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Technologies and the elderly

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Abstract
Technological development and the increase in the elderly population are undoubtedly the two phenomena that have most characterized the last forty years. Although the elderly are credited with a certain resistance towards new things, in the last 20 years there has been a growing interest in the use of technological tools such as smartphones, PCs and tablets by the elderly population. This phenomenon has undergone a strong acceleration starting from the COVID-19 pandemic which has made technological tools indispensable in order to maintain virtual social and family relationships as it was not possible to meet people directly. Technologies promise undoubted advantages, especially for elderly people who are more easily subject to fatigue and walking problems and are more in need of constant monitoring of their health, but, at the same time, it exposes everyone, especially those over sixty-five, to collateral damage, such as reduction of in-person relationships and exposure to online scams. In this article we will try to identify the pros and cons of the diffusion of modern technological tools among the elderly.

Keywords: technology, elderly, health, cyber security

1. Introduction

The two phenomena that have characterized the last forty years are certainly on the one hand the rapid technological development, which has led to the spread of personal digital communication tools, and on the other the increase in the elderly population which creates a series of problems in the future related to health management and the economic costs of care. The use of technologies is usually associated with the younger portion of the population: the so-called digital natives have always been thought of as those who have the greatest ease in learning the use of the most advanced technological tools, vastly exceeding the possibilities of adequate use of this instrumentation by adults and, above all, by the elderly. Those who work in the educational field know perfectly well that the presumed superiority of digital natives materializes, on a mass level, more in the ability to quickly use certain devices to communicate through social media rather than in using them for work purposes. Furthermore, research has amply demonstrated that young people have a greater learning speed than older people, which can translate into a significant advantage when they must learn how to use new technologies. Despite this, the possible positive role of new technologies in promoting a protected and more easily assisted old age has been underlined by many (Ekeland et al., 2010; Kuoppamäki et al., 2017; Nikou et al., 2020). This would imply the use of technologies both with a view to passive use by the elderly, and in an active way which implies the direct involvement of those over sixty-five and consequently their learning of the notions necessary to make the best use of the technologies made available disposition. In this article we will try to evaluate the pros and cons of the use of technology in old

age with particular attention to the active involvement of the elderly in all those activities that can benefit from the use of high-tech devices.

2. Obstacles to learning new technologies in old age

We can distinguish the main obstacles to the learning of new technologies by the elderly into two typologies: the objective obstacles, mainly connected to the aging of cognitive processes, and the subjective obstacles more linked to emotional and motivational aspects. The two typologies interact to determine a greater or lesser inefficiency in terms of learning but must be evaluated beyond the stereotypes that the elderly person is slow, resistant to new learning and, in general, not very interested in new things (Chen, Chan, 2014; Czaja et al., 2006; Braun, 2013; Ellis, 2021; Ma, 2016).

The presence of cognitive difficulties linked to normal aging, which actually affects people from the age of thirty, is known and demonstrated by a large amount of experimental research (Craik, 1994, Small et al., 1999). The same researches, which have highlighted the increasingly wider gap that is observed when comparing young and old people, have also found a series of explanations capable of demonstrating that the aging process does not follow an all/nothing type trend, is strongly influenced by cultural aspects, is affected by level of education, work activity, quality of life of an elderly person and have also identified a series of factors which, in some way, have a protective function towards the aging of cognitive processes to which we are all exposed.

The ageing process progressively affects individuals already at birth but more significantly from the age of 30 (Ferguson et al., 2021). The many studies that have compared the performance of young and old have highlighted certain aspects of cognitive processes that appear to underlie progressive deficits in cognitive functioning.

Reduced attentional resources and slower information processing speed seem to be among the main factors behind the cognitive deficits observed in old age (Salthouse, 1996; Yakhno, 2007). This results in slower learning also influenced by unfamiliarity with new technologies and possible difficulties in eye-hand coordination. But a relevant role is also played by emotions and motivation (Yin et al., 2017; Scheibe, Blanchard-Fields, 2009). Older people perceive that they perform less well than they used to and therefore tend to minimise the frustrations resulting from failures in more demanding activities. Faced with novelties, such as learning to use technological devices, may defend him/herself against the risk of experiencing failures by entrenching himself behind an attitude of disinterest in situations that would involve an effort to learn and the risk of failure. The activation of avoidance behaviour is very widespread among the elderly as a defence mechanism against the self: to avoid engaging in something in which one might fail is to avoid triggering situations that would be further demotivating.

Both neurological changes and the emotional-motivational component therefore play an important role in a normal ageing process. At a time when learning to use technological devices is considered to have a positive influence on the quality of life

and accessibility of services for the elderly, it becomes a priority to take into account the processes of ageing and the inhibiting/facilitating factors in learning new skills.

3. Protective factors and non-linearity of ageing processes

Normal and pathological ageing processes have individualised trajectories, and their symptomatology is characterised by wide inter-individual variability. This is because the ageing process is strongly influenced by the individual history of the elderly person. One of the factors that is unanimously recognised as being protective of the ageing process is education: those with a high level of education are more likely to have a gradual and relatively restrained ageing of their cognitive abilities, apart from complications such as the presence of strokes or pathological neurodegenerative processes. A good level of education brings with it a series of advantages that influence the quality of life of an individual: a higher education generally corresponds to a better job position which is accompanied by a better income which allows one to enjoy better living conditions and access to first-rate health services, all aspects that contribute to increasing life expectancy. Engaging in activities related to the social world or cultivating interests, passions and hobbies represent protective factors that can help prolong one's self-sufficiency. Furthermore, it is particularly relevant to preserve social relationships which on the one hand guarantee against isolation and, on the other, encourage involvement in actions and activities aimed at helping others and conducted together with others (Schieber, 2003). Although apparently simple to implement, these actions that can promote a good quality of life in old age are not within everyone's reach. In fact, interests, passions and hobbies as well as the propensity to take part in socially useful initiatives need to have already been part of an individual's life before arriving at old age. Those who have been completely absorbed by their work and not finding the space to cultivate other interests will hardly be able, once retired, to develop interests capable of fueling their physical and mental activity, thus obtaining the advantages linked to quality aging. The different life experiences of people are therefore at the basis of the wide individual variability, typical of old age, which determines different aging trajectories even in the absence of relevant pathological events. In this sense, actions aimed at guaranteeing a good old age in the future should be activated in early adulthood, inducing people to adopt good life practices, to develop personal interests other than the main work activities, to facilitate participation in collective activities in so as to be already predisposed, and in some way prepared, to fill the free time of old age with similar activities, thus achieving an active old age. Due to the various non-normative events that characterize the life of everyone, it is not possible to think of obtaining homogeneous aging processes of the population, but it is legitimate to imagine a greater diffusion of behaviors capable of positively influencing aging processes.

4. Technology and third age

Technology is an integral part of daily life: the vast majority of commercial transactions take place using technology, many personal services make use of new technologies and, consequently, users must learn the use of technology. Depending on the country, between a fifth and a third of the population is over 65 and has to deal with the massive use of technology in daily life. Since its introduction, technological progress has been seen as particularly useful for the population in general but, above all, for those in fragile conditions. The possibility of requesting health services from your own home, the opportunity to get food without having to go to the shops are just some examples of the useful use of modern technologies. The spread of the Internet and increasingly high-performance cell phones has increased the possibility of maintaining relationships even in the event of physical impediment, making frequenting places of aggregation no longer essential. The increase in the mobility of people, which has favored the phenomenon of disintegration of family units whose members have had to move away from their family unit for work reasons, finds, in the use of modern communication systems, a useful tool for preserving and strengthening parental, family and friendship ties. Communication, once entrusted to the postal system and subsequently to traditional telephone lines, now makes use of modern technologies allowing, through mobile phones, personal computers and tablets, to communicate in real time in oral, written and by video dialogue with people who live in distant countries.

We have already mentioned the possible resistance to the use of technology by the elderly, but it must be noted that the more active elderly population has shown an ever-increasing interest in learning about the use of digital technologies with particular reference to the use of mobile phones and computers (Shirahada et al., 2019; Chen et al., 2021;. Clear proof of this interest is provided by the high attendance by the elderly of training courses in the use of personal computers which are never lacking in the programs of organizations such as third age universities or the popular university whose target student population is predominantly made up of those over 60. The COVID pandemic, which has had global resonance and has seen millions and millions of people forced to drastically reduce in-person relationships, has provided a further push to learn and use modern technologies (Yap et al. 2022; Pan, Jordan-Marsh ,2010). The elderly, forced to be isolated in their homes to safeguard their own health and that of others, have discovered the usefulness of being able to interact, albeit virtually, with their family members using personal computers. The skills acquired during the pandemic continued to be used afterwards, providing elderly people with the opportunity to maintain a wide network of relationships without having to face physically burdensome movements or travel. The virtual remote relationship mode is not always preferable as it induces a substantial reduction in the opportunities to carry out physical activities to reach meeting places, friends' houses, etc. But if used wisely, technology allows the elderly to keep in touch with a greater number of people, to be updated on events in the world and to be able to satisfy countless curiosities through the information and services that the

internet makes available. The increase in the electronic market and the spread of online shopping delivered to home are just the most obvious examples of the changes induced by the recent pandemic which have translated into an objective advantage for elderly people as well as the progressive development of online access to health services that avoid sometimes fruitless journeys and long waits (Zhou et al., 2019; Kuoppamäki et al., 2017; Lian, Yen, 2014; Ekeland, 2010; Nikou et al., 2020).

We are therefore seeing an ever-increasing number of elderly people approaching the world of technology partly for the advantages it can guarantee them, partly because the world is increasingly moving in the direction of automated processes that exploit the most modern technologies with the intention of facilitating a series of operations by reducing the time needed to complete them. The most widespread learning methods among the elderly are self-learning, attendance at training courses dedicated to the elderly, and teaching by younger family members.

Self-learning involves the ability to understand the operating mechanisms of the devices which imply a sufficiently high level of education or previous experience acquired during the last years of working life. The cases of people who undertake a self-learning path without any type of previous experience in the field are very rare: generally people have already had the opportunity to deal with new technologies and, thanks to this experience, they aim to improve their skills mainly in the use of the most widespread mobile telephony, simpler and which does not require further investments to set up Internet and wi-fi at home.

Curiosity, the need to be able to operate with a larger screen size and the need to better manage the information found on the network are the basis of the interest in the world of information technology, in particular for personal computers and their possible uses. The many computer literacy courses and learning to use software that are made available by the main training agencies for the elderly respond effectively to this need. And this is a sector that mainly attracts young-older people who, having finished their work, want to deepen their knowledge of computer use, if they have not already done so. Carrying out operations, currently also possible with the use of smartphones, having at their disposal not only the possibility of bypassing possible sensory limits but also the opportunity to access software that allows them to make the most of technology, pushes the elderly to equip themselves with a wi-fi connection at home and a personal computer to communicate with the world. Writing emails, connecting via videoconference with relatives and friends, accessing multimedia content available online, carrying out banking transactions, purchasing on the electronic market, accessing the healthcare system's booking service, and receiving medical prescriptions are just some of the possible uses of modern technology which can encourage older people to deepen their knowledge in the sector. Finally, we must take into consideration the possibility that the process of training in the most common functions made available by modern technology can be stimulated by the relationship with one's family members, in particular with one's grandchildren who, belonging to the so-called digital generation, are familiar with

the use of smartphones and personal computers and can, in the presence of an emotional relationship with their grandparents, pass on to them the minimal skills necessary to keep in touch. Any learning of this type can stimulate the elderly person to carry out further investigations on their own.

5. Advantages and risks of technology in older age

Obviously, technological progress also has advantages and disadvantages that are specific when the person using it is elderly. We know that maintaining a good network of social relationships averts the risk of loneliness, which is dangerous both from a psychological point of view, since it can represent a risk of depression, and in terms of physical health: having a very strong network of social relationships reduces the possibility of getting help when the need arises. Therefore, the use of mobile tools and personal computers to maintain, strengthen and, in some cases, start new social relationships can only be seen as useful and valuable. At the same time, it is important that the technological medium is not the only channel used to keep the network of social relationships alive. In fact, a large network of relationships usually corresponds to a conspicuous possibility of participating in group events, of being involved in activities or actions outside the home walls, which, in itself, has a beneficial effect on the motor component of health. Technology, therefore, must be used to integrate the system of social relations, to overcome any impediments due to health conditions, atmospheric conditions, transport difficulties, but it must not be a substitute for in-person social relations so as not to have negative repercussions. not only on the psychological side but also above all on that of physical health.

Even applications that allow you to carry out banking operations without going to the bank or those for e-commerce that allow you to make purchases without leaving home expose you to the same risk: if, on the one hand, they speed up procedures, save time and reduce the effort of moving, waiting and carrying burdens, on the other eliminate the opportunity to move and meet people.

However, there is a series of applications aimed at monitoring the health of the individuals which, although not a substitute for the usual clinical tests and the relationship with the doctor, can contribute to the monitoring of the main functions as well as the level of activity performed on a daily basis (Deng et al., 2014; Block et al., 2020). These applications make it easier for the elderly to take care of themselves, using technology to remember to take medications, to monitor their heart rate, breathing, the number of calories consumed, and the distances covered on foot, to name some of the functions most common easily detectable through a smartphone connected to a smartwatch (Li et al, 2019). But we know that a lot is also being done in terms of controlling the values associated with certain pathologies, such as diabetes which can be controlled without resorting to the classic finger prick and the use of reagents but simply by wearing a particular patch which can send a reliable blood glucose measurement to your smartphone. Even in this case, the use of technologies must not be thought of as a totally substitute for the direct relationship

with one's doctor. But it must be thought of as an integration to the attention towards one's own health which can mean prolonging their expectation of recovery life for an elderly person.

Using the Internet also involves other risks to which all users are exposed regardless of age, but which represent a danger especially for the elderly. The possibility of contacting many people without necessarily having to reveal one's identity has favored the development of a series of online scams which, despite repeated warnings and information campaigns, continue to claim victims, some of whom fall into the elderly. The elderly have always been among the favorite victims of scammers because they are more easily deceived. To the usual scams conducted by impersonating maintenance or energy supply workers, in which criminals try to break into homes to steal money and precious objects, a great variety of telematic scams have been added which, by exploiting naivety and curiosity of users, aim to steal sensitive information through which they can access bank accounts to carry out money transfer operations without the victims' knowledge. This type of scam was born shortly after the spread of modern technologies and has struck and continues to strike regardless of age. However, the approach of the elderly to the use of technologies for the reasons we have explained above has increased the number of people over sixty who use the Internet, exposing them to the risk of being scammed. In a country like Italy, reports of online fraud in 2022 exceeded the number of 144,000, but this is a value that underestimates the real data given that many, out of shame at having fallen for the deception, do not report the facts. 18% of the victims were over 65 years old and were predominantly male (), reflecting the greater spread of internet use among males. The increasingly frequent use of the Internet to carry out commercial operations and the impressive increase in online scam attempts pose a clear IT security problem which, beyond its intrinsic importance, is fundamental in encouraging the maintenance of this trend approach to technologies by the elderly. In fact, the succession of fraudulent actions and the ineffectiveness of security mechanisms can discourage the elderly from using tools that in other respects show that they can help them. Fraud against the elderly is not only one of the vilest, because it affects fragile and often economically poorly endowed people, but it also produces psychological damage, which adults can overcome with a certain ease, but which is difficult for the elderly to overcome and elaborate, linked to the sense of guilt that the individual feels for having been deceived.

The shame of having been deceived, despite the experience, and the embarrassment of having to resort to the help of family members to make up for any economic damage suffered, often lead the defrauded elderly people to hide the fact, not to report it, to passively suffer thus entering a perverse loop in which, without the possibility of comparing oneself with others, a rumination mechanism is activated which fuels anger on the one hand and a sense of guilt on the other and pushes the elderly person to isolate themselves. From a psychological point of view, the consequences of these changes, induced by the scam suffered, can determine the

appearance of depressive symptoms, increase the fragility of the victims and make them more fearful of the world that exists outside their front door.

6. Conclusions

Technology has undergone an accelerated development process which, in less than a hundred years, has taken us from the first tube computers to the astonishing capabilities of artificial intelligence. The use of technology has therefore become pervasive, extending from industrial applications to daily use by all of us. This expansion into the various spheres of existence responds to an evident economic need to obtain profits from the huge investments made over the years. Like all changes, the introduction of technology has also produced advantages and manifested limitations: if on the one hand we are already experimenting with automation processes that involve activities that until recently were specific to human beings, on the other hand we are learning to know the limits and dangers that can be associated with the use of technology. The massive use of technology, for example, in the production of vehicles has made it possible to implement safety controls, providing help to drivers in reacting promptly to dangerous situations but, at the same time, it has also shown its limits where the technological component, misinterpreting the information received, takes control of the vehicle, preventing the driver from managing it with often unfortunate results. The elderly population is increasing globally but particularly in advanced developing countries, those whose economic conditions allow us to think of the elderly as an interesting market for modern technologies. For this reason, applications have been developed aimed at promoting communication, health monitoring, access to healthcare services and facilitating control of domestic equipment. However, the possible advantages of technology are strictly connected to the user's real ability to fully exploit it: this implies particular attention to the process of learning how to use technologies, learning which must deal with the changed conditions of cognitive efficiency which frequently are observed in people, especially older ones. The ever-increasing diffusion of tools such as personal computers, smart phones and tablets and the traumatizing experience of isolation experienced during the pandemic period, partly addressed and overcome thanks to the use of the tools listed above, have further increased the interest of the elderly to learn and use new technologies to improve the quality of life and facilitate the execution of a series of actions as well as the maintenance of personal relationships. However, we must not forget that the excessive or inappropriate use of new technologies can produce undesirable effects to the point of being counterproductive with respect to the objectives for which they were introduced. We observe the most dramatic effects among young people, who are probably among the greatest users of the applications introduced by new technologies, but we cannot ignore the risks associated with the use of new technologies for the elderly population. The diffusion among the elderly of applications designed to positively influence their quality of life must be accompanied, in addition to the learning of the notions necessary to use them

effectively, by adequate training in the moderate and "intelligent" use of tools that can have ambivalent towards issues such as loneliness and activity on the part of the elderly which, we will never cease to remember, represent fundamental aspects for guaranteeing good aging and minimizing the periods of non-self-sufficiency of an elderly person. Added to the risk of resorting almost exclusively to the use of technologies to manage daily life and maintain personal relationships, forgetting the importance of the physical activities that usually accompany these actions, are the increasingly frequent fraud attempts perpetrated using technologies. Beyond the purely legal aspects, since the psychological impact associated with suffering a scam is now known, it is essential to combine learning of the use of technologies with knowledge of the risks connected to them so that the elderly user is not simply able to use a personal computer or a smartphone but is also able to avoid falling into traps and scams, the frequency of which has certainly increased thanks to the possibility of easily and anonymously reaching millions of people.

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