New Foundational Metaphors for Human Thought

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ABSTRACT
In this paper we present an argument that sex serves as a foundational metaphor for much of computer science, Human-Computer Interaction and human thought more generally. While human sexual behavior is highly variable throughout history and geography, we further argue that a specific orientation toward sexual behavior underlies most of the current work in human-computer interaction. Further, we explore a set of different possible orientations toward sex and what these may imply for approaches to HCI as well as human thought more generally.

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INTRODUCTION
Sexual selection and the chromosomal cross-over and recombination opportunities that arise from sexual reproduction are much more important mechanisms in evolution than mutation. Sexual reproduction occurs in both in animals and in plants. It is widespread in the animal kingdom although asexual reproduction is not unknown, typically in extremely stable environmental situations where relatively rapid adaptation is not required. Our ancestors engaged in successful sexual reproduction for at least 500 million years. Sexual behavior is obviously deeply embedded in our genetic make-up. Furthermore, in our culture, as in most others, the gender socialization process begins immediately upon birth with variations in clothing, interaction patterns and toys. From birth, various potential sexual activities and partners are considered taboo. It would be astounding in this light, if sexuality did not greatly influence our behavior and our cognitive and emotional stance toward every aspect of life. Many natural languages put gender markers on nouns (e.g., French, German, Spanish) and some languages traditionally even have different syntactic constructions and writing systems for males and females (e.g., Japanese). In this paper, I argue that sexuality pervades our thinking about computer design as well as the design of “human-computer systems.” It is further argued that a particular stance toward sexuality greatly dominates design and that other stances toward sexuality might be more productive, appropriate and fun.

THE FAIRY TALE
Many contemporary societies in the so-called developed world share much about a common fairy tale about how sexuality and associated gender roles are ideally “supposed to be.” Although details differ, elements of the fairy tale include:

- Sexual behavior is appropriate only after a certain age.
- Sex is appropriate only before a certain age.
- There is one and only one ideal “soul-mate” for everyone.
- People should only have sex with this one person.
- Sex is natural only between people of the opposite sex.
- Sex should involve exactly two people at a time.
- Males should take the lead in sex.
- Males are stronger, more powerful, and should “take care of” their partner.
- Sexual attractiveness and sexual behavior are tightly coupled to the physical body.

THE NATURE OF A FAIRY TALE
Obviously much has been written to dispel the reality of every element of this fairy tale. Indeed, if one were to poll members of the CHI community, very few would claim to subscribe to most if any of these statements. Nonetheless, one claim of this paper is that although many people in the CHI community may consciously reject this fairy tale, early and pervasive socialization processes based on this fairy tale influence the way the world is seen and the way
designs are “conceived.” It should be also be noted that dispelling the gender bias in the above fairy tale, does not change its fundamental nature. Even modifying the fairy tale to include “ideal” sexual relations between same sex couples does little to change its fundamental nature.

**Competition**

The fairy tale of ideal sex is entwined with another pervasive notion of our society: competition. Nearly every human activity in our society is portrayed as a sporting event with a clear winner and a clear loser. For instance, the vast majority of “popular” news coverage during election campaigns does not focus on the ideas, qualifications, or platforms of the candidates but on “how well they are doing” in the polls, what their strategies are, and how likely they are to win or lose. There is hardly a field of art or science that does not have awards. There are prizes for music, art, architecture, poetry, movies, advertisements, and design. The way we view competition also implicitly presumes a zero-sum game; one side wins; one side loses; and whatever one wins the other loses. Whether one wins or loses is primarily determined by personal factors such as skill, desire, and strategy.

With competition being so pervasive, it is perhaps not surprising that competition finds its way into the sexual arena as well. There are two main ways that our sexual myths and our competition myths intersect. First, and most pervasively, sex is seen as one major prize for successful competition. Those who win wealth or other types of prizes (popularity, gold medals, fame, etc.) “deserve” to have sex with highly desirable members of the opposite sex.

The second way that competition and sexuality interplay is that our pervasive view of competition often injects itself into sexual relations. We may easily begin to view sex itself as a contest with a winner and a loser. Does she give him what he wants? Much of pornography and prostitution have as much to do with control as with sex, per se. One way to “win” of course, in any contest, is to have as much power as possible while your opponent has none.

**Computers and Computing**

What, if anything, does any of this have to do with computers and computing? Everything. The entire goal of a computer system is to have it essentially be our slave; to command it and control it and have it do exactly what we want. In order to achieve this, we have spent the last half century making computer hardware as reliable as possible. If the computer shows any behavior it was not designed for, it is making an error. The operating system, the communication systems, the software applications --- all of this is also supposed to be error free. In other words, the machine should do what we want. Ideally, the computer should be a personal computer; that is, something we can possess and carry around with us at all times.

Much of the early terminology surrounding computer systems made these connections explicit. We gave the computer “commands” and “instructions.” We “entered” these commands and if we did not like the results, we “aborted” the job. The physical interconnection of computers involves mating male and female plugs. The binary nature of the beast and even the numerals 0 and 1 have obvious sexual connotations.

**Total Irony**

The field of HCI, and in fact, computer science more generally has been dominated by concepts that are at least consistent, and in many cases, seem to celebrate the conceptual legacy of a particular stance toward sex and competition. Ironically, the very technology underlying human-computer interaction offers the possibility, not only of breaking down traditional views of HCI, but also of expanding our possibilities of human sexuality. At this point in our evolution, it may seem difficult to imagine what follows, but we should recall that “Civilization has its point in our evolution, it may seem difficult to imagine its discontents.” In other words, many of the “natural” human sexual tendencies have already been culturally restricted, channeled, or sublimated.

The possibilities of technology (originally restricted and constricted by our cultural myths) now enable humans to break every one of the “restrictions” that apply to sexual relations based on the restrictions of our physical bodies.

**Age, Sex, Location?**

From the first days of on-line chats, people began exploring role-playing people who were not physically identical to their own bodies. A common question when a stranger entered an AOL chat room, e.g., was “Age, sex, location?” However, since AOL identities are not necessarily “real”, people often lied about this and “played” people who were younger, cuter, or a different gender. Sherry Turkle [1] explores this phenomenon in some detail. Despite the fact that people often “faked” identities, the structure of most of these on-line social/sexual interactions mirroring the same biases about ideal sex and competition that are rampant in our “real” society.

**Beyond Competition**

Although competition continues to dominate thinking in most endeavors, the presumption does not go unchallenged. Fisher and Brown [2,3] for instance, illustrate how negotiating from needs rather than positions, can often result in win/win situations. In their classic example, two sisters each claim that they want an entire orange. In their ordinary thought pattern of our society, each vies for dominance in order to obtain a larger share of the orange. When neither is able to gain dominance, they compromise and split the orange in two. As it turns out, one sister actually wanted the orange peel for cake icing and the other wanted the orange fruit for a snack. Had they revealed their actual needs, both could have been 100% satisfied.

Jane Jacobs [4] points out a similar flaw when people think about business competition. First, someone opens an antique store. A few months later, someone else opens
another antique store down the block. A few months later and a third antique store opens. In the traditional thinking pattern, the first store owner might view the two new stores as annoying competition. But such a view overlooks the wholistic aspects of the overall system. In fact, with three antique stores in close proximity, people interested in buying antiques are much more likely to drive to that area in search of antiques. The appearance of two new stores likely increases the sales opportunities for the first store.

On a larger scale, phenomena such as Silicon Valley illustrate similar effects. Recent writers in the business domain have also argued that companies need to foster the ecology of their industry, not simply “beat” the competition. In fact, in natural ecologies, the positive interaction (implicit cooperation) among various species is at least as important as competition. For example, the flowers in a region “cooperate” in their blooming seasons “in order” to provide bees with continuous opportunities. This also has the effect that each species of flower is more likely to be pollinated. In the field of human interaction, David Bohm [5], among others, has described a way for a group to have a dialogue; that is, to seek meaning cooperatively as a group, rather than have a debate or discussion. In dialogue, each person is meant to separate their ego from their contributions. Rather than striving for immediate resolution and action, inquiry is balanced with observations. The group attempts to build meaning “in the center.”

**Human-Computer Interaction**

The term “human-computer” interaction connotes two sides with specified interaction paths. Imagine instead, a thinking pattern in which systems of people and computers interact in an ever-changing ecology.

Imagine that the electronics in such an ecology are not designed to be absolutely “reliable” to do what they are “commanded” to do, but rather that they are capable of reacting to signals with some fairly immediate reaction but also to store and later retrieve information (perhaps imperfectly) about those signals, and modify their behavior.

**VIRTUAL UNREALITY**

Now imagine that human sexuality is no longer bound by images and assumptions based on the physical human body. Although at first this may sound impossible, we already have several patterns of thought and language that reach in this direction. For instance, if I were walking into a parking lot with you, you might well ask, “Where are you?” This question would not refer to the physical location of my body, of course, but to the physical location of my automobile. Similarly, if we were viewing my neighborhood with Google Earth, you might say, “Where are you?” In this case, the question means, “Where is your house.” Of course, you are not actually seeing my house either, but a representation of it on a computer screen. Still more abstractly, we might be talking about the pros and cons of illegal wiretapping to thwart terrorism. At some point, you might say, “Where are you on all this?” In this case, the question refers to my conceptual stance.

**Location Redefined**

In our society, we typically think of our body as a closed system that exists in one specific place at a time. In reality, the body is actually more like an open system. We exchange water, air, and food particles with the environment continually. Imagine now that all of these interactions leave a “trace” or “trail.” Indeed, with modern forensic science, this is not such a far-fetched image. Although “criminal” activity typically leaves physical evidence such as clothing fibers, skin cells, and hair, all activities leave such “evidence.” It is only that investigating criminal activity motivates us to find these traces. Imagine then, that the individual human body is not a single entity in a single place, but that it exists in many places simultaneously. If this is so, what new possibilities for interaction (sexual or otherwise) arise?

To stretch further the notion of what it means to be “you”, consider that all of the actions taken throughout your life have ripple effects. These actions include physical actions, but also include words, spoken or written. At any particular time, something that you wrote may be influencing, directly or indirectly hundreds of people from all over the planet. One obvious modern example is the blog. People write a blog entry at one time, but others may read it, or refer to it, at various times in the future.

In many cases, people work to produce various kinds of other artifacts. For example, someone might produce a painting or a piece of furniture or a computer program. Other people in other places then see that painting, or sit on the furniture; or use, read, or modify that computer program. In a very real sense, these artifacts must to some extent reflect and reveal who the producer is. In the same way, each instance of interaction must also reflect and reveal to some extent, the specific nature of the user as well. No two people will see the painting in exactly the same way. No two people will sit on the furniture in exactly the same way. No two people will use the computer program in exactly the same way.

The uniqueness of our “self,” according to this view, is continually interacting in an “intimate” fashion with the uniqueness of other selves all the time and potentially in thousands of places simultaneously. The word “intimate” is reasonable here precisely because the specific nature of this interaction depends upon the uniqueness of all the individuals involved in the interaction.

**Age Redefined**

Given the nature of all the thousands of impacts that we make in the world, in what sense do we have an “age?” Our physical bodies are tagged by convention with a number that depends on how many times the earth has revolved around the sun since we were born. However, this tagging is rather arbitrary. For instance, some cultures
begin to count age at conception rather than birth. There is also evidence that “age” is actually “passed on” from egg to egg. In other words, if you breed animals from the youngest eggs of the youngest, over many generations, the average life expectancy increases while if you breed from the oldest eggs of the oldest, over many generations, the average life expectancy decreases. In other words, your biological “age” is partly dependent on the age of the line of eggs that you came from. We all know “older” people who are “young at heart” and some “young” people who have already grown rigid in their thinking and behavior.

Aside from these technical “details” about physical and psychological aging, a still more telling dissociation between age and the number of revolutions about the sun is the fact that one can interact with our ideas, our words, our artifacts, and the echoes of our physical actions at any time in the real or imagined future. Recently, I attended a workshop on “persistent conversation” in which we focused on Pepys’ Diary. This was originally written in the 1600’s and is being reprinted one day at a time and being discussed on a website. How old is Pepys? If you are reading a selection for the first time now that was written when he was, say, thirty years old, does it make more sense to say that he is thirty years old, or that he is over 350 years old?

Redefining Gender
There are probably good evolutionary reasons that there are exactly two biological sexes rather than three, four, or twelve. (Actually, since XO, XXY, and XYY combinations actually do exist, one could argue that there are not precisely two biological sexes). However, once again, these footnotes of biology are not so important as the conceptual freedom we can consciously choose to introduce to dissociate gender from biological sex. Just because there are two biological sexes does not prove that we “need” to have precisely two genders.

Let us suppose for the sake of argument, that there is one gender for each color of the rainbow: red, orange, yellow, green, blue, indigo, and violet. Or, we could imagine that these represent various gender dimensions and that each person may exhibit particular (but varying) “amounts” of red, orange, yellow, green, blue, indigo and violet.

Redefining Sex
What does sexual interaction mean? If we need not be located in only one specific place, associated with one particular type of body at a specific age and of one of two genders, then what new possibilities arise? One might define as sexual any act in which someone has sexual feelings. What then of two porn stars who are simply “faking it” for the camera without feeling anything? This definition is also suspect because there may be no clear distinction between sexual feelings and other related feelings such as affection, appreciation of beauty, or even, in some cases, domination, pain, or humiliation.

In fact, sex is ultimately what we define it to be, either as a society or as individuals. So far, most “phone sex” and “computer sex” has been a partial re-enactment or description of physical sex. But the computer allows us to invent an unlimited number of variations. For example, one person could “play the part” of the sun while thousands of others could be raindrops and produce a rainbow as a result enjoyed by still other participants. One person could be a flower, another rain, and a third, sunlight. They could grow, bend, give, receive, enjoy. One person could be content and another form, dancing through a universe of stars. Whether and to what extent people actually experience sexual feelings during such interactions is largely under the control of training and attention. In this view, whether the feelings that accompany such interactions are actually of a sexual nature is secondary. Such interactions could instead be considered sexual to the extent that they are intimate; that is, to the extent that the interactions reflect and reveal the individuality of the people involved.

REDEFINING THE MYTH
What will this broadening of sexual interactions mean? It is impossible to predict with certainty, but the most likely outcome is that human thought will become less dichotomous. Not only will the myth of perfect sex be replaced by a broader spectrum of possibilities; duality will cease to be a presumption. Power and greed may become less important. If human sexuality breaks the bonds of our 500 million year old legacy, our thought processes may follow.

CONCLUSION
Our current thought patterns are largely conditioned by our views of sex and gender. These patterns are leading us to destroy the planet we need to survive. With imagination, the computer may allow us to engage in completely new and different kinds of sexual interactions. It is postulated that such experiences could re-shape thoughts to include less self-destructive patterns.

REFERENCES