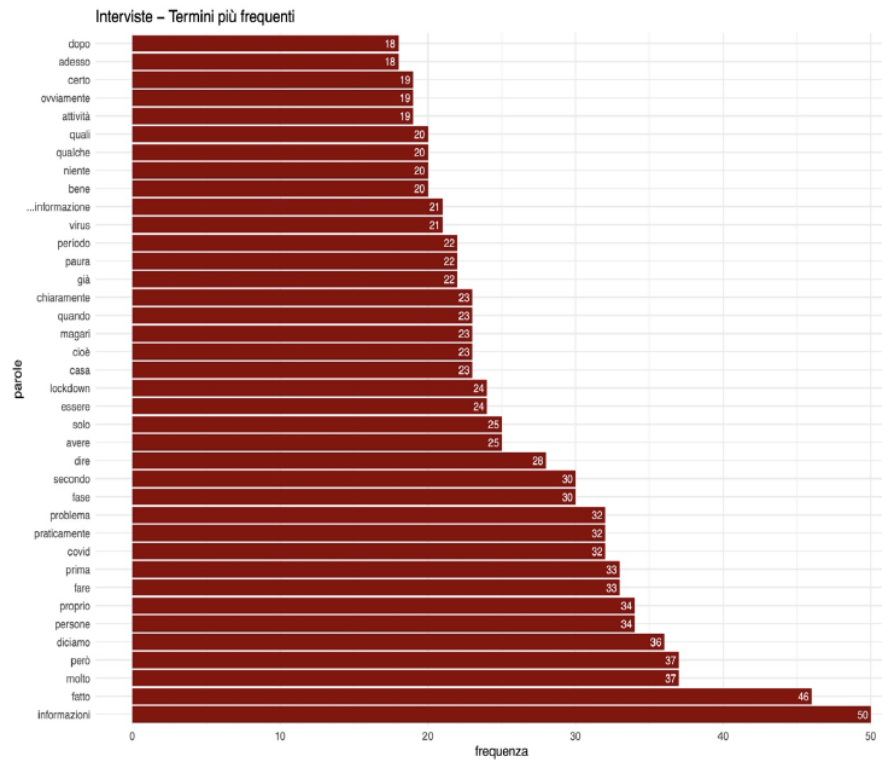
The represented histogram shows the terms mostly used by the interviewees in giving their answers. The term 'information' is the one mostly at the center of debate regarding the interviewees' thoughts. Looking at the histogram it appears that there is a close relationship between the information dimension and that of COVID.

The four categories isolated by incidence and correlation, are those on which we have worked more systematically and which, based on the percentage of attendance, have been isolated: 1) Opinion on the media and scientific-health information; 2) Work of the Government; 3) Management of disease and Lockdown; 2) Use of ICT.

FIGURE 3. *Frequency Categories of Analysis.*

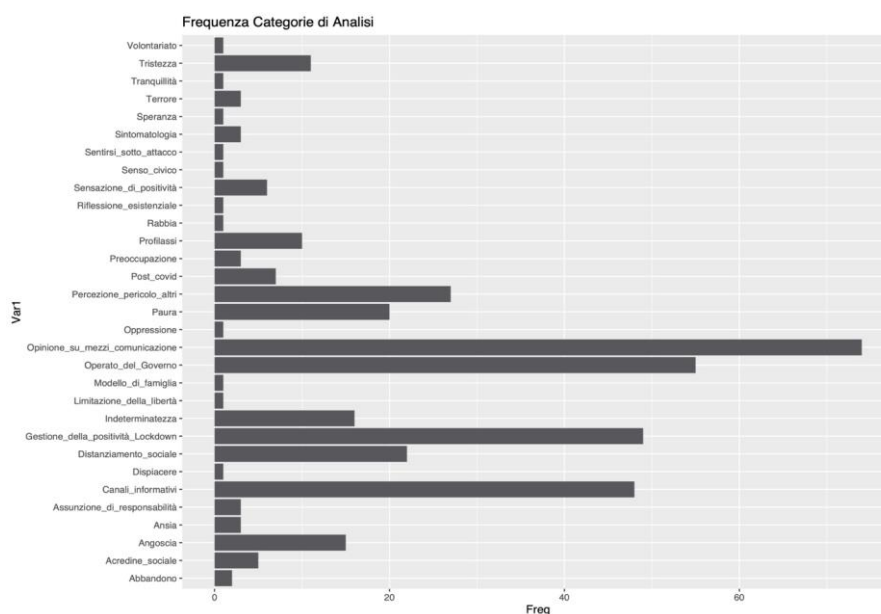Frequenza Categorie di Analisi

Figure 3 indicates the frequency of the categories of analysis that were prevalent in the interviews carried out. The category of analysis most detected by incidence (almost 80% of the total number of interviews) is represented by the opinion that the interviewees gave on communication media. The graph shows how this category, not disconnected from the opinion about information channels and the work of the government, has significantly prevailed over the others.

The first focuses on the relationship that the interviewees had with the general context of communication and, specifically, with the return of institutional and health information. From looking at the graph (see fig. 3), it is evident that the category of analysis represented by the interviewees' opinion on the means of communication and media coverage was the most relevant and, therefore, a particularly sensitive topic for the interviewees. The second focuses on the impressions and opinions expressed by the interviewees regarding the work of the government and institutions; this too is strictly dependent to the others as to the information dynamics of both health and institutional type. The third offered important information on the most intimate experiences of the interviewees and on their fragility as to contagion and social isolation; the perception of fear and risk during the period of isolation was strictly dependent on the quality and quantity of information they received, and on the support

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returned by the NHS (see fig. 4). Through the identification of the fourth and final focus and its subsequent analysis, it was possible to evaluate how the interviewees related to technology and digital devices and their use during isolation and, then, during the subsequent return to everyday activities.

FIGURE 4. *Word Association Fear-Risk.*

Word Association – Termine: paura

iniziato	●0.97
domande	●0.97
dentro	●0.97
sempre	●0.98
rischio	●0.98
paure	●0.98

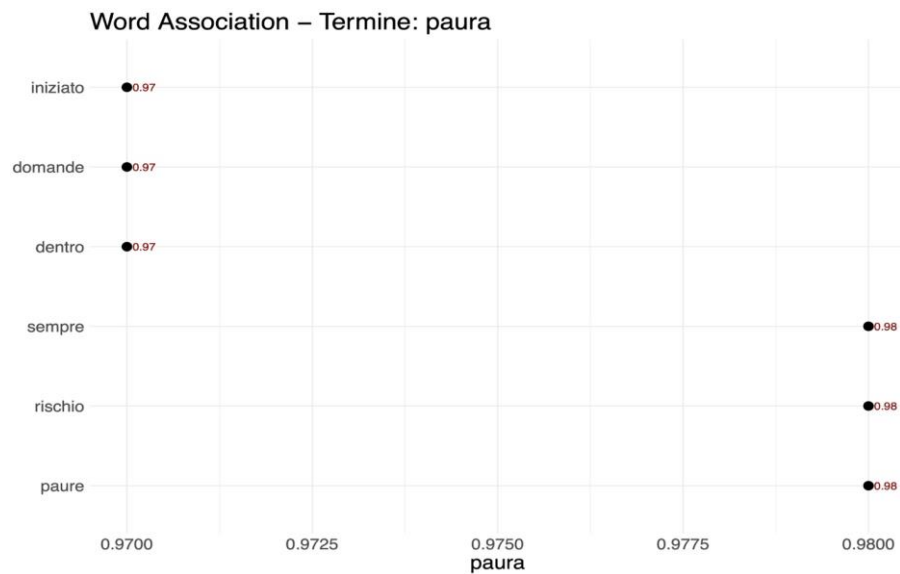0.9700   0.9725   0.9750   0.9775   0.9800
paura

Figure 4 indicates the close correlation between the concept of fear and that of risk. Specifically, whenever the software, in the transcribed corpus, found the term 'fear', the word risk was closely related to this, in 98% of cases.

Considering these outputs, it emerges that some of the isolated categories, often, are explained through their own intersect and their close dependence. Analyzing the contents of the processed dataset, we find that the interviewees, although aware of the indeterminacy deriving from a state of generalized "anomie", have a rather unanimous opinion of the media, but widely unbalanced towards a negative comment of them, due to lack of clarity and scientific relevance.

This data led to reflect on how limited and reduced the possibilities of scientific understanding could have been for those older people not accustomed to a specific scientific/medical terminology, and lacking the tools to be able to give it a critical interpretation.

Generally, the interviewees condemned an overreacted alarmism and the fact that there was too much space dedicated to badly managed information.

Specifically, the space reserved by the media to information regarding COVID and the health crisis was overabundant, and, above all, it was not used properly. The interviewees noted that both the quality of the news, often unclear and contradictory, and the quantity of news too present on the various information channels, led to a sense of disorientation and concern. Some of the interviewees spoke of 'abuse of the media' and 'psychological terrorism'; and others said it led to social anxiety. Here is one of the interviewee's comments[1]:

> For me, psychological terrorism was also committed by the media that addressed the common feelings of the people, like for example that of the no vax. They have carried out a whole series of campaigns to influence public opinion, and for me this is very wrong! (patient who managed the disease at home).

Through the analysis of the data, about indexes of association within the category 'Opinion on the media', the word that appears most is 'person', to which many words that fall within the semantic field of fear and death are anchored to. It may indicate how much communication and information channels had returned a sense of terror, dealing almost exclusively with reporting numbers on deaths and infections. Some short excerpts from the interviews follow:

> I have always found that the information given was quite contradictory. This has, at least in my case, destabilized us, because one virologist spoke and said it was a terrible thing, whilst the other, said: 'No, but do not worry it's not like that!' So, at times, it was all an abuse by the media" (patient who managed the disease at home). "The problem is disinformation because of too much information. We only read the headings and do not read the articles, often the headings are decontextualized! (patient who managed the disease at hospital).

The interviewees recognized strong communication asymmetries: often the news, given to the population, created states of anxiety and fear; in some answers, the interviewees spoke of terror deriving from an uncontrolled 'infodemic', accompanied by strong images transmitted during the day as in an obsessive loop:

> Yes, because it was evident that it was an anxiogenic information system, it is not healthy to wait for the everyday appointment with the bulletin of deaths, infected, etc. I prefer to get the information I need when I need it,

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[1] Our translation for all the following excerpts.

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but I have finally avoided that daily liturgy of war bulletins (patient who managed the disease at home).

In the course of the empirical research, further elements, closely anchored to the communicative context and its asymmetries, attracted our attention.

If we look at the answers provided by the interviewees who spent a period of their illness in hospital, we see how these subjects found further communication asymmetries and dissonances. Specifically, patients repeatedly confirmed that scientific communication, often conveyed through social media, talk shows, television, was in part discordant with what they themselves had been able to receive from medical-health personnel during their stay in hospital. These interviewees, when making a comparison, underlined a fundamental dichotomy: within the healthcare context, they claimed to have been recipients of an orderly, reassuring, although not always constant, communication; instead, outside the hospital context, the risk of 'infodemic' and precarious scientific solidarity aroused perplexity and disorientation. Therefore, these aspects suggested many reflections on the methods of dissemination and management of information and the goals that wanted to be achieved.

An interviewee's comment on the information received stated as follows:

Having gone through this disease and having also received feedback from the doctors who treated me, in my opinion, much of the news was not only inflated, it was also given badly because, in my opinion, doctors gave us completely different information comparing to the media and above all they were able to give us tranquility in the ward. They explained what they could, what I needed to know, and compared to what professionals said on television it was a completely different story. So different to what the social networks told us every day, televisions, radios, everything that could pass, in short! The doctors, who were always in the front line, gave much more information than all those fake doctors did on TV, which instead caused a lot of terror. There were many mistakes in the communication sector so, before giving so much news, they should have listened to the medical staff, that were actually on the front line (patient who managed the disease at hospital).

The interviewees, who were able to make a comparison between the scientific information coming from social media, television, internet, and that returned by medical and health figures in the hospital context, underlined the social benefit deriving from a communication given in a clear way, unique and scientifically supported.

Leaving aside, for a moment, the considerations regarding institutional and scientific information, let's try to answer one of the initial questions, concerning

technological acceleration, and whether we can talk about technological acceleration in relation to the target interviewed.

Among the questions addressed to the participants, the interviewees were asked whether, since lockdown, the frequency with which new technologies were used to get information about the health situation had changed. Regarding the frequency of use of new technologies, the interviewees confirmed an increase comparing to the past. They had been mainly used to find and verify information, read online newspapers, follow newsletters and talk shows, have conversations and contacts with friends and relatives. In this sense, the new ways in which technological devices had been used contributed to changing the new conception of the space of interaction and online experience (see Lupton, 2018).

The most used technological tools were mobile devices, such as telephones and computers; the interviewees said they connected to the internet in the ways and times that better suited them. Main aims were to seek updates and more detailed information or make comparisons with other sites or newsletters or, simply, to give answers to questions or doubts, avoiding relying only on news or television broadcasts. One respondent said:

> Yes, without a doubt! Because it was the only one available, it was as if with the internet I was the one who chose the news that suited me most, rather than having it come from the outside and be overwhelmed by the news (patient who managed the disease in hospital).

Many interviewees admitted that mobile devices were the main tools that allowed them to communicate with the outside world, to give reassurance about their health to their relatives, but also a way to distract them from difficult times. In this sense, an interviewee stated:

> Yes, because, fundamentally, it also helped me to keep my mind occupied, to stay informed and to connect with others, and therefore not to travel away with thoughts (patient who managed the disease in hospital).

Through technological devices, old people confirmed they were able to see those who for a long time remained physically distant figures; indispensable tools that allowed continuing a relationship with the rest of the world, without feeling abandoned.

Although for many the stay in hospitals was difficult, their smartphone, previously seldom used, was a tool of primary utility:

> Let's say that when the disease is in progress, you don't even want to talk because you really can't breathe, so it's quite difficult to talk and answer

questions, but at the same time the telephone was very important, it was the only way to speak to family and friends! It was very useful; it was also helped to kill the time that never went by. There were very difficult days, very, very difficult (patient who managed the disease in hospital).

Thanks to technological devices that became more integrated into their daily lives people managed to maintain relationships with the outside world, avoiding deeper forms of social isolation:

> Surely! Because [devices] helped us not to lose contact; we were totally isolated, they helped to maintain a minimum of contact with others, it was the only way (patient who managed the disease in hospital).

Considering the above responses, the elements that have characterized communication during the pandemic are certainly inconsistency, overexposure of news and confusion of content. For better or for worse, people form their ideas in relation to images and information they receive from communication networks (see Castells, 2017); in this situation between risk and insecurity, the mass media represented the vehicle through which individuals built their awareness. Castells still remembers the role that mass media played when they became the primary source for raising citizens' awareness of global warming; and today the mass media played the same role regarding the pandemic, but instead returning '*liquid*' forms of awareness, that is, unstable information due to generalized confusion.

In this situation of insecurity, not supported adequately by the institutions, citizens risked a sense of "disaffection", undermining the general social trust, which is closely related to political trust (Castells, 2017: 363). In this sense, Putnam, in his studies on social capital, has widely demonstrated how civil commitment and interpersonal trust contribute to general social trust, and consequently to political trust (Putnam, 2000). As Castells recalls, the information media are "formatted" in such a way as to "have a strong influence in establishing the connection between the individual's predispositions and their judgment on the issues that constitute the substance of political life" (Castells, 2017: 281, *our translation*). Mostly, this risk can affect more exposed categories such as those of older sick people.

If we look at the answers given regarding the punctuality in receiving and understanding scientific information, these certainly cannot be said to be any better. Respondents isolate two phases regarding scientific information. The first, that referred to the first months of the pandemic, in which the scientific information regarding COVID was not adequate or clear, it certainly wasn't reassuring or verifiable; and a second phase, in which, compared to the first,

there was a slight improvement, but not sufficient to consider this information exhaustive and satisfactory. This aspect has led to an important consideration. Scientific and techno-scientific communication needs to be transferred to the community in a clear and accessible way; some interviewees, in this sense, complained about the lack of information regarding the progress made by scientific studies on the evolution of the virus. In fact, as Ulrich Beck pointed out, techno-scientific development with its pace and with the modalities of its progress "must guarantee the ability of learning at every stage" (Beck, 2020: 247, *our translation*).

Knowing these aspects would surely have reassured these people, instead according to them, the information given was mostly contradictory and often confusing. Nevertheless, above all the respondents claimed not to understand the bickering and the altercation without scientific basis between virologists and experts on several news channels, a sign of insecurity and an element of social disorientation.

The lack of a univocal and constructive dialogue between the scientific communities and, consequently, with the social community, led to moments of destabilization and mistrust. It was evident that the interviewees had noticed a lack of a scientific solidarity, pointing out the issue of the so-called 'armchair Epidemiologists'. We must not underestimate, in fact, that "many are turning to social media for information and advice, the differentiation between individuals who are qualified to provide accurate information online and so-called armchair epidemiologists is increasingly difficult. Members of the lay public might try to identify the most seemingly qualified member of their close network as a trusted resource to vet information" (Limaye et al., 2020: e278).

Furthermore, the information on the health risk was not always adequate; this information, according to the opinions of our interviewees, needed a more accurate and organized management. This led some of the subjects to seek information outside the relevant contexts, with the risk of not finding adequate solutions.

In the space of a few weeks, skepticism towards techno-scientific research was generated, leading some interviewees to doubt that neither science had the answers to face the health crisis or the ability to manage the health problem.

The confusion caused by the media, in some cases, was even perceived as a strategy not to reveal the truth about COVID, with the risk of fueling ideas of conspiracy and "*negationism*"; this because the institutional information remained confusing and contradictory. Overabundant, excessive and not adequately filtered information raised doubts about the actual objectivity of the situation, shaking the already precarious psychological state of many fragile people:

> Among the leading elements of the scientific world there were people who provided us with conflicting information, and I found this terrible, it showed a lack of communication amongst the many hospitals, and we are supposed to be talking about the best ones, those in the field of infectious diseases in Latium as well as in Lombardy which, however, were unable to communicate with one another and provide the population with univocal guidelines. That is why I found myself, whenever I turned on the tv to listen to a professor, an epidemiologist saying, "It is always necessary to use a mask and the individual device", then, changing channel, I would listen to another one say that the mask was to be worn only if you are in hospital, if you are already infected, etc. This way of carrying on only led to total d confusion (patient who managed the disease at home).

We know how difficult it is to create trust in technology amongst older people and how difficult it is to create the conditions for an inclusive digital society in which these people can experience active ageing. We can't ignore, of course, the fact that there is a tradition of older people, while clashing with important resistances and *technophobia*, that have daily used assistive devices; this, however, for these categories, so fragile and exposed to the critical consequences of prolonged social isolation, could not be enough to guarantee them proper care and protection. For the social response to be valid, it is necessary to investigate the different aspect that characterize their loneliness and to examine the contexts, "taking into consideration individual needs and environmental factors" (Conroy et al., 2020: 258).

In this sense, the state of mistrust in institutional communication, but above all in the scientific one, has highlighted the need to identify correct practices for the diffusion of techno-scientific knowledge and information. Specifically, according to the research carried out, it appears necessary and urgent to draw attention on: 1) the citizens; 2) the need to communicate a non-closed and non-elitist scientific-technological information; 3) the necessary involvement in decision-making process of the whole community.

Some aspects of the survey underline and confirm the importance of placing trust in human creativity and in the sharing of common goals: forms of social inequality can regress, as already mentioned by Touraine, despite the contradictions of a hypermodern society in a state of health emergency.

5. Conclusions

In conclusion, pandemic time has forced a reinterpretation of established habits, actions and practices, instead of only temporary situations, some of which are destined to be imprinted on the social practices of each of us. At the

same time, the impact of the pandemic forced a social adjustment waiting to partially recover a dormant rituality, while the slowdown in socio-economic dynamics was inversely proportional to the deployment of practices of technological acceleration and techno-scientific innovation, especially in the socio-health sector.

In this sense, recalling H. Rose's point of view, we know that social acceleration is an intentional acceleration that aims to a certain goal, even though technology itself is not the cause of social acceleration, but a condition that makes this increase possible (Rosa, 2015: 22). Despite this, technological acceleration, very often linked to the introduction of new technologies, it nearly always leads to a change in social practices (Rosa, 2015: 29); therefore, this type of acceleration proceeds simultaneously with the acceleration of social changes, understood as changes in social structures and schemes (Rosa, 2015: 30).

In our case, technology and new methods of using it, especially by the old people, resulted in the change of social behaviors and habits of these people who welcomed these new experiences into their daily lives and not without difficulty. We do not know if this is sufficient to allow us to speak of a permanent and profound technological acceleration; certainly, we can see that there has been a strong increase in the use of digital and IT devices, determined by the necessity, the need, but also by the fear of experiencing a digital, as well as social, lockdown.

The processes of technological acceleration are indissolubly anchored to the implementation of digital systems and to their use in socio-health areas, with a consequent bottom-up involvement of social actors, no longer just recipients of such practices, but co-promoters of these same techno-scientific practices. The development of a scientific and techno-scientific culture has always been one of the indicators that evaluate the development of a society and its organizational capacity. This aspect, however, has led to a lack of alignment between a more and more invasive dimension of advantages or limitations, and the modest social and collective awareness of their relevance and their implications on different social and economic levels.

The need to understand the factors that could have prevented the transfer or disclosure of a techno-scientific culture to a disoriented society becomes a matter, which social sciences must think about and consider now. The scientific community must investigate where the possibility of dialogue and exchange has been lacking. To speak of acceleration does not mean referring exclusively to an evident use of digital devices, apps, wearable devices or quantified self-tools. It means taking into consideration the fact that the pandemic has forced to reconsider the relationship between techno-scientific culture and the citizen, seen as a creator, recipient and user of services.

Maurizio Esposito, Iolanda Romualdi
Technological Acceleration, Ageing Process and COVID-19. The Role of Scientific Information
Between Opportunities and Limits. Results of an Empirical Research in Central Italy

Citizens have found themselves for a long time exposed to a techno-scientific knowledge that has not always been able to be converted into useful resource. This aspect emerged in a state of necessity, induced by the pandemic itself, drawing attention to the urgent need to rethink social innovation and the need to adopt policies aimed at promoting digital literacy and scientific dissemination initiatives through specific and accredited communication channels.

WHO published in September 2020 a document aimed at informing about the risks deriving from the 'infodemic' related to the situation we are experiencing, inviting Member States to develop and implement action plans to manage uncontrolled 'infodemic' flows, through timely dissemination of accurate, science-based information (WHO, 2020). Furthermore, a critical event, such as this current one, has drawn attention to the need for citizen involvement in permanent democracy practices, in which choices must be the subject of wide-ranging discussion, so that they can be shared by most of the social actors. "Users are often best placed to identify their own needs and come up with ideas about how they can best meet them. Therefore much of what is called 'user-led design' would be better described as 'user engagement in design', with designers and professionals still playing key roles as orchestrators and facilitators" (Murray et al., 2010: 31). The key lies in the fact that users are the best subjects that can identify their own needs and, therefore, are able to develop new ideas; the synergy between users and producers represents the perfect osmosis to rethink services.

If we think about the current situation and the data in our possession, are the unexpected consequences of the pandemic accelerating this aspect? Are they contributing to an essential osmosis between the techno-scientific culture and the community? Alternatively, is scientific knowledge destined to remain still entangled in the academic mesh of research, far from being involved with the community, thus limiting the possibility for citizens to express pertinent judgments because they do not have adequate information and suitable knowledge? They are all legitimate questions that support the view that citizens should be considered not only as recipients of a service, but, above all, as an integral part of the entire project design, in a moment of social disorientation such as that caused by the pandemic.

Recent studies highlight the lack of active roles attributed to older people during the pandemic: "They are reduced to passive agents, where their history and actions are devalued to approach this crisis and where their bodies are only the recipient" (Fernandes, 2020: 266). It follows that, in the relationship between science and society, an adequate technology transfer becomes necessary, capable of giving an account of scientific results in a clear and usable way to an audience of non-experts. The aim is to involve the greatest number

of users in this process, in the belief that each one of us can be the custodian of experiential knowledge and put it into circulation, increasing the social and cultural capital of a society.

Creating a techno-scientific culture means implementing social innovation, returning opportunities of sharing, of debate, of osmosis between science and knowledge that the custodians of such knowledge choose to share with the social community, thus transferring the tools to interpret social and scientific reality, and become an active part of it. In this case, the techno-scientific culture would help to fulfill an important gap, becoming a tool to compensate uncertainties, fears and restore greater awareness and safety to users, especially those belonging to the most vulnerable and fragile social groups, such as the older people. Thus, the promotion of a techno-scientific culture and innovation, shaped on the needs and limits imposed by this moment, would be the best idea in order to contain the disorientation of the community, in favor of a "new regime of collective experimentation" (see Wynne, Felt, 2007), with solutions for constant interaction and exchange between citizens and the scientific community.

"In the regime of collective experimentation new forms of interaction between scientists and other actors have to be 'invented', because the traditional authority of laboratory-based science is not sufficient" (Wynne, Felt, 2007: 27).

In these months of pandemic crisis, acceleration and technological innovation have laid the foundations for an osmosis for future innovation projects. An approach, however, that has certain limits due to different factors, such as communication asymmetries, digital illiteracy, infrastructure limits, cultural lag, technology transfer not always supported by adequate information, and, last but not least, resistance by the so-called *non users* of technologies, i.e. those who aren't able to use technologies for both voluntary and involuntary reasons.

We do not know how science will intermingle with society; this uncertainty cannot fail to create a hybrid state of skepticism and concern outside the scientific communities, especially at a time when both scientific and technological innovation are recording strong accelerations interconnected with pandemic dynamics; this limit exists because innovations always have an *aura* of uncertainty and insecurity.

In this *scenario*, split between necessity and uncertainty, the social sciences are called to ask themselves what resources could derive from a permanent project of mutual collaboration and scientific transfer aimed at building a techno-scientific culture, and capable of putting people at the center, with their needs, but above all with their resources and their knowledge.

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