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Human Development: The Role of Biology and Culture

Maria Lucia Seidl-de-Moura and Deise Maria Leal Fernandes Mendes
University of the State of Rio de Janeiro
Brazil

1. Introduction

This chapter discusses contemporary tendencies in Developmental Psychology, the concept of development in ontogenesis, and basic assumptions to study them. We assume a life cycle perspective from an evolutionary and social-cultural orientation. This perspective aims at understanding ontogenesis as based in our phylogenetic history and occurring in specific social-cultural and historical contexts. The inseparable relationship between biology and culture is highlighted, and we discuss the importance of considering groups from the *majority world*, beyond specific Anglo-Saxon North American and European ones. Recent research on different aspects of development are presented and discussed as examples of the perspectives adopted.

2. What is development?

Human development is a multidimensional process, involving considerable variation in both the direction and functionality of changes throughout life course, including gains and losses in all its phases. It is not a linear movement towards progress, increase of efficacy or growth, but involves basically transformations. It moves from conception to death, including an intra-uterine phase, and the period after birth. No single period in this process can be considered to be more important than the others (neither infancy nor adult age, for example) (Baltes, 1987). The task for researchers in this area is to look for the available capabilities and the limits imposed at different moments in the process, balanced by the plasticity of individual development.

According to Cole (1998), development involves the emergence of new forms and functions of interactions among people and their worlds. It is the result of the articulation of two different paths that follow different patterns of change: phylogenesis and cultural history. Human babies are born with a biological organization resulting from our phylogenetic history (Seidl-de-Moura & Ribas, 2004). Through an epigenetic process (Cole, 1998), genes interact with the environment. Successive forms and patterns of interaction between the organism and the environment emerge and the result is the human newborn baby. At the same time, human babies are born in an environment that is the result of cultural history within a historical time. They are born *bathed* in culture and are part of it. We can observe this in the different traditions presented when a baby is received in his / her family. In Brazil, the hospital room door is

usually decorated according to the baby's gender, family preferences, and even the fathers and mothers' soccer team. The expectations are clearly stated in the decorations and a socialization trajectory is somewhat demarcated at this moment. Obviously, this trajectory starts to be delineated even earlier, when a baby is planned or the mother is expecting. Thus, culture allows for development and circumscribes it. As Bussab and Ribeiro (1998) and other authors from an evolutionary perspective, Cole (1998) considers the baby to be both a biological - born with adaptive characteristics - and a social being.

Individual development is the result of a probabilistic process. It is not entirely predictable, but is rather the result of the dynamic articulation among diverse influences, such as the physical, social and cultural characteristics of the environment, genetic predispositions and propensities, neural activity, and individual experiences and behavior. Human babies' first experiences are intra-uterine, when they move in their mothers' uterus, and hear their voices and others'. These experiences are unique and they enter in this non-linear equation of influences. Bjorklund and Pellegrini (2002a & b) propose a systemic perspective to explain ontogenetic development, including genes and both the organisms' internal and external environments. What gets transmitted, according to these authors, is not only genetic information, but also development interacting resources (such as genes, the necessary apparatus for their functioning, and a larger context of development).

Bjorklund and Pellegrini (2002a & b) consider that it is not only a species' specific genome that is inherited by humans, but also a typical environment, even with all the apparent variations that characterize it. Some examples of characteristics of this typical environment are pregnancy, nursing, necessary care resulting from our altricial condition, and etc. This environment is a system of contexts partially fitted in different levels, from micro to macro. Organisms and contexts interact in different forms throughout the life cycle. There are specific tendencies for certain behaviors or mechanisms, such as attachment, which are characteristics of the species. However, the form through which these mechanisms express themselves varies, depending on the environment or ecological conditions experienced in certain moments of development, which also vary. These conditions can be described as developmental niches (Harkness & Super, 1996), which include three interrelated subsystems: the social and physical environment in which the individual lives; the shared practices of care, and the psychology of the caretakers.

As mentioned above, human development is markedly influenced by cultural conditions in a specific historical period and by the direction in which these conditions change. According to this perspective, the course of ontogeny is shaped by these circumstances, by the macro and micro social contexts, as well as by individual temperament. The idea of development as a process is crucial because it focuses on changes and relations at different moments, rather than only focusing on products of development. In order to understand human development it is necessary to take into account not only the relationship between biology and culture, but also the inseparability of different planes of analysis: phylogenetic, ontogenetic, historical-cultural, and microgenetic (Vygotsky & Luria, 1996). From this assumption, considering development in ontogenesis is to think of a process that occurs in a historical time, within a specific context, and which is a product of evolution by natural selection throughout our constitution as a species.

In studying behavioral development it is also important to attend to the four questions proposed in ethology by Tinbergen (1963): 1) *what are the stimuli that elicit the response, and*

how have them been modified by recent learning? How do behavior and psyche "function" at the molecular, physiological, neural-ethological, cognitive and social level, and how do the relations between the levels look like? (Questions related to the proximate mechanisms - the immediate influences in behavior); 2) how does the behavior impact animal's chances of survival and reproduction? What are the selective advantages? (Questions related to function of behavior or adaptation - the adaptive purpose); 3) how does the behavior change with age, and what early experiences are necessary for the behavior to be shown? Which are the developmental steps (the ontogenesis follows an "inner plan") and environmental factors that play when / which role? (Questions related to the ontogeny - the developmental influences in behavior); 4) how does the behavior compare to similar behavior in related species and how might it have arisen through the process of phylogeny? (Questions related to the phylogeny - the evolutionary or philogenetic origins of behavior).

One final aspect to be considered is the object of study in Developmental Psychology, and its possibility of generalization. Tomlinson and Swartz (2004) pointed out that 95% of studies on infancy conducted from 1996 until the time of their review are from Anglo authors. In contrast, at the time of their publication approximately 135 million babies had been born in the world, approximately 90% of them in "third world" countries, which we can consider the *majority world*. One can infer the implications of this bias in the construction of knowledge on human development.

Henrich, Heine and Norenzayan (2010) discuss the question raised above, based in a broad review in psychological literature. The authors claim that evidence in general behavioral science is often concentrated in data from a very specific group of subjects, who they label WEIRD (western, educated, industrialized, rich and democratic groups). They are Western educated, high social-economical level subjects, from industrialized countries, frequently psychology undergraduate students. They notice that researchers assume, either implicitly or explicitly, that these evidences can be generalized to other members of the species in general, especially data from psychological "basic processes". Their review indicated that 96% of the samples in psychological publications were from countries that represent only 12% of the world population. Even in these countries the chosen samples are not representative of the population, since they are many times composed by psychology students. This can lead to serious distortion, especially because authors are not cautious in their conclusions and generalizations. They aim at understanding and explaining the human mind or behavior using samples that not only are not representative of the population, but also may consist of a group of outliers.

In the review presented in the article (Henrich, Heine & Norenzayan, 2010) studies with adults are predominant, but they also point out that developmental research is biased towards focusing North American middle-class children. They cite studies in spatial reasoning and present evidences on gender differences, all of them found in high middle-class North American children, but not in ones from low SES or from non-urban contexts. Lancy (2010), one of the discussants of the main article, criticizes the ethnocentrism of developmental studies, mentioning evidences related to play, parents-children interactions, attachment and parental styles.

The perspective we propose to assume in our studies on human development takes into account the questions addressed above. It aims at understanding universal processes, but it assumes they occur in specific ecological and social-cultural contexts. Thus, knowledge

cannot be constructed based on evidences from restricted groups. The psychology of the *majority world* needs to be incorporated in mainstream Developmental Psychology. This has been the policy defended by the International Society for the Study of Behavior Development (ISSBD), which held its last scientific meeting in an African country, Zambia, part of this *majority world*.

3. Ontogenesis and phylogenesis: Evolutionary perspective on development

The conception of ontogenetic development presented here follows the perspective of developmental psychology oriented by the biology of evolution, which represents a recent tendency in the area, the perspective of the Evolutionary Developmental Psychology (EDP).

“We believe that the *zeitgeist* has changed, and we are pleased to be part of a growing group of developmental psychologists who see the possibility of an evolutionary-based theory of ontogeny that will encompass all who think seriously about development” (Bjorklund & Pellegrini, 2000, p. 341).

Ontogenesis is related to the history of our species. The development of individuals in the course of their life is based on the history of modern *Homo sapiens* and is a product of this history. Individual development varies according to limits and possibilities imposed by this history and by different cultural characteristics.

Although it is important to consider the evolutionary perspective on development, we emphasize that it does not exclude other contributions. Evolutionary Developmental Psychology (EDP) should be integrated and understood from a perspective that incorporates the recommendations of both Vygotsky (about considering in development the inseparability of different planes of analyses) and Tinbergen (1963).

Evolutionary Developmental Psychology consists in the application of the basic principles of the Theory of Evolution to explain contemporary human development. This approach is relatively recent and it aims at investigating the ways in which our evolutionary past influences the ontogenetic development of human beings (Bjorklund & Pellegrini, 2002a, b).

There are two main assumptions with heuristic contributions to Developmental Psychology, and which are related to evolutionary perspectives (Charlesworth, 1992). One of them is related to *individual differences* and is concerned to the physical and social environments. In this way, there are differences among children in relation to mortality rates, abuse, neglect, malnutrition, quality of care, and education. This condition of the presence of individual differences can be related to the immediate effects on children's health, life and development, and has repercussions in long-term survival and reproduction in adult life.

The second assumption is the notion of *typical characteristics of the species*. In human beings, these would be behaviors or motivations that tend to appear in different cultural and historical contexts (universal predispositions), mainly because of their high adaptive value. In other words, they are associated to the survival of individuals and their fitness. As a result of the long period of relative immaturity of human beings, it can be registered the following examples: parental care, which includes attachment and conflict between child and adult, interaction between siblings, moral development training, structure and functioning of groups of children with similar ages, which involves domination, submission, competition and cooperation, learning, among others.

Based on this perspective, we conceive the adult not as the final product of selective forces in evolution, but all life cycle. Human life cycle is organized through universal developmental tasks that need to be solved in specific ecological and social-cultural contexts. Due to environmental variability, traits and strategies throughout life cycle are not fixed or determined genetically, but evolve to show plasticity, that is, to maximize fitness in diverse ecological conditions. Culture and cultural acquisitions are adaptations, and they serve individuals' fitness.

4. *Homo sapiens sapiens*: "Biologically cultural"

It is commonplace to consider humans as a special species, or to think about ourselves as specials in comparison to individuals from other species. Although humans are proud of their nature and of their *unique* abilities, findings from diverse scientific fields (neuroscience, evolutionary biology, ethology, and others) demystify the idea that the human species is superior in many aspects to any other. Today we know, for instance, that humans and chimpanzees share 99% of their genetic material, other species can make use of what some consider a rudimentary type of language, some non-human primates use instruments, have culture and a sense of justice. In addition, we can be highly intelligent, but neither the human brain is the largest among the primates, nor humans have the largest encephalization quotient (Dolphins have larger ones).

As happens to other animals, humans have many adaptive capabilities resulted from selective pressures. However, what is wonderful is that we display characteristics that have evolutionary relationships to the cultural context, such as dependent childhood, parental investment, propensity to attachment, cooperation, complex language, and tendency to lasting connections between lovers. All of these characteristics seem to be crucial for our great capacity to deal with a diverse and complex world, in terms of its physical and social-emotional aspects. Although some primates have been known to have some rudiments of culture, certainly human beings are distinguished from other animals by their highly specialized cultural way of life. As mentioned before, humans are *biologically cultural* (Bussab & Ribeiro, 1998; Rogoff, 2003).

Based on the discussion above, it is surprising that biology and culture have been considered for centuries as opposite dimensions in human development. Since ancient times, philosophers and other scholars have shown great interest in how we acquire knowledge, how we can learn about things and people, and so on. Psychologists also have thought about these questions, investigating humans' mind and behavior. The attempts to answer these and other related issues often bring the dichotomy nature x nurture, genetic determination x environmental influence, biology x culture as an explanation for developmental processes.

The relationship between nature and culture is not simple and still needs to be better understood. Apparently, as soon as our ancestors developed a cultural dependence for survival, natural selection began to favor genes for the cultural behavior. According to Bussab and Ribeiro (1998), analyses of fossil records show an evolution *pari passu* between biology and culture, supporting the *cultural nature* of men. There is evidence that our supposed ancestors, the *Homo habilis* and the *Homo erectus*, had had a social-cultural way of life, inferred by a systematic use of manufactured stone tools, increase in social exchanges

and knowledge transmission. There are strong indications that the characteristics favorable to culture development and transmission were selected.

Some characteristics presented by human beings are at the same time selected by cultural context and favor cultural evolution. Therefore, this old discussion involving radically opposed positions seems to be ineffective and outdated. The challenge is to understand how they work together throughout the life cycle. Thinking about ontogenetic processes and the genesis of development can help us to move forward in this debate. As proposed above, we adopt a social-cultural and evolutionary perspective, which presupposes an interactionist position. According to this view, we are products of our genetic predispositions, which are updated in the environment.

Pathways followed by social interactions and parental care in ontogenesis are illustrative of these issues regarding biology and culture's roles in development. Human development is constructed through the individuals' social interactions with their co-specifics. These interactions are product of ecological and social-cultural conditions, and follow diversified socialization trajectories of development. In contrast, the tendency for interacting with others and the need for emotional warmth may be considered human predispositions. Keller (2007) proposes a cultural model of parenting to discuss how human beings are, since conception, oriented by certain predispositions or open genetic programs. From these programs they are able to have experiences that conduct to the construction of a modal conception of self.

The *Component Model of Parenting* is conceptually composed by six universal and independent systems (Keller, 2007). In different cultural contexts, caretakers emphasize this systems differently, both with respect to their care practices with their children, and to their beliefs and parental ethnotheories. In addition, their socialization goals are related to a cultural model and reflected in their practices, involving what they think is good for raising children.

The first of these described systems is *primary care*, considered phylogenetically the oldest system. It involves a set of activities that aim at meeting babies' survival needs, including health related activities, such as nursing, diapering, bathing, washing,, and so forth. The function of this system is to reduce stress and promote security and trust in relation to caretakers' protection. The second one is the *body contact system*, which promotes corporal contact, and involves carrying the baby close to the body. This system affects the bonding between mother and baby and group cohesion, and has the function to protect the baby from dangers and predators.

The *body stimulation system* is also based on communication through the body and involves any motor, kinesthetic, tactile and balance stimulation of the baby. Dyadic activities are exclusive, and this system's function is to stimulate motor development and to intensify corporal perception. The fourth system is *object stimulation*, and it has the goal to present the object world and physical environment to the child, and is related to exploratory activities.

Face-to-face context is characterized by mutuality through eye-gazing. It is promoted by the mother, when she places the baby in a position where their faces are close, so they can maintain eye contact. The frequent use of language and unique dedication in dyadic interactions are characteristics of this system. The *proto-dialogues* that happen between

mother and baby in this context provide the baby with the experience of contingent perception. Finally, the sixth system is the *narrative envelop*, which refers to the symbolic mediation that involves the infant through mothers' conversations. This system presents different styles according to cultural models.

Keller (2002) argues that according to the predominance of these parental systems and of interactional mechanisms, learning, based on open genetic programs, is translated into experiences that lead to a modal conception of self. This same author (Keller, 2007) also discusses about two contrasting modes of care. The first is a non-Western way, with multiple social environments (caretaking is shared) and co-active attentional structure. Mothers perform their daily activities carrying their baby. In contrast, in a Western, urban way, the social environment is dyadic and attentional structure is unique. In general, while the adult takes care of a baby, no other activities are simultaneously performed.

Interactional experiences are different in these two modes of care. In unique dyadic environment it appears to predominate an interaction style that focuses on visual communication and on oral/verbal exchanges. In the multiple social environments, in turn, the corporal contact between the mother and her baby is much greater, and the cues partners received from one another are tactile.

Socialization goals can be understood in relation to these two ways of parental investment. Urban Western cultures, in which babies spend much time alone, favor earlier autonomy. On the other hand, in most non-Western and non-urban cultures socialization goals emphasize close interrelationship between babies and their caretakers. This contrast is possibly a good example of an open genetic program, an innate tendency to parenting that is expressed in different modalities, according to specific ecological and cultural contexts. In theory, according to Keller (2007), these goals are related to practices and are correlated to different self development trajectories (We will return to this point ahead).

Evidence in this and other domains signal that being cultural is part of our biology, and that genetic heritage can only be expressed in specific ecological and social-cultural conditions, hence describing the epigenetic landscape of potential developmental pathways.

5. The interaction between biology and culture: Investigations and evidences

Parental investment and care

Life history theory focuses on strategies employed by organisms to allocate their time and energy to deal with different demands throughout their life-cycle. These demands include various trade-offs between somatic effort (aiming survival) and reproductive effort (and within it between mating and parenting). Parenting involves a complex dynamics that mobilizes cooperation and conflict, different kinds of emotions and strategies. As the other aspects discussed in this chapter, parenting is the product of both biology and culture. Biologically, it is basic for individuals' (parents and children) fitness, but the form it takes is varies (Keller, 2007). Human babies are born dependent on care for their survival and future reproduction. Despite individual variations, they are born with a set of characteristics that attract adults who care for them and that predispose them (babies) to interact with their co-specifics, as mentioned previously. On the other hand, adults are capable of caring for infants and they are oriented by the dynamic of investment in their offspring. Since life

history strategies are not fixed, but rather evolve to show adaptive developmental plasticity, parental investment and care can assume different forms. Local environments and ecological conditions are automatically assessed by parents and are crucial for the adoption of diverse strategies of investment and care.

The *Component Model of Parenting* proposed by Keller (2007) sets predispositions of care in terms of parental systems. The organization of these systems in response to ecological conditions is translated into some basic socialization trajectories. Such trajectories have been described as moving towards the socialization of either autonomous/independent selves or towards interdependent selves. Findings in several cross-cultural investigations, carried out by Keller and her colleagues (Keller et al., 2006; Keller et al., 2007; Keller, Borke, Lamm, Lohaus, and Yovsi, 2011; see also Keller, 2007), are representative of these notions of different trajectories of development of the self. In these studies, Keller and colleagues analyzed general orientations concerning parental beliefs, and values among parents of several distinct cultures (German, Euro-American, Greek, Indian, Chinese, Mexican and Costa Rican).

In one of the most recent study (Keller et al., 2011), two prototypical socialization contexts of independence (autonomy) and interdependence were addressed: German middle-class families, and Cameroonian *Nso* farming families. The results confirmed the expectations in identifying two different parental styles. German babies experience significantly more face-to-face contact in free-play interactions in the first three months of life than do the *Nso* babies. *Nso* mothers perform significantly and consistently more body contact from the beginning than German mothers. It was also confirmed the hypothesis that face-to-face contact and autonomous discursive style are positively correlate, while face-to-face context and style of relatedness are negatively correlated over time. Results still showed that body contact and style of relatedness are positively correlated, while body contact and autonomous style are negatively correlated. These correlations validate body contact and face-to-face contact as supporting different socialization strategies.

Considering agency and personal distance, Kagitçibasi (2007) has added the trajectory towards an autonomous-relational self to the two proposed by Keller (2007). Data from Brazilian studies on socialization trajectories showed this mixed trend, and indicated the importance to take in account intra-cultural differences in studying development.

One study conducted with 350 primiparous Brazilian mothers, from the five geographic regions of the country, aimed to investigate their socialization goals (Seidl-de-Moura, Lordelo et al., 2008). The Socialization Goals Interview (SGI), adapted from Harwood (1992) was used. Answers to the instrument were coded in five categories: Self-maximization, Self-control, Lovingness, Proper Demeanor, and Decency. The results showed that Brazilian mothers gave more emphasis to Self-maximization and Proper Demeanor than to other categories, presenting a pattern that fosters the development of children's autonomous-relational selves. Intra-cultural variation was found among the different cities studied, and the three different cultural models described in the literature were identified, indicating that there is not homogeneity in Brazilian mothers' socialization goals.

In a different study, parenting cultural models of a group of 200 primiparous mothers from Rio de Janeiro, Brazil, were studied in terms of systems of beliefs and practices (Seidl-de-Moura et al., 2009). Participants had children less than 44 months-old. Mothers answered the

Socialization Goals Interview (SGI), and an adapted version of an inventory on beliefs about care practices, developed by Suizzo (2002). Answers to the SGI were coded in the five categories listed above, and scores in each of them were calculated. A factor analysis indicated three dimensions in mothers' beliefs about practices: awaking and exposing the child to diverse stimuli (Stimulation), ensuring the Proper presentation of the child, and Responding and bonding to the child. Results showed that mothers from Rio de Janeiro share a cultural model of autonomy for their children, but they also believe in the importance of their children's relationship to others, which reinforces the findings of Seidl-de-Moura et al. (2008a).

A different study on mother-infant interactions (Seidl-de-Moura et al., 2008b), conducted with dyads in Rio de Janeiro, Brazil, brings evidences on socialization goals and practices. Analyzing characteristics of interactional instances in two groups of dyads (N=56), the authors reported the prevalence of face-to-face interactions when the babies were one month old, and of object stimulation when the babies were five months-old. Based on Keller's (2007) model, the pattern observed is characteristic of a socialization trajectory that emphasizes the development of autonomy and independence, in contrast to a trajectory in which body contact and body stimulation are prevalent. The mothers studied seem to value goals of autonomy and independence, while also holding sociocentric goals.

Vieira et al. (2010) also aimed to investigate characteristics of Brazilian mothers' beliefs system in the dimensions of autonomy and interdependence. One group of 600 women, half from state capitals and half from small towns, participated in the study. They were individually interviewed using Scales of Allocentrism, Beliefs about Parental Practices and Socialization Goals. The results indicated that although mothers from both contexts valued autonomy, those living in small towns considered the relational dimension as the most important, whereas mothers living in capitals equally valued both dimensions, either in their beliefs about practices or in the socialization goals for their children. Mothers from small towns have a higher mean score on allocentrism than mothers living in capitals. Thus, place of residence proved to be a relevant variable in modulating maternal beliefs. In contrast, educational level was not a significant factor in the variables considered and with this group of mothers.

The results in these studies contribute to the understanding of the relationship between dimensions of autonomy and interdependence in mothers' beliefs system. They also confirm the idea of a high complexity in parenting models, which are simultaneously the product of cultural demands and the expression of predispositions for care.

Attachment and relationship style

Attachment theory (Ainsworth, 1988; Ainsworth & Bowlby, 1991; Bowlby, 1969/1984a & b) considers human beings to have the tendency to form emotional bonds with certain individuals as a basic component of human nature, present since birth. As a universal feature, this is understood as having patterns of adaptive innate behaviors, which have the function of ensuring care and protection to children. These patterns of behavior and reactions are generally considered the same for all individuals, independent on the context.

The theory is based on ethology and evolutionary concepts. In its original formulation, attachment is considered a disposition to search for proximity and contact with a specific

figure, establishing a sense of security. This species' tendency has an important biological function, since we are a semi-altricial species and the survival of infants depends on the proximity of adults who provide food, protection, and comfort.

Bowlby proposed control systems - attachment, fear, affiliative and exploratory -, each of them with important functions. The attachment system has the function to ensure that children bond with persons who will provide care and protection against predators. Fear involves the avoidance and distancing from threatening situations. Although it is essential for survival, it has to be balanced by a system that allows children to interact with conspecifics with whom they do not have attachment bonds. This is the function of the affiliative system, which allows children to explore the social world. Finally, it is also adaptive that the child knows the surrounding environment, which is a function of the exploratory system. Exploratory behavior is activated by novelty (Bowlby, 1969/1984a & b), and what determines the end of its action is familiarity to what has been explored. This is the process we call habituation. Control systems act dynamically (Barnett & Vondra, 1999), and their different activation levels interact. For Bowlby and colleagues who follow attachment theory, healthy development depends on the balance between functioning of the diverse systems.

The process of establishing attachment relationships starts at birth and uses mediator behaviors that make the attachment figure move towards the child or vice-versa. In the first case, for instance, when the child cries, smiles, babbles, makes gestures, she/he propitiates mother's proximity. In the second case, behaviors of the child bring him/her closer to the mother, such as walking in her direction, follow or grabbing her. According to Bowlby (1969/1984a & b) the child develops internal functional models, which are mental representations of the availability of attachment figures. The need to develop attachment relations is universal, but there are individual variations related to the child and to the adult sensitivity.

Attachment theory has been widely accepted in its original formulation. Based on its propositions, children can be classified as presenting different patterns of attachment according to their performance in the *Strange situation*, an evaluation setting developed by Mary Ainsworth (1989). Attachment quality has been classified as secure, insecure, insecure/avoidant, and insecure/ambivalent. Some include also disorganized, avoidant/ambivalent, and unstable/avoidant styles (Barnett & Vondra, 1999; Waters & Valenzuela, 1999). The evaluation setting focuses on the child's reaction to mother leaving the room, the presence of a stranger and the mother's returning. Seidl-de-Moura and Ribas (2004) have reviewed the literature on cross-cultural studies on attachment and have concluded that attachment theory needs to be investigated in different social-cultural contexts, in order to be assessed in regards to its limits and to receive a trans-cultural validation.

Along these lines, recent research has shown that different patterns can be adaptive depending on local conditions and cultural contexts, and that distinct historical moments can produce different attachment patterns (Keller, 2008). Evidences are challenging the idea that the secure attachment pattern, as observed by M. Ainsworth, represents a universal norm. Implicit in this idea is the definition of independence and autonomy as conditions for healthy human development. However, as discussed above, socialization trajectories and adaptive strategies vary in different conditions and cultural contexts. The reaction to people they do not know is diverse according to the way babies are raised, as Otto (2008, in Keller,

2008) has demonstrated with African *Nso* babies. Research shows that the most adaptive emotional regulation strategies for some children from non-urban and non-Western societies are not the same as those considered as secure attachment for Western middle-class infants (Otto, 2008, in Keller, 2008).

Chisholm (1996) has proposed that varied attachment patterns may have adaptive functions. When parents are willing to consistently invest in their children, but with scarce resources, the pattern of insecure-ambivalent attachment maximizes the available investment, indicating needs for care, immaturity, and dependency. On the other hand, when parents are not willing to invest, developing insecure-avoidant attachment, emotional distancing and independency from parents reduce the child's demands to them. This will reduce risks of abuse or abandonment while the child is still vulnerable.

Thus, while predisposition for attachment may be innate, different experiences in interactional history determine an infant's development of either emotional security or insecurity in attachment relationships. The way this is manifested depends on the adaptive value of the child's behavior and on culturally defined beliefs and practices of care.

Emotional expression

One other example of our argument on the relationship between biology and culture is emotional expression. This is one of the controversial issues related to human emotion, and the discussion on whether facial expressions of emotions are universal or culture-specific goes back more than one century. There are those who claim that facial expressions of emotion are universal across human cultures and thus biologically determined. In contrast, there are those who defend these expressions to be cultural in their origin. For these scholars, such expressions are analogous to language, once they function as a means for communication, and that they must be learned. However, this is not a simple question and intermediate views certainly exist.

Publications from Silvan Tomkins and Robert Plutchik on emotions gave origin to many studies about facial expressions of emotion from the 1970s. Recognized researchers in this area as Paul Ekman and Carroll Izard developed theories, methods and evidences that constitute what became known as *Facial Expression Program*, focusing on the universal, *basic* emotions, which are assumed to be the cause and the signal received from facial expression. This program generated a huge set of evidence (Ekman, Sorenson, & Friesen, 1969, Ekman, 1972, Izard, Huebner, Risser, McGinnes, & Dougherty, 1980, see also Ekman, 2003 and Izard, 1971).

The interest in investigating the origins of emotional expressions considering the controversy between nature and nurture is present in the work of Ekman. After conducting different cross-cultural researches, he claimed that in contrast to the belief of some anthropologists, including Margaret Mead and Ray Birdwhistell, and even of some psychologists as Otto Klineberg, facial expressions of emotions are not culturally determined, but universal across human cultures, and thus biological in origin. According to him, a large body of evidence reinforces this view (Ekman et al., 1969; Ekman, 1972; Ekman, 1994).

Ekman (1999) believes that it is reasonable to propose that what is universal in facial expressions of emotions is the connection between particular facial configurations and specific emotions. However, the ways in which this universal connection between

expression and emotion is established is not yet satisfactorily answered. For many investigators, it is likely that this connection gets established through natural selection. For others, in turn, it cannot be ruled out the possibility that some of these expressions are acquired through species-constant learning. One might ask whether it is reasonable to think that the pathways of learning are not associated to predispositions and species-specific adaptive mechanisms, freely following in either direction.

Discussion around the expression of emotions continues, and it is hard to agree on how many different expressions are universal for any given emotion, although there is evidence to suggest that there is more than one universal expression for each emotion. In a similar way, it is also not certain how many emotions have a universal facial expression (Ekman, 1999).

Contributions from Carroll Izard also deserve attention. His Differential Emotions Theory (DET), and the Maximally Discriminative Affect Coding System (MAX) have inspired many studies. DET maintains that universally recognizable innate, basic emotions emerge within the first two to seven months of post-natal life (Izard, et al., 1995), and argues for the congruence between emotion expression and subjective experience (Izard & Abe, 2004).

Despite the evidence for the universality of emotional expressions, there have been challenges to this perspective, including James Russell's studies on how words are used to judge photographs of facial expression. He is one of the most prominent critics of universals in facial expressions of emotions. Although he believes that facial expressions and emotion labels are probably associated, this association may vary between cultures and it is loose enough to be consistent with various alternative explanations (Russell, 1995).

Within the area of emotional development there have been perspectives that consider basic emotions to be innate. However, these views present some difficulties in dealing with the emergence of new emotional forms, particularly in initial development. Some perspectives have emerged more than a decade ago, and were exposed in a symposium of the *International Society for Research on Emotions*, in 1996. Alan Fogel, Klaus Scherer, Linda Camras, Marc Lewis and others defended the approach of emotional self-organization based on the *Theory of Dynamic Systems*, and were interested in finding best alternatives to deal with the issue.

Studies with infants, children and adults discuss the universality, as well as the cultural diversity in some patterns of emotional expression (Kitayama, Mesquita, & Karasawa, 2006; Matsumoto, Willingham, & Odile, 2009; Trommsdorff, Friedlmeier, & Mayer, 2007). Matsumoto et al. (2009) assumed a distinct perspective in relation to emotional expressions. Contrary to a certain consensus, which agrees that when emotions are aroused the display of these emotions are either universal or culture-specific, these authors investigated the idea that an individual's emotional display in a given context can be both universal and culturally variable, as they change over time. Evidences from their study confirmed their hypotheses. Adults from individualistic and urban cultures expressed their emotions more than those from collectivistic and less urban culture, who had the tendency to mask their emotions. The results reported also indicated that these culturally influenced expressions occurred within a few seconds after initial, immediate, and universal emotional displays.

Cole and Tamang (1998) results support the idea of complexity and cultural specificities in relation to emotional expressions. They investigated mothers' beliefs about appropriate

emotional behaviors for children in two different groups of Nepal (the Chhetri-Brahmin and the Tamang). Tamang mothers' group valued equality and harmony, based on Buddhist teachings. Their way of understanding the world and interpersonal relationships lead Tamang people to avoid strong emotions as anger. In turn, the Chhetri-Brahmin, who are part of the Nepalese Hindu population, are embedded in a social system ruled by caste. In this context, discipline and self-control are appreciated behaviors, and the expression of certain emotions is occasionally allowed. For this reason, people learn to soothe the expression of intense emotions.

Keller and Otto (2009) also analyzed the cultural determinants of emotion regulation and emotion expression in two different social groups (urban context in Berlin, and rural context in Cameroon) and found contrasting results. What they considered to be an urban Western group prototype emphasizes the expression of emotions in children, while in rural context in Cameroon it is desired that children be calm and do not express their emotions. Positive emotions stand out in the socialization goals and in interactions among urban middle-class in Berlin. In regards to negative emotion regulation, strategies adopted also differ completely. In one hand, German mothers talk with their babies, asking them about what is happening, in a quasi-dialog format, trying to find out the reason for crying, for example. On the other, Cameroonian mothers use shaming devices, requesting immediate compliance and restoring emotional harmony once the child complies.

An evolutionary perspective seems to be a fruitful approach to deal with emotions and their expressions. According to this view, we can consider the existence of some basic, innate and universal emotions and corresponding particular expressions universally expressed and recognized. Throughout our species' history certain emotional expressions had evolved in order to solve adaptive problems presented in the evolutionary environment. Although the biological basis of them as predetermined features of our species, it is clear the role of culture in the displaying of these emotions, as well as in the developmental process in which this displaying is based. The expression of emotions can be considered adaptive for men and other animals, and we consider this field of study as highly appropriate to discuss the interaction between biology and culture as a bi-directional trajectory.

6. Final considerations

This chapter presents some assumptions for a theoretical perspective to study human development. We argued in favor of a life cycle perspective from an evolutionary and social-cultural orientation, aiming at understanding ontogenesis with emphasis on epigenetic processes, which are based in our phylogenetic history and occur within specific social-cultural and historical contexts. The inseparable relationship between biology and culture was highlighted. This perspective should consider simultaneously universal and cultural aspects in development, focusing not only on traditional restricted groups of subjects in developmental studies, but considering groups from the *majority world*.

In order to illustrate the perspective proposed, we discussed recent research on specific aspects of development, such as parental care, attachment, and emotional expression. In all of them, it can be noted researchers' concern to take into account specific ecological and social-cultural contexts in which the studies had been developed. Evidences were presented and discussed avoiding inappropriate and hasty generalizations; universals were contrasted

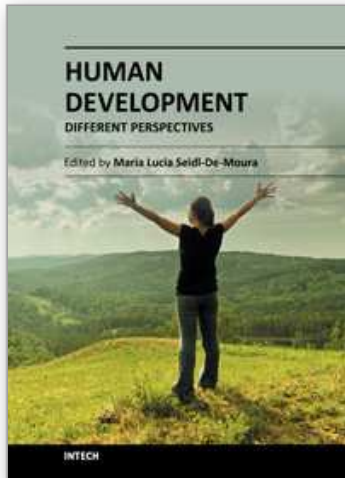
with specificities. Such an approach seems more fruitful and consistent with the human development view here proposed. We believe this chapter may represent a starting point for students and professionals interested in human development.

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Human development has different meanings depending on the area we focus on. To the psychologists it is the ontogenetic process of individual development. It considers systematic psychological changes that occur in human beings over the course of their life span. To sociologists and economists, among others, the main consideration is the macro-level of countries or regions and their development conditions related to human needs. Our book has two parts. The first one is entitled "Development in the ontogenesis" and it consists of three chapters whilst the second is "Human development: contextual factors", also including 3 chapters. Together, the two parts give the readers a panoramic view of very complex subjects and complement each other. Researchers of ontogenetic development cannot ignore that contextual factors are the basis of this process. On the other hand, social scientists worried about the macro variables need to remember that they are dealing with people, who are affected one way or another by those variables and whose development is the product of biology and culture.

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51000 Rijeka, Croatia
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中国上海市延安西路65号上海国际贵都大饭店办公楼405单元
Phone: +86-21-62489820
Fax: +86-21-62489821

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