

HUMAN AWARENESS: UNDERSTANDING THE BIOLOGICAL BASIS OF KNOWLEDGE AND LOVE IN EDUCATION

By Humberto R. Maturana and Sima Nisis de Rezepka, University of Chile, Santiago, Chile. Edited by Jane Cull, Life's Natural Solutions, Australia.

BIOLOGY OF COGNITION

This article is written from the view of Humberto R. Maturana and was developed under the title of Biology of Cognition.

The biology of cognition arises in the process of accepting that cognition is a biological phenomenon, and that it has to be explained as such. To do so entails asking the question, how do we do what we do as observers while we operate as living systems? Accepting such a question entails accepting all questions about how do we do what we do as living systems and as human beings. But it also entails that any explanatory answer that we may propose must be embedded in the understanding that living systems are structure determined systems, and that all that happens in them, to them, or with them, must happen in their continuous realization as structure determined systems.

This means that as structure determined systems, we human beings are such that, nothing external impinging upon us can specify what happens in us, and that external agents impinging upon us can only trigger in us structural changes determined in us. This fact has consequences in all the dimensions of our living.

One of these consequences, is that the phenomena proper to our physiology and the phenomena proper to our behavior, occur in non-intersecting phenomenal domains, and cannot be reduced one to the other.

Another consequence of structural determinism is, that as living systems interact recurrently, they enter into the dynamics of recursively triggering structural changes in each other, such that they undergo congruent structural changes that keeps them in congruent behaviour. It is from this understanding that we say all that we say in this article about education, and particularly, that education is a process in which both students and teachers change together congruently as long as they remain in recurrent interactions, so that the students learn to live with their teachers in whatever domain of living.

OUR VIEW OF EDUCATION

The Task

We consider that the central task of education is to attend to, foster, and guide children in their growth as self respecting, socially and ecologically conscious and responsible human beings.

In the origin of humanity, and in early cultures, there was no education as a special activity in the life of growing children of the community. The children learned all the

practices and relational dimensions of their living as members of the human community to which they belonged, by living all its dimensions in their daily living. This does not happen anymore now.

In our present culture, children live mostly separated from the community in which they are supposed to belong, spending most of their time in a school, in a nursery, or in a special place for little children. And they do so precisely in the period of their lives in which they should be growing as socially conscious and ecologically aware, well integrated human beings by participating in the life of the community. This state of affairs is usually justified in our times with theories of cognition that associate knowledge with information, and that see the task of education as an acquisition of knowledge.

The basic statement of the convocation in this congress seems to agree with this view in education as stated: "Cognitive education has a vision that humans are genetically and culturally endowed and inclined to be learners, as well as transformers, and generators of information, therefore having the potential to be active participants in and beneficiaries of the information age." According to what this statement says, cognitive education is concerned with the acquisition, transformation and generation of information.

Our Perspective

Education is a process of transformation in living together with an orientation defined by the manner of living of that person that acts as the parent or teacher. In this process, the child becomes one kind of human being or other according to the course of the interlacing of the emotions and doings lived by him or her in his or her recurrent, and recursive interactions with his or her parents and teachers. The form adopted by the living together of the children and the parents or teachers in the educational space of our culture, depends on the latter's explicit or implicit view of what education is or should be. Furthermore, the explicit or implicit view of what education is or should be for the parents and teachers, is dependent on the view that the members of the culture have about knowledge, the purpose of life, and matters of spiritual and material existence.

In other words, education has to do with the soul, the mind, the spirit, i.e., with the relational or psychic space we live and we want our children to live. Education is not concerned with the particular things that our children may have to do in the realisation of the psychic space that they will live, that is a matter of knowledge, learning and teaching. Moreover, education has to do with becoming human beings and the kind of human beings that we become while learning and teaching, has to do with the acquisition of the operational abilities needed to live in the particular domain of existence in which one is a human being. In these circumstances, it is the task of the educators to use teaching, any teaching, as a means for educating in the creation of the living space that will lead the student to become a self-respecting and socially conscious responsible human being.

The following in italics, has been written by Humberto Maturana Romesin, an article called *Biological Foundations of Morals and Ethics in Education*.

BIOLOGICAL FUNDAMENTALS

"In order to answer these questions, let us first consider some aspects of our biological existence in relation to how we become what we become. The reader, however, is invited to look into the article in whatever order he or she wishes.

Structural Determinism

Living systems are structure determined dynamically closed molecular systems. As structure determined living systems are such that everything that happens in them, happens at every instant determined by their structure at that instant. Accordingly, an external agent impinging upon a living system only triggers in it structural changes determined in it by its structure.

As dynamically closed molecular systems, living systems are in permanent structural change in a continuous flow of molecules through them, and exist as such as long as they conserve their organization as living systems (molecular autopoiesis) and remain in operational congruence with the medium that contains them (conserve adaptation in it). That is, living systems exist in a continuous flow of structural changes that arise both through their autonomous internal dynamics and through the structural changes triggered in them by their encounters in a medium, and they last as long as they conserve their organization as living systems (molecular autopoiesis) and their adaptation in that medium (interactions with conservation of organization).

There are several fundamental consequences in relation to this process:

- a) The structure of living systems and the structure of the medium change together congruently. Operationally the medium does not pre-exist living systems that operate in it, but arises with them, and changes with them in the dynamic relation of constant structural congruence, or adaptation. This is what I call structural coupling. So living systems do not adapt to the medium, but exist in it, in the conservation of adaptation while the form of the realization of their living, that is, the form of their structural coupling, may be in continuous change.
- b) Living systems exist in the present. For the dynamics of living there is no past or future, the past and the future as well as the present, exist only as explanatory notions that the observer uses to explain the operation of living systems and the cosmos.
- c) To the extent that living systems interact with each other, they are part of each other's medium, and change together congruently, conforming together with the non-living elements of the medium with which they interact, as a dynamic structurally coherent whole or biosphere.
- d) In the realization of living systems as structure determined systems, nothing is good or bad, desirable or undesirable, better or worse. The history of living systems has not taken place in the survival of the fittest, but in the conservation of the fit.

Time It is only for us human beings that as we exist and operate in language, we can generate reflections and explanations, in that the past, the present, and the future, have a presence and operational value in our living as explanatory notions of our experiences.

As we live in language, we become aware that we exist in the flow of irreversible processes as the central experience of our living. The notions of time; past, present and future, have been invented as explanatory notions to deal with our experience (distinctions in our living) of living in such an irreversible flow. But although these notions allow us to provide explanations and understanding of living and the flow of living. That life happens as such, out of time, in a continuous present. Time, past, present, and future, however, are fully relevant for our daily living in terms of planning what we wish to do with ourselves and with others, as we do, for example, in education with our children, when we say that we prepare them for the future. But, for what future? Where are our children as autonomous living beings that exist in the present, as we prepare them for the future?

Languaging

Language is a manner of living together in the flow of recursive coordinations of consensual behaviors, and it is our living in language as the particular kind of bipedal primates that we are, that makes us human. Or, in other words, we exist as human beings in the flow of consensual coordinations of consensual coordinations of behavior that language is. As such, language is a flow in recursive coordinations of behaviours, that takes place through the actual structural operation of our interactions, and involves the dynamics of structural changes in the participants that follows a course in each of them contingent on every moment in the flow of the recursive coordinations of behavior in which they participate. Language, therefore, is not a domain of operation with symbols, nor does it occur through symbols.

Symbols are elements of the flow of recursive coordinations of consensual behaviour, that languaging is, that are distinguished by the observer as abstractions of regularities in that flow, and as such, are secondary to language. Consequently, as we do things with our bodies (including the nervous system) as we flow in language in our interactions, the structure of our bodies changes in ways that are contingent to the flow of our languaging. Nothing that we do in language, consciously or unconsciously is irrelevant, because we become in our bodies according to what we do in language, and what we do in language, we become in our bodies.

As children, we learn to language usually through speech, but also in other ways, through hand and body signs as with deafness for example. Yet, as we learn to language, we create with others different ways of living together according to the different doings in which we participate, and we become in our bodies according to the language in which we grow. As a result, we create as adults the world that we live as a further expansion of the world we created as children.

Emotioning We exist in the flow of emotions as well. As we distinguish emotions in daily living, we distinguish different domains or kinds of relational behaviors, and as we flow from one emotion to another, we change the domain of relational behaviors.

In terms of what happens in the organism, one could say that when we distinguish an emotion in a living system, we connote a body dynamic (including the nervous system) that specifies what it can and cannot do at any moment in its relational behaviors. Indeed, emotions can be fully characterized by describing the relational behaviors that they entail as manners of relating. Let us see in these terms, three emotions: love, aggression and indifference.

Love: Love is the domain of those relational behaviors through which another arises as a legitimate other in coexistence with oneself under any circumstance. Love does not legitimize the other, love lets the other be. Through seeing the other, entails acting with the other in a way that they do not need to justify their existence in the relation.

Aggression: Aggression in contrast to love, is the domain of those relational behaviors through which another is directly or indirectly denied as a legitimate other in coexistence with oneself. As such, aggression does not let the other be, either through denial in a direct physical assault, or in an indirect physical assault through emotional denial. This occurs when the other does not fulfil some expectations that were not agreed upon beforehand.

Indifference: Indifference, in contrast to love and aggression, is the domain of those relational behaviors through which the other is not seen as another. In indifference, the other has no presence, and what happens to him or her is outside the domain of our concerns.

Emotions constitute the grounding of our relational living, and as we become what we become in our living with others, we live in our emotions the configuration of emotioning that we create as we live with those with whom we live. Therefore, the world that we happen to create as growing children, and which we expand and transform as adults, we create in the context of our living with others, as the ground that operates as a historical reference for our self and social knowledge. So, it is possible to say that we learn as children, the emotioning of the community in which we live, and transform or conserve it through the particular flow of emotioning that we happen to live in our singular individual lives. Or, in other words, a child creates the emotioning that he or she lives and will live as an adult, as an expansion of the emotioning that he or she lives with other human beings with whom he or she happens to live with, and particularly with the male or female person with whom he or she lives, which is the basic mother/child relation.

Biology of Love

As a feature of our evolutionary history, we human beings are biologically, loving beings. This means two things: the first, is that love has been the central emotion conserved in the evolutionary history that gave origin to us some five to six million years ago; the second, is that we become ill when we are deprived of love, as love is the fundamental emotion in our relational existence with others and ourselves. As such, the biology of love is central to the conservation of our human existence and human identity.

Social Life

Not all human relations are relations of the same kind, and it is the emotion under which a particular relation occurs that defines its character as a particular kind of relation. Accordingly, I maintain that not all human relations are social relations. The emotion that constitutes social relations is love, and love is the emotion that constitutes social relations. At the same time, I claim that work relations are not social relations, as they are relations that arise in the commitment for the realization of a task for a retribution.

Hierarchical relations are not social relations, because they arise in self denial and denial of the other, in the dynamics of domination and submission. Social relations founded on love, constitute the opening for sharing and collaboration in the pleasure of doing so, without the expectation of retribution.

Conversations

In this process, children grow as human beings interlacing languaging and emotioning in their living; a continuous flow of the braiding of relational domains (emotions) and recursive consensual coordinations of behavior (language). This is what we call conversations.

All that we human beings do as such, we do in conversations, and that which we do not do in conversations, we do not do as human beings. Furthermore, every behavior as a particular relational doing arises from some emotion, and emotions specify the relational space in which each behavior takes place, which gives each behavior its particular character as an action. Moreover, as the emotion changes, the languaging changes, and as the languaging flows, the emotion may change too, in recursive dynamics that modulates the flow of living of those who participate in the network of conversations that human living is.

All that we do as human beings we do in conversations, and conversations take place in the flow of our interactions. All that we do in conversations modulates the flow of our structural changes, and we become in our structural flow according to the conversations in which we participate. As a result, there are no trivial conversations for the flow of our living.

The Nervous System

The structure of the organism defines the operational space in which it lives, as the domain of its possible structural encounters in a medium with its sensory and effector surfaces. The nervous system is at the same time in a structural intersection with the organism at its sensory and effector surfaces. The nervous system is anatomically arranged as a closed network of interacting neuronal elements, and operates as such as a closed network of changing relations of activity between its neuronal components.

The nervous system, however, does not interact with the medium. As the organism encounters the medium at its sensory surfaces, the structural changes triggered by the encounter in the sensors of the sensory surfaces, in turn trigger structural changes in the neuronal elements that intersect with them. These structural changes in the neuronal

elements that intersect with the sensors, change their participation in the flow of changing relations of activity taking place in the nervous system. At the same time, the changing relations of activities occurring in the closed dynamics of the nervous system, trigger structural changes in the effector elements of the effector surfaces of the organism which changes its incidence on the medium. Due to this manner of inclusion of the nervous system as a component of the organism, the nervous system operates giving rise to different sensory effector correlations in it, which result in different behaviors as the organism encounters the medium.

As we have said before, the structure of the organism is not fixed. It changes in a manner contingent to the flow of its encounters in the medium with which it interacts in the conservation of its structural coupling with the medium or it disintegrates. Congruently with this, the structure of the nervous system is not fixed either, as it is open to continuous change in a manner that follows a course contingent in every moment of its internal dynamics, and the course followed by the interactions of organism in the medium along the realization of its living in the conservation of its structural coupling. Moreover, as the structure of the organism changes, the manner of operation of the organism in the medium changes too, and as the structure of the nervous system changes also, the sensory effector correlations that this generates changes as well, which following the course of the conservation of the structural coupling of the organism.

From all of this, it is apparent that the nervous system does not operate with a representation of the features of the medium in which the organism realizes its living. That the adequate participation of the nervous system in the generation of the proper behavior of the organism, is the result of following its structural changes with the conservation of the structural coupling of the organism to the medium.

Let me repeat what I have said, but in different words. As the structure of the nervous system changes in a manner contingent to the flow of the interactions of the organism in the medium, in the realization of its manner of living, the nervous system continues generating in it sensory effector correlations as well as the dynamic structural configuration of the medium that makes possible its realization in the flow of living of the organism, must be conserved from the moment in which a new living system is conceived. Moreover, for such a thing to happen, the actual living of the organisms members of the arising lineage must contribute to its occurrence. Therefore, reproduction and the constitution of lineages, are systemic processes that involve both the reproducing organism and the medium in which it exists, in a mutually generating dynamic manner that stabilizes the manner of living through the flow of the structural changes of both the organism and the medium.

As a manner of living is conserved in a lineage, everything else becomes open to change around it. As new features are included in the manner of living which are conserved through reproduction generation after generation, the characteristics of the lineage changes, and a fully new lineage may arise. We human beings are the present of such a process, and we think that the central feature of living around which everything else changed, was the biology of love. Furthermore, we think that this happened through the continuous expansion of the emotioning of the mother/child relation of love and play, in

the mutual trust of body acceptance, that extended to the whole life span, in a neotenic trend.

We think that it was in the conservation of this neotenic (expansion of childhood) trend, that a stable intimate living together in small groups through the expansion of the female sexuality could arise, and constitutes the relational/interactional space in which living in language could begin and be conserved. That is, we think that the living in language as the manner of living that makes us the kind of beings that we are as human beings, occurred as part of the neotenic trend of our lineage in the conservation of a living centered on love, and not on aggression, as the central emotion that guided daily life in our ancestors. Moreover, we think languaging, as the core of the manner of living conserved in our ancestors, must have begun more than some three million years ago.

Finally, we think that the total involvement of our bodyhood and our cultural living as we live in language, shows that languaging in our lineage must have begun so long ago.

Culture

Cultures are closed networks of conversations, that is, closed networks of recursive coordinations of doings and emotions. Yet, it is the configuration of emotioning that is realized in the closed network of conversations that constitutes the culture, and not the particular behaviors realized by its members. As we live in a culture, we are its members and conserve it as we do what we do through our recursive participation in the closed network of conversations that constitutes it.

Different cultures entail different psychic spaces, that is, different configurations of unconscious and conscious relational/interactional dimensions that are lived through different configurations of emotioning.

Language, as a cultural feature, together with the biology of love, constitutes the core of the manner of living that was conserved generation after generation and defined us as human beings in our ancestral evolutionary history in the last three or more million years. Moreover, since a lineage is constituted in the systemic conservation of a manner of living, the features of the manner of living conserved are not genetically determined, even though it is the initial genetic constitution of the organisms that makes them possible. The flow of genetic changes conserved in the lineage, follows a drifting path defined by the manner of living conserved. So, cultures are not genetically determined, but their conservation channels the course of evolutionary genetic change. Finally, the manner of living conserved in a lineage generation after generation, arises in each organism in an epigenetic manner.

Intelligence

If we attend at how we use the word intelligence in daily life, we may notice that we use it to connote situations of consensuality in the behavior of animals, human or non human. It either refers to the establishment of a new domain of consensual behavior between them, or it refers to their actual operation in an already established behavioral domain. Therefore, consensuality takes place in the coordinations of behavior that arises in the flow of recursive interactions between animals. This arises through the coherent course of

structural changes that take place in them as a result of their structural plasticity. Consensuality does not require language to occur, and the coordinations of behavior that constitute it, arise spontaneously.

Agreements are different. Agreement occurs in the stipulation in language of a coordination of behavior to occur, in a different moment. Thus, consensuality is the commentary that connotes or indicates it and agreement occurs in the operation in language that constitutes it. The greater the structural plasticity of an organism, the greater its capacity for intelligent behavior, through the participation in recursive interactions with others in the generation of new consensual domains, or in the operation and/or expansion of those that already exist.

Language as a domain of recursive consensual behaviors is secondary to consensuality, and requires structural plasticity to make it possible. Moreover, the structural plasticity required to live in language, as we modern human beings live as a result of our biological and cultural evolutionary history, is so enormous that all human beings as long as they have not had some brain damage, malnutrition, or some developmental anomaly, are equally intelligent or capable of equally intelligent behavior. Yet, intelligent behavior can become restricted or expanded in the emotional flow of the person. Thus, fear, envy, competition, ambition, restricts intelligent behavior by narrowing the relational domain in which one moves, restricting the domain of possible consensuality. Only love expands intelligent behavior, by broadening the relational domain in which one operates, expanding the scope of possible consensual behavior.

WHAT SHOULD WE DO?

Children, as the introduction to this congress claims, are indeed learning beings. And we would add that they are learning beings, both in the emotional and the rational domains. Yet, they are, above all, learning human beings, and will learn to live any kind of life that they happen to live. And the emotioning that we human beings happen to live in our childhood, we conserve as the fundament of the psychic space that we generate as adults. Our childhood is both our treasure and our bane.

Human life is not genetically predetermined, nor are we genetically predetermined to be one kind of human being or another. This is what this means, we human beings are learning beings, and this is so regardless of how much we speak now days of genetic determinism. In these circumstances, the kind of human being that a growing child becomes, arises as a systemic identity conserved in dynamics of interactions in the human domain in which she or he lives; be this at home, in the school, the street, or the homo world at large. In these systemic dynamics, the growing child contributes to conserve the world that arises in his or her interactions with other human beings in the same manner in which the adults contribute to conserve it, that is, by living it. But how we live, what manner of living we realize, depends on our emotioning, not on our reason.

Our knowledge, that is, what we know how to do, is our instrument of doing in any domain, be this abstract or concrete. It is because of this, that the task of education in as much as it has to do with the configuration of the manner of living of the growing child, is a task concerned with the emotional psychic space that the child learns to live at home and

the school, not with the doings that the child may learn in any relational domain. The doings, abstract and concrete, that the child learns along his or her education, are instruments for his or her use in the realization of the kind of human life that he or she will lead and conserve in his or her living. And the manner in which one uses one's knowledge in life, depends on the manner of living that one lives. But the manner of living that one in fact lives, results from, that is, determined by the emotioning of the emotional psychic space that one learned to live as a child, not by the knowledge, or the types of rational arguments that one may have accumulated along his or her life.

It is for all the above that we think that the central aspect of education is the dynamics of becoming human as a self-respecting, and socially conscious responsible person. It is usual to speak of values when speaking of education in these circumstances. This is fine, but we wish to say that values have to be lived at all instants in the process of education, and not be taught as independent actions or notions. Values are abstractions of the emotional dynamics of social living, and as such correspond to relational dynamics that are intrinsic to social living. And this is so, because values pertain to the domain of emotions, not of reason, and in particular to the domain of love which is the emotion that constitutes social coexistence.

OUR PRACTICAL PROPOSAL

We think that the most fundamental factor in education is, of course, the teacher, and that the most fundamental supporters and collaborators that the teachers have, are their students. But we also think that for the teachers and the students to collaborate with each other, the teachers must operate in relation to their students in self-respect and self-love. Since we live in the present and, mostly in a culture that devaluates emotions, and destroys self-respect through the use and abuse of human beings for mercantile purposes, we think that teachers must be given ample support in order that they expand their awareness of the biology of love. It has been with this intention that we have written a small book called in Spanish, *Formacion Humana y Capacitacion*. We are using this book as a manual for the training or retraining of teachers in the biology of love. In what follows we present some excerpts from it.

Excerpts from "Formacion Humana y Capacitacion" - Becoming Human and Training in Education.

Introduction

The central subject of the book is Education, and it is written with the understanding that the purpose of Education is to guide our boys and girls in the path of their becoming human beings that respect themselves and others through the continuous generation of a space of coexistence that gives rise to collaboration, joyfulness and responsible freedom. The conceptual grounding implicit in what we propose and develop in this book, is the biology of love.

We live a cultural present in which the word love appears and is frequently used in many different areas of reflection and doing. Thus we may speak of love from the

perspective of religion, philosophy, or daily life. Furthermore, we frequently speak as if there were many different kinds of love, each according to the relational domain in which it occurs.

At the same time, there are now days, many kinds of workshops and trainings that offer to connect, or reconnect us with love. This is not our purpose. Our subject in this book is Education, that is, the relation between the teachers and the students, the teachers and the students themselves, and what one may wish to happen in the relation between teachers and students in the process of education. And love is the fundament that makes possible what we want to do.

The biology of love is the relational dynamics that gives origin to humanness in the history of our lineage. When we speak, imply, evoke or connote the biology of love, we speak, imply, evoke or connote the systemic conditions of the evolutionary and ontogenic constitution of humanness. The claim of the participation of the biology of love in the constitutive origin of humanness, is not an opinion, it is a denotation of the biological process that constituted and still constitutes us as the kind of living beings that we are and could stop being (see *Biology of Love*, by Maturana and Verden-Zoeller, 1996).

Love is an emotion, a manner of living together, a kind of class of relational behaviors in living systems. Love as an aspect of the realization of our animal living, is a biological phenomenon. Love is not a sentiment nor a feeling, love is not a recommendation for a better living in company. As an emotion, as a class of relational behaviors, love is very simple, and can be characterized by making reference to the circumstances when there is love: love takes place as in our living interactions with other beings, the other, whoever or whatever, he, she or it may be, arises as a legitimate other in coexistence with us. Or, what is the same, love (loving) is the emotion that constitutes and conserves social living.

Our reflections in this book arise from our biological knowledge and understanding, not from a philosophical, religious or political position. No doubt we wish that our children may grow as happy self-respecting and responsible citizens. But what we say here is not an exhortation, a recommendation, or a message, and its fundament is not moral or ethical, even though accepting it has moral and ethical consequences. We only speak of that that happens in the human relational domain under different emotions and particularly under love, and the validity of what we say and propose for education, rests precisely on the biological knowledge and understanding of humanness and of what makes it possible.

We are living beings, and all that happens to us as human beings even though it happens in us in conversations as a continuous flow of the recursive braiding of languaging and emotioning, it happens to us in our living in the realization of our living. It is from this that the understanding of humanness requires the understanding of the biological dynamics that gives rise to it. Finally, it is precisely for all that we have just said, that our purpose in this book is the expansion of our understanding of what occurs in the educational process as well as the implications that that process has, or may have for human life, and does so from a perspective that recognizes the biological fundamentals of knowing and learning.

EDUCATION

Much is said now days about the need of accommodating or adjusting education to the conditions and needs that will prevail in the twenty first century. This is surprising for three reasons.

1. We do not know how life will be in the twenty first century, and any prediction in that direction will only be an extrapolation of our present living.

But if our present manner of living is what indeed preoccupies us because we do not find it satisfactory, and if we think that education is in crisis because it reflects that manner of living, is it adequate that we should think in a future defined from our actual present as a continuation of it?

Furthermore, if the manner of living that we now live in our historical present, has arisen from our present manner of feeling, desiring, acting, and arguing, and we do not like it, do we want the future to which that manner of feeling, desiring and reasoning is leading us?

2. We human beings create the world that we live arises moment after moment in the flow of our living, how can we pretend then, to specify a future that will not belong to us because it will arise in the living of our children and will not be created by us? Do we want to steal from them that responsibility by specifying now the world that they will live as a cage from which they cannot escape?

We act now as if we wanted our children to grow and create a world that we specify now, in our ignorance of the future and our disrespect for them. Where do we leave them in all of this?

3. We human beings live in the present; the future and the past are manners of being in the present.

If we want to prepare our children to live in the future by making our present their future, we negate them in their present, trapping them in a manner of living that is basically alien to them, and we force them to search outside themselves for an identity that will give sense to their lives. And we know that he or she who searches for his or her identity outside him or herself, is bound to live in the absence of him or herself and will always be moved by the opinions and wishes of others. Such a person has no place in his or her own life, and is not even there, as young people are prone to say.

We think that the future must arise through the life of those men and women that will make the future with their living. And if we want a future in the conservation of human dignity, mutual respect, collaboration and social and ecological consciousness and responsibility, those men and women must be persons of integrity, that can be autonomous and responsible for the life that they lead, because they act in self respect.

They must be loving men and women, conscious of their social existence and aware that the world that they live arises through their living it. Men and women of that kind can arise only if our children do not grow alien to themselves. Such men and women can exist only if our children grow in self-respect and social consciousness. Men and women of

such a kind can exist only if our children grow, who are capable of learning anything because their identity does not reside in what they do, but in their being self-respecting human beings.

It is because we think in this way, that we think that the task of education is to create a relational space in which our children grow now, in the present, as self-respecting socially conscious and ecologically responsible human beings. That is, we think that the task of education is to create a relational space in which our children may grow to live in the present, in any present, aware of the desired or possible future, but not alienated in any description of it. Thus, a relational space in which our children can grow as human beings can be trusted, because they respect themselves, i.e. human beings capable of reflecting on anything, and of doing whatever they do as a socially responsible conscious act. Our intention in this proposal is to contribute to create such a relational space.

OUR PROPOSAL

The greatest difficulty that we face in the domain of education in our cultural present, is the confusion between two different kinds of processes that take place in the upbringing of children. Namely, what we call the growth of a child as a particular kind of human being, and the learning of the operational abilities proper to the historical moment that they happen to live in. This is so, particularly if we want our children to grow and become socially conscious and responsible human beings in a democratic culture. Thus, we think:

A. The aspect of education related to the process of becoming a particular kind of human beings concerned with the growth of the child as a person capable of being a co-creator with others of a desirable social space of human coexistence.

In these circumstances, the task of education refers to the growth of the children as socially and ecologically conscious and responsible human beings, and creates with them the following relational conditions: a) that would guide and support them in their growth as human beings capable of living in respect for themselves and others; b) that would guide them in their growth as human beings and who can say yes and no, as they stand in their integrity and autonomy that provides their self respect; and c) that would guide them in their growth as human beings whose individuality is founded on their self respect and self acceptance and not in their opposition or difference from others. Therefore, they can collaborate, because they do not fear to disappear in their relations with others.

B. The aspect of education referring to the learning of the operational abilities proper to the historical moment that the children happen to live, is concerned precisely with the acquisition of those abilities and operational capacities by the children, as a set of resources or instruments that they will have for the realization of what they want in the course of their living.

Accordingly, the teaching of the operational abilities proper to the historical moment that the children happen to live, consists of: a) the creation of the relational and interactional space in which the abilities and capacities that are desired for children to learn, can be realized as a space of coexistence with their teachers; and, b) in the creation of such a space as an ambience in which its openness for the expansion of the capacities for actual

doing and to reflect on what has been done, is part of the life that the children live, and wish to live at that moment.

Finally, we think that the creation of the relational space in which the children become self-respecting and socially conscious responsible human beings, is the central task of education. Only if this aspect of the upbringing of a child is realized, the child can become a person capable of living as a socially conscious and responsible human being. A person who is capable and free to reflect on his or her doings are free to see and correct errors and mistakes in relation to his other living as a conscious social and ecologically responsible individual human being. Only if this central aspect of education is taken care, the child can grow to become a person capable of living in cooperation as an ethical being, because he or she does not disappear in his or her relations with others, as his or her individuality is founded on his or her self acceptance and self-respect.

It is only if this central aspect of education is taken care of, that a child can grow as a person, free and capable of rejecting the peer pressure to use drugs or any other kind of self corruption. This is so, because he or she does not depend on the opinion of others for his or her identity.

The teaching of operational abilities is an instrument for the realization of the central task of education, which guides children in the growth as human beings. A child that grows in self-respect and self acceptance can learn anything and acquire any ability that he or she wishes. That natural thing is that there are no limitations of intelligence in the learning of the children. Intelligence is the capacity for participating in the realization or development of plastic domains of operational coherences with other living systems or with non living circumstances in which they may happen to live. Language is one of those domains of plastic operational coherences, and we human beings exist as such in language. But, what is significant in this respect, is that the intelligence required to live in language as we human beings do, is so enormous, that we human beings are all essentially equally intelligent unless, we have lived particular situations such as trauma, genetic alterations, or nutritional failures. Under these conditions, learning difficulties are usually the result of emotional conflicts, not limitations in intelligence.

In the following, we present 15 points that we consider to be valid and fundamental as the fundamentals for the task of education if we want our children to grow as self-respecting socially conscious responsible human beings:

Education as a Space for Becoming a Self-Respecting Human Being

1. We think that the task of education as an artificial relational and operational space of coexistence, should allow, facilitate, and guide the growth of our children so that they can become human beings that live and act in self-respect and respect for other. As a result, they operate with ecological and social consciousness, and can behave with responsibility and freedom in a democratic human community.

Freedom and responsibility are possible in human life only if one acts in the conditions of self-respect and self acceptance, which are the only conditions that permits us to choose without being swayed by external opinions.

2. We think that for point (1) to be realized, the relational space generated by the teachers in their recursive interactions with their students, must be one in which these arise at every moment as totally accepted and respect legitimate complete beings, and not as transitory entities in the process of becoming adults.

Point (2) means that the attention of the teacher as he or she interacts with his or her students, should not be oriented to the desired outcome of the educational process, but to accept and respect them in the total legitimacy of their present, while he or she acts in the full awareness of what he or she wants his or her students to learn. This point also means that education must be centered on the growth of children as self-respecting and socially conscious responsible human beings. And that all the particular technical, operational, or reflective abilities which they must also acquire to participate in the activities of the human community to which they belong or will belong, must also be treated as tools or instruments for the realization of such a fundamental purpose.

3. We think that the basic task of teachers is to make the school a relational and interactional space that permits and invites the children and students in general, to expand their capacity of action and reflection so that they can contribute as they grow in their continuous creation and conservation of the world that they live with other human beings, as a space in which one can and live in self-respect, social consciousness and ecological responsibility.

For the realization of point (3), the different themes of study, or the different activities with which the children or the students in general become involved at the school, should be done so that they live them as fields of reflective and manipulative activities that continuously invite them to look in freedom at any changes that they want to do at any instant. What is involved here, is the expansion of the capacity of the children in the fields of doing and reflecting, not a change in the nature of their being.

4. We think that education occurs as a process of transformation of the children in their living together with the teachers. This occurs as the teachers constitute it with their living the domain of relational coherence in which the children become transformed in the process of their growth as human beings.

This transformation takes place in the child, in all the explicit and implicit dimensions of coexistence that the child lives with the teacher, through their conscious and unconscious interactions. What is central in the process of education, is that the teacher/child relation modulates the emotioning of the child determining in every moment the emotioning of the child. The child learns this in an unconscious manner of seeing, hearing, reflecting, understanding, accepting, reasoning and doing. Furthermore, what is also central in the process of education, is to know that the emotioning learned by the child at school will constitute his or her manner of relating with him or herself and others, during his or her whole life unless his or her manner

of emotioning changes through the awareness of disliking it. Finally, it is also central in the process of education that the teachers should know that their students become whatever they become through learning their emotioning with them.

5. We think that this is fundamental for educators to know, that human life follows the course of emotions not of reason, and that this is not a limitation but a feature of our human constitution as living beings. Education, then, must take place in the knowledge and understanding that emotions are the grounding for all that we do, including our rationality.

Biologically, emotions correspond to internal body dynamics that specify the kinds of relational behaviors in which an animal can participate at any instant. Yet emotions occur in the relational space of the organism. This means that although emotions arise in the flow of our internal dynamics, what we distinguish as we distinguish emotions in daily life, are kinds or classes of relational behaviors.

It is because emotions occur as kinds of relational behaviors that they can be fully characterized in terms of the relational behaviors that constitute them. Thus, for example, love is the domain of those relational behaviors through which the other arises as a legitimate other in coexistence with oneself. In similar terms, aggression is the domain of those relational behaviors through which the other is negated as a legitimate other in coexistence with oneself.

We human beings belong to an evolutionary history defined by a manner of living centered on love, not on aggression. This is so much so, that we become ill at any age when we are deprived of love. Depriving a child of love results in a serious interference with his or her growth as a self-respecting human being that can live as a conscious and responsible social person.

It is because we are loving beings, that we think that the educational space must be one of love, cooperation and mutual respect, and not of competition or strife. It is because we are loving beings that we think that the educational space reflects this. If a correction seems necessary, what is corrected is the doings of the child, and not his or her being.

The learning and the behavioral difficulties that children show at school or at home, do not arise from intellectual difficulties or from intrinsic traits of their personality, but arise from their living in a relational space in which love is denied, and can be solved by restoring love.

6. All that we human beings do, occurs in conversations, that is, in the interweaving of languaging (coordinations of coordinations of consensual behaviors) and emotioning.

At school all conversations of life intercross, particularly the conversations of learning some particular abilities, and in their intercrossing, they become confused, mostly without our awareness. The conceptual and operational

separation of these two kinds of conversations allows us to do two things: 1) training the emotioning and understanding of the teacher in such a way that he or she interacts with his or her students in the biology of love, and thus encounters them without correcting their being; and 2) creating for the teachers a space of expansion of their capacity for reflecting on what they know, as well as an expansion of their capacity for doing and reflecting on what they do in their different domains of knowledge.

To the extent that those two types of conversation can be kept separated conceptually, it is possible to mix or to separate them at will in the process of education.

7. We think that the purpose of education is not to prepare our children to become useful and responsible citizens, but they become so in their simple spontaneous growth as socially and ecologically conscious self-respecting human beings.

We also think that the purpose of education should not prepare the children to be well-integrated members of the community to which they belong, but rather this should be a spontaneous natural result of their growth as integral members of it. The school as an artificial relational space in which the children grow to become particular kinds of human beings, and learn the doings proper to the community to which they belong, replaces the space of daily living in which they should learn the emotioning and the doings of such a community through living in it.

It is because of what we have just said, that a school will not be adequate if it does not replace those relational aspects of the life of the community to which the children belong or will belong. It is also because of what we have just said, that if we want the children to learn social values, they do not have to be taught. They have to be lived through living the biology of love. Thus, for example, the school should not teach cooperation. The children must learn it through living it as they live in the mutual respect that arises from living in mutual respect.

8. The teachers and the children are the most fundamental elements in the process through which the children grow to become self-respecting human beings capable of learning any ability or of acquiring any capacity for action, because they provide all that is needed in human terms.

The children and their teachers are equally intelligent and equally capable in the emotioning domain, although they may be different in their preferences and habits of thinking and doing, because they have lived different lives. If a child arises as a legitimate other in the biology of love, it does not mean that the teacher does not see the particular present features of the child, or that he or she does not have a liking or disliking of them. On the contrary, it means that the teacher sees them and is aware of his or her emotioning about them, but relates with the child as a legitimate other even if his or her task as a teacher is to create for the child a relational space in which he or she may expand his or her capacities for action and reflection.

9. We think that the task of education is to be realized only in one way, namely, in the biology of love, that is, through relations and interactions between teacher and students that do not intend to correct the manner of being of the students, but continuously invites them to reflect on what they do, and on what they want to do, in a space of mutual respect.

A central aspect of teaching teachers to become teachers, is to treat them in the same desired way as they would treat their students. At the same time, it is central to train them in the reflexive attitude that will permit them to see their own emotions in their relations with the students. This provides an opening to correct their mistakes and to apologise for them, with the fear of wanting to disappear in the act. They are able to do this, because they act in self respect.

10. The educational space as a space of coexistence in the biology of love, must be lived in the pleasure and joy of seeing, touching, hearing, smelling, and reflecting. This makes us capable of seeing, hearing, smelling, and touching all that which becomes accessible to us when we are freed to look. When we look simultaneously at the context and particularly the situation in which we are at any instant, we do so in openness and not in fear.

For the educational space to be lived in that manner, students and teachers must meet in mutual respect with the implicit or explicit understanding that they are the cocreators of what they live, i.e. the operational coherences of what they are doing together.

The scope of our intelligent behavior changes in the flow of our emotioning. Thus, envy, fear, ambition, competitiveness, restrict and reduce our intelligent behavior. They restrict our vision of the sources of our envy, fear, ambition or competition, which in turn limits our reflective abilities of those sources.

Only love expands our intelligent behavior, because it expands our vision. Love is visionary, not blind. Accordingly, for the educational space to be a relational space of expansion of the intelligent behavior of the students and teachers, it must be lived in the biology of love. The biology of love are relational dynamics that conserves and fosters the self respect of the students, even when it seems necessary to correct their doings.

What this means, is that the educational space must be lived in a manner that respects the different learning temporal dynamics of the students. This allows each of them to take a learning pace that fits him or her, without treating the apparent slowness of some of them as a deficiency or intrinsic limitation.

The School as a Relational Space for Acquiring the Operational Abilities of the Community

1. The learning of manual, conceptual, or reflective operational abilities, occurs in the actual practice of the abilities to be learned. Those abilities are learned in the expansion of the intelligent behavior when such a practice is realized in the relational space of mutual respect, the biology of love. It is only in the biology

- of love that the students learn a relational sense that is meaningful in their lives.
2. All human beings can learn to do what other human beings can do. All human beings are basically equally intelligent, and they differ with respect to their learning abilities only in their learned emotioning. Yet, the learning of any operational ability in self respect, requires thereflexive freedom and trust of the student in his or her capacity to learn anything that other human beings can do. Such self trust is possible for the students at school, as an act in harmony with their own lives. However, this can only occur if the teacher acts in total intimate recognition and acceptance that all human beings are equally intelligent and capable of learning to do whatever any other human being can do. Furthermore, for the students to learn in self respect, respect for the others and self trust, the school must create a noncompetitive relational space as a feature of the basic emotioning that defines the students coexistence in it.
 3. A student learns his or her operational abilities in any domain as a capacity to act, and with the freedom to reflect on what he or she does, only if he or she has learnt the possibility of being responsible. For this to happen, the school must offer the students the operational space required for their responsible practice, of the abilities desired to learn in self respect and responsibility.
 4. A teacher can contribute to the learning of his or her students of whatever operational capacity he or she is teaching, when acting from his or her own operational abilities. That is, thereflective freedom, and capacity for doing what he or she teaches in self respect.
 5. The students, at whatever age, come to the school from a cultural world that they have lived as a network of conversations, that has made them whatever they are at that moment. So the students are, in themselves, the very fundament for their becoming self respecting, socially and ecologically conscious responsible social beings, that can learn anything.

COMMENTS AND FINAL REFLECTIONS (From *Formacion Humana y*

Capacitacion, Humberto R. Maturana and Sima Nisis)

The students at whatever age, come to the school from a cultural world that they have lived as a network of doings and emotions (network of conversations) in a way that has shaped their bodies both as their self and as their instrument for action and reflection. So in the totality of their being as bodyhoods at every moment, the fundament for their becoming self-respecting, socially and ecologically conscious and responsible human beings that can learn anything if they lived in the biology of love. The educational process must respect this condition all the time, at every moment, accepting the students as totally legitimate beings, even though the task of the school is to create a space for the expansion of their capacities for action and reflection. What the students know at the moment they enter the school, should not be devaluated because that which they know is the starting point for whatever transformation they will live in their capacities for actions and reflections as they grow as self-respecting, socially and ecologically conscious responsible human beings.

Education as the whole process of creating a relational and interactional space for the children to grow as self-respecting, socially and ecologically conscious responsible human beings able to learn anything is possible only in the biology of love because we human beings belong to an evolutionary history centered on the conservation of a manner of living in which love was the emotion that defined that manner of living.

COMMENTARY

Obviously these fifteen points are valid only to the extent that what we want of education is that it should be the relational space in which our children grow to become self-respecting, socially and ecologically conscious responsible and joyful human beings, that are capable of generating in their daily life a creative, harmonious, joyful and democratic cooperative living.

These fifteen points are valid only to the extent that we do not want to conserve through our children a culture that makes all of us mere instruments of a market centered on competition, control, dishonesty and mutual negation in the daily negation of the biology of love which is the culture that we now live. Indeed, as we live in such a culture, and we are not happy in it, we think that we must explicitly teach our children spirituality, values, honesty and justice, because as we do not live these in our daily life, our children do not have the opportunity to learn them as a matter of their daily living. But values, spirituality, honesty and justice cannot be taught as courses in a school, they must be lived at all moments as spontaneous aspects of daily life, and one should speak of them only as commentaries and reflections when they are momentarily lost due to errors and mistakes that we commit in our co-existence.

For this to happen, education must take place in the biology of love, and this is so because spirituality, honesty, justice and in general, all that we call values, are spontaneous features of daily life as it is lived in it.

BIOLOGY OF LOVE

Introduction

The biology of love constitutes the fundament of humanness. That is, we are biologically loving animals, and we become ill when we are deprived of love at any age.

Furthermore, it is because we are loving animals that love is the first medicine in any illness. We are not usually aware of this because, we do not understand love as a biological phenomena and we treat it as if it were something special and we put it out of the natural features of our daily life.

Love as a biological phenomena, consists in living in the domain of those relational behaviors through which the other (whatever it may be) arises as a legitimate other in co-existence with oneself. Love, however, does not consist in those behaviors but in the relational dynamics lived through them, and the biological dynamics in which such a manner of living generates well being in solitude, or in co-existence.

PURPOSE

The purpose of this workshop is to create situations of co-existence that permits us to become aware of what happens when the biology of love is interfered with. Thus, the workshop consists in creating a relational space in which the participants live what one lives when one is excluded from the biology of love, and what one lives when it is recovered.

EXERCISES

1. Each participant is asked to write a list:
 - a) of all the good things that he or she would say when receiving someone whose company is sincerely welcomed and desired.
2. Each participant is invited to make a list that would:
 - a) include all the expressions of rejection that he or she would use when he or she does not want the company of another person.
 - b) include all the gestures and movements that he or she would use in the case of a), above.
3. The participants are invited to reflect in silence on what they have written.
4. The participants are invited to form groups of six, and to choose a co-ordinator. This person will invite one of the members of the group to go outside the room. Then he or she will speak with the remaining to choose one of the following plans to receive the person that went outside the room when he or she returns.
 - * The remaining members of the group will ask the one that went outside to return but will act as if they did not see him or her.
 - * As in the previous case, but the members of the group will talk among themselves without speaking with the one that went outside.
 - * As in the previous case, but the members of the group will form a barrier that will exclude the returning one.
 - * As in the previous case, but the group will directly reject the returning one.
5. The participants are asked to reflect and make comments on what they lived.
6. As what was done in point 4, but now the conspiracies to receive the person that went outside is positive.
 - * The returning member of the group is received with kind words.
 - * The returning member of the group is received kindly and is invited to participate in some activity.

* The returning member of the group is received with hugs and caressing body contact, with many expressions of enjoyment of his or her company, showing him or her how much he or she is loved and needed.

7. The participants are asked to comment what they lived.

8. The exercise should be repeated with all members of the group.

FINAL REFLECTIONS

What one lives in the domain of emotions is never irrelevant, even if it is supposed to be a mere joke or jest. No person accepts as an irrelevant joke to live a negation or an acceptance, whichever the circumstances. Due to this, this exercise must be done but not overdone in the negative aspects. To live a negation is a destructive experience, one enters in self-depreciation, intelligent behavior is restricted, and one enters in aggression or depression. To live acceptance is an up-lifting experience, intelligent behavior is expanded in self-respect and opens a space for collaboration.

The experience of being denied recurrently makes life meaningless and whatever one does, and the experience of being accepted leads to the consideration of the development of meaning in life and in what one does.

Acceptance lived as a sincere relation occurs in the biology of love. Denial is always an act in the biology of aggression.

INTELLIGENCE

Intelligence is the capacity to participate in the creation or expansion of a domain of consensual behavioral coherences with somebody else or with oneself. As beings that exist in language, we human beings are all equally intelligent unless we have had some brain damage through some intervening circumstance. This is a basic condition in our existence as human beings.

In these circumstances, the purpose of this workshop is to show that the different emotions have different effects on the intelligent behavior and that the only emotion that expands the intelligent learning is love, because it makes accessible all relational dimensions.

People become different kinds of persons according to the different lives that they lead, and not only as a result of their initial, genetic differences. It is easy to imagine that the differences in initial constitution of the children may imply differences in the abilities that they may develop along their lives. It is also easy to imagine that the different circumstances of life may lead to the development of different potential abilities. But what one should not forget, is that the initial constitution of all human children is essentially the same in the domain of intelligence. From the perspective of intelligence, all human beings as beings that exist in language are equally intelligent, and the differences when they exist are due to interferences and alterations of the natural growth of the nervous system to genetic anomalies, malnutrition disease or trauma.

The emotions modulate the intelligent behavior as a feature of co-existence, and open or close the path of consensuality in daily life. Thus, envy, fear, ambition, and competitiveness restrict or narrow the intelligent behavior because they channel the attention of the persons restricting "vision" into a narrow path. Only love expands "vision" through self acceptance and acceptance of the circumstances in which one lives, expanding the domain of possible intelligent behavior. This we know well in daily life as knowledge that appears expressed in sentences such as "he is blinded through ambition,....envy or competitiveness".

In daily life we frequently create situations that restrict the intelligent behavior of the persons, particularly children, with whom we are, by undermining their self-respect as we continuously devalue what they do with criticism, control of their behavior, lack of trust and demands that are blind to the circumstances in which they live. That is, we restrict the intelligence of others, particularly that of children, with our own blindness, insecurities, vanity or competitiveness. Namely, we restrict the intelligent behavior of others through our own lack of intelligent behavior as we live in the lack of love.

The cultivation of one ability or another by a person, depends as much on the circumstances of his or her life that facilitates or restricts such cultivation, as on his or her emotioning. If the person lived in self-respect in the biology of love, will be able to do what he or she prefers wherever he or she lives. Intelligence is rarely a limiting factor in the learning and culture of an ability, because all human beings are basically equally intelligent, and what one person can do, others can do it also, if they wish to do so. What is central in the learning and culture of an ability if the circumstances of life permit it, is the desire to do so in self trust and self respect.

No doubt a teacher can see many of the abilities that a child may develop and orient him or her on how to do so in the best way. It is also possible to see those different abilities as different forms of intelligence. Yet to do so, the latter may be seriously misleading under the temptation of measuring intelligence to make comparisons that become sources of discrimination. When we do so, we begin to act as if there were children that are more intelligent than others, and we forget that the differences belong to their emotioning and the different preferences that they develop along their life. The different practices of assessment of intelligence mostly measure the cultural inclusion of a person, not his or her capacity for consensuality.

EXERCISE ONE

1. Form groups of six persons.
2. Choose a theme about which one of the members of the group will be examined by the others.
3. The person to be examined is asked to go away for a moment, and the remaining participants make a plot to generate fear in the person to be examined. It is recommended that the plot should resemble what the teachers do unconsciously when they want the student to fail.
4. The person to be examined is called back, and the plot is carried out.

5. Reflection on what was lived.

EXERCISE TWO

1 and 2 as in the previous exercise.

3. A plot is made under the desire that the person examined should pass the test. Accordingly the exam is carried out creating an ambience of trust and mutual respect.

4. The person to be examined is invited in and the plot is carried out.

5. Reflections on what was lived.

FINAL REFLECTIONS

The intelligent living is expanded in a co-existence in mutual respect (biology of love), and is restricted and diminished in a co-existence in fear, ambition and competitiveness. If we are not conscious of this, we are blind with respect to what happens with our students and we continuously deny them creating conditions in which reduce and restrict their intelligent behavior.

The following in italics has been taken from an article written by Humberto Maturana Romesin, called, *Biological Foundations of Morals and Ethics in Education*.

"We create the world that we live as we live it, and we do so moment after moment according to how we are at that moment as a result of how we have lived until that moment. The world that living beings in general, and human beings in particular, live, arises in their living. The world that a human being lives is a network of processes which only exists as those processes take place. Accordingly, it is because of this that in the living of living systems that which is not lived does not exist. Thus, by consciously or unconsciously choosing how to educate, educators determine the process through which the children that they educate will become cocreators through their living together of the world they live. No doubt teachers know this, but what we are adding here is that this is a biological process in which the world that children live arises as an expansion of their bodyhoods, and in their growth they become humans. Therefore, as we parents and educators chose to educate in the biology of love we chose to live for our children a world centered in the emotioning of ethics and not of morals.

To educate in the biology of love is basically simple, we just have to be in the biology of love. We have to be with the children under our charge in education as we are with our friends, accepting them in their legitimacy even if we do not agree with them. All that our friends do is legitimate even when we object to their doings or are in serious discrepancy with them in that respect. In friendship discrepancies or disagreements are opportunities for reflections in expanding conversations, not occasions for mutual denial. This is why we can talk with our friends about everything. In friendships there are no demands, and when a demand does appear, the friendship comes to an end.

Finally, there is total mutual trust and openness for collaboration in friendship because we are with our friends and do things with them out of pleasure, and not from obligation.

Friendship is a word in our culture that, most of the time without our awareness, connotes the biology of love.

Education in the biology of love occurs in the daily coexistence of parents, teachers and children when they do things together in friendship, that is, in self respect and respect for the other as well as self acceptance and acceptance of the other, without demands in the emotioning of collaboration and not competition, in the behavior through which the other arises as a legitimate other without fear of disappearing in the interactions.

We modern human beings mostly live in a culture of mistrust and control. We do not trust our children in their intelligence as biologically social beings capable of living any culture that does not destroy them before its reproduction. As we do not trust our children as socially intelligent beings, we deny them, as we continuously control them under the demand that they surrender to our will in the self denial of obedience. As we do not respect and trust our children, we do not hear them, and we act in education as if all that we wanted from them were their submission to the norms and demands of the community in which they happen to live without being responsible for what they do.

I do not want that, I do not want children that grow in the recurrent contradiction between morals and ethics, and the only way to avoid that is that education should be a space of coexistence in the biology of love. For that to happen, teachers and parents must recover self respect and self acceptance in a domain of trust as well as respect and acceptance of the other, so that as they respect and trust themselves they can trust and respect the children.

Only if parents and teachers respect themselves is it possible for them to respect their children and students and not deny them in their recursive interactions with them. Only when the parents and the teachers accept themselves, is it possible for them to accept both their children and their students and not deny them in a recursive devaluation of their being. Only if parents and teachers respect and accept themselves is it possible for them to trust, respect and accept their children and students, and correct what they do and not deny them as they do so, inviting them to reflection in the openness of awareness. But for that to happen, most teachers and parents must be reeducated in the biology of love, so that they recover self love, self trust and self acceptance, in the awareness that they themselves and the children, have all that they may need for education to be a joyful, spiritual, intellectual and aesthetically wonderful manner of living in which children can become happy and socially responsible human beings.

That is a big task, no doubt, but as we attempt it, let us be aware that there is a particular practice that can help us: let us not correct the being of the child, only his or her doings, inviting him or her to reflect and act in awareness of what he or she does in self respect and not in obedience.

And, teachers a final reflection on the ultimate significance of education in our times: Education defines the culture our children and their children will live, and as such defines in the course of a few or many successive generations, the channeling of the genetic drift of the human lineage, making it genetically more easy or more difficult the epigenic conservation of the biology of love as the fundament of our human biological and cultural condition as *Homo sapiens amans*".

HUMANNESS

What makes humanness?

Languaging.

What makes a man a man?

Nothing more than his sex.

But,.....what makes a man a human being?

His sensuality and tenderness in open awareness of his earthly interconnections as he dances therecursive dance of eating, playing, and kissing.

And,.....what makes a woman a woman?

The same through her own sexuality.

But,.....what makes her a human being?

Her tenderness and sensuality in open awareness of her earthly interconnectedness as she dancesthe recursive dance of eating, playing, and kissing.

What is the difference, then?

None and everything, since the woman is always aware of being in her humanness a cosmic source out of nothingness, while the man has to learn this anew when he becomes seduced and enchanted by the delight of linear reasoning that the woman has always known to be a transitory winter blossom.

And novelty, what is novelty in all this?

An unexpected turn in an always recursive dancing dance.

Empty seems human life to be!

Yes!....Or, rich, in the fullness of an always changing present of eating, playing and kissing.

Poem written by Humberto Maturana Romesin for a book called, Origin of Humanness, 1996.

This paper, was presented by Mrs Sima Nisis at the 6th Conference of the International Association for Cognitive Education in June and July, 1997, at Stellenbosch, South Africa, entitled "The Challenge to Cognitive Education for the Empowerment in the Information Age for Developing and Developed Countries."

The authors of this paper can be contacted at the Faculty of Sciences, University of Santiago, Casilla 653, Santiago, Chile.