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Creative Bonding and Human Computer Interaction

Abstract

In this paper we explore the relationship between the creative bonding and human computer interaction (HCI). Today, faced with various, diverse and incredibly different definitions, theoretical models for conceptualizing bonding and HCI, coupled with huge variety of contradictory methods and techniques for measuring it, we were encouraged to create an Integrative approach. Our Integrative approach is inspired by Card, Newell and Moran, 1983), Relational Transactional Analysis (Hargaden and Sills, 2008) and Creative bonding (Mandić and Ristić, 2013). In this rapidly changing world technological progress is fascinating, becoming rather a universal than a rare and exceptional human experience. Researches observe different ways in which humans interact with computers and design technologies that lets humans interact with computers in novel ways. Today's Psychology of Human-Computer Interaction is much more concerned with those communication issues. Computer created a new possibility and place to an open-ended dialog between the user and the computer. Humans dreamt of a perfect object, might it be it? Can we play with our magical toy and have a sense of being real at the same time? It is not only a handy gadget, it will endure all of our projections, as well as other defense mechanisms, becoming a perfect transitional object and imaginary friend ready to play, never abandon and ready to go if we get bored of it.

Key words: *HCI, creative bonding, changing communication, and play.*

1. From Human Computer Interaction,

Human-Computer Interaction is a scientific field that studies the design and use of computer technology. This research created the possibility of observing different ways in which various interactions including machine and humans happen. Amongst other interactions, as between software and hardware, the crucial interest of this paper is the interaction between humans and computers. Interface between humans, i.e. users and computer is also one of the main interests of Psychology of Human-Computer Interaction (Card, Moran, Newell 1983).

The Human-Computer Interaction researches are interested in designing graphical user interfaces, web interfaces, developing new devices and software systems, exploring new interaction paradigms and theories of interaction. Also, their main concern is practical application of design methodologies to problems in the world. They have to consider the usability of computer interfaces and how it relates to other social and cultural values (Chalmers, Galani 2004: 243-245).

The interface or intersection between machine and man, apart from being the main focus of computer designers, has a great psychological and socio-cultural relevance and some issues within the phenomenon of interface require multidisciplinary approach including communication theory, ethics, cognitive psychology, linguistics, social sciences, media study and similar.

The dawn of computer – human communication was verbal, linear and digital but it announced the beginning of new era. From the traditional perspective, the ease, the simplicity and the comfort of computer use were dominant values in user-adapted interaction research. The computer usage was modeled as a human-computer dyad in which the two were connected by a narrow explicit communication channel.

Later researches introduced study of physiological interaction, virtual reality and biometrics, which changed the course and nature of human – computer communication and opened new horizons and possibilities. And while the future use of HCI offers incredible possibilities, some points of that development, such as an idea about implant chips, in the name of global security, bring discomfort, unease and raise a lot of questions. We might understand the medical logic of the chips implanted in our body because they store valuable information about our physical condition and us in general, and can easily be scanned in an emergency or life-threatening situation (Haag, 2006). If we ever were in trouble the chip can be scanned and all the relevant information about us will be right there. (Haag, 2006). So, we can safely live alone when old without the extended family feeling guilty if we fall. Who needs the family when we have the chip? Extreme individualism can last until the day we die. But, if we remember well Adler's writings about each individual's need for a privacy, crucial to his identity, we must become aware of the conflict arising. It seems contradictory, that in the name of safety and security we are giving up on our privacy and in doing so we are jeopardizing integrity of our personality. It seems that we do not think deep and thorough enough about the subject and that we are not able to picture ourselves possible negative effects of the technology development.

Further technical development of computer technologies, among other things, leads to:: portability, lowering costs, increased widespread use of computers, larger memory, faster systems, innovations in input techniques, computer access by social disadvantage groups, new hardware functions and mixed media merging. It is also inevitable that this fast development of computer devices and technology also change the means by which humans interact with computers and the nature of these interactions continues to evolve.

In this rapidly changing world technological progress is fascinating, becoming rather a universal, than a rare and exceptional human experience. Researches observe different ways in which humans interact with computers and design technologies that lets humans interact with computers in novel ways. Today's Psychology of Human-Computer Interaction is much more concerned with those communication issues. The means and the effects of this interaction and communication come in the focus of human sciences and psychology. Some of the questions arising are - what type of bonding will humans develop with the machine and also with the world having a machine as an intermediary in the process of communication with others.

Human Computer Interaction researches pursue two perspectives. One is cognitive perspective where HCI deals with adjusting interfaces to humans` mental abilities and activities and the other is a post-cognitive perspective in which researches focus on the relation of interfaces and social-cultural values. Some Human Computer Interaction researches stress out the role of man in this relation. Their basic argument is that the most sophisticated machines are worthless unless men can use them properly (Karray, Alemzahed, Saleh, Arab 2008: 138). Most of the Computer Human Interaction designs are passive in nature i.e. they only respond whenever invoked by user and the future of Human Computer Interaction is focused on developing ultimate intelligent and adaptive, or active interfaces. (Karray, Alemzahed, Saleh, Arab 2008: 142). So the usability of the interface is still measured by a human factor but it seems that it is not possible to predict with certainty will that remain so even in the near future.

Computer created a new possibility and place to an open-ended dialog between the user and the computer, but all these possibilities basically rely on three human senses: vision, audition, and touch. They address some or all of these senses in the process of communication with humans. What about the smell? We should be aware of this sensory restriction, preference or imposition that narrows those scientific beliefs protecting them in the same time from irrational grandiosities.

Psychology of Human-Computer Interaction is presently much more concerned with the cognitive aspects of communication issues. The question is whether it ignores the rest of the human potential or maybe it still does not have the adequate answers to all questions about our potential. One amongst things implied by the human potential is the type of bonding created between man and machine. Understanding the types of bonding offers us understanding of crucial limitations in the Human Computer Interaction as well as a chance for adequate use of those denied or simply not recognized potentials. Road for further research?

Humans dreamt of a perfect object, might it be it? Computer scientist doesn't speak much about other human functions besides perception, memory and other cognitive functions. There is some timid mentioning of emotions and motivation, but unconsciousness is entirely avoided, at least officially in theories. But are they using its power and principles?

2. From psychodynamics

For the purpose of this paper, we consider that it is necessary to mention five basic psychodynamic principles that according to the psychodynamic theories form dialectics of the unconscious mind (Mandic and Milovic 2003). They can simply be described as dichotomous points of belief axioms:

1. OMNIPOTENCE - IMPOTENCE
2. OMNISCIENCE - IGNORANCE
3. IRRESISTIBILITY - REJECTION
4. IMMORTALITY - MORTALITY
5. OMNIPRESENCE - ABSENCE

These five basic premises are universal and cannot be remedied by reason, facts, formal logic or common sense, but they are unexceptionally susceptible to manipulation. We may be aware of our ignorance, impotence, mortality, repulsiveness, our living in a meaningless void, some of us may be lucky to sublimate, or we can do our best to ignore and deny them, but we are becoming more and more prone to believe that computer technology is, if not entirely perfect, then certainly, unlike us, free of all weaknesses, vulnerably, confusions and fears. Doesn't that remind you of a perfect object we dreamt of, of an imaginary friend and a transitional object between this cruel world and us? Computer is no longer an alien object, interface is now an intimate space that we use to project our desires and ideas onto the machine making it ego syntonic.

Some people believe that modern computer technology is omnipresent, knows everything and that power of knowledge is boundless. That limitless flow of information invokes in human consciousness the idea of infinity and a dream of immortality. It seems as if computer technology became a remedy for many unpleasant and even painful conditions of human life such as loneliness, uncertainty, feeling of inadequacy and similar. When in doubt, ask Google; when alone, Google is your best friend; when feeling week, Google will give you power. We shouldn't be surprised when Marek; Rinderknecht, R. Gordon asked: "Do people like working with computers more than human beings?" and got a positive answer. (Marek; Rinderknecht and Gordon 2015).

Can we play with our magical toy and have a sense of being real at the same time? It is not only a handy gadget, it will endure all of our projections, as well as other defense mechanisms, becoming a perfect transitional object and imaginary friend ready to play, never abandon and ready to go if we get bored of it. Do we give it a name and personalize it? Lots of us do, and that implies that computers have much more functions than HCI researches talk about.

Our irrational mind is receptive to myths. Even though modern man looks with arrogance at the pursuit of philosopher's stone, elixir of life and mastering the powers of transformation, this longing still lives in us, in a different way.

Becoming Godlike, are we?

3. From a psychology of human communication

For the purpose of this paper we have chosen the very early research that made a tremendous impact on the research of human communication. Let us remember the famous MRI findings from the study conducted by Watzlawick and colleagues.

Watzlawick's first axiom simply states: "one cannot *not* communicate" (Watzlawick et al, 1967: 51). This shows the inevitability of communication. The second axiom of the *Pragmatics* is: "Every communication has a content and a relationship aspect such that the latter classifies the former and is therefore a metacommunication" (Watzlawick et al, 1967:54). Bateson's definition of metacommunication in *Communication* is: "We shall describe as 'metacommunication' all exchanged cues and propositions about (a) codification and (b) relationship between the communicators" (Ruesch and Bateson, 1951:209). Watzlawick's third axiom stresses the punctuation of communication. "The nature of a relationship is contingent upon the punctuation of the communicational sequences between the communicants" (Watzlawick et al, 1967: 59). The fourth axiom formulates the differentiation between digital and analogic aspects in communication. Watzlawick writes: "Human beings communicate both digitally and analogically. Digital language has a highly complex and powerful logical syntax but lacks adequate semantics in the field of relationship, while analogic language possesses the semantics but has no adequate syntax for the unambiguous definition of the nature of relationships" (Watzlawick et al, 1967: 66-67). The fifth and final axiom is about the symmetry or complementarily of interaction. Watzlawick: "All communicational interchanges are either symmetrical or complementary, depending on whether they are based on equality or difference" (Watzlawick et al, 1967: 70). "The possibilities of differentiation of groups are by no means infinite, but fall clearly into two categories (a) cases in which the relationship is chiefly symmetrical, *e.g.*, in the differentiation of moieties, clans, villages and the nations of Europe; and (b) cases in which the relationship is *complementary*, *e.g.,* in the differentiation of social strata, classes, castes, age grades, and, in some cases, the cultural differentiation between the sexes" (Bateson, 1935: 67). Watzlawick goes a step further and argues

that *all* interchanges are „either symmetrical or complementary". So there is either competition or dominance/submission, at least for Watzlawick. (Bateson, 1966: 372). But this distinction is not a simple one, and the final point is that: "In the natural world, communication is rarely either purely digital or purely analogic" (Bateson, 1968: 291). Yes, in a natural world, but what is our "natural world" today? Those five axioms inspired a huge amount of further research. They made clear how trivial the simplistic models of communications are and how dangerous lead in future studies they tend to be.

It is interesting to observe what these axioms reveal us about the nature of human – computer interaction. Obviously the communicational need and conditionality stated in Watzlawick`s first axiom is also the basis of human interaction with the computer. However, we need to verify applicability of all the axioms to human – computer interaction in order to verify this interaction as communication. It is evident that we lack a relationship factor in human – computer model of interaction, crucial for defining purpose, nature, direction and conditions that shape human communication. Clearly we cannot talk about the communication in a real sense. But having a computer as an intermediary or a communicational channel for communication with other humans is generally being understood as one phenomenon, while the problem we should investigate is actually completely differently – did human interaction with the computers influence human communication in a positive or negative way, or has our communication maybe remained the same? In this context analyzing the communication between the man and the computer gives a solid ground for critical thinking, on one side, and the possible new hypothesis, on the other.

4. From transactional analysis

As it is the case with many other theories, TA is also integrated with different theoretical models. TA is primarily a communicational model and for the purpose of this article we will point out Relational principles described by Hargaden, H. & Sills, C. (2002). The principles they outline are fully described in their book, `Relational Transactional Analysis - Principles in "Practice"`.

The ideal goal of different models of TA is an autonomous individual who is aware, to the extent possible, of both the internal world (insights) and the external world (outsights), and that awareness helps the individual to achieve a high levels of conscious. Autonomous individual is spontaneous in his/her behavior, owns the possible freedom of choices and is capable of risking intimacy, while remaining bonded to others and to the world.

There are few things we must bear in mind in the process of helping people achieving autonomy: The centrality of *relationship* – most of us are aware that the age of an isolated individual is gone. We can rightly call that approach a myth, "myth of an isolated man" as defined well by George Attwood (Stolorow, Atwood 1993). We know that we live in an interconnected web or relations. And our research should be placed within the same reality as well.

In this "objective world" and "objective science" about humanity, we forgot about the significance of *subjectivity* crucial for understanding humans. HCI researches and computer technology developers use this very element as a basis for their work. Varieties of designs, applications, functions and platforms, among other elements of HCI, address subjectivity, innate psychological human need to be treated as different and unique. Different interfaces are necessary in order to satisfy human need to be valued as an individual existence with specific needs, tastes, possibilities, desires, principles and beliefs. To be successful or fruitful, every interaction or communication with any human must respect and grant him the right to create and keep his subjective relationship with reality.

For understanding the nature of human relationship it is also necessary to understand the importance of *engagement* - parties engaged in a communication process are, and needs to be active participants and not just passive objects.

We need to take into account the significance of the constant *interplay* of conscious and non-conscious patterns of relating and the possibility of harmony of those if we intend to get a good grasp of human interactions.

The importance of *uncertainty* is the TA principle, which recognizes that certainty is neither possible for humans nor desirable when working with implicit relational expectations. TA sees the value in holding an open mind for multiple meanings in a given communication.

The importance of *curiosity*, *criticism* and *creativity* emphasizes a freedom to practice alongside a responsibility, to be curious and reflective about the work and the relational patterns that get evoked (Hargaden & Sills, 2002).

No approach to human interaction and communication can give valid and useful answers unless it takes psychodynamics of human communication into account. TA communicational model is one of the possible approaches to the subject that opens up the possibility of observing the complexity of human communication phenomenon from another angle, the angle which is often ignored or neglected.

5. From creative bonding

In various research projects conducted at the Faculty of the Dramatic Arts in Belgrade, the concepts of different types of bonding were used (Mandic, 2003) with intention to identify and describe specific type that creative people form and that can be called *creative bonding*.

One of the researches was conducted on directing and dramaturgy students, as subjects and initial hypothesis suggested that creativity can be stimulated by the means of communication: asking questions and building the creative bonding with the subject. In one research two groups of students participated in the experiment and every participant was asked to construct a story based on the Rorschach test. During the process of creating the story students were asked questions: the number

of questions was the same but their content varied. Students in the control group were asked the questions from the standard Rorschach protocol ("What do you see? Where do you see it? ..."), while the students from the experimental group were asked questions which directly followed the answer. For example, if the student responded to a question "What do you see?" with "I saw a Bear", the next question was: "Is the bear married?" Every succeeding question depended on the answer given with the clear intention to stimulate development of the story. And the atmosphere in the two groups was different. In the first group the research team was properly seated, well behaved and serious. In the other situation the questing team was scattered in the room, nonchalant and openly curious about the story. After that, all stories were transcribed and given to neutral experts (professors) for the evaluation. Despite the fact that professors were severe when reading their students` stories, their evaluation showed that the creativity of future artist was on a significantly higher level when constructing a story in the circumstances of creative stimulation and bonding.

Stories told by the subjects who managed to connect in a creative way during the given task were evaluated as more original and more imaginative. Also, they presented greater verbal variety and showed more freely use of words. The research amongst those lines continued.

The results showed that creative stimulation and bonding can significantly influence semantically development and linguistic playfulness in a story formation (Mandic and Ristic, 2011). It seems that in development and stimulation of creativity, people play greater role than physical resources. That can be observed during the formation of the personality and during every specific creative process of a formed artist as well. But if a computer is perceived as ego synchronic, "not just an object" it has its place in a creative process and bonding.

Creative bonding emerges in a playful "as if" context where participants manage to mutually stimulate curiosity and spontaneity. It develops in a chosen space/time frame in which partner becomes *significant other*, without whom there is no creation – or even *significant third, which* anticipates and symbolizes audience, real or imaginative one. Connected in that way, participants are able to take risks, develop tolerance to confusion, ambiguity and paradoxes, to differences, retaining their right to make mistakes. Creative bonding enables them, at least for a moment, to become free from fright of change: new rights are gained, such as, for example, protection from destructive conflicts, but also new obligations – obligation not to destroy creative process and product with the given freedom, and to maintain bonding strong enough until the optimal totality is formed. It is logical that from such development the concept of relational creativity arises.

It has been proved by now that creativity is very sensitive to different external influences and that its formation depends on intersection of multiply factors: from a "wrong look" to great thematic challenges, from reward to censure, from support to revolution and huge historical movements. Still, the human factor remains the most important, as necessary and perhaps sufficient condition for manifestation of creativity. That is a relationship with someone who observes, follows and expects, with someone who reacts and participates, and with someone who desires to create something

together as in a group creation. It could be the most demanding research subject, but inspiring in the same degree for understanding the highest artistic achievements.

We hope that by giving brief interpretation of our researches on creativity we have raised significant questions instead of giving simple answers.

While teaching TA George Kohlereiser gave us 7 types of bonding, all independent of each other, and we added the eight one: creative bonding. It is important to understand that those types are not mutually exclusive. Each individual has an individual profile. How do you connect to your computer technology?

BONDING STYLES

STYLES	1	2	3	4	5	6	7	8	9	10
SAFE										
UNSAFE										
CREATIVE										
ANGRY T										
ANGRY C										
AMBIVALENT										
RESCUING										
MORBIDE										

A teaching and researching tool presented at TA educational seminars, Zagreb 1988 (Mandic, 2003).

6. Instead of a conclusion

Some of the questions that interest us the most are: Can a computer become a significant other, and can we bond creatively with it? We don't need to dwell upon paranoid ideas that the computers will replace us, or hate us, or make us slaves, for those are human projections that are need to be calm down and resolve some fears and anxieties.

Also, we cannot stop the progress, why should we? What should we do is only to take care of side effects while enjoying the benefits and move on. Let us not forget that every thing finds its purpose through the one who is using it. In a hand of a fool, even the most brilliant thing will lose its radiance, and in the hands of a wise man, everything finds its purpose. So does computer technology.

We know that bonding creates identity, so the question is what identities do we want, need or must create for a better, creative world? Ask Google? Or maybe first try to think for ourselves? Or shall we continue to carelessly play further with our magical tool.

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Ljudsko povezivanje i interakcija čovjeka i kompjutera

Sažetak

U ovom članku želimo istražiti odnos između kreativne povezanosti (bonding) i interakcije čovjeka i kompjutera (HCI - human computer interaction). Naša današnjica je pretrpana nevjerojatno različitim definicijama i teorijskim modelima za konceptualizaciju povezanosti i HCI. Tome se pridružuje varijetet kontradiktornih metoda i tehnika za mjerenje prilikom istraživanja, a mi smo se osjetili spremni stvoriti svoj Integrativni model. Naš integrativni model je, s jedne strane inspiriran radovima Karda, Novela i Morana (Card, Newell and Moran, 1983), a sa druge strane Relacijskom transakcionom analizom (Hargaden and Sills, 2008) i našim istraživanjima kreativne povezanosti (Mandić and Ristić, 2013). U današnjem užurbanom svijetu tehnološki progres je fascinantan, i postaje univerzalzamena za rijetka ljudska iskustva. Istraživači su nakon promatranja interakcije čovjeka sa kompjuterom stvorili tehnologije koje omogućuju ljudima da komuniciraju sa strojevima na različite načine. Današnja oblast psihologije HCI je najviše zainteresirana za takve komunikacije. Kako kompjuter stvara nove mogućnosti otvara se beskrajan prostor za dijalog s otvorenim krajem izmedju korisnika i kompjutera. Ljudi su oduvijek sanjali o savršenom objektu; je li moguđe da su ga napravili? Kompjuter nije samo zgodni gadget već podnosi sve naše projekcije, skupa s ostalim mehanizmima odbrane, te tako zbilja postaje savršeni prijelazni objekt i zamišljeni prijatelj koji je uvijek spreman za igru, nikad nas neće napustiti, a možemo ga isključiti kad god to poželimo.

Ključne riječi: *HCI, kreativna povezanost, mijenjanje komunikacije, igra.*