Socio-cognitive destruction: reality or fiction? - and the imperative of ethics

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Abstract

The Web 2.0 has become a buzzword that is used to illustrate a wide range of online activities and applications. In fact, Web 2.0 enhances tremendously the chance to detect and re-examine cognitive, social psychological and interpersonal communication models.
Moreover, cognitive dissonance is a psychological phenomenon which refers to discomfort felt at a discrepancy between what you already know or believe, and new information or interpretation. Therefore, the aim of this paper is to debate the following questions: do Web 2.0 create cognitive dissonance? In what extent? What are the consequences for younger people? And, does computer ethics may help?

Introduction

The Internet has a number of striking features. It is instantaneous, immediate, worldwide, decentralized, interactive, endlessly expandable in contents and outreach, flexible and adaptable to a remarkable degree. It is egalitarian, because anyone with the necessary equipment and modest technical skill can be an active presence in cyberspace, declares his message to the world, and expects to be heard. According to users tastes, it lends itself equally well to active participation and to passive absorption into a narcissistic, self-referential world of stimuli with near-narcotic effects. Therefore, it can be used to break down the isolation of individuals and groups or to deepen it, because Internet use embraces "eroding boundaries between the real and the virtual, the animate and the inanimate, the unitary and the multiple self" (Turkle 1997: 10).

Cyberspace provide us with an interesting opportunity to observe and re-examine cognitive, social psychological and interpersonal communication models (Riva, 2002), as well as theoretical arguments referring to personality structure and dynamics (Amichai-Hamburger, 2002) in the context of emotional experiences, interpersonal and group behaviour. Plus, the special characteristics of Web 2.0 makes a unique environment, at least as interpersonal communication is concerned. It is an experience equated with the psychological state of presence (IJsselsteijn, Freeman and De Ridder, 2001), a concept that has regularly been investigated regarding human sensations in virtual reality. This subjective experience, which is reflected through psychological and behavioural measures (Insko, 2003), creates a sense of being there (IJsselsteijn and Riva, 2003). So, why Internet makes adolescents tick? Suler (1998) pleads the following features: identity experimentation and exploration (adolescents are struggling with their "self" in a intense way); intimacy and belonging (during adolescence, humans experiment intensely with new intimate relationships, which Internet allows); separation from parents and family (teenagers search for their own identity separate from their parents, and online interaction engages such ambivalence); venting frustrations (adolescence is a period of "storm and stress", and anonymous behaviours is a Internet reality).

All theories of social development understanding have recognized the influence of social interaction on social understanding, however in different ways and most of them account an individualistic perspective. It has seemed that the only possible alternative is to contrast individualistic accounts with unspecified statements about child "enculturation". In this paper we argue for an alternative account for understanding mental state development, which integrates the social and individual dimensions of development (related to cognitive dissonance). We contend that a child does not merely adopt socially available knowledge, but

rather, within social interactions develops and constitutes mental states. Our approach is based on Chapman's (1999) reformulation of Piagetian theory, drawing on Vygotsky and Wittgenstein, and it is also consistent in some ways with other contemporary approaches (Hobson, 2002). Remembering Jean Piaget (1932), moral judgment is derived from the child's understanding of conventional rules that eventually become internalized into an autonomous respect for law and order. Lawrence Kohlberg (1969) expanded upon Piaget's work by adding higher stages of moral development. The highest stage of development according to Kohlberg's model is reached when the individual surpasses the confines of "conventional" rules and can make impartial moral decisions based on "post-conventional" principles of justice.

Therefore, our objective is to engage a discussion concerning the following questions: will Internet 2.0 enhance teenager's cognitive dissonance? In what degree? What are the costs? And, may computer ethics provide answers regarding such challenge? As a concluding remark, we acknowledge the arguments concerning the paper structure that will allow such debate: the concept of cognitive dissonance; discussing Internet 2.0; Internet 2.0 versus cognitive dissonance; and, finally debating future measures.

Development
Cognitive dissonance

Cognitive dissonance is a psychological phenomenon which refers to the discomfort felt at a discrepancy between what you already know or believe, and new information or interpretation. It therefore occurs when there is a need to accommodate new ideas, and it may be necessary for it to develop so that we become "open" to them. The theory is that dissonance, being unpleasant, motivates a person to change his cognition, attitude, or behaviour. This theory was first explored in detail by social psychologist Leon Festinger (1957) in his book, "A theory of Cognitive Dissonance". Festinger still argues that there are three ways to deal with cognitive dissonance, which did not consider mutually exclusive: one may try to change one or more of the beliefs, opinions, or behaviours involved in the dissonance; one may try to acquire new information or beliefs that will increase the existing consonance and thus cause the total dissonance to be reduced; or, one may try to forget or reduce the importance of those cognitions that are in a dissonant relationship. Cognitive dissonance has been called "the mind controller's best friend" (Levine, 2003: 202). Yet, a cursory examination of cognitive dissonance reveals that it is not the dissonance, but how people deal with it, that would be of interest to someone trying to control others when the evidence seems against them, which means we need to address mental structures and processes.

In fact, for several decades social psychologists have investigated such theme, and why we can feel so certain that our attributions are correct even when we have not given them careful thought. Kelley's (1967) theory, it will help to introduce some simple terminology: action; actor; and, situation. First, there is the action, which is defined as the behavioural event we are trying to explain. Second, there is the actor, which is defined as the individual performing the action. Third, there is the situation, which is defined as the situational context in which the action occurs. When we make an internal attribution for an action, we infer that the cause of the action is inside the actor- that arises due to a "personal factor".

So, such concept embraces the need to debate attributional biases? In everyday life, we often are unaware of situational factors that influence our cognitions, emotions, and behaviours. This is because these situational factors activate schemas that cause us to automatically process information important for our responses to the situation. Because of the influence of schemas, this information is processed in biased ways. There are two main types of biased information-processing: cognitive biases; and, motivational biases.

A cognitive bias is a tendency to think about and respond to events in particular ways because of the manner in which our minds process information. A simple cognitive bias can be seen in our tendency to perceive more easily things that change in the surrounding environment, than things that do not change (Ross, Amabile and Steinmetz, 1977). Our minds seem to have been "built" to rapidly perceive environmental changes, probably because aspects of the environment that are quickly changing tend to be more important for our survival than are aspects of the environment that do not change. Some argue that most cognitive biases exist because, on average, they produce cognitive, emotional, and behavioural responses that are adaptive. Finally, a motivational bias is a tendency to interpret events in ways that support our desires, needs, and wants. Motivational biases are adaptive in the sense that they help to decrease stress; but if they lead people to develop irrational beliefs about important aspects of the world, their ability to respond adaptively to their environments will be reduced (Lerner and Miller, 1978).

Internet 2.0
The Web 2.0 has become a buzzword that is used to illustrate a wide range of online activities and applications. However, to determine if it is a myth or hype, we need first to compare Web versus Web 2.0. Tim O'Reilly (O'Reilly, 2005) states that it is important to realize that Web 2.0 is not a new web standard or a "paradigm shift" as the name implies, rather it is an evolution of technologies and communications approaches which have grown in importance since 2004-5. However, after almost three years of increasingly heavy usage by techies and the press, the writer Paul Boutin criticizes and argues that the term is in danger of being rendered useless unless some boundaries are placed on it (Boutin, 2006). In accordance to O'Reilly (2005) is best viewed as a collection of services of which a site may incorporate any or all of the following: blogs; RSS; more dynamic, interactive, responsive web sites often using AJAX technology; support for community participation forming a social network; encourage interaction and creation of user-generated content; enable end-user rating and categorisation of online content; fund free services through online ads; involve data and service exchange between differences sites (mashups).

Blogs and wikis
A well known definition of weblogs is given in Barger (2006): "a weblog (sometimes called a blog or a news page or a filter) is a webpage where a weblogger (sometimes called a blogger or a presurfer) logs all the other web pages that finds interesting". In the following new technologies like permalinks and backtracks for better addressing and localization were introduced. Not only the content but also blogrolls and link policies shape the blogosphere (Bernstein, 2004). Downes even wrote (2006): blogging is something defined by format and process, not by content. Indeed, Gurak et.al. (2004) claims that the content of blogs combine musings, memories, jokes, reflections on research, photographs, rants, and essays, though we would argue that is not content that defines a blog, but the nature of such content, because all posts placed into a blog are time-stamped with the most recent post at the top, creating a reverse chronological structure governed by spontaneity and novelty.

Really Simple Syndication (RSS)
From a technology view point, Really Simple Syndication (RSS), also sometimes known as Rich Site Summary, is an Internet standard for publishing and exchanging content using XML. From a practical viewpoint it enables two things. First content can be syndicated or published on one site that originates on another site. Second, and of much greater interest to the e-marketer, it is relatively new method of distributing messages or alerts to subscribers (RSS Advisory Board, 2007).

Dynamic web services or interactive applications often using AJAX technology
These services are hosted on the web and cover a range of applications for information
sharing, or blogging services. Such services often, but not exclusively use rapid application
development using interactive technology approaches known as AJAX (Asynchronous
JavaScript and XML) (Portal Java, 2008). Perhaps the best known Ajax implementation is
Google Maps.

Supporting participation
Many of the new Web 2.0 applications are based on altruistic principles of community
participation forming a social network. The best known Social networks are Wikipedia,
MySpace and Bebo. Users can post text comments, images, audio clips (podcasts) or video
clips. Some sites such as You Tube have an incredible array of video clips.

Encouraging creation of user generated content
Many of the social networks like MySpace are effectively an amalgamation of personal blogs
containing text, pictures and videos, but with integrated messaging built in. However, another
well-known example of collaborative content creation is encyclopedia Wikipedia.

Enabling rating of content and online services
One of the challenges regarding personal content creation is to find anything worth reading,
listening to, or watching. Rating and tagging services may become a helpful tool here. Sites
such as Blogpulse and Technorati perform such task, but their focus is blogs.

Ad funding of neutral sites
Many of the Web 2.0 services we have described are freely used by non fee-paying users,
although site owners are always trying to monetise their sites through upgrades to
subscription services with additional features. The classic example of this is the web mail
companies such as Yahoo! Mail and Hotmail where subscription services are available which
give more storage.

Data and service exchange between sites through standards data exchange
O´Reilly sixth aspect of Web 2.0 is technical, however significant, particularly for retailers.
Web 2.0 gives the potential for integration of data between sites. Data integration can be
facilitated by different technical standards such as XML, SOAP or .Net. What is relevant is
that all enabled content and functionality to be shared between web sites. These are best
known as the "mashups" between different data sources such as Google to give a new service.

In conclusion, the new digital media are a rich frontier with opportunities and risks,
particularly for young people. Through digital technologies, young people are participating in
a range of activities, including social networking, blogging, gaming, instant messaging,
downloading music and other content, uploading and sharing their own creations, and
collaborating with others in various ways. We argue that five key issues are at stake in the
new media, including identity, privacy, ownership and authorship, credibility, and
participation. So, the need for ethics is unconditional, because ethics deals with the standards
of human conduct that direct the behaviour of individuals and groups. These standards, in
turn, are developed by the society within which the individual or group exists. However,
having in consideration our research aims, we will not debate such issues, but to approach the
consequences of unethical or dangerous behaviours such as cyberbulling or pornography into
teenager's socio-cognitive development.

Internet 2.0 versus cognitive dissonance
Internet usage has been conceptualized as the actual time in front of the computer as well as, the effects of perceived experiences in the cyberspace environment. Identity development was conceptualized as the Internet user's degree of commitment to a specific conception of self. The concept of identity development has been widely studied by scholars from different disciplines, including the social psychological (Waterman, 1992), communication (Ponterotto and Pederson, 1993), and critical studies (Katz, 1995).

Presently, research on identity is expanding to consider influences from the realm of the Internet (Turkle, 1997). Psychology and sociology approach the concepts of identity by different routes. The former lays its emphasis on the interior and interpersonal relationships, while the sociological viewpoint derives from interpersonal aspects and its concerns with intergroup and social-structural processes (Cote and Levine, 2002). In fact, in Cote and Levine's view, self-concept is not synonymous with identity but when reflected on "becomes the schema content for the domains of either personal or social identity" (2002: 88). When this process of reflection is activated, it propels the individual forward through a series of developmental life stages or crises that results in the gain of a character virtue if successful or a character weakness if unsuccessful. This suggests that the essence of identity is formed through the interplay of the social and the psychic.

Identity formation involves the individuation process and normally occurs between the ages of twelve and twenty. Erikson (1964) was careful to point out this stage of life is a time of searching for identity not necessarily achieving one. The inner search or "crises" takes place during a period of development called a psychosocial *moratorium* or a time between distinct phases of childhood and adulthood. This search also happens online. Therefore, if the identity crisis stage is left without a successful resolution, the young adult may adopt a negative identity or a condition known as "role confusion" or the inability to choose a direction in life beyond one that is superficial at best. A positive resolution of the identity crisis results in the person gaining the virtue of fidelity which is "the ability to sustain loyalties freely pledged in spite of contradictions in value systems" (Erikson, 1964: 125), which entails into the features that characterize cognitive dissonance.

Plus, the link between cognitive dissonance and threat to self-concept has implications for interpersonal relationships as well. In a recent review of the literature, Baumeister, Smart, and Boden (1996) suggest that violence or aggressive tendencies are most commonly the result of a threat to self-concept. Because dissonance threatens the self-concept, it is logical to suggest that dissonant individuals would be likely to have alterations in interpersonal perception or assert themselves against another individual than would non-dissonant individuals. There has been relatively little research on the connection between cognitive dissonance and Internet 2.0 behaviours, such as: virtual life (avatars), cyberbulling and suicide. Some of the potential readers may criticize such claim, justifying their critical argument demonstrating that some research has been made concern virtual life; however, we claim that cognitive dissonance is a new and urgent level of analysis, as the following news and reports demonstrate ethics has to become an imperative!

In the context of text-based virtual environments, presence can be described as a feeling of getting lost or wrapped up in the representations of the text. Conceptualized as flow, presence refers to a merging of action and awareness, during which a person loses self-consciousness and a sense of time, focusing on the present and blocking out the past and the future. "Presence may also be said to entail an unselfconscious transparency in which a participant enters a virtual world, looking through rather than at the text that represents it" (Jacobson, 2001: 654). This subjective experience, which is clearly reflected through physiological and behavioural measures (Insko, 2003), creates a sense of "being there" (IJsselsteijn and Riva,

2003). Not surprisingly, the personal state of "being there" is clearly associated with the concept of empathy; that is, the ability to experience the "as if" condition (and emotional state) of another. If there is a "if", or virtual, experience of presence induces dramatic cognitive, affective and motivational effects in the participating individual (Gaggioli et al., 2003) and it apparently affects modes of thought. Furthermore, as Grigorovici (2003) has shown, emotional arousal, information processing and cognitive awareness while experiencing presence in an immersive virtual environment have significant effects on gullibility, which subsequently increases one's vulnerability to persuasion!

Cyberbullying is negative or hurtful behaviour using an electronic medium, repeated over time, which involves an intention to hurt the victim and a power differential between the bully and the victim. However, the term bullying has been defined in different ways by experts in the field. Many use a definition from Olweus, a pioneering researcher on bullying, which states, "a student is being bullied or victimized when he is exposed repeatedly and over time to negative actions on the part of one or more other students" (Olweus, 1993: 9). Other researchers have maintained that bullying involves an intention to hurt the victim, and a power differential between bully and victim (Coloroso, 2002). Most experts now agree that bullying must include these four features:

- negative or hurtful behaviour- the behaviour of the bully is negative or hurtful to the victim. The bullying behaviour can range from nonverbal aggression, such as stares and teasing, to serious physical assaults. It can be direct or indirect; indirect bullying comprises behaviours that covertly cause distress to the victim, such as gossip, spreading of rumours, or encouraging others to exclude a person;
- intent to harm- the bully means to inflict emotional and/or physical harm on the victim;
- imbalance of power- the bully is more powerful (either real or perceived power) than the victim. The power differential in bullying may arise from differences in size and stature, but also from higher social status, a knowledge of vulnerabilities, or from the number of children colluding with the bully;
- repeated over time- the negative behaviour towards the victim occurs repeatedly.

Cyberbullying is behaviour that involves these elements and takes place via e-mail, cell phones that can send text messages, instant-messaging programs, Internet chat rooms, or web sites or blogs. In accordance, to Ybarra and Mitchell (2004), boys and girls are equally likely to be victims of cyberbullying. Teens of 14 years old and over are more likely to be targets than are children under 14. As Sullivan reports, the research on bully victims generally reveals that they feel guilt, shame, and a sense of failure because they cannot cope with the bullying (Sullivan, 2000). They tend to be unpopular and isolated. They are often depressed, worried, unhappy, and fearful, and significantly more neurotic than the norm. Being considered a common experience, bullying has long been considered to be almost a rite of passage, for many if not most children (Olweus, 1993). Bullies have various cognitive and emotional deficits, and victims also have various cognitive and emotional deficits. Many victims also demonstrate poor emotion regulation as they are highly emotionally reactive (Mahady, Craig and Pepler, 2000). This reactivity may be reinforcing for bullies, initiating a cycle of bullying and maintaining a high level of victim distress.

Finally, concerning suicide information online and its consequences a recent study was conducted by Biddle et al. (2008). The authors of such study tried to determine whether it promotes suicide or not, and the influence regarding suicidal behaviour. To diminish the knowledge gap, the researchers collected 12 broad search terms gathered in part from interviews with those how had attempted suicide: suicide, suicide methods, suicide sure methods, most effective methods of suicide, methods of suicide, ways to commit suicide, how

to commit suicide, how to kill yourself, easy suicide methods, best suicide methods, pain-free suicide, and quick suicide.

The researchers then used these 12 terms on four of the top search engines (Google, Yahoo, MSN, and Ask) and looked at the first ten results for each search. The 480 results that this generated were consolidated to produce 240 unique web sites, which were then divided into 14 groups that ranged from dedicated suicide site, pro-suicide to academic or policy site to news reports of individual suicides. The results varied by search engine: Google produced the most dedicated suicide sites by a wide margin (nearly twice as many as MSN), while MSN topped the list when it came to prevention sites and academic sites. But perhaps most disturbing was that the most frequent results were pro-suicide and the top sites provided information about methods, speed, and pain associated with suicide attempts! In fact, some of this websites presented personal stories regarding suicide attempts by teenagers.

Computer ethics as a research field
Ethics is the philosophical discipline that deals with theories of morality, or how we ought to behave toward one another. Traditional ethics offer us principles of not "harming", but say little about how to apply them. However, in accordance to Górniak-Kocikowska (1996), understandably computer ethics is an applied ethics. It does not just talk about the proper principles of ethical thinking. Instead computer ethics considers ways of forming arguments and judgements on particular information technology related activities, such as: privacy, security, intellectual property, and so on. And certainly, through the codes of ethics of professional societies, computer ethics is highly normative, because it brings a direct message to computer professionals and users of ICT that they need to consider how they ought to behave.

The first temporal remark concerning computer ethics is pos Second World War, due to the intervention of Norbert Wiener, one of the co-creators of computer technology, in its outstanding work "The human use of human beings" (1950). In his visionary book Wiener paid attention to the ethical problems that this technology might cause. Before Manner coined the concept "computer ethics", Donn Parker and Joseph Weizenbaum also paid attention to the arising ethical issues in computer technology, however at different levels: Parker noticed the unethical behaviours of computer technologists and Wiezenbaum conceived the software ELIZA. After that, Manner created a "Starter kit on teaching computer ethics" (1978) and started his "underground movement" with Bynum, as stated by Bynum itself during ETHICOMP 2007. Manner's arguments for a rationale computer ethics are well documented in his paper "Unique ethical problems in information technology" (Manner, 2003). His arguments are: certain ethical issues are transformed by the use of computers that they deserve to be studied on their own, in their radically altered form; or, that the involvement of computers in human conduct can create entirely new ethical issues, unique to computing, that do not surface in other areas.

Manner still pleads a "weaker view" and a "stronger view" regarding computer ethics. Although the weaker view provides sufficient rationale, he draws mainly his attention on establishing the stronger view using six levels of justification:
- level 1- computer ethics should be addressed because it will allow computer professionals behave in a responsible way. At a minimum level this rationale view maybe considered as a moral indoctrination. At a maximum level, it is weakened by the need to rely on an elusive connection between right knowledge and right conduct;
- level 2- computer ethics should avoid computer abuse and catastrophes;
- level 3- computing technology continuously creates temporary policy vacuums, and for that, anyone who studies computer ethics would have to perpetual task of tracking

a fast-moving and ever-changing target. The other purpose of a computer ethicist is to be aware regarding policy frameworks clashes;

- level 4- the use of ICT permanently transforms the degree of certain ethical issues, and for that an independent study is required;
- level 5- the use of computers creates, and will create, novel ethical issues that require special study;
- level 6- the rising issues on computer ethics are so broad and large that is enough to define a new field.

However, another breakthrough on computer ethics can be found in James Moor's (1985) article "What is computer ethics?" In that paper Moor argued that computers are logically malleable, and that characteristic makes them a revolutionary technology. That characteristic implies that through them it's possible to manipulate and to do any activity that can be characterized in terms of inputs, outputs, and connecting logical operations. We should still refer that this property functions syntactically and semantically. Finally, another characteristic that Moor states is that information technologies are also informationally enriching.

Is having in consideration such attributes, that Moor presents us his vision of computer ethics, which engages two components (Moor, 1985; 2003): the analysis of its nature and social impact; the corresponding formulation and justification of policies for the ethical use of such technology. The use of the concept "computer technology" is to demonstrate the broader vision of such technology.

Another concept introduced by Moor was policy vacuums. Such phenomenon can be understood as the way that computing technology is being employed in a given situation, but people are puzzled how it should be used. Simultaneously, Deborah Johnson set also a course of computer ethics given origin to her book "Computer ethics" (1985). This was a book mostly dedicated to teaching, and for that reason, covering issues such as: intellectual property; software ownership and son. However, this book was reviewed in 1994 and 2001 with the purpose to include the arising ethical issues outside professional settings, and that is clearly seen in her excellent introduction to computer ethics in the 1994 version: "computers are new species of old moral issues." Also during the 90´s, Donald Gotterbarn (1992) devoted his attention to the social responsibility of computer technologists.

Finally, in the late 90´s, Floridi and his colleagues (1999; 2006) developed the information ethics theory. The name information ethics is appropriate to Floridi´s theory, because it treats everything that exists as "informational" objects or processes. In fact, all entities will be described as clusters of data, that is, as information objects. More precisely, any existing entity will be a discrete, self-contained, encapsulated package containing because: the appropriate data structures, which constitute the nature of the entity in question, that is, the state of the object, its unique identity and its attributes; a collection of operations, functions, or procedures, which are activated by various interactions or stimuli (that is, messages received from other objects or changes within itself) and correspondingly define how the object behaves or reacts to them.

At this level of abstraction, informational systems as such, rather than just living systems in general, are raised to the role of agents and patients of any action, with environmental processes, changes and interactions equally described informationally (Floridi, 2006). However, Tavani (2007) present some interesting critics to Floridi´s work. Having in consideration the previous statements, we may affirm that since its birth and evolution, computer ethics as a research field engages mainly three perspectives:

- the human values approach- focus on human beings and their actions, intentions and characters (see the ethical theories section);

- the professional approach- devoted to the social responsibility aspects regarding computer technologists;
- and, the information approach- analyse information to create a new ethical theory.

The human values approach was the first vision on computer ethics history, and obviously is based on Wiener's work, and continued by Terrell Bynum as easily perceived for example in his latest work "Flourishing ethics" (2006), and also in Górniak-Kocikowska (see for example, 2007). The professional view is mainly supported by the work of Johnson (2001), and Gotterbarn (1992), which is criticized by Górniak-Kocikowska (2003). In fact, Kristina claims the idea of a code of ethics for computer professionals, but stating the need for a global ethics and other professions to intervene. Finally, Luciano Floridi (1999; 2006) is the leading author for information approach.

ICT is the most human centred technology invented by mankind, and its evolution (for example Internet 2.0), requires a more intense human perspective, because individuals will hold responsibilities never glimpsed before. In that sense, integrate computer ethics into the educational process since early ages will be a plausible answer to such problem, as stated into the panel discussion during ETHICOMP 2007.

Conclusion

There is no doubt that technology use will continue and even escalate with time. Therefore, it is imperative continuously to examine our understanding of technology's impact and implications for personal behaviour, because Martin and Holz (1992) considered a naive assumption that efficiency was the main purpose, not moral values!

Australian performance artist Stelarc, who extends his body through physical and psychological means, shares the view that the body is immaterial to the mode and level of social interaction between people. Stelarc basis his work on the concept of extending the body to explore levels of existence: "where the body becomes the object for physical and technical experiments in order to discover its limitations" and where "electronic space becomes a medium of action rather than information" (Stelarc, 2005: 1). Stelarc believes in the freedom of form and sees that "as humans increasingly operate with surrogate bodies in remote spaces they function with increasingly intelligent and interactive images" (Stelarc, 2000: 560) for that, he firmly believes that technology is what defines being human (Stelarc, 2005: 3). Perhaps Stelarc is right with his critical outlook on the role technology has in society, to say that technology is what defines being human is to say that without it humans would operate and exist in an entirely different matter, which is disturbingly accurate. Such work demonstrates his concern about extending the physical body, but the same principle can be applied to the psychological extension of the mind. To move beyond the skin as a barrier, where the skin no longer signifies closure, relates remarkably to the very principle of living an alternate identity on the screen through the Internet. Contemporary society is moving beyond the skin as a barrier for identity, however, in the real world security and safety is dependent on physical appearances, so to remove this key element in the virtual world leaves deception, risk, and security, also open to individual interpretation that characterizes Internet 2.0.

In that sense, we may claim that computer ethics provides important instruments to struggle against the cognitive dissonance imposed by Web 2.0, without forgetting the important contributions of moral psychology and neurobiology. Therefore, a good place to start is the following two levels of arguing: the relationship between moral psychology and information ethics; and, the bond between neurobiology and the human centred approach.

Regarding the first level of arguing, the electronic format acts as if it establishes a kind of "psychological distance" between communicators and their audiences as well as, between people and property owned by others. This "distance" potentially impacts all four component

processes involved in ethical action (Narvaez and Rest, 1995): ethical sensitivity can be reduced because the "distance" factor makes it more difficult to empathize with the audience or property owner who ultimately might be affected; ethical judgment may be altered because reduced empathy can reorder the priority of possible actions that could be taken such that what might be unethical in a different context; ethical action is influenced by a "no harm, no foul" mentality, which can lead to the occurrence of unethical behavior; ethical motivation can change because the "distance" makes it far less obvious who is and the lack for all.

Finally the second level of arguing, each ethic has neurobiological roots that are apparent in the biological structures and circuitry of the human brain. Triune ethics theory derives its structure from MacLean's (1990) Triune Brain Theory, which embraces three types of affectively-based moral stances that persons can take: one oriented to security (the ethic of security) and focused on self-preservation through safety, personal and in group dominance; another oriented to emotional engagement with others (the ethic of engagement), particularly through caring relationships and social bonds; and, the third (ethic of imagination), which is focused on creative ways to think and act socially.

Given all the previous statements we may claim that cognitive dissonance is a reality with still unforeseen consequences, and computer ethics may help us to deal with such problem.

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