Piaget’s Legacy to Human Development

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Abstract: The main goal of this article is to present, and discuss on, Piaget’s legacy to human development as it encompasses the development of both individuals and countries. Although Piaget had been more interested in the former than the latter, it makes sense to speak about Piaget’s legacy to human development because these two forms of development, individual and collective, are deeply intertwined. The article has five sections. The introduction section sets the context for the development of countries and individuals. The second, third, and fourth sections are focused, respectively, on Piaget’s epistemological, psychological, and educational legacy to the development of individuals and, by implication, the development of countries. Some misunderstandings of Piaget’s views on education and development are also examined. The last section summarizes the main ideas of this article and reflects on comments and criticisms they might raise.

Keywords: Piaget, Human developmental, Psychological development, Development, Education.

1. INTRODUCTION

Although human development encompasses the development of both countries and individuals, when certain experts in human development think of it, they generally refer more to the development of countries [1,2] than the development of individuals [3]. Even so, human development’s theorists and researchers [4-6] are fully aware that these two forms of development are deeply intertwined. Thus, when they speak about human development they are speaking about the development of countries and, by implication, the development of individuals.

Actually, the development of any country has implications for the development of its own and even inhabitants from other countries [7]. Reciprocally, the development of individuals from any country has implications for the development of the country where they live and grow, and even the development of other countries [4]. This means that more than ever, we live in a global world [8].

For example, according to Bronfenbrenner’s [5] ecological and even bio-ecological approach to human development [9], the development of individuals is affected by their surrounding environments/systems. The country where they live and grow is a case in point. An individual’s macrosystem, for example, encompasses the economy, social norms, and the political system of the country in which s/he lives and even those of other countries. The individual’s macrosystem, like his/her microsystem, mesosystem, exosystem and chronosystem [5], can have either a beneficial or a detrimental effect to his/her development. Consider, for example, the different effects of these systems on the development of a child growing up in the former Soviet Union vs. the United States [7].

The development of a country is assessed through the human development index (HDI), an index proposed by the Indian Nobel laureate economist Amartya Sen [1] and the Pakistan economist Mahbub Ul Haq [2]. According to these economists, the human development index (HDI) of a country is a summary measure of average achievement of its inhabitants in the following parameters: (1) a long and healthy life of those inhabitants; (2) how much they are developed, knowledgeable, and well-informed; and (3) to what extent they have a decent standard of living. Parameter (1) is assessed through life expectancy at birth. Parameter (2) is based on mean years of schooling for adults aged 25 and even older, and the expected years of schooling for children of school age. Parameter 3 is measured through gross national income per capita [10].

The fact that the human development index refers more to individuals than countries seems inconsistent with my previous argument that when certain experts in human development think about this form of development, they generally refer more to the development of countries [1,2] than the development of individuals [3]. This inconsistency, however, is more apparent than real. First, to conceive of a country without individuals/citizens would defy our imagination. Second, countries’ and individuals’ development are two forms of development deeply intertwined [7]. Third, it would be highly surprising, even strange, that the human development index of a given country did not take into
account, among other things, its inhabitants’ health, longevity, as well as their educational and socio-economic level [10]. Fourth, Bronfenbrenner’s [7] ecological approach to human development is a model of human development, and yet deals much more with the development of individuals than the development of countries.

The HDI was proposed to emphasize that individuals’ health, competencies and expertise, not only their socio-economic level, are the ultimate criteria for assessing the development of the country in which those individuals live and grow [1,2]. This index can be used, for example, to reflect on national policy choices, and to examine why two countries with almost the same gross national income (e.g. Switzerland and Qatar) can end up with different human development outcomes [11].

The DHI has been criticized on many respects. Chiefly among them are the following: (a) Although the three parameters of the HDI are weighted equally, they do not necessarily contribute to the development of countries equally; (b) such parameters are too strict, because they do not refer, for instance, to one’s freedom, which is considered to be crucial to one’s development by many people and countries; and (c) the three components of the human development index do not take into account inequalities within countries [12]. The last, (c), is critical. It is morally unjustified that in many countries, a relatively small group of individuals earn much more than the great majority of their compatriots [13].

With a few exceptions [14,15], Piaget did not elaborate directly on the development of countries, while this type of development is closely related to the human development index. Even so, his epistemological [16-18], psychological [3], and educational [14,19] views on individuals’ psychological development have, as will be seen, deep implications for the human development index and, in turn, the development of countries. Because of these implications, the present article shows that Piaget’s theoretical framework [16-18] and empirical findings [3] constitute an important legacy to human development. Note, for example, that parameter 2 of the HDI refers to how many years of schooling individuals from a given country have and, hence, to what extent they are knowledgeable and developed. As will be seen, more than any other, Piaget’s approach [20,21] to our understanding of individuals’ psychological development is unique and remarkable.

Individuals’ psychological development has much to do with their capacity for: (1) intellectual decentration [3] -- i.e. to be capable of going beyond the perceptual features of a given task and taking into account its inferential features (e.g. to understand that the number of elements in a set remains constant despite their spatial configuration in the set); (2) moral decentration [13] -- i.e. to be capable, in a situation of moral conflict and choice, of going beyond personal interests, legal laws and moral norms, and taking into account reversible and universalizable moral principles, in particular, the principle of justice; (3) social decentration [22] -- i.e. to be capable of seeing other people not only in physical terms, but also as psychological, complex systems or as individuals who are able to play different roles in their everyday life; (4) emotional decentration [23] -- i.e. to be able to understand, for example, that one can be disappointed and the others can be satisfied; (5) epistemological decentration [24] -- i.e. to be capable of seeing that any scientific theory (e.g. geocentric theory) is doomed to being replaced by a more progressive research program (e.g., heliocentric theory) [25]; (6) aesthetic decentration [26] -- i.e. to be able to understand that the beautiful is not only what we like; and (7) moral-ecological decentration [27] -- i.e. to be able to understand that we should respect nature not only because of its usefulness for us, but also because it deserves to be respected in itself.

Although Piaget was mainly concerned with individuals’ cognitive [3] and moral [28] development, his views on these two forms of development have deep implications for the other types of decentration mentioned above. Suffice it to say that, for example, it has been found that the more an individual is cognitively developed, the more s/he is likely to be developed in emotional [23], aesthetic [26], and social [22] terms.

Of course, the development of a given country rests on the cooperation and interactions that such country is able to establish with other countries [8]. Similarly, for Piaget, the development of individuals from any country is connected to their ability to cooperate and exchange viewpoints with inhabitants from their own and even other countries. For example, Piaget argued that without interchange of thought and cooperation with others the individual would never come to group his operations into a coherent whole [29]. More to the point, Piaget [28] elaborated on two types of social interaction: a horizontal interaction or an interaction among children, and a vertical interaction or an interaction among children and adults. He found [28] that whereas the former tends to lead to the child’s moral autonomy -- a morality oriented to equality and cooperation -- the latter tends to lead to the child’s moral heteronomy -- a
morality guided by constraint and unilateral respect. Needless to say, morally autonomous individuals, such as Abraham Lincoln and Martin Luther King, for example, had a great, positive effect on the development of their own and even other countries [13].

It is worth mentioning that the global world mentioned in this introduction was foreseen by the Greek philosopher Socrates (470 – 399 BC). It is alleged that he proclaimed that he was a citizen, not of Athens or Greece, but of the world. [30]. In what follows I hope to argue and demonstrate that Piaget’s legacy to the development of individuals and, by implication, the development of countries, has much to do with his epistemological assumptions [16-18], his developmental findings [3], and his reflections on education, teaching and learning [14,19].

Although there exists an immense literature on Piaget’s oeuvre [20,21,31-33], there is no paper doing what this paper does: to argue and show, in a succinct way, that Piaget left us an outstanding, far-reaching legacy to the development of individuals while he was an epistemologist, a developmental psychologist, and an educationist. As countries’ development is closely associated with individuals’ development [7], one may say that Piaget’s legacy to the development of individuals is also a legacy to the development of countries and, hence, to human development [14,15].

2. PIAGET’S EPISTEMOLOGICAL LEGACY TO INDIVIDUALS’ DEVELOPMENT

Piaget was an epistemologist in terms of vocation. In his conversations with the French journalist Jean-Claude Bringuier [34], Piaget considered himself to be above all an epistemologist. He was mainly concerned with the emergence and development of several types of scientific knowledge as individuals [3] and societies [15] evolve over time. The psychogenetic development of mathematical knowledge [16], physical knowledge [17], and biological, psychological and sociological knowledge [18] are examples of individuals’ development. The historical development of geometry, for instance, is an example of Piaget’s concern with the development of the history of sciences and countries [15].

For Piaget, the development of individuals [3] and societies [15] over time occurs according to a small number of epistemological principles. The following three are worthwhile, for they have implications concerning the development of individuals and countries.

2.1. Interactionism

According to Piaget [35], individuals’ development results from: (a) the interaction between subjects and objects -- i.e. physical experience or empirical abstraction. To put two objects in our hands, and then to conclude that one object is heavier than the other is an example of a physical experience and knowledge [36]; (b) the interaction between subjects and other subjects [28]; and (c) the coordination of the subject’s own actions upon objects -- i.e. logico-mathematical experience or reflecting abstraction [36] -- and the coordination of his/her interactions with the others [28]. To count the elements in a given set from left to right, from right to left, and so forth, and then to conclude that the number of elements in the set remains constant is an example of a logico-mathematical experience and necessary knowledge [36]. As mentioned, Piaget distinguished an interaction between peers -- a horizontal social interaction -- from an interaction between a child and an adult -- a vertical social interaction. Whereas the former is likely to lead to the child’s moral heteronomy, the latter is likely to lead to the child’s moral autonomy [28].

These three types of interaction (i.e., subject-objects; subject-subjects; the subject’s coordination of his/her own actions upon objects and her/his coordination of his/her interactions with the others) are greatly responsible for the development of individuals [35] and, by implication, the development of countries [15]. More precisely, according to Piaget, individuals’ cognitive development begins with their sensorimotor actions upon objects, which is as an example of a subject-objects interaction [37]. As times goes by, individuals are able to interact and cooperate with other individuals -- a subject-subjects interaction [28,38], and to coordinate their actions upon objects [36] and their interactions with other subjects [38]. These two forms of coordination are examples of the third type of interactions mentioned above. Finally, individuals are able to think of such coordinations and interactions in an abstract way [39; see more below].

As these types of interaction lie at the heart of individuals’ cognitive and even moral development [3,28], they have, to say the least, much to do with parameter 2 of the HDI (i.e. how much individuals are developed and well informed). Because the three parameters of the HDI are deeply intertwined, it makes sense to argue that those three types of interaction play a role in the human development index, and hence, in countries’ development. Thus, cognitively and
morally developed individuals are in a good position to foster the development of their own and even other countries [14,15]. Reciprocally, the more a country promotes such types of interaction in its inhabitants/citizens, the more it promotes their cognitive and moral development [14]. All of this also means that we should look at the development of both countries and individuals from a holistic perspective, a perspective that lies at the heart of Piaget’s whole thinking [28,34,40].

How does a subject-objects interaction -- one may ask -- may be related to an individual’s moral development? According to Piaget [37], the child’s cognitive knowledge begins with his/her actions upon objects. This sensorimotor knowledge is the ultimate basis on which relies even the most abstract form of Piagetian knowledge, formal operational knowledge [38]. Given that cognitive development is a necessary, albeit not sufficient condition of moral development, everything that has an effect on one’s cognitive development may have also an effect on one’s moral development [13].

2.2. Constructivism

Although accepting that maturation, physical experience, and social experience play a role in individuals’ psychological development [29], Piaget [3,40] referred to maturation, physical experience, and social experience as the three traditional factors of development or the “American question” [34]. In other words, contrary to a maturational, empiricist, sociological, and narrow representational view of knowledge and development, Piaget espoused a constructivist perspective of development and knowledge. On several occasions, Piaget [40,41] held that one’s knowledge is not a result of maturation alone, nor is it a copy of reality, a simple exposure to others, or a mental image of an object/event. In fact, for Piaget [34,41], to know is to modify, to transform the object, and to understand the process of this transformation.

According to Piaget [35], equilibration is the most important process of developmental change. Equilibration is a balance between assimilation -- to incorporate something from the environment into one’s cognitive structures -- and accommodation -- to modify one’s existing cognitive structures to deal with their “perturbation” due to external contradictions and internal limitations or gaps in one’s knowledge. As Elkind [42] sustained, for Piaget, equilibration is, at all levels of analysis, the dynamic of cognitive change without which the effects of maturation, physical experience, and social experience cannot be understood or explained.

Piaget’s constructivist assumptions have implications for the development of individuals and countries because both individuals and countries are greatly responsible for their respective development [14,15]. For example, no graduate student becomes a creative researcher only because s/he attends to what his/her professors say in their lectures [14]. Similarly, no so-called developing country became a developed country only because of the external aid provided, for instance, by the International Monetary Fund (IMF). This is one of the reasons why the IMF has been criticized by several theorists [43].

2.3. Structuralism

According to Piaget [3,42], knowledge is not a compilation of isolated facts because it is organized around what he called overarching structures (i.e. structures d’ensemble). For Piaget [42], overarching structures are a certain way of thinking. With a few exceptions [44], this way of thinking tends to be applied to different contents and domains. For example, it has been found that when a child is capable of operating at the intellectual level [29], s/he is more likely to cooperate with others at the social level [22], and to dispute with them at the verbal level [45].

Piaget’s structuralist assumptions have implications for how one conceives the development of individuals and countries. For example, according to Piaget [42] and other theorists [46,47], we should look at the development of individuals as a whole or from a relational/structural perspective, not as a mere addition of their several types of development (e.g. cognitive, moral, verbal). For example, it has been found that the more an individual is cognitively developed [3], the more s/he is likely to be socially [22] and morally developed [13]. However, as Kohlberg [13] found, cognitive development is a necessary, but not a sufficient factor in the development of moral thinking.

Piaget’s [14,15] idea that we should look at countries’ development from a structural/relational framework is echoed in the human development index. Actually, the three parameters of the human development index (i.e. life expectancy; years of schooling; gross national income) are deeply intertwined [48]. Consider, for instance, the case of a healthy life of the majority of the inhabitants from a given country. The more they are healthy, the more they tend to live longer, to be knowledgeable, and to have a decent standard of living. It seems that this example emphasizes individuals not countries. This conclusion has not to be necessarily the
case. First, the human development index is a tool to assess the development of countries, not the development of individuals [1,2]. Second, the development of a given country greatly depends upon the development of its citizens. Therefore, an example that emphasizes individuals’ development also emphasizes countries’ development [7]. Third, it would impossible to think about a developed country in which the majority of its inhabitants were unhealthy, poorly cultivated, and without a reasonable standard of living [48].

To sum up, Piaget’s assumptions of structuralism, constructivism, and interactionism constitute a far-reaching, Piagetian epistemological legacy to individual and collective development. In other words, individuals and countries develop as a whole; construe, to a great extent, their own development; and develop as they cooperate and exchange their perspectives with other people and countries [15,29,38].

3. PIAGET’S PSYCHOLOGICAL LEGACY TO INDIVIDUALS’ DEVELOPMENT

Being an epistemologist or someone concerned with scientific knowledge in terms of vocation [34], Piaget became a psychologist, so to say, in terms of necessity [40]. That is, differently from other epistemologists [49], who only use armchair speculation to think of the problems involved in scientific knowledge (e.g. is it possible?), Piaget [3,38] used developmental psychology to investigate and “test” what he called the two great mysteries of knowledge [50].

3.1. First Mystery

How do new forms of knowing/intelligence appear and develop over time? Succinctly, according to Piaget [3,40], such forms of knowing/intelligence are the following:

3.1.1. Sensorimotor, Practical Intelligence

Sensorimotor, practical intelligence [37] is a kind of intelligence which is related to Piaget’s sensorimotor stage. At this stage, children relate to their physical and social worlds through sensorimotor actions and schemes. For example, a doll is something that children can shake, look at, and so forth. At the end of this stage, children are already capable of looking for a desired object which vanished from their vision because it was hidden, for example, under several napkins (i.e. object permanence) [51].

Parenthetically, it should be mentioned that Piaget’s critics, Baillargeon [52], for example, have claimed that object permanence appears much earlier than Piaget [51] realized. However, unlike Piaget [51], Baillargeon [52] used the reaction of surprise or looking time, not the active search for the hidden object, as a procedure to assess object permanence in infants. In addition, Piaget -- unlike Baillargeon and other critics [53] -- was interested in grasping strong marks of a given competence, not only minimal indicators of it [51]. This remark may be applied to all studies designed to show that Piaget underestimated infants’ and children’s competences [53,54].

3.1.2. Preoperational Intelligence

Preoperational Intelligence, a form of intelligence which is connected to Piaget’s [29] preoperational stage. At this stage, children are capable, for example, of playing with a doll as if it were a cat (i.e., pretend play). Even so, those children do not accept, for example, that a cat is a cat and an animal at the same time. Thus, children are not yet capable of Piagetian mental operations. For Piaget [40], mental operations are actions which have become internalized, reversible, and governed by rules of transformation (e.g. 4 + 2 = 6; 6 – 2 = 4).

3.1.3. Concrete Operational Intelligence

Concrete operational intelligence, a type of intelligence which is associated with Piaget’s concrete operational stage [29]. At this stage, children are already capable of understanding that a cat is a cat and an animal at the same time. Thus, children are now capable of mental operations. These operations, however, are always based on concrete things which can be classified, counted, and so forth [3].

3.1.4. Formal Operational Intelligence

Formal operational intelligence, a form of intelligence linked to Piaget’s formal operational stage [39]. At this stage, subjects are capable of abstract, deductive-hypothetical, and propositional reasoning. For example, they understand that “If p V q”, then this proposition or exclusive disjunction is only false when both p and q are false.

Piaget’s finding that in their developmental process individuals go through qualitatively different forms of knowing or stages [3] reminds us of subjects’ development as a process that generally takes (much) time. If development takes time and involves, for instance, integration of a previous stage into the next one [13], then it is pointless to want an individual to be capable of operating on operations (formal operations) before s/he is capable of simply operating (concrete opera-
tions) [39]. This caution (not to expect a subject’s development to go from a stage to the next too quickly and without having gone through the necessary steps) is an important Piagetian legacy to individuals’ psychological development [14].

Given that countries’ development greatly depends on the development of their citizens, such Piagetian legacy is also a legacy to human development [14]. Thus, the less countries are developed the more they want their children to rapidly become adolescents and even adults in order to enter the labor market [55]. As is evident, child labor deprives children of their childhood, their potential and their dignity ([14]; see more below).

3.2. Second Mystery of Knowledge

How do the above mentioned new forms of knowing become not only what is the case -- i.e., true knowledge -- but also what has to be the case for it could not be otherwise -- i.e., necessary knowledge? [56]. When a child understands that the number of elements in a given set does not depend upon its spatial arrangement in the set at hand, s/he shows that s/he understands that this fact is not only true, but also necessary.

Differently from other psychologists, who employ psychometric testing to assess individuals’ quantitative intelligence [57], Piaget [58] used his famous clinical-critical method to assess individuals’ qualitative intelligence. In other words, for Piaget [3], development amounts to knowing better, that the arithmetical operation of adding can be annulled by the operation of subtracting, for instance, than knowing “more of the same”, to count from 5 to 10, and then from 10 to 15, for instance. In addition to generally knowing less than a typical adolescent or adult, children have quite a different logic from that of adolescents and adults.

When attending a Meeting at the International Center for Genetic Epistemology, a physicist -- i.e. F. Halbwach -- confessed that, after knowing Piaget [14], he could not continue to think as he thought before knowing him. For a physicist, it is surprising, for example, that 6/7-year-olds are not yet capable of weight conservation [29]. Similarly, Flavell [21] held that when a psychologist looks at children’s development through the lenses of Piaget’s theory, s/he does not continue to see children as s/he was accustomed to seeing them.

Actually, Piaget’s findings [3,38] clearly show that children cannot be seen as adults in miniature or on a small scale. In other words, the more individuals and countries look at children as human beings qualitatively different from adolescents and adults, the more they are likely to respect children and their rights, and to be developed individuals and countries [14]. Thus, Piaget’s idea that children are not illogical creatures, but that they have a logic different from that of adolescents and adults [40] is an important Piagetian, psychological legacy for today and tomorrow. This Piagetian legacy is not taken into account by many countries. A telling example that many countries do not educate their citizens to look at children as human beings qualitatively different from adolescents and adults, or that they do not include this as a criterion to measure the development of a country is child labor or work that harms children or keeps them from attending school [14]. Unfortunately, child labor is a sad reality in many countries. This undesirable reality occurs, for example, in several countries of Asia, Africa, and Latin America [59], but also in industrialized countries [60].

To sum up, Piaget’s legacy to individuals’ psychological development is unique, remarkable and outstanding [20,21]. Given that the development of individuals greatly affects the development of their own and even other countries [7,14], Piaget’s legacy to individuals’ development is, by implication, a legacy to the development of countries.

4. PIAGET’S EDUCATIONAL LEGACY TO INDIVIDUALS’ DEVELOPMENT

Epistemologist in terms of vocation [34], and psychologist in terms of necessity [29,40], Piaget was an educationalist in terms of implication, that is, as a result of his epistemological assumptions [16-18] and his theory of psychological development [3]. Piaget’s educational legacy to the development of individuals and countries is outstanding [14,19].

Although Piaget has held that teaching/learning was never his major concern, he wrote a lot on education, mainly when he was the Director of the International Bureau of Education (1929-1967). His two main books on education [14,19] are pervaded by the wise idea that only education is capable of saving countries and societies from possible collapse, be it violent or gradual. Of course, education involves many resources and, as it were, it costs a lot. Ignorance, however, is much more costly than education. Actually, ignorance is highly detrimental to the development of individuals and countries [61].

The idea that only education is able to save countries and societies from possible collapse [14] is
an important educational legacy of Piaget's theory to
the development of countries [14] and, by implication,
the development of individuals [7,48]. Note that
parameter 2 of the human development index of a
country is assessed through the number of years of
schooling of its inhabitants and, hence, through their
educational level [10]. Note also that only certain kinds
of education, not for example, those based on rote-
learning, truly make for fundamental change in indi-
viduals and countries [15,32,62].

Another aspect of Piaget's educational legacy to the
development of individuals and, in turn, the develop-
ment of countries, rests on his thesis that education is a
scientifically oriented process in a double sense
[14,19]. That is, the teacher/professor should know not
only his/her own area of specialization and even other
domains somehow related to it, but also be well versed
in the details of the child's and adolescent's develop-
ment [14]. It is worth mentioning that Piaget argued for
a college or university background even for preschool
teachers, and for an interdisciplinary approach to
development and education [14]. Needless to say,
countries that take into account these two Piagetian
ideas are more developed (e.g. Switzerland) than those
ignoring such ideas (e.g. Burundi) [13,14].

When the teacher/professor is not well acquainted
with his/her area of specialization, s/he is no teacher/
professor at all because s/he does not know what is
necessary to be a teacher/professor [14]. When s/he is
not well versed in the details of the child's and ado-
lescent's development, the teacher/professor risks teach-
ing to his/her pupils/students concepts whose under-
standing is far above or below their cognitive structures
and capabilities [19].

Think of a teacher who intends, for example, to
teach the concept of proportionality, which requires
formal operational competencies, to 5-year-old children.
As the understanding of that concept is quite above a
preoperational understanding [3], those children tend,
at their best, to memorize rather than understand that
which was supposed to be "taught" and "learnt". In short,
there is neither significant teaching nor significant
learning because no assimilation and accommodation
occurs [14,19].

Think now of a teacher who intends, for example, to
teach the concept of number conservation, which re-
quires only concrete operational competencies, to a
formal operational student [38]. Because the under-
standing of number conservation is quite below the
student's formal operational competencies, the student
is not interested in what was supposed to be taught
because s/he knows the point in advance. Thus, there
is nothing to be incorporated into the cognitive
structures of the student. Accordingly, these cognitive
structures remain as they were before, because they
were not subject to any "perturbation", and hence, no
accommodation took place [19]. Again, no significant
teaching/learning occurs [14].

These last two examples show that Piaget's views
on education [14,19] are based on his theory of psy-
chological development [3,29,40], and his epistemo-
logical assumptions (16-18). Piaget's idea that the main
good of education is to create individuals who are
creative and discovers, and not limited to simply
repeating what other generations have done [14,19], is
an important educational legacy to the development of
countries, and relies on his psychological theory and
epistemological assumptions. This also happens with
the active methods that Piaget advocated for educa-
tion. As he held, he active methods give broad scope to
the spontaneous research of the child or adolescent
and require that every new truth to be learned be
rediscovered or at least reconstructed by the students
[14]. In other words, the teacher should be mainly a
mentor and organizer of learning situations or someone
who, in a relatively Socratic way, helps students to
actively rediscover or reconstruct every new truth to be
learned, not a simple transmitter of knowledge [19; see
more below].

Another important educational legacy of Piaget's to
the development of individuals has to do with his idea
that education is a process oriented to the subject's
moral and intellectual autonomy. As noted above, for
Piaget [14,19], the goal of intellectual education is to
develop intelligence rather than to promote rote learn-
ing, and give rise to inventors, not to conformist people.
The goal of moral education is to bring about an auto-
nomous, not a heteronomous, morality [13, 28,32,63].

Therefore, for Piaget, education aims at forming
autonomous and critical individuals, not individuals who
are oriented to an uncritical acceptance of dogmas,
and truths imposed on them from outside [64]. This
educational goal is opposed to the relatively conser-
ervative goal of traditional education, whose purpose is to
transmit to pupils/students the existing knowledge and
values from one generation to another [65]. Piaget's
views on the goals of moral education have implica-
tions for an endless debate regarding education's
moral goals [66]. Should moral education aim at
forming one’s moral character or at developing one’s
moral reasoning?

Although Piaget’s [14] views on moral education are
rightly considered to be more consistent with the latter -
to develop one’s moral reasoning -- than the former --
to form one’s moral character -- [66], they are not at
complete variation with the former. Suffice it to say that,
for Piaget [28], thought always lags behind action and
cooperation has to be practiced for a very long time
before its consequences can be brought fully to light by
reflective thought. In other words, according to Piaget
[28], cooperation -- which is a main virtue for psycho-
logical approaches to educating for moral or character
development [67] -- appears at the level of one’s action
and moral attitude (character?) before it appears at the
level of one’s thought and moral reasoning [28].

Piaget also embraced the idea that education shall
promote understanding, tolerance, and friendship
among all countries, ethnical or religious groups, and
shall foster the activities of the United Nations for the
maintenance of peace [14]. As far as I know, this idea
is accepted by all proponents and defenders of the
thesis that moral education should aim at developing
one’s moral character [66,67], and by all proponents
and defenders of the thesis that moral education should
aim at developing one’s moral reasoning [13,32,63].

For Piaget [14,19], individuals who do not accept
dogmas and truths imposed on them from outside are
autonomous individuals in intellectual and moral terms,
because they are more self-governed than dependent
upon established intellectual truths or moral norms.
Piaget’s views on education (and development) as a
process designed to promote individuals’ cognitive and
moral autonomy has given rise to several misinterpre-
tations [31].

Three common misunderstandings follow: (1) Piaget
equates autonomy to total freedom [14]; (2) he sees
intellectual and moral autonomy as synonymous with
individualism [14]; and (3) he considers heteronomous
morality and autonomous morality stages of moral
development [31].

For Piaget, far from implying total freedom, auto-
nomy requires one to be subject to moral rules, such as
the “golden rule” [13], or to reason more than to
perception while solving cognitive tasks [3,38]. When
children think that the number of elements in a set
depends on the spatial arrangement of those elements
in the set at hand, they are being perceptually oriented,
and, so to speak, intellectually heteronomous. When
children understand that such number is independent
of its spatial configuration in the set, they are reason-
oriented, and, so to say, intellectually autonomous [29].
Similarly, when children take into account the intentions
underlying a given moral transgression, they are
morally more autonomous than children who judge
moral transgressions only as a function of their material
outcomes [28].

For Piaget, autonomy is not tantamount to indivi-
dualism, but rather to exchanging points of views and
coordinating different perspectives. Those who fault
Piaget for being oriented to individualism regarding his
views on development and education [46,68,69] are not
aware that, on several occasions, he held, for example,
that (a) it is quite evident that social life affects intelli-
gence, the content of interaction, and rules imposed on
thought [29], and (b) there are neither individuals as
such nor society as such. There are just inter-individual
relations [38]. The last idea, (b), clearly shows that for
Piaget one cannot think of individuals without thinking
of countries and societies, and the other way around.
Therefore, the development of individuals and the
development of countries are, as it were, two faces of
the same coin -- human development -- and, hence,
two inseparable realities such that the former is
implicated in the latter, and the latter is implicated in
the former [70].

Contrary to a “received view” of Piaget’s theory [31],
a view in which a given interpretation of Piaget’s
thought is being utilized as it if were Piaget’s own
thought [71], Piaget [28] never considered hetero-
nomous and autonomous moralities stages of moral
development. For Piaget [1928], these two types of
morality are two moral attitudes/orientations which may
coexist at the same age in the same child.

Another educational Piagetian legacy to the devel-
opment of individuals rests on his idea that education
and development are an interactionist process. Piaget’s
interactionist relational perspective on development
and education is well documented in his ideas that: (1)
development and education result from a continuous
interaction between assimilation and accommodation
[37,38]; (2) individuals develop and learn as they
interact with their physical and social milieu [29]; (3) the
active methods for which he argued are neither
teacher-centered nor child-centered, for they appeal to
an interaction between a teacher organizing classroom
situations and a learner who rests on these situations
for actively reconstructing that is taught to, or demons-
Piaget's Legacy to Human Development

Piaget's constructivist conception of education [14,19] and development [3,29,38] has given rise to several misunderstandings, such as (1) the teacher has no role in students' education because their achieving and success depends on leaving them entirely free to work as they wish [65]; (2) Piaget's emphasis on the subject's actions and coordination of actions and interactions as the main process responsible for his/her development and education overlooks the role of the traditional factors of development [71]; (3) because Piaget subordinates learning to development, learning cannot accelerate the individual's development [75].

With respect to (1) -- the teacher has no role in students' education -- suffices it to say that for Piaget what is desired is that the teacher ceases being a lecturer, satisfied with transmitting ready-made solutions; his/her role should rather be that of a mentor stimulating initiative and research [14]. As for (b) -- Piaget overlooks the role of the traditional factors of development -- Piaget [3] never denied the role of maturation, physical experience, and social transmission in the subject's development and education. However, for Piaget, the maturation of the nervous system simply opens up a series of possibilities but without giving rise to an immediate actualization of these possibilities [40]. In the same vein, for Piaget, a social transmission/stimulus is a social transmission/stimulus only to the extent that it is significant and it becomes significant only to the extent that there is a cognitive structure which allows its assimilation [38]. In relation to (3) -- learning cannot accelerate the individual's development -- Piaget accepted the idea that, to an extent, is possible to accelerate through learning the subject's operational competencies, such as conservation and transitivity [41]. Although accepting that possibility, Piaget [41] had the following to ask: (1) for how long will that learning endure? (2) Is it possible to apply that learning to other, not trained, competencies? (3) At what operational level was the individual before being subject to that learning and what more complex structures did such a learning produce? And (4) is acceleration beneficial or rather detrimental to the child's development and education? These questions still wait for a conclusive response on the part of those who argue that it is possible and even desirable to accelerate the subject's operational competencies [75].

For Piaget, whenever one prematurely teaches a given child something that s/he could have discovered by herself/himself, the child remains deprived of understanding it completely [14]. Accordingly, for Piaget [14], it is more important that, in their developmental

A last educational Piagetian legacy to the development of individuals and, by implication, the development of countries (see above), is his thesis that education is a constructivist process [14,19]. Like the above mentioned Piagetian educational legacies, this legacy is closely connected to Piaget's constructivist assumptions [16-18], and his findings on the individual's psychological development [29,38,40].

Constructivism has a lot of meanings [73]. For example, contrary to the constructionist thesis that all knowledge is socially constructed [74], Piaget's [3, 29, 38] constructivist perspective assumes that individuals all construct essentially the same understanding of knowledge as a result of their interactions with their physical and social environment. It should be mentioned that constructivism is relevant when there is truly structural change, which does not apply to all knowledge acquisition [32,62].

The idea that Piaget embraced a constructivist conception of development and education is accepted, as far as I know, by all psychologists and educationists [31,32-34]. For Piaget, to embrace a constructivist stance implies, at least, to espouse four intertwined ideas: (1) the importance of action, be it sensorimotor or mental, for the individual's development [37] and education [14]; (2) knowledge is not a copy of reality because to know an object/event is not simply to look at, or make a mental copy of, it. To know an object is to act on it, to transform it, and to understand the process of this transformation [41]; (3) a truth learnt is only a half-truth because to understand is to discover, or reconstruct by rediscovery [14]; (4) the most appropriate methods at schools are the active methods, for they stress the student's spontaneous activity and initiative, and require that every new truth to be learned is at least reconstructed by the student, not simply transmitted to him/her [14].

The correct answers suggested by the interviewer [51].

To grasp the child's spontaneous way of thinking, not the idea that Piaget embraced a constructivist conception of education and development [14,19] and development [3,29,38] has given rise to several misunderstandings, such as (1) the teacher has no role in students' education because their achieving and success depends on leaving them entirely free to work as they wish [65]; (2) Piaget's emphasis on the subject's actions and coordination of actions and interactions as the main process responsible for his/her development and education overlooks the role of the traditional factors of development [71]; (3) because Piaget subordinates learning to development, learning cannot accelerate the individual's development [75].

With respect to (1) -- the teacher has no role in students' education -- suffices it to say that for Piaget what is desired is that the teacher ceases being a lecturer, satisfied with transmitting ready-made solutions; his/her role should rather be that of a mentor stimulating initiative and research [14]. As for (b) -- Piaget overlooks the role of the traditional factors of development -- Piaget [3] never denied the role of maturation, physical experience, and social transmission in the subject's development and education. However, for Piaget, the maturation of the nervous system simply opens up a series of possibilities but without giving rise to an immediate actualization of these possibilities [40]. In the same vein, for Piaget, a social transmission/stimulus is a social transmission/stimulus only to the extent that it is significant and it becomes significant only to the extent that there is a cognitive structure which allows its assimilation [38]. In relation to (3) -- learning cannot accelerate the individual's development -- Piaget accepted the idea that, to an extent, is possible to accelerate through learning the subject's operational competencies, such as conservation and transitivity [41]. Although accepting that possibility, Piaget [41] had the following to ask: (1) for how long will that learning endure? (2) Is it possible to apply that learning to other, not trained, competencies? (3) At what operational level was the individual before being subject to that learning and what more complex structures did such a learning produce? And (4) is acceleration beneficial or rather detrimental to the child's development and education? These questions still wait for a conclusive response on the part of those who argue that it is possible and even desirable to accelerate the subject's operational competencies [75].

For Piaget, whenever one prematurely teaches a given child something that s/he could have discovered by herself/himself, the child remains deprived of understanding it completely [14]. Accordingly, for Piaget [14], it is more important that, in their developmental
process, children came to be capable of attaining formal operational competencies when they become adolescents than to supposedly attain those competencies when they are still children. So, it would be a waste of time if, for the sake of a rapid attaining of formal operations on the part of the child, his/her teachers tried, for example, to teach the proportionality concept to that child. In other words, formal operations cannot be ‘taught’ and they cannot avoid first taking the form of concrete operations.

To sum up, Piaget’s educational legacy to the development of individuals and, by implication, the development of countries, was in several respects much ahead of his time. His emphasis on the idea that only education is capable of saving countries and societies from possible collapse [14] is well substantiated with what is happening (e.g. poverty, social exclusion, and the like) in many countries all over the world. Among other countries [76], Afghanistan is a typical and unfortunate example.

5. FINAL WORDS

In this article, I have analyzed Piaget’s legacy to human development, as human development is closely associated with the development of individuals [15]. As individuals’ development is greatly related to the development of the country or countries where they live and grow [9,48], Piaget’s legacy to countries’ development was, to some an extent, also analyzed. Note that Bronfenbrenner’s ecological model of development is presented as a model of human development [5,7,9,48], and yet elaborates mainly on individuals’ development [5,7]. Thus, although Piaget’s theory is mainly focused on individuals’ development [29,38,40], his theory also constitutes a model of human development because the development of countries greatly depends on the development of their own and even citizens from other countries.

In this article, I have argued that Piaget’s epistemological legacy [16-18] to both the development of individuals [3,29,39,40] and countries [14,15] has much to do with his interactionist, constructivist, structuralist, and relational epistemological assumptions. In other words, according to Piaget, individuals, countries, and societies (a) develop as they interact with other individuals, countries and societies [15,38]; (b) are greatly responsible for their own development [40]; and (c) evolve as structural, relational entities [42].

Piaget’s psychological legacy to the development of individuals [3] and countries [14] is varying and outstanding. For example, his findings that children’s way of thinking is much different from that of adolescents and adults [40] put an end to an old, widespread idea that children were homunculus-like creatures or adults on a small scale [14].

To a great extent, Piaget’s views on children’s development [3] and education [14,19] are consistent with the United Nations Declaration of the Rights of the Child in 1959. Unfortunately, children’s rights are still violated in many countries. A sad example of that violation is the existence of child labor in several countries [59,60]. Piaget’s finding that in their developmental trajectory, individuals [29,40] and societies [14,15] go through new and qualitatively different forms of knowing is an acclaimed legacy of Piaget to the development of both individuals and societies.

However, the most important Piagetian legacy to the development of individuals and, to some extent, the development of countries, has to do with his views on education [14,19] as (a) a scientifically oriented process; (b) a process oriented to the subject’s intellectual and moral autonomy; and (c) an interactionist, structuralist, and constructivist process. His idea that only education is capable of saving societies from possible collapse is worthwhile [14]. Unfortunately, many countries spend most of their resources more in military affairs than in education [14]. When this is the case, poverty, criminality, social exclusion, and so forth are likely to appear [76]. Education is really costly, but it is far less costly than ignorance [14].

Some readers might object that a major issue with this article is that I did not discuss much on Piaget’s legacy to the development of countries, and yet kept saying that I looked at Piaget’s legacy to human development (both individuals and countries). It is true that this article is more focused on the development of individuals than the development of countries, and that certain experts in human development [1,2] are generally more interested in the development of countries than the development of individuals. However, as amply shown throughout this article (a) a country without individuals/citizens would deify our imagination; (b) individuals’ development has deep implications for countries’ development [14]; (c) although Piaget had elaborated much more on the former [3,29,38,40] than the latter, he also elaborated directly on countries’ and societies’ development [14,15]; (d) Piaget’s oeuvre on individuals’ development [3] and education [19] has clear implications for countries’ development [14]; and (e) Bronfenbrenner’s ecological model of development
is a model of human development [5,7,9,48], and yet elaborates mainly on individuals’ development. Among other reasons, these five points -- (a), (b), (c), (d), (e) -- show that it makes sense to say that I have looked at Piaget’s legacy to human development (both individuals and countries).

Other readers might object that Piaget’s epistemological [16-18], psychological [3,29,40] and educational [14,19] legacy to individuals’ and countries’ development should have been more intensively analyzed. Although this objection is understandable, I believe that I have addressed, in a succinct way, the main contributions of Piaget’s epistemological, psychological, and educational thought to the development of individuals and, by implication, the development of countries.

Readers of this article might object that when it refers to human development from the countries’ development framework, the article refers less to Piaget [14,15] than to certain experts in countries’ development [1,2,10-12]. Although being true, this possible remark should take into account that (1) Piaget was more interested in the development of individuals than the development of countries [34]; (2) the development of countries and the development of individuals are deeply intertwined [15]; and (3) the main goal of this article was to present, and reflect on, Piaget’s legacy to human development from the viewpoint of the development of individuals [40] and, in turn, from the viewpoint of countries’ development [14,15].

Finally, some readers of this article might still object that no theory is being offered, and say that if you have no theory to present, then is better to remain silent. However, to offer a new theory on Piaget’ legacy to human development was not the goal of this paper. If every psychological paper advanced a new theory, then we would have in psychology an immeasurable number of (mini) theories. Needless to say, progress in a given science is not necessarily related to the number of theories that science offers. If this were the case, then psychology would be the queen of sciences [77]. This we definitely know is not the case. Even so, there is no paper doing what this paper does: to argue and show, in a synoptic way, that Piaget’s epistemological, psychological and educational legacy to human development in general and the development of individuals in particular is remarkable and outstanding.

It is said that Alexander the Great (356-323 BC), king of Macedonia, once asked his tutor, geometer Menaechmos (380-320 BC), to teach him a shortcut to mastery of geometry. Menaechmos is alleged to have replied to the king that for traveling through Alexander’s country there were royal roads and roads for common citizens, but in geometry there is only one road, and this (difficult) road is the same for all people [78].

As shown in this article, Piaget did not follow a shortcut to describe and explain human development, as this development has much to do with the development of individuals, countries, and societies. Actually, Piaget followed a demanding track to (a) reflect epistemologically on individuals’ [16-18] and countries’ [14,15] development; (b) investigate psychologically the two great mysteries of knowledge [50]; (c) discuss on the role of his investigations in both individuals’ [29,40] and countries’ [15] development; and (d) draw on his epistemological assumptions [42] and psychological findings [3] to speak about the most important issues involved in individuals’ education [14,19] and, hence, in the development of countries in general and individuals in particular.

Like any other, Piaget’s theory will fade and will be replaced by more progressive research programs [25]. Be that as it may, we should profit from Piaget’s remarkable epistemological, psychological and educational contribution to our understanding of human development, as this development encompasses the development of individuals and the development of the country or countries in which they live and grow. Note also that as critic John Horgan [79] once remarked “theories of human nature never really die; they just go in and out of fashion”.

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