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MOTS-CLES : *DIGITAL NATIVES* AND MENTAL ILLNESS. SCHIZOPHRENIA AND ROLE OF MEDIA IN REPRESENTATION. INSERTION, SERIOUS GAMES, BRAIN AND COGNITIVE REMEDIATION.

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¹ See so : Galinon-Méléneec Béatrice, *From "Sign-Traces" to "Human-Trace"*, traducted by L. Brown, Hong Kong, 2013. halshs.archives-ouvertes.fr/halshs-00935346

Introduction

The information and communication sciences that are nourished by interdisciplinary exchange face many challenges. One of the most difficult to account for is the current advances of the cognitive and medical sciences on brain function. What processes allow us to learn, behave and communicate with others? Advances in neuroscience condition “those in medicine, neurology and psychiatry, those with knowledge of normal and pathological development of the nervous system, those in the humanities, particularly education” [...] and those who “highlight the brain’s extraordinary plasticity and capacity for regeneration, its underlying mechanisms for communication between neurons, for memory, for affective states, for sleep, for pain and for consciousness” (KORN, 2003). As such, it is possible to incorporate some of their contributions into my research on the relationship between *signes-traces* and communication, especially for what concerns me here between *corporeal signes-traces* and communication in the context of social and professional insertion.

First, I will take up some of the points raised in previous chapters, and the issue of classifications and their discriminatory consequences. I am particularly interested in the 18-to-30-year-old demographic, so will draw their digital video game consumer profile. I will probe the influence of games and the digital on the brain, and why recruiters find an advantage in recruiting this profile type. This leads me to cross this analysis with those conducted on schizophrenic patients, to know whether new avenues are opening to promote their social and professional insertion.

MENTAL ILLNESS AND SOCIETY

Economic and Cultural Contexts of “Advanced” Societies

In the year 2000, Alain Ehrenberg (Ehrenberg, 2000) had already warned that the enhancement of well-being that had developed in the second half of the twentieth century was exacerbating the rise of individualism. It appeared that the ever-increasing Rights of Man “for himself” and the expansion of individual freedom to choose were confronting the challenge of responding to the injunctions of total quality in every domain. I have analysed the spread of diagnoses of anxiety, musculoskeletal disorders² and chronic fatigue as *signes-traces* of a body that has internalised the societal constraints of modern humans (GALINON-MELENEC, 2011: 181). The need to perform at a high level, which, beginning in the

²Musculoskeletal Disorders (MSDs) encompass several pathologies that develop following a series of repetitive movements, carrying heavy loads, or vibrations. The most well-known are low back pain, tendinitis, and carpal tunnel syndrome. They apply to all industries and to all employees. These diseases increase by 18% every 10 years. Viewed 21 January 2013, <<http://www.juritravail.com/Actualite/accident-du-travail/Id/2710>>. Translation by L. Kraftowitz.

twentieth century, extended to all fields, is even more pronounced in the post-2010 context of economic crisis. *Le Monde*³ states in this vein that “tension at work has significantly increased in almost all OECD countries⁴. In the United Kingdom, it affected 40% of employees in 2010, compared to 25% on average from 1995-2005. In France, 30% were affected, compared to 20% for the same periods, and in Spain, 41% were affected compared to 29%. The least skilled workers are most at risk [...]”. The OECD states that “the growing work insecurity, and the current increasing pressure at work could cause a worsening of mental health problems in the years to come [...]” and that “by ‘poor mental health’⁵ it means major depression, severe addiction (alcohol, drugs), manic-depressive disorder ... and all the mental illnesses that be determined through medical diagnosis”⁶. In that same vein, the World Health Organisation (WHO) reports that mental disorders are currently booming insofar as the WHO considers them to have entered the list of top ten most concerning global pathologies of the 21st century. This ranking makes them high-priority issues for the WHO because, firstly, they are responsible for a certain amount of mortality by suicide⁷ and, secondly, because they are carriers of a significant social toll, not only for their victims, but also for those with whom those victims come into contact. Indeed, the “companions” who are absorbed into the disease’s management are subverted from their normal activities, and this has consequences on health, economics, and cultural and social ties. In this way, society loses the contribution of a portion of the population and takes on the direct or indirect cost of the treatment. Finally, these pathologies are a significant factor in exclusion. Because of the weight of these societal and economic consequences, multidisciplinary research on mental handicap is developing.

My analyses aim to build bridges between my work and the information and communication sciences on the question of the *Homme-trace*⁸. Here, I place the perimeters of an ongoing research project on the *digital native* demographic because in this section of the population there are, of course, “digital consumers”—all activities inclusive—but more specifically, there are users who are addicted to virtual games. In the present context, I will focus more closely on the youngest section of that population (18-30 years old) that corresponds to the double criteria of being *digital natives* and also part of the population that expresses a specific mental pathology: schizophrenia⁹. Without pretending to understand its

³ See <http://www.lemonde.fr/societe/article/2011/12/17/les-troubles-mentaux-augmentent-chez-les-salaries_1620062_3224.html, viewed 20 September 2012>.

⁴ The OECD includes 34 of the most economically advanced countries, but also some emerging countries such as Chile, Turkey and Mexico.

⁵ *Le Monde*, 17 December 2011.

⁶ *Ibid.*

⁷ 10,500 deaths in France by the year 2006 (UNAFAM).

⁸ Galinon-Méléneac Béatrice, « Des signes-traces à l’Homme-trace. La production et l’interprétation des traces placées dans une perspective anthropologique », dans Mille A. (dir.), *De la trace à la connaissance à l’ère du web, Intellectica*, 2013/1, n°59, pp. 89-113. Publié en anglais sous le titre *From "Sign-Traces" to "Human-Trace"*, L. Brown, Hong Kong, 2013. halshs.archives-ouvertes.fr/halshs-00935346

⁹ Schizophrenia has three types of risk factors (See: "La prise en charge de votre schizophrénie. Vivre avec une schizophrénie [Taking Charge of Your Life With Schizophrenia: Living With Schizophrenia,], HAS, November 2007.) “Biological/genetic, early environmental (such as birth complications or infection during pregnancy), and late environmental (such as the use of cannabis or some certain communicational difficulties within the family). These three types of risk factors favor the onset of the disease by acting independently but also together. Psychiatrists over the past thirty years have developed the concept of a multifactorial susceptibility to schizophrenia, rather than considering a solely biological or psychoeducational one. The treatment for the illness is multidisciplinary: medication (antipsychotics, which act on the level of brain on the neurotransmitters associated with schizophrenia *via* dopamine and serotonin), psychotherapeutic, and social measures: great

complexity, I approach the situation of schizophrenic patients, whose disease is still difficult to cure, because it requires a multidisciplinary approach that is only now emerging—but for which it has been proven that patients are “primarily dangerous to themselves, since one out of two attempts suicide”, and are subjected to a “stigma” that affects their social and professional insertion (Bottero, 2012). My work is thus a part of this desire to contribute to opening the academic disciplines towards the goal of improving the social integration rates of these “*mainstream*” patients. This is quite far from the idea of intervening directly in the medical field, in which I am a complete novice. The developments discussed below extend the pathways begun in the previous chapters. I take up some points, including how games develop concentration and motivation, encourage initiative¹⁰, and support steps towards the employment of the mentally handicapped. The video game “encourages its user to communicate by making available an increasingly connected medium, an online technology, and an essentially playful grammar. That this communication is biased changes nothing [...]” (LAFRANCE and OLIVERI, 2012). In this context, video games can be considered a “new technical response to the fundamental question: how to approach the Other?” (*Ibid*).

The intersection of controversial themes (digital traces, video games, the scope of schizophrenia, etc.) requires analytical and interpretative caution. In addition to those needed for any research, in this case I add those brought on by the combination of multiple disciplines to address heterogeneous theoretical positions. This plurality of languages creates misunderstandings that often feed mutual disapproval, or interdisciplinary conflict. Given these challenges, I propose nonetheless to overcome these divisions that are often provoked by research on the body-mind relationship (CHANGEUX and RICOEUR, 1998)¹¹, and to explore the topic of games in support of an approach that aims to restore behaviour that can aid the social integration of schizophrenic *digital natives*.

Schizophrenia, a Hundred-Year-Old *Modern Disease*

Current official figures for schizophrenia indicate that 1% of the world’s population, and about 600,000 people in France, suffer from it. These figures are even more shocking because it was only at the beginning of the 20th century that the observation of patient behaviour allowed for distinguishing between psychotic disorders. The term “schizophrenia”, originally coined by Eugen Bleuler (BLEUER, 1911) comes from the Greek σχίζειν (*schizein*), meaning to fracture, and from φρήν (*phrên*), meaning mind. This etymology’s meaning is often confusing. The fracturing in question primarily indicates a fracture between reality and its representation in an individual’s mind. Attention to this illness is growing. This leads one to believe that it is actually a “great unknowable” (BOTTERO, 2012), whose contours are unknown. The categorisation therefore seems quite imperfect, and even if I use it here to report on the most experimental and cutting edge research, we must keep in mind that

importance is given to measures to support professional integration.” It is on this latter aspect of the treatments that my work focuses on. Translation by L. Kraftowitz.

¹⁰ See the plan for science and technology at the School launched by the Ministry of Education in France in 2011 (Pamphlet No. 2011-038, 4 March 2011).

¹¹ The controversy on this topic was widely discussed.

its scope is in doubt. Indeed, it is difficult to establish precise thresholds between behaviours considered *normal* by society and others, with society and knowledge evolving, and with it, the focus on the pathological.¹²

Research on schizophrenia is increasing, and is exploring both genetics and environmental factors, as well as the link to the use of toxic chemicals, dysfunction in the dopamine neurotransmitters, the data obtained from brain imaging, etc. Today, researchers from different disciplines are linking the increased presence of the disease to connected factors (none of them taken in isolation¹³), which include psychological and environmental stress that, if associated with genetic predispositions, could create a particular vulnerability to risky behaviour (use of drugs, alcohol, etc.)¹⁴. The correlation between increased drug use in the adolescent population and the increasing occurrence of schizophrenia in young adults (18-30 years) can hardly be doubted, even as the illness's causes today appear to be multifactorial and difficult to identify when accounted for individually. So for example, if the transmission of genetic predisposition may be able to explain a particular susceptibility to a schizophrenia that is associated with risky behaviour, it cannot be considered alone *per se*. Similarly, while progress is being made in medical imaging for examining patients with methods that are not only behavioural (TIBERGHIEU, 2008)¹⁵, this alone cannot unlock the complexity of factors involved in this disease (BOTTERO, 2012). It is therefore with great caution that I discuss in this chapter some observations made *via* brain imaging methods and cognitive science. However, I bring them up because they seem to partly support my hypothesis on the history of individual-environment interactions, on the existence of *corporeal signes-traces* in general and, for our purposes here, within the brain.

In 1940, Gaston Bachelard (BACHELARD, 1940) had already published his book *The Philosophy of No*, defending the thesis that a child is born with an incomplete brain. A few years later, Jean-Pierre Changeux (CHANGEUX, 1983) took this idea further by explaining how he built himself up until puberty through interactions with his surroundings. For Changeux, the *Neuronal Man* is born with an abundance of neuronal connections. At every moment, the baby moves, looks, fusses, thereby acquiring a store of information from the outside world. Stimulation caused in this way results in signes-traces (according to my terminology), which are registered in the brain and through the elimination of synapses. As I

¹² The case most often cited by way of illustration is *hysteria*.

¹³ This is a very important point to avoid ethical compromise.

¹⁴ See <<http://www.drogues.gouv.fr/etre-aide/sites-internet-utiles/sites-ministeriels/>>, viewed 21 January 2013.

¹⁵ This approach must be subjected to numerous interpretative precautions. I rely here on the words of Guy Tiberghien (2008): "The functional locations suggested by neuroimaging are all the more convincing because they relate to stable and repeated associations between carefully defined and measured behaviour in an objective and tightly controlled situation: for example, a situation where we simply detect the presence of a clear suprathreshold signal (a sound or a light, for example) by pressing a key (a sensorimotor association). In this case, the primary auditory cortex, the premotor cortex and the motor cortex are stably activated. Controversy is far greater when the research objective is to locate the brain's various complex and hypothetical cognitive entities, as is often the case with studies that focus, for example, on language, memory, attention, or problem solving. In any case, we should not lose sight of the fact that locating a cognitive process in the brain does not alone explain it. Explaining a cognitive process is a theoretical enterprise involving the consideration of numerous indicators and the integrative linkage of many regions of the brain. The findings of some studies become very scientifically questionable when it comes to locating in the brains entities for which we do not yet possess sufficient empirical or consensual knowledge." Viewed 21 January 2013, "Par quel miracle des entités cognitives mal définies pourraient-elles être précisément localisées dans le cerveau ?" <<http://sfpsy.org/IMG/pdf/Tiberghien-21fev2008.pdf>>.

have already discussed, all but a very few signes-traces become invisible-visible signs, a silent but meaningful language¹⁶.

Brain plasticity¹⁷ does not move only in one direction. If there is damage from high-risk behaviour, or from other factors, remediation activities through cognitive rehabilitation must be considered. This, of course, is designed in an ethical context protecting the individual from abuse. In this perspective, some researchers also highlight the importance of games (FRANCK, 2006), something I'll return to further on, although with some reservations as to the conditions of their implementation.

SCHIZOPHRENIA BETWEEN FANTASY AND REALITY

Schizophrenia: A Pathology of Controversial Contours

Let's first remember that schizophrenia affects people who have an average, even an above average, intellectual quotient (IQ). This intellectual capacity comes with brilliant successes that sometimes mask symptoms. Even when those symptoms are identified, they are often seen as part of the person's talent or intelligence. In this case, there is no exclusion, or only a *relative exclusion*. Thus, exceptional people who have marked the history of science and societies have been, rightly or wrongly, assessed to be schizophrenics (Socrates and ISAAC NEWTON, for example). Some have even won a Nobel Prize (the great mathematician JOHN FORBES NASH, Jr., who received a Nobel in economics, for example¹⁸). Many produce great works, as evidenced by the masterpieces left by Vincent VAN GOGH¹⁹, Robert SCHUMANN²⁰, Jean-Jacques ROUSSEAU²¹, and Antonin ARTAUD, to name a few. The social utility of schizophrenia is not in doubt for these exceptional cases, particularly when, *ex-post*, their abnormality no longer bothers contemporary people.

The contours of schizophrenia are far from uniform. From my reading, I maintain that there exist several forms of schizophrenia²²; some authors even say there are as many forms as there are patients. The definitions overlap only at the moment of crisis: this is characterised by a loss of contact with reality, which engenders distress that interferes with the individual's ability to perform professional, familial, or "normal" social functions. The crisis only occurs

¹⁶ I have already explained that the lack of trace may also be an indicator. See Galinon-Mélénec B., *L'Homme trace* (CNRS 2011), chapter entitled "Prolegomena" pp. 15-30.

¹⁷ Brain plasticity means its ability to change and adapt in response to experience. According to J.-P. Changeux (Changeux, 1983), the human brain is incomplete at birth. It builds until puberty through interactions with its surroundings.

¹⁸ <http://www-irem.ujf-grenoble.fr/irem/publi/TradMatematica_Articoli_Nash.htm#ha>, viewed 21 January 2013.

¹⁹ Blumer M., (1984).

²⁰ Duperret N., (1994).

²¹ Binswanger, L. (2002). Verdeaux J. (2004).

²² According to "La prise en charge de votre schizophrénie. Vivre avec une schizophrénie", HAS, November 2007, viewed 2 September 2012, <<http://sante-az.aufeminin.com/w/sante/s339/maladies/schizophrénie/5.html>>. There are seven main types of schizophrenia. The first, "Simple Schizophrenia", is characterised by "prominent negative symptoms: depletion of social and professional relations, a tendency towards isolation, and autistic withdrawal to an inner world. Little to no delusional symptoms".

once in life, revealing a fragility which must then be continuously addressed, although not necessarily through a permanent medication regimen.

Behavioural differences commonly attributed to schizophrenia are those generally observed in the acute phase of the disease. Here, I am only addressing the one type (paranoid) that is most commonly portrayed by the mainstream media, particularly its episodes of crisis²³, a portrayal that contributes to a simplistic representation of this condition within the collective unconscious.

The paranoid individual “is characterised by a pervasive distrust and delusional beliefs that they are the target of persecution, which are often bizarre (e.g. being controlled remotely by electromagnetic waves), as well as auditory hallucinations (hearing voices) giving the individual orders or relentlessly commenting on their actions. The perception of being persecuted, and the mistrust that this engenders, often leads to anxiety, irritability, or more rarely violence with the goal of defending against or purging their persecutors.” This form is often showcased in violent thrillers (depicting crimes, etc.), which are at times propelled by media imagery (linking crime with schizophrenia), which contributes, with no backing by the statistics on schizophrenia, to this association between violence and schizophrenia.

Challenging Classifications

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR)²⁴ provides criteria to facilitate the diagnosis of schizophrenia. Its taxonomy is disputed; and as with any classification of humans, it is indeed questionable. For if the differentiation is within the nature of people, and if every person is different, then choosing criteria for differentiation to establish classifications results in communicative interactions between people who need a simplified representation of the world in order to think and act upon it. Language is necessary to for humans to name fragments of reality and communicate about them, but it introduces discontinuity to the world’s continuum. With every scientific revolution, the representation of the world changes, and with it, the systems of classification evolve (Hacking, 2001). Classifications of people and their behaviour are dynamic and interactive: they result from interactions between actors in society at the heart of which²⁵ it is possible to count not only expert scientific knowledge, but also “populist knowledge nourished by news articles and mainstream books, or spread through oral statements that are often widely disseminated on television” (HACKING, 2001)²⁶.

²³ For both international classifications of psychiatric diagnoses, see the International Classification of Diseases, 10th Edition (ICD-10), published by the WHO, and the Diagnostic Statistical Manual, fourth edition (DSM-IV), published by the American Psychiatric Association. Source: Dr. Celine Brean and Dr. Raphael Gourevitch (psychiatrists at Sainte-Anne Hospital Center of Paris) and Aude Caria (Coordinator, Psycom75), *Les troubles psychiques*, Psychocom75, www.psycom75.org/.../bleu. These classifications provide a clinical description of syndromes (including all symptoms). They do not account for personal history.

²⁴ DSM-IV-TR, Paris, Masson, 2003.

²⁵ Hacking (Hacking, 2001) considers autism to be not only a developmental disorder, but also “an administrative classification, especially in schools and institutions of assistance and care.” Translation by L. Kraftowitz.

²⁶ Observing with Thierry D'Amato (Amato, 2012) that already today the symptoms associated with a diagnosis of schizophrenia come from categories across several pathologies, it seems likely that it will be the same tomorrow for schizophrenia.

The Role of Media in Representation

Media's influence on collective fears and rejections leads me to recall one of Edgar Morin's major works (Morin, 1969), *La rumeur d'Orléans*. In this book, he took up the case presented in *Le Monde* on 7 June 1969, under the headline, "Des femmes disparaissent à Orléans. Canular ou cabale ?". Let's revisit the content of this rumor²⁷:

"A disturbing rumor was reported regarding the disappearance of young women, who were allegedly chloroformed in fitting rooms in shops on the Rue de Bourgogne. A wave of panic blew over the city for several months [...]. One morning, a group of curious onlookers was pressed against a ready-to-wear store window on Rue de Bourgogne. The owners were concerned by the crowd and called the police. When the police arrived, the onlookers had swelled in their ranks. The police questioned passersby. People were arrested because they were told that a young girl had entered but never emerged [...]. The police hadn't been alerted to any suspicious disappearance. This fact had also been highlighted in the press from the start. But it was not enough to kill the rumor, because people imagined that the truth had been hidden from them in order not to alarm them (MORIN, 2009)²⁸."

The rumor spread by generalising under the headline, "Be Careful in Changing Rooms." Edgar Morin explains the process as follows:

"The emergence of this rumor in a quiet town seemed indicative of the profound changes that French society was undergoing at the time [...]. I had been impassioned for the events of May 1968. There, we were faced with something equally captivating: the resurgence in a modern city of a story borrowed from the Middle Ages [...]. One thing that was not said openly, but which shone through when studying this rumor, is that all the traders involved in the rumor were Jews. This rumor thus betrayed an unconscious anti-Semitism coming directly from the medieval period. The Jews played the age-old role of scapegoat. This catalysed the anxiety of the rest of the population [...]." The anxiety was born "from change. The one who incarnated, in a way, these girls who went to stores to buy miniskirts or fashionable clothes. This anti-Semitic frenzy against the Jewish merchant taking girls away to feed a secret prostitution ring revealed the malaise of some of these women, who were torn between the desire to act emancipated, and their old inhibitions. Their parents could also use this rumor, saying: You see, it starts with the miniskirt, but we do not know where it might lead" (MORIN, 2009).

In Orleans, the historical context lent itself to an interpretation that viewed Jews as scapegoats. The rumor spread in Paris and throughout France, in a general French context

²⁷ For more details, see the INA archives, viewed 21 January 2013, <<http://www.ina.fr/economie-et-societe/vie-sociale/video/I08016656/edgar-morin-a-propos-de-la-rumeur-d-orleans.fr.html>>.

²⁸ "La rumeur d'Orléans, Quarante ans après", interview with Edgar Morin, *Le Point*, 5 July 2009.

where erotic fantasies were spreading in the media, and where the new behaviour of the younger generation was worrying parents. E. Morin's analysis reminds us that controlling interpretation is always illusory. The imaginary and the contextual make them uncontrollable. The judgments of some contemporaries about schizophrenics comes from the same process. It is the same with digitisation. They objectify the anxiety of the unknown, of the different, of memory resurgence linked to individual and social history. For schizophrenics, discrimination should improve with better knowledge of the disease²⁹. In this sense, like Livia Velpry's conclusions following his pragmatic observations of the daily life of the ill, (Velpry, 2008), I too emphasise the impact of "profane management"³⁰ of the relationship to a person with a mental disability. In the digital world, it shows that the humans are not yet able to master the social change they herald. The publications and dissemination to the general public of the works of researchers on these issues should help to reduce this³¹, but can never eliminate it as long as humans have less than total control over their environment.

18-30 YEARS OLD, THE FIRST VICTIMS

Social Withdrawal: A Symptom Whose Meaning is Difficult to Index

Today's 18-30-year-old demographic is certainly composed of *digital natives*, which gives them, as I stated above, certain assets. But they also live in a social context that encourages the development of certain mental pathologies (ERHENBERG, 2000) that are not always recognised as such. It is at the onset of a crisis that the disease is diagnosed. However, the appearance may be brief and episodic, or simply unique. In the latter case, it is above all marked by the person who is the victim. For one, the patient, who lives the disease without knowing it, "*self-treats*" using various methods (drugs, alcohol, etc.), which leads to interpretative confusion. It follows that medical providers in France often confuse symptoms with typical adolescent behaviour, or attribute them to illicit substances. This is why a disease that affects the young adult population is not always diagnosed at its first symptoms.

Video Games: An Alternative to Social Withdrawal ?

The victim often undergoes a social withdrawal that leads to deserting professional development and becoming unsuitable for insertion. In the solitude of a room and the company of an alter ego, the individual begins diligently practicing video games. While gradually excluding the rhythms and customs of ordinary life, this provides a certain level of capability in these areas. Until now, this digital aptitude been little exploited³². Drawing from the principle of plasticity discussed above, Serge Tisseron says: "To the extent that these technologies merely reproduce and potentiate the entirety of our mental operations, [...] all the benefits that human beings can draw from them are those that they draw from the resources of their own minds, and the risks they court are also the same" (TISSERON, 2012).

²⁹ See *Sciences Humaines* 28, 2012.

³⁰ Data organized by the concept were collected in a Medico-Psychological Centre (CMP) in the Ile-de-France region.

³¹ Knowledge, by increasing the level of control, allows us to control fear.

³² Within the above specified limits.

By using the idea of psychological plasticity, he lays the foundation for therapy through avatars, “these pixel creatures that video game players build for themselves, and through which they interact.” Such analysis should be connected to my own concerning *the internalisation within the brain of signes-traces of interactions with one’s surroundings* (GALINON-MÉLÉNEC, 2011), and that of N. Franck (FRANCK, 2009)³³ on the importance of games³⁴ as a therapeutic accompaniment procedure for schizophrenia.

GAMES, IMAGINARY, BRAIN

From Child Games to Adult Games

Above, I discussed³⁵ the benefits and risks of online games for employability. I return to that now as a reminder that in terms of importance of games for development, a parallel significance has not been discovered with digital games. It should be remembered, following Jean Piaget (PIAGET, 1975)³⁶ and George Herbert Mead (MEAD, 1963)³⁷, that games respond, from the beginning of life, to the need to nourish the *primary process*³⁸ of building the world ; until adulthood³⁹, they support projections, open possibilities, and allow us to test reactions within specific contexts⁴⁰. Proposing to use games to help a mental handicapped person to rehabilitate therefore appears to be *a priori* perfectly legitimate. One can hypothesise that properly analysed by teams trained for the purpose, role-playing can develop within the panoply of techniques enabling the mentally handicapped to rebuild their lives and be socialised.

Games, Imaginary, and *Signes-traces* in the Brain

Paul Harris (Harris, 2000) conducted observations on three-year-old children. According to him, turning into a wolf, witch, or monster in a game did not produce any confusion for the child on the difference between reality and fantasy. Virtual games generally cater to adults. Take, for example, the digital identities emerging from the creation of *avatars*. In this case, the player develops a remote parallel identity in the space of his physical identity. In on-line video games, virtual behaviours build virtual socialisation. The consequences of choosing a violent avatar thus deserve to be explored carefully. Some work is beginning to emerge on this topic (Ceglie, 2011). With the change in medium, certain effects, particularly social ones, occur. Fanny Georges (George, 2012) conducted a study on the link between the

³³ Franck Nicolas, "Des jeux contre la schizophrénie ?" in *Cerveau & Psycho*, 33 May/June 2009, viewed 21 January 2013, <http://www.pourlascience.fr/ewb_pages/f/fiche-article-des-jeux-contre-la-schizophrenie-21981.php>.

³⁴ For my hesitations as to the conditions of implementation, see above.

³⁵ For how online gaming leaves digital traces on the Web, see below.

³⁶ For Piaget, children practice a “symbolic game”, in which they replay the scenarios of their daily environment (giving their dolls a bath, dressing them, putting them to bed, etc.). “La psychologie de l'enfant, quarante ans après Piaget”, *Les nouvelles psychologies*, 3, June-August 2006, viewed at <<http://www.scienceshumaines.com/>>.

³⁷ Mead, G. H. (1963).

³⁸ “Primary process”: Freud.

³⁹ And sometimes even after...

⁴⁰ Harris P.L., (2000) and Harris P.L., *Imaginer pour grandir*, Interview with Gaëtane Chapelle <<http://www.scienceshumaines.com/>>.

type of avatar a player chooses (“the puppet avatar, the mask-avatar, and the movement-avatar”) and the actual player. She concluded that the modalities for identifying the player's avatar induced more or less visible behavioural changes within the person's real environment. The question of cerebral signes-traces of identity borrowing, and their impact on behaviour, once again rejoins the problematic that I have posed elsewhere (Galinon-Melenec, 2008, 2011, 2012) on the *visibility and invisibility of corporeal signes-traces*.

Antonio Damasio (Damasio, 2010) also argues that games allow the individual to test out emotions and reactions to new situations, and provide an individual with a decision tree linking emotion to reason. It would be appropriate, it seems, to observe the relevance of these findings for patients with schizophrenia. To better discern the emotions and experiences of patients, ICT is also used: a study on the subjective everyday quality of life of a person with a mental handicap was performed using computerised method of data collection⁴¹. She worked with 40 subjects with schizophrenia and 43 control subjects. Responses to electronic questionnaires were held five times daily for 7 days. The investigation confirmed that the overall subjective quality of life appeared lower in people suffering from schizophrenia, particularly with regard to interpersonal relationships. The results also showed that healthcare dominates their daily life. This aspect might not be different from other people with diseases (often when a patient fights an illness, time management becomes a priority), but it can raise disparities in employment.

DIGITAL TRACES AND PROFESSIONAL INSERTION: FINDINGS

Digital Traces and Recruitment: Variable Importance According to Function

To determine the relevance of my assumptions, I conducted a survey⁴² aiming to better understand where the barriers to successful systems are placed, with a view to enabling the autonomy and social and professional insertion of the mentally handicapped. Starting out from the hypothesis discrimination could come from the difficulty of dealing with difference or strangeness, the study first focused on the use of digital social networks, a space where a handicapped person can seek out a kind of visibility that puts in the background or eliminates altogether the visibility of their difference. Observations were made in relatively small numbers that preceded a deeper investigation taking place over a longer time. To interpret them more precisely, I linked them to other recent surveys and research. It appeared that in the Estuaire de la Seine, the practice of tracking digital traces with the goal of recruitment was not on the agenda for the types of jobs being filled. In addition, it became apparent that the mastery of digital tools by companies was far from generalized. Chambers of commerce and industry were increasingly holding meetings to inform and motivate companies to use digital technology, encouraging them to change old strategies of global communication and

⁴¹ EMA: Electronic Momentary Assessment.

⁴² Investigations, mentioned above, led by Hadi Ayon Saba, doctoral candidate at CIRTAI/UMR IDEES (“Homme-trace” Team led by Beatrice Galinon-Mélénec). A former journalist in “sensitive” areas of the world, he used forms of surveys and interviews through the Web, as well as the role of standards and organizations in the visibility and invisibility of digital traces.

communication products to new media, and offering training on creating websites or ensuring a strong presence on existing sites⁴³. One sentence sums up the issue: “We are entering an unprecedented period of innovation and transformation: we must master it if we are to benefit from it”⁴⁴.

In fact, from the initial investigation onward, it appeared that the Le Havre recruiters were not tracking digital traces to better understand the identity of their candidates, regardless of “job profile” and general public. When asked about this, they explained that the cost of the practice could only be justified for high-stakes recruitment, for *management staff* personnel, most often located in the headquarters of international companies.

Companies that collect comprehensive data related to an individual (their searches and downloads, information on their geolocation, purchases, tweets⁴⁵, and so on) collect digital traces intended to predict the behaviour of the targeted individuals. This projection is based on the theoretical principle of “behavioural congruence”⁴⁶ between an emerging identity profile and the future behaviour of the person being digitally profiled. This projection is questionable at different points of view, but it is clear that it exists.

The digital traces found on the Web are both linked to and detached from the individual in question. They fragment and allow content to be autonomous and mobile. Detached from a page, place, document or person, they combine to construct other information. To be meaningful, digital traces are processed by algorithms designed on an ad hoc basis ; of course, the result reflects the algorithm’s sorting and processing process. Also, in general, any digital trace, simple or composite, should have its sustained mediations examined (GALINON-MELENEC, 2012)⁴⁷. All these mediations change their meaning, and we should examine them (JEANNERET, 2012). We cannot claim a meaningful interpretation without such a procedure of examination.

What produces a barrier among recruiters is less this uncertainty than the fact that the approach requires an investment in human and financial capital. Consequently, this procedure is only established in relation to expected profit or other economic-commercial issues. That’s why service providers and manufacturers seeking sales targets are consistently more interested than recruiters in tracking digital traces, since by targeting potential buyers they can expect a more immediate gain.

⁴³For the program and content of the day of *Compétitivité Numérique* (digital competitiveness), subtitled “*Quelle stratégie numérique pour votre entreprise ?*” (What digital strategy suits your company?), see <www.oretic.fr>. This event, held on 19 June 2012, organised by Pôle Normand des Échanges Électroniques and its partners, addressed “CEOs, marketing executives, and internet service providers. After an extensive survey on the needs of 400 business owners and managers in our area, we would like to provide answers to help you make the most of information technology”. Translation by L. Kraftowitz.

⁴⁴Corniou JP., *Émergences numériques au XXIème siècle*, lecture on 19 June in Rouen, PDF available online at <www.oretic.fr>.

⁴⁵A message of 140 characters, posted on the social network Twitter.

⁴⁶I use the term “behavioral congruence” here to mean a perfect fit between an identity profile coming from digital traces and future behaviour. This should not be confused with the concept of “behavioural consistency” that I have cited, analysed and commented on in Galinon-Méléne B., Monseigne A., (2011): p. 111-124.

⁴⁷As already indicated and as underscored by Yves Jeanneret (Jeanneret, 2011 and 2012).

Support for the Professional Insertion of the Mentally Handicapped in the Mainstream

In reading the responses to questionnaires sent⁴⁸ to the mentally handicapped or to their surroundings, it also appears that the use and impact of digital media on the communication of the mentally handicapped is not only a very relevant field of exploration, but is also ahead of the current practices⁴⁹.

In the study, recruiters employing the *corporeal signes-traces*⁵⁰ of a mentally handicapped person with schizophrenia said the signs were so *inconspicuous* as to be forgettable; which is not without difficulties when the job is in an overly “mainstream” milieu, as in a business where the elasticity of market demand is strong. The pressure and consequent stress affect communication with the patient. However, that person often has an emotional sensitivity and vulnerability to stress. Cognitive and emotional patterns are quickly saturated by this environment, which has the effect of causing psychological imbalances that may require a protective hospitalisation. In this context, it is conceivable that in the enclosed space, the person may benefit from cognitive remediation activities allowing for better adaptability. Considering that some digital games require a quick response, we can assume they can play a driving role in creating greater responsiveness to external stimuli. This course of treatment remains to be explored under certain conditions of experimentation and use.

The study also shows that even when the disease’s signes-traces are not perceptible in an ordinary social environment, a cognitive tension may arise for a mental handicapped person who wonders if their disease still exists when their symptoms, “the signes-traces of the internal illness”, disappear following successful psychiatric care. The initial diagnosis of mental handicap plays on the patient’s self-representation. When the medications stabilise, even though the illness is invisible to others and causes no further major internal disturbance, the patient does not know how to self-situate. The person’s immediate environment (family caregivers) continues to prioritise the initial diagnosis that recognised the handicap, and considers the disease to remain even when its signes-traces are no longer noticeable. Often, especially with family, this tends to keep people with disabilities in a protectionist accompaniment stage that is insufficient for insertion. All possibility for the patient to leave this environment that interprets their behaviour and practices in the wake of that initial psychiatric diagnosis returns to give the person an opportunity to have another way of interacting with their surroundings. These interactions, then, play an important role in the construction of every individual. We can therefore safely assume that a change of surroundings can help change self-representation, bit by bit. With the weight of the judgment

⁴⁸ See *Handicap psychique et recrutement*, Rouen, Klog éditions, volume 1.

⁴⁹ The surveys I will undertake in 2013 will therefore seek to understand how the issue of the visibility and invisibility of digital traces affects the use and impact of this type of communication for the mentally handicapped.

⁵⁰ On this concept, see Galinon-Méléne B., THE “SIGNE-TRACE PARADIGM”. FRAGMENTS. translation by Laura Kraftowitz, from « *Fragments théoriques du signe-trace, propos sur le corps communicant* », in *L’Homme trace, Perspectives anthropologiques des traces contemporaines*, Paris, CNRS éditions, série L’Homme-trace, tome 1, 2011, pp. 191-213, by Laura Kraftowitz, Sterling Height, USA, 2012.

of the hospital psychiatrist being heavy with consequences as to the possible risks in case of error, the patient is likely to choose the safe path.

This is all the more important now that emerging research indicates that discrimination does not take place the way that we once thought, and that the handicapped person's self-image and estimation of their surroundings to recognise their contributions is the first brake against insertion mechanisms. It is therefore necessary to support actions that allow both the handicapped person and their surroundings to identify what constitutes that person's specific strengths and skills (artistic expression, writing, sports, etc.). This point inclines one to think that these actions - which are often already in place in protected areas (the hospital, ad hoc associations, etc.) - must be accompanied by systemic dynamics—especially familial ones—that allow the surroundings to evolve in their representation of the illness and of the patient. Already strongly established abroad, the associated methods are still too underdeveloped in France.

Because my observations were on business and first responses to surveys with a heterogeneous public⁵¹, issues directly related to the relationship between digital traces and recruitment were set aside during the interviews. However, the combination of information on the value of games (on the one hand for cognitive remediation and learning, and the other for the field of recruitment—through the rising role of *serious games* in recruitment procedures) led me to first shift my questions to the link between digital games, traces, and recruitment⁵²; and further on to return to the *Homme-trace*⁵³ “constructed from traces of interactions” and producer of traces through online games.

COURSES FOR IMPLEMENTATION OF THE DIGITAL

Using ICTs, Behavioural Gearing, and Digital Traces

In the introduction to *L'Homme trace: perspectives anthropologiques des traces contemporaines* (GALINON-MELENEC, 2011), I noted that the first decade of the 21st century was characterised by the exacerbation of fears related to the proliferation of human traces, specifically digital traces, due to behavioural gearing produced by the possibilities that ICTs offered. Increasing challenges are being posed to traceability, and to its ethical implications on the very notions of privacy and freedom. But before addressing this complex issue and its challenges directly, I gathered researchers from a variety of disciplines (communication sciences, sociology, computer science, psychology and linguistics, as well as geography and anthropology), to treat the concept of traceability from various angles. A first conclusion emerged: prior to this collaborative work, there had existed no common understanding as to the concept of “trace”. But following this, an agreement was reached on the need to link the contexts of the trace's production, delivery and interpretation. The diversity of disciplines also allowed us to better explore human nature itself, which brought us to later clarify the *Homme-trace* paradigm (Galinon-Mélénec, 2012 and 2013).

⁵¹ Affected or not by mental disability.

⁵² See in this section an example of the workings of these processes.

⁵³ See Galinon-Mélénec B. *From "Sign-Traces" to "Human-Trace"* (halshs.archives-ouvertes.fr/halshs-00935346).

Contributions of the Homme-trace Paradigm

The “Homme-trace paradigm” is built on the idea that humans are not only fundamentally 'producers of traces', but also 'builders of traces', the two roles consisting of a continuous and systematic process of interactions and relationships (GALINON-MELENEC, 2012 and 2013).

Accordingly, in the second book of the “Homme Trace” series (*Traces numériques: de la production à l'interprétation*, CNRS Editions, 2013), I again met with researchers responding to contemporary concerns about the explosion of the production of digital traces and the significance of their enlistment, as before: by examining interpretation and the human ability to judge. Only here, I focused on the cognitive dimension built into the brain through the human-digital interaction. This approach is based on the assumption that I explained above and elsewhere: for me, humans are entirely composed of signes-traces born of ongoing interactions between themselves and the milieu where they maintain relations based on mutual interdependence.

Digital Traces between Trust and Mistrust

During my research, I noticed that in the context studied, *digital natives* seemed to feel no distrust of digital traces. This “blind” trust might prove to be a mistake. For example, if future situations they cannot anticipate lead others to use digital traces to search for their references, group memberships, or more generally, their practices and past behavior. For the category of “digital addicts”, the imaginary of amicable socialising, or a contract of mutual trust or faith in progress related to collective intelligence is at play. On occasion, they might produce an intimate exhibition of themselves. This action, although voluntary, requires trust. To assume that interactors of digital communication share the same rules, code, and values is to imagine a utopia. Those who predict that digital traces, left intentionally or not, will not be read by a digital voyeur⁵⁴ or a mole network⁵⁵ are mistaken. Those who assume that the Data Protection Act⁵⁶ actually protects data privacy and law enforcement are sometimes faced with a contrary reality. In fact, the fantasy of a world where relationships are based on trust crumbles under actual practices. Should we then establish a contract of mistrust (MARZANO, 2010)? The answer is individual. The atmosphere of mistrust continues to spread among “non-digital natives”. It permeated the turn of the century, and now seems destined to become a lifestyle. The explosion of digital traces is invading all spheres of life, and seems autonomous from any control by individuals participating in this evolution.

⁵⁴ In the general sense, a voyeur watches without participating. The *digital voyeur* likes to observe the digital traces of others without their knowing. Strictly speaking, it refers to a person who seeks intimate access without the knowledge of the person. By extension, it denotes a person who wants to know the supposed truth about another beyond their appearance or statements (Galinon-Méléneec, 2012).

⁵⁵ A mole refers to a person who participates in a group with a hidden objective and contrary to the interests of the collective concerned. The mole is integrated into digital networks with a false identity and unspoken goal (Galinon-Méléneec, 2012).

⁵⁶ Law No. 2004-801 of 6 August 2004, on the protection of individuals with regard to the processing personal data, amending Law No. 78-17 of 6 January 1978, which related to computers, files and freedoms.

Digital Practices and Identity Markers

It therefore seems appropriate to make a learning process of digital technology itself, as Anne-Marie Paveau does (PAVEAU, 2012)⁵⁷ by taking up Michel Foucault's definition of technology itself (FOUCAULT, 1982): "procedures [...] that are proposed or prescribed for individuals to determine, maintain or transform their identity into a number of purposes, thanks to relations of self control and self-knowledge" (PAVEAU, 2012: 1032). This approach requires skill in the techno-linguistic forms of writing (PAVEAU, 2012), and the ability to choose self-disclosures that allow for a makeup of perennial identity markers.

This method is so much more interesting that, according to Marciana Martin (MARTIN, 2005)⁵⁸, circumstantial identity markers selected by virtual game players (choosing an avatar) or internet users (creating pseudonyms) take their "sources in the paradigm of the private space of the social subject". The responses of three hundred users show that when it "hides a civil status identity at work in the offline social life", the user selects an identity "at the heart of a rich semantic development of oneself online", in which the *subject's identifying aspectualisation* nestles (CISLARU, 2009)⁵⁹.

Digital Practices and Cognitive Remediation of the Mentally Handicapped

At the time of my fieldwork in the Le Havre area, I met Dr. Djamel Zaghia⁶⁰. In a published summary studying the passage from "health to the medico-social", he advocates the "cognitive remediation of social disorder illnesses" (ZAGHIA, 2011: 58), through psychoeducation of the patient, a motivational approach, and a cognitive-behavioural approach. He builds on the work of Mueser, who "proposes to include in the strategy of cognitive remediation concrete tools to aid employment", advocating the use of "multimedia cognitive remediation" (ZAGHIA, 2011: 59).

My approach also joins the work of other psychiatrists on the principle of neuronal plasticity to promote the rehabilitation of social skills in schizophrenia. Thus, Thierry d'Amato (AMATO, 2011) relies on *RehaCom*⁶¹ software to seek out the mechanisms by which the brain "encodes experience and learns new behaviours". According to Th Amato,

⁵⁷ Following Fred Dervin and Yasmine Abbas: <<http://penseedudiscours.hypotheses.org/?p=10057>, consulté en septembre 2012>.

⁵⁸ Source: (Paveau, 2012: 93). Translation by L. Kraftowitz.

⁵⁹ "Many internet pseudonyms are openly meaningful: we witness not only the forms chosen (*Argyra, Marsophile, Oxyhre, Pabolavion, SpeedFireFox*), but also presentation texts (the signature) that often comment on the nickname, along with semantic considerations that are made during the exchange of messages. The pseudonym, which operates as an identifying aspectualisation of the subject, highlights the discursive ethos of the latter and opens it to multiple semantic interpretations. A serialising of these phenomena shows that meaning is constructed largely in the discursive space and that there is thus a co-construction of meaning and discourse. It appears that the pseudonyms function as tools of discursive production that tend to converge topic, name and address". Cislaru G., "Le pseudonyme, nom ou discours?" in *Les Carnets du Cediscor*, 2009, p. 39-59, viewed 21 January 2013, <<http://cediscor.revues.org/746>>. Translation by L. Kraftowitz.

⁶⁰ Dr. Zaghia is head of Secteur A at the Pierre Janet Psychiatric Hospital in Le Havre.

⁶¹ See <<http://www.schuhfried.fr/cogniplus-cps/rehacom/>>, viewed 21 January 2013.

the injured brain thus relearns forgotten behaviours (AMATO, 2011)⁶². He verifies the relevance of the proposal with his patients⁶³ and concludes positively on cognitive training with the support of ICTs to improve cognition. However, he emphasises the relevance of placing the exercises in one temporality for long enough to obtain a change in the structure and function of the neurons.

Conditions of Implementation for Achieving Visible results

Brain plasticity is only achieved by visible results in the mainstream—and therefore in social inclusion—if the neural circuits are actively engaged in a specific training that occurs over time. On the other hand, this he states that:

- “The training must have sufficient *salience* (relevance⁶⁴) to induce plasticity” [...],
- “Plasticity induced through repeated training occurs more rapidly in young minds” [...]
- “Plasticity induced by training a set of neural circuits can promote the plasticity of other networks, or a later plasticity”.

However, the interference principle should not be overlooked. This means that in trying to improve certain circuits, it other circuits may be modified. So we must be careful and specific with ICT-based training programs. Thierry d'Amato⁶⁵ notes that for schizophrenic patients, brain imaging initially shows a destruction of brain cells; he also concludes that after the training, the imaging shows them to increase.

Foundational Programs for Better Understanding the Real

Beyond the controversies discussed above on the behavioural scope of the pathology inducing a mental disability, we can retain as shared criteria for some of them “an excessive attribution of meaning to things that most people don’t accord significance to, or giving everything in one’s surroundings a feeling of foreignness”. In these cases, ICT-based training exercises can be useful insofar as they are designed⁶⁶ primarily to improve the attribution of meaning given by a person to the signs given off by their surroundings.

CONCLUSION

This chapter presented a new approach to understanding the social exclusion of *digital natives* who are diagnosed with schizophrenia. Having contextualised human, economic, and social issues, as well as psychiatric pathologies, as well as discussing the systemic hypothesis to place them in interaction with the workings of contemporary society, and examining the scope of the now centenarian pathology of schizophrenia pathology (1911-2011), the chapter

⁶² Dr. Thierry d’Amato, “Rehacom et plasticité cérébrale”, communication at the time of the Psychosocial Rehabilitation Association’s Annual Congress, 2011, available online at <http://www.dailymotion.com/video/xqpjxy_professeur-thierry-d-amato-audio-presentation-powerpoint-rehacom-et-plasticite-cerebrale-2eme-congre_webcam>. See also (Amato and Saoud, 2006).

⁶³ Thierry d’Amato is a psychiatrist at Le Vinatier Hospital in Lyon.

⁶⁴ This must have a meaning in terms of the sought after goal.

⁶⁵ Psychosocial Rehabilitation Association’s Annual Congress, 2011.

⁶⁶ This is the topic of a multidisciplinary research project I am coordinating through the “Homme-trace” team that I lead (CIRTA/IDEES, UMR 6266 CNRS-Le Havre Université).

placed the *Homme-trace* paradigm at the service of the questions that follow: the “*Homme-trace* producer of traces” led me to examine discrimination suffered by this population through digital practices. The “*Homme-trace* producer of traces” led me to investigate how using new technologies will likely expand the repertoire of skills and the acquisition of new behaviours in this population, with an eye to its inclusion in mainstream schools. This approach also led to an examination of the contribution of neuroscience and the value of ICTs in cognitive remediation programs aimed at improving the conditions of social cognition in this population.

In a more general way, mentally handicapped or not, *digital natives* are at the dawn of an era where the ICT use is opening up new opportunities that will be most beneficial if they can take stock of the dangers and take the time to understand their production and interpretation processes in order to protect themselves. In this sense, they must come to see that the issue of digital traces not only one of content but also of composite digital data built by reconstructing scattered data. It also applies to logical processes, and even to video hardware.

As a result, modern humans, digital natives or not, must learn to assess the relevance of the available digital data. They must also implement regulatory procedures for this evaluation: first, they must ensure the visibility of all layers of software, technology, and systems implemented. In this way, they can understand the biases at play in bringing about what turns up on the screen. In fact, the ‘epistemological deconstruction’ of the digital trail could become the main condition for lifting the current feeling of distrust and adding to the criteria for qualification a degree of interpretative viability. This could be part of digital professionals’ deontology. But, while necessary, this step would still be insufficient.

In fact, usage itself is why these data and their interpretation should also be scrutinized with both methodological and ethical rigor. For, while in a society of distrust⁶⁷, it is always possible to respond to a wrongdoing with legal protection mechanisms, it is probably better to put into place procedures that allow users to reclaim and manage their own digital traces. In my view, an education for all, especially for *Digital Natives*, in the management and interpretation of digital traces is a societal imperative. My work aspires to contribute to this.

⁶⁷ Rosanvallon (Rosanvallon, 2006) also explores the existence of a society of distrust by the focusing on our relationship to politicians: “the democracy of organized defiance against the democracy of electoral legitimacy” happens via the internet, which allows for the functioning of a “democracy of indirect powers scattered across the social body [...]”.

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