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The Boundaries of the Human: The Relationship Between Natural, Cultural, and Artificial

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Abstract

What constitutes the 'absolutely other' for the human being in relational terms?

How do nature and culture relate to the human being and orientate his constitution?

Are there insurmountable limits that distinguish humans from the natural and artificial non-human?

Starting with these research questions, we will trace theories and paradigms in the sociological and anthropological fields that from the 19th century to the present have generated and constructed fractured relationships - the result of dualist, stereotyped, and conflictual interpretations - between natural, cultural, and artificial.

Continuing the analysis from a comparative perspective, contradictions and unanswered questions will be highlighted.

Keywords: culture, nature, artificial intelligence (A.I.), relationship, human, transhumanism.

1. Introduction

If we take the 'denotative' meaning of the expression 'nature', we must examine the set of hereditary factors that humans possess independently of the influence of culture. Using the same procedure with the expression 'culture', we define the latter as the set of knowledge, beliefs, arts, techniques, norms, habits, and skills acquired by humans over time and as members of a community.

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But looking at the multiple 'connotative' meanings of the two terms of reference, the relationship between culture and nature (human and non-human) becomes problematic, ambiguous and in constant hermeneutic evolution.

The prevailing connotations have determined symbolic forms and recurring patterns declined into binary oppositions, stereotypes, and interpretative habits (D'Andrade and Strauss, 1992; Archer, 2007; Spillman, 2022; Larsson, 2024).

The nexus between nature and culture is the result of a symbolic invention: once a distinctive interpretation of nature versus culture nexus has been constructed and stabilized, it becomes difficult to erase it (Remotti, 2014). Overcoming reductionist views, maintaining stable distinctions, means proposing a relational observation with a stated ontology (Donati, 2022, p. 30) and avoiding that the boundaries between natural and cultural are observed as *"mere processual and contingent constructions of meanings"* (Spillman, 2022, p. 26).

This is why we decided to start with the symbolic dimension, examining some of the best-known symbolic definitions and distinctions given to the nature/culture nexus, highlighting the first breaks with the natural sciences, starting with Descartes, and arriving at contemporary anthropological and sociological paradigms. This represents an attempt to understand how different theories have highlighted not only the symbols, but also the links between nature and culture: weak, strong, hierarchical, causalistic, circular, and processual links according to the different theoretical declinations.

Finally, we will illustrate which theories are able to capture the 'emergent effect' between the processes of nature and those of culture.

From the questions posed and the comparisons examined, the radical and conflictualist distinctions that are particularly present in anthropological and sociological theories from the 19th century to the first half of the 20th century will become evident. Such theories consider nature as distinct in symbolic terms from culture. Nature and culture are differentiated from each other through negations or linked together through binary oppositions.

Starting from the second half of the 20th century, theories have emerged that attempt to overcome the dichotomies between nature and culture through constructivism and systems theory, establishing circular links, contradictory fusions, and unstable integrations. Nevertheless, both the Sociology of Culture and Cultural Sociology (Archer, 1996; Alexander, 2003), will continue to propose culture as a set of interactions that contribute to the construction of a meaning, whose processes are irreducible and totally *"distinct from biological processes"* (Spillman, 2022, p. 25). Critical realism and relational theory, on the other hand, observe the emerging relationships between nature and culture, avoiding both the classic anthropocentric perspective and the radical anthropodecentralized one that preludes transhumanism.

In the first chapter we will examine theories that from the 19th century to today have established binary or dialectical relationships between non-human natural, human natural and cultural, highlighting unanswered questions.

In the second chapter we will examine the 'deficiency' theories, initiated by philosophical anthropology, which have allowed another vision of the relationship between nature and culture, building a relational bridge with the artificial dimension of technopoiesis. Again, we will highlight unanswered questions. In the third chapter, always proceeding by questions, we will examine the boundaries between human and non-human.

There will always be a comparative reference between 'non-relational' theories and relational theory, in order to highlight the distinctions in terms of symbolic references, connections, and emergent effects. In the paragraph dedicated to the conclusions, the differences that emerged between the various approaches will be examined in a schematic way, also proposing explanatory tables.

2. Between nature and culture: symbolic references, connections, and emerging effects

In the organization of scientific knowledge of the modern age, the first cultural construct 'symbolically re-invented' as a scientific object is nature.

Bacon, Galilei, and Descartes confer epistemological priority on the knowledge of nature (in human and non-human meanings), relegating the knowledge of society to a sphere of secondary interest and defined by the aforementioned as unstable. From this perspective, nature appears ordered, made up of certain laws, clear causes, stable relationships, and predictable effects on the basis of available data.

On the contrary, the world of society and its historical evolutions is characterized by variability, instability, uncertainty, and unpredictability.

Provoked by this dualism, scholars of historical and social sciences implement a long process of reorganization of their knowledge, the first objective of which becomes to demonstrate an existing order both in history and in society.

The provocation of modern scientists determines a reflexivity that stimulates the thought of Vico (Vico,2012) and Herder (Herder, 1971). In the second half of the 19th century, the anthropologist Edward B. Tylor - the inventor of the science of culture, or what would later be called cultural anthropology - stated that: *"our thoughts, our wills and our actions must conform to laws just as determined as those that govern the motion of waves, the combination of acids or the growth of plants and animals"* (Tylor, 1871, p. 23-28).

Influenced by Tylor - and by his well-known definition of culture in its broader ethnographic meaning: *"Culture is that complex whole which includes knowledge, beliefs, arts, morals, law, customs, and any other capabilities and habits acquired by [a human] as a member of society"* (Tylor, 1871, p.1) - Durkheim introduces the key theme of the symbolic dimension. He is among the first sociologists to place the relationship between society and culture as an object of study, without enucleating a specific sociology of culture - the foundation of a 'Sociology of Culture' and the subsequent (but different) elaboration of a 'Cultural Sociology' will come with later authors, see Griswold (2020).

According to Durkheim, the symbolic dimension is expressed in shared beliefs and collective rituals. Symbols are representations of society that enable sharing, exchange, and cohesion between humans. If there is no collective consciousness, there can be no individual consciousness.

Even systems of cooperation and trust relationships between individuals are mediated by ritualized, repetitive, stable, and structural symbolic dimensions. For Durkheim, the totality of cultural representations consists of social facts with binding regularities. Man, individually, is natural in the sense of 'instinctive'. Deprived of the symbolic dimension, he lives in conditions of anomie (D'Alessandro, 2023c).

Hence, human nature, taken individually, consists of natural instincts identical to animal instincts and is influenced by the environment, whereas culture is the attempt to give rules through symbols and rituals, transcending the individual through the collective.

For Durkheim, society is a *sui generis* reality from which the cultural dimension springs. At this point, the first questions arise.

How does nature establish its causalistic relationship with culture? How do natural laws and their specific logic fit in to guide instincts? If natural propensities for solidarity and gift-giving are enabled by their transformation/objectification into symbolic rites/dimensions, does this mean that symbolic mediation derives from a natural need?

Durkhemian sociology is unable to answer these questions.

In contrast to the Durkhemian view, another reflection asserts the autonomy of the social sciences as sciences of the spirit or culture. From this latter perspective, it is not a question of softening divergence, but of accentuating the 'differentiation' between the humanities and the natural sciences: German historicism insists on the distinctive superiority of culture[1].

[1] In the 19th century, Dilthey (1833-1911) distinguished between the natural and social sciences. The natural sciences possess paradigms, theories and methods that enable them to explain (Erklären) natural phenomena placed objectively and externally to the observer, whereas the spiritual sciences can only understand (Verstehen) the processes that take place internally to the subjects. Windelband (1848-1915), on the other hand,

The aim here is to claim autonomy on a metaphysical and spiritual level, emphasizing the preciousness of what is not 'explainable' in quantitative terms. Weber, for example, identifies in cultural practices the human need to make sense of action, establishing connections that allow us to understand how historical events in society manifest themselves. The meaning, values, and vocation (Beruf) of the subject are elements that can be understood but cannot be explained. In this case, culture finds meanings specific to human nature.

But how do we explain man's natural vocation to 'seek meaning'? Is it an innate property? Is it a natural law that cannot be 'understood' by the human sciences? Is it an extranatural/transcendental reality that is irreducible and not scientifically explicable?

Here, too, we find questions that remain unanswered.

We can include Marx in the debate as an original variant on previous positions. He sees culture as a superstructure that conceals, through the construction of a false consciousness (or dominant ideology), a deep (natural, material, and economic) structure that drives cultural production. Human beings and society are part of nature. Through exchange, which takes place through labour, nature is humanized and transformed according to human needs.

This appears to be the first attempt to recognize a specifically human 'second nature of culture'. Every change is the result of nature reacting to the transformations brought about by human beings. A way of connecting, in a hierarchical sense, the relationship between nature and culture.

But if culture is the consequence of a deep and hidden structure that has to do with material conditions of the human and non-human environment, does this mean that nature already possesses the codes for possible emancipation from itself? Is it constructed to produce culture and artificiality? Is it designed to transcend itself?

Even in Marx there are unanswered questions. The authors considered so far, albeit with due distinctions, establish dichotomies, distinctions, and hierarchies between nature and culture. They show symbolic references and connections that proceed by juxtaposition. They are unable to capture emergent effects. Marx describes reactions and modifications by nature; but he is unable to observe in terms of feedback and re-entry as Luhmanian systemics will do a century later. After all, *"all the great theorists of classical sociology wrote works when the idea of culture was still evolving; thus, they did not offer a paradigmatic approach to understanding culture (...) each of them bequeathed interrelated ideas"* (Spillman, 2022, p. 21). A change in the way of looking at the relationship between nature and

proposes the distinction between idiographic and nomothetic disciplines: a) idiographic disciplines or human sciences, are based on a method that interprets events according to value criteria; b) nomothetic disciplines or natural sciences, are based on a generalizing method that formulates laws.

culture occurs with Simmel, who understands culture as a set of practices that enable a reciprocal relationship between the objective and the subjective.

Going beyond previous theoretical perspectives, Simmel considers culture to be the producer of objectivations that are useful for systems of interaction. Cultural formations are 'objectivations of practices that enable reciprocity' between people. For Simmel 'reciprocity' is the general form of existence (Simmel, 2024).

Religion, fashion, morality, economics, law, and politics are specific worlds that mediate with the knowing subject. Two examples clarify Simmellian thought:

- Money is a specific cultural realization of the general form of existence, according to which things find their meaning in the relationship of reciprocity as far as the world of economics is concerned.
- Fashion is a social and cultural configuration that unites the fascination of difference with that of equality, reciprocally relating to the needs for imitation/integration between homogeneous circles of people and the peculiar elements of distinction with respect to the classes to which they belong.

In a process of continuous exchange, worlds produce symbolic mediations that modify human nature. Humans exchange meaning with others through mediations that are objectified cultural forms that allow reciprocity even under conditions of distinctiveness.

In later works, Simmel modifies his definition of culture, understanding it as a set of practices that enable a reciprocal relationship between the objective and the subjective: *"Culture is (...) a very special synthesis of the subjective spirit and the objective spirit, the ultimate meaning of which resides unquestionably in the perfecting of the individual"* (Simmel, 1998, p. 214).

If we limit ourselves to a binary observation of Simmellian thought - from the point of view of the objectification of structure or the subjectivity of agency - we would call it ambiguous: a paradoxical form of *coincidentia oppositorum*. If, on the contrary, we observe his perspective under the lens of interactions, we note that in his understanding of the relationship between nature and culture there is a processual co-determination that critical realists consider formally relational (Archer, 2007; Archer, 2015).

But it remains an open question even from Simmel's perspective. *If culture is a process of mediation, does nature guard the content of that mediation?* Simmel has no notions of anthropology or ethology that would allow him to understand how nature constructs reciprocity with the cultural dimension and what the result is. The questions that emerge when we examine the definitions of the masters of discipline explode the relationships between nature and culture by declining

them into oppositions between object and subject, instinct and reason, norm and exception, uniqueness and reciprocity, mediation and immediacy.

In later authors such as Park, Blumer, Gould, Berger and Schütz we observe the relationship between nature and culture in more abstract terms but still based on binary distinctions[2].

The terms of interaction oscillate between predictability versus unpredictability (Gould, 1980; Blumer and Morrione, 2004 in opposition to Wilson, 1980[3]), routine versus creativity (Park, 1952), objectification versus social construction (Berger and Luckmann, 1966), rationalism versus common sense (Schütz, 1974).

Furthermore, within the same definition of culture, different authors decline further dichotomies such as *"conflict versus consensus"* (Spillman, 2022, p. 23).

But how can we define one as predictable and the other as unpredictable? If a law of nature is meant to create expectations that are repeated over time, the first time it is generated it produces an unpredictable effect. Consequently, is it natural or cultural to step outside the box? Is it natural or cultural to build habits based on shared rules?

These questions have produced incomplete, ambiguous, or contradictory answers from cultural studies. With Raymond Williams (1973), the distance between nature and culture increases. Here, cultural sociology places *"the processes of meaning-making at the centre of its investigation"* (Spillman, 2022, p. 24).

The concept of culture becomes a hermeneutically evolving process, influenced by social constructionism. But what limits can we place on the interpretation of meanings to avoid the risk of unlimited semiosis and deconstruction(Eco, 2016)*? How can permanent hermeneutics explain time-stabilized rituals, beliefs, norms, and values?*

Cultural Studies exponents do not have exhaustive answers to these questions.

Parsons' functionalism attempts a partial answer to the previous question because it observes the cultural dimension as a function of maintaining a latent model that enables the transmission of values, ensuring that they are internalized by members of society.

As a result, human nature returns to the realm of instinct; while culture (re)inserts itself into the realm of structure, as had already happened in Durkheim. In the strong programme of the neo-functionalist Alexander (2003), on the other hand, a dialectic is proposed between the creative, unpredictable,

[2] In this essay, we merely mention authors who have explicitly examined the relationship between nature and culture.

[3] Gould examines the unpredictability of human behaviour from its genetic roots, in opposition to Wilson's sociobiology.

conflictual, and transformative dimension of culture that opposes the conservation instinct, habit, and homeostasis of nature.

In this case, nature is the search for repetition, while culture is the construction of difference (Alexander, 2003) and of possible otherwise[4].

The theme of 'possible otherwise' is also present in Luhmann who, in addition, constructs a direct incommunicability between system and environment (dimensions connected and distinct in a kind of structural coupling not analytically defined in its dynamics) where the system can understand the needs of the environment from the system itself. Here we return to the starting theme: the nexus between nature and culture is a cultural construct based on binary oppositions. But there is also a *"detachment (...) from the humanistic lexicon of the Western tradition (...) it even becomes possible to speak of a sociology (...) centered more on 'possibility' than on reality"* (Belardinelli, 1992, p. 7-8).

Functionalist, neo-functionalist and systemic perspectives open other questions that remain unanswered.

Is the impulsiveness that generates change (or entropic chaos as in the case of revolutions) natural, cultural or the emergent result of a complex relationship between the parties? Does instinct only follow laws and order? Is it only functional? Do crises and disasters always fulfil functions? In this latter case, would the concept of disaster/calamity, linked to the unpredictable, be lost?

The dilemmas already present in Durkheim's sociology return and remain unresolved. According to System Theory, the chaos in the environment must be reduced by the system. According to functionalism, it is unclear whether instinct must be contained by the latent cultural function or whether it is guided by a natural order that has autonomous laws. According to neo-functionalism, human nature has creative energy at the moment of culturalization.

But where is the emerging connection between the cultural dimension and the natural dimension?

If we adopt a relational perspective, we understand that the previous definitions construct bipolar visions that shift the focus once to the side of nature and another time to the side of culture (conflictualist or segregationist visions)

Such approaches are open to symbolic reference incomplete in the dimension of bonding, but above all lacking the emergent effect that is determined in the relationship between natural and cultural[5].

[4] In this case, the cultural process is seen as autonomous with respect to both the natural order and the social structure.

[5] To better understand what has been said, an example should be given. When man discovers fire (a natural element), he has the possibility of eating cooked food (culturalization of a natural process). Consequently, his digestive system and dentition

These paradigms are the result of a *"preconditioning philosophical dualism (first theorised by Descartes) that opposes humans as subject to humans as object. This dualism persists in sociologies that respectively place social action or the social system at the centre"* (Donati, 1986, p. 11) and influences contemporary sociological theories that simply revisit earlier theories, adding the constructionist dimension.

In the next section we will examine theoretical perspectives that go beyond the binary nature versus culture relationship. Alternative theories that attempt to understand the relationship between nature and culture by adding two more keywords: technique and artificiality.

3. Deficiency, technique, artifice: the paradox of human incompleteness

Philosophical anthropology assumes that human beings have an unspecialized, vulnerable, deficient, and unresolved nature compared to other animals, but for this reason inevitably creative (D'Alessandro, 2025a) and open to contamination between the natural and the artificial.

Philosophical anthropology goes beyond the dichotomies examined in the previous chapter and implies overcoming Cartesian dualism. Philosophical anthropology defines culture as *"human's second nature"* (Gehlen, 2010, p. 54). For Plessner (2006), culture and environment combine to define human evolution and development. Within this paradigmatic framework, technical knowledge becomes a necessary condition for overcoming environmental constraints and producing new human forms of existence.

With the development of technology, an anthropological category of primary importance for mankind can be determined: the emergent phenomenon of exoneration. A technical object (tool or machine) facilitates an action, exonerating the human being from physical or cognitive fatigue.

The technique saves energy that can be used for other activities.

This has enabled the increase of faculties peculiar to humans such as abstract thinking: another emergent effect produced by the exoneration mechanism.

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change, evolving in form and substance (emergent effect of the relationship between nature and culture). The presence of fire and cooking also change the rules of coexistence, accentuating aspects of conviviality. The possibilities opened by fire affect artefacts that are cultural expressions but are also the result of the needs induced by the natural contexts of survival. The previously described theories do not capture the emerging aspects described in the example.

Plessner's and Gehlen's reflections are complemented by those of Scheler, who identifies language as the possibility of arriving at the artificial object (D'Alessandro, 2017; Krämer, 2020).

The word exceeds and transcends organic relevance, allowing symbolic reference, but also the construction of the tool that represents a prosthesis of the human being and is at the basis of the process of civilization (Elias, 1982; 1987). The suggestions of philosophical anthropology not only influenced the anthropologists of the second half of the 20th century (Geertz, 1973; Bonner, 1980; Harris, 1987) but was also taken up by sociologists such as Gallino (1993). The latter, guided by the anthropological vision of Polanyi (1974), defines 'technique' as: *"a codified complex of norms and ways of proceeding, recognised by a collectivity, transmitted by learning for the purpose of performing a repetitive manual or intellectual activity"* (Gallino, 1993, p. 690).

Human beings are naturally predisposed to improvement through cultural forms supported by specific technologies that, in turn, modify human nature even (in some borderline cases) in its innate constants.

Scheler argued that humans are open to the world and with a constant tendency to go beyond himself (Scheler, 2000).

According to philosophical anthropology, the invention and use of culture saved human beings from extinction because (unlike other animals) they are not equipped with organs suitable for defense or predation and do not manifest efficient instincts. Philosophical anthropology and its epigones rethink the boundaries between nature and culture, observing the emerging relationships between the two terms starting with the concepts of incompleteness and exoneration. At this point in the discourse, a question emerges: *is deficiency the cause or effect of human diversity?* In introducing this question, we point out that binary oppositions also arise around the concept of 'deficiency'.

If the followers of classical philosophical anthropology are convinced that is the cause of human inventive dimension, contemporary epigones believe that deficiency is an effect that has increased human capacity to learn and stabilize cultural processes through rituals, symbols, values, norms and categories (Spillman, 2022). There is, then, a strand of research that makes the relationship between nature and culture even more dense and complex, showing that culture per se is not an exclusively human phenomenon (Marchesini, 2009; Descola, 2021; Safina, 2022).

Here, the specific complexity of human culture is admitted, but not the exclusivity of cultural predisposition: a 'reasonable anthropodecentred' paradigm that contrasts with the anthropocentric mainstream.

Following anthropodecentrism, examples of proto culture can be found in various animal species: a) in the ability of the chimpanzee that sticks a twig into

the termite mound to catch termites; b) in the tits that have learnt to pierce the tin foil of milk bottles; c) in the collective organisation of ants etc.

Culture presents itself as a zoological possibility pre-existing to the human being. In this respect it cannot be antithetical to nature.

A 'radical anthropodecentred' view is, finally, presented by sociologist Bruno Latour, who proposes the elimination of boundaries between nature and culture. According to Latour, this separation was inherited from Kantianism. Taking into consideration the positions of Bergson, Tarde, Stengers and Whitehead, Latour intends to break down the barriers between epistemology and ontology (Latour, 2000; 1991) and to consider nature-culture as an agglomeration of networked actors, including non-human beings in the social dimension, revisiting the definition and mission of sociology: *"from the sociology of the social to the sociology of associations, I would like to use the term associology"* (Latour, 2022, p. 32). Latour's theory is constructivist, but not socio-constructivist (D'Alessandro, 202), as the author himself states: *"constructivism should not be confused with social constructivism which is its opposite. When we say that a fact is constructed, we simply mean to account for the solid objective reality, mobilizing various entities whose assemblage could fail"* (Latour, 2022, p. 145).

The French sociologist asserts that ideas, artefacts, and social facts arise from an intricate network of relationships in which human and non-human actors, definable as actants, interact.

At this point, the evolution between non-human animal, human animal and artificial non-human becomes an indistinct and borderless flow. This thought prepares the field for the transhumanist possibilities elaborated by Bostrom (2016). Also, for Keller (2010) the boundaries between nature and culture are non-existent and the possibilities of hybridization are unlimited.

The well-known philosopher of science introduces the term 'nurture', which can be translated connotatively as 'spontaneous learning': a conflation of nature and culture (Archer, 1995). However, the anthropodecentred view shows limitations. The cultural capacity of other non-human animal species is limited, whereas in the human species it has reached self-reflexive dimensions that do not exist in the animal world.

Human language represents a unicum in terms of recursiveness, but this structural boundary is not considered by Latour's theory. In this chapter, we have examined different anthropocentric and anthropodecentred theories that have in common the concept of deficiency as a relational bridge between natural, cultural, and artificial.

The anthropologists and sociologists under consideration tend to reduce the boundaries between nature and culture. Latour and Keller eliminate boundaries, constructing paradoxical fusions. Having reached this point in the discourse, the questions we must ask ourselves are as follows: *is man born*

naturally predisposed to technological construction? Is society naturally cultural and is culture a symbolic construction of artifice? In order to answer these questions, it is necessary to employ relational theory, based on the paradigm of critical realism. Relational theory, going beyond reductionist views of the relationship between nature and culture (Archer and Maccarini, 2021), shows that: *"nature is not a fixed datum (...) it is a reality that changes and can develop. For these reasons, the nature that is in people is a primary component of their being human, which admits of creativity"* (Donati, 2022, p. 43).

Nature accompanies human beings, also predisposing creative acts and unpredictable acting. Relational theorists are aware that there is an inextricable but non-binary relationship between nature and culture. They are also aware of the anthropodecentred choice in favour of a reflexive neo-humanism, capable of entering into relationships with 'non-humans'. But real boundaries remain. It is the distinctions that make it possible to understand what it is possible to relate and in what way, establishing the degree of hybridization beyond which it is impossible to proceed.

Latour's paradigm of radical indistinction does not allow for the relationship between different identities, nor does it clarify the real differences between human and non-human. Consequently, it does not allow us to understand what happens when a human being enters into a relationship with a living or artificial non-human being. In the next chapter we will identify the limits of humans in relation to non-human-animals and artificial non-humans.

4. Human versus transhuman: emergent phenomena and impassable limits

Thinking in emergentist terms, preserving a realistic and critical observation means going beyond opposing epistemological positions (examples: mechanicism versus vitalism; materialist monism versus Cartesian dualism; reductionism versus holism; scientist objectivism versus humanist subjectivism). It also means reaffirming the limits to both intersections and emergent effects. Indeed, if we assert that there is an emergent and surplus phenomenon - such as the case of water (Donati, 2022, p. 317) or the example of the relationship between fire, cooked food, and human dentition given in footnote 5 of this essay - it means that we observe a transformation that has nothing to do with the integration or summation of pre-existing parts. Moreover, emergence is not always possible, because there are elements that do not trigger any generativity different from and exceeding the sum of the parts. This means that emergence sets impassable limits that are not contingent.

The concept of limits has to do with a critical realist perspective, because it starts from the existence of a reality that is independent of our conceptual

schemes and linguistic practices. Independent reality concretely (not just ideally) blocks certain fusions between nature and culture. Impossibilities exist.

We know, for example, that in nature certain crossbreeds result in limits to reproduction, such as the case of the mule - the result of a cross between a horse and a donkey - which is almost always sterile due to its chromosomal inheritance. The ability to intuitively identify essences in space-time existences is, according to critical realists, not only a function of our intellect, but also a concrete response to the environment. Alongside this realist view, the other assumption is the stated relational ontology. Relational theory assumes that there is a relationship at the beginning. This means that in the nature/culture relationship the 'between' - which determines the emergent effect - exists contextually. In other words, emergence cannot be dismissed as an effect but is present from the beginning and in a substantial way in the evolutionary dynamics of living things.

In the relational view, even *"distinction is read and interpreted as a phenomenon emerging from a field (...) that is marked by oppositions that are relational tensions"* (Donati, 2015, p. 162).

This means observing oppositions as relations from which *"inclusion and exclusion emerge alternately"* (Donati, 2015, p. 161). This is why the relational view allows us to overcome the reductionism of classical (dualism and conflictualism) and contemporary (constructivism and functionalism) paradigms. In the following, we will start with the latest research questions, continuing with answers oriented by critical realism that set concrete boundaries. We will articulate, with specific examples, the relational limits between human and non-human, making evident what is not captured by other theories. The limits pose a structural stability, reaffirming that the relationship, however intangible, has its own structure that shows conditions of possibility and impossibility. First of all, the scientific community - in its determinist and anti-determinist currents - appears to agree on the insurmountable boundaries between human and non-human animals on the linguistic, cultural, and behavioural levels. We know, for example, from sociobiology that: *"the existence of social behaviour is not peculiar to our species alone (...) In fact, it is known that many species, and not only the human one, have developed social behaviour: from insect societies, such as bees or ants, up to (...) mammals (...) Social action is (...) connected with the sphere of hereditary impulses"* (Marletti, 2006, p. 3).

But we also know, thanks to the exponents of methodological individualism, that: *"human sociality is characterised by the distinction and relative autonomy between the social and individual spheres of behaviour that in the animal world is weak or non-existent (...) in every human aggregate, even in the most archaic, it is possible to find a space of existence and action that is left to the individual"* (Marletti, 2006, p. 4).

From these assumptions follows a more important one as it distinguishes, by connecting, humans from non-human relationships: the concept of human altruism[6] which is different from the concept of cooperation.

"Human altruistic behaviour presupposes that the individual favours another individual even without gaining any benefit from his or her own behaviour, whereas the basis of cooperation is the expectation of the common good, which is a legacy inherited from animal behaviour" (Marletti, 2006, p. 20).

The non-human animal is social and cooperative. The human animal is social, collaborative but also altruistic and endowed with remarkable individual behavioural autonomies.

Human culture, finally, differs from other cultures in that it develops a language that is a technology of the self (Foucault, 1992) endowed with syntax and semantics: *"the principle of recursive generation of a discrete infinity became available in evolutionary history (...) along with Homo Sapiens"* (Chomsky and Moro, 2022, p.37). Linguists have shown that non-human animal proto languages exist, but that they are flat (Larsson, 2024).

The human linguistic system is recursive: based on finite syntactic rules capable of generating infinite semantic combinations. For these reasons, the relations between human and non-human animals will always be influenced by such limits that reaffirm the distinctions (not the indistinctness) each time, confirming that the way of establishing relations that humans have distinguishes them from everything else: *"Interhuman relations have completely different qualities and causal properties"* (Donati, 2022, p. 313). The debate that, on the contrary, divides the scientific community concerns the relationship between artificial human and non-human. According to the supporters of so-called 'strong A.I.', it is possible to build machines capable of simulating human thought. A suitably programmed computer can indeed be endowed with genuine intelligence, not distinguishable in any sense from human intelligence. According to the proponents of 'weak A.I.', there are insurmountable limits not only in terms of what is possible today, but in terms of what will never be possible.

The uniqueness and non-replicability of the human inter-human relationship lies in the fact that it is not limited to the mechanical union of a set of symbols. The human relationship can understand the semantics of its languages and is endowed with (self)consciousness and reflexivity that are consequences of a long evolutionary process that has led the substrate of biological organisms to interconnect, generating the modern human brain. From this perspective, what differs between a human and a machine is the

[6] There is a debate between anti-humanist functionalists, who interpret altruism as a form of cooperation necessary for survival, and humanist theories that include the concept of 'free and selfless help' in social actions.

quantity of connections between the elements that constitute the thinking substrate (Tononi, 2008) and the emerging surplus constituted by inter-human relations.

Thought - which is not to be confused with an intelligent system - is a feature of consciousness that machines do not possess, not least because, as the philosopher John Searle argues, if they do possess it, they have so far not been able to tell us about it, nor to make senses perceive it. If they are not able to communicate it to us, then they are not aware of it. If they are not aware of it, then they do not possess true consciousness, this being the result of a set of functions that produce meta-cognition, i.e. knowing that they are aware of knowing and being able to communicate it to another (; Searle, 2005; 2023). We can say that relational theory is quite in line with the weak A.I. thesis, while transhumanism is influenced by the strong A.I. thesis. There are basic questions that distinguish scholars oriented by relational theory according to critical realism and other contemporary theories characterized by a neo-Cartesian dualism functional to the transhumanist, and transactional vision.

Here we present questions, examples, and comparative counterarguments:

- Do athletes enhanced by technological prostheses or subjects enhanced by intra-body digital grafts transcend the premises of the human or are they variants of the human?
- Are there limits to the hybridization of human and non-human, governed by a normativity that is non-contingent, non-relativistic, and cannot have functional equivalents?

The way the questions are answered separates the exponents of relational theory from functionalists and radical anthropodecentrists. In order to analytically answer the questions posed, we list below the limits that distinguish humans from non-human relations, which are currently accepted even by scientific communities that do not follow the relational paradigm, with the exception of the transhumanist current:

- As already mentioned, reflexive, conscious awareness of acting is inherent to us humans and consists in the fact that we know how to observe and perceive ourselves while we are engaged in performing an action - 'Dasein' while dwelling says Heidegger (1988); we also know how to return at a later time to how we acted (Archer, 1995; 1998; Donati and Archer, 2010; Archer and Maccarini, 2021; D'Alessandro, 2023a).
- The ability to 'decide to decide' even in the absence of information and/or in the absence of clear information (Simon, 1955; Bateson, 1980; D'Alessandro, 2017) distinguishes human beings from machine learning and conflicts with the logic of finite-state predictability of algorithms. From this

point of view, the artificial non-human possesses merely exploratory creativity, whereas the human possesses both exploratory and transformative creativity. Exploratory creativity merely recombines prior knowledge, while transformative creativity invents new categories that make the unexpected 'emerge' (Klein, 2022). Finally, the human being voluntarily decides to make a mistake or an anomaly (Antomarini, 2007) in order to change the point of view by overturning, combining, separating, or elaborating paradoxes (D'Alessandro, 2025a; 2023b), which allow one to go beyond prior knowledge, whereas the machine is capable of creating on the basis of combinations that rest on existing data.

- The ability to make sense of what we do and to understand meaning even in the most ambiguous nuances is another characteristic that distinguishes us from artificial non-humans. It is not possible in this paper to go into the analytical merits of the issues involving semantics and creativity, but numerous research studies show the limits of ai. The Winograd and Winogrande tests probe the semantic inability of the machine through sentences that can only be understood if they are contextualised. The Lovelace 2.0 test measures the machine's inability to 'surprise' the human evaluator (D'Alessandro, 2025b).
- Finally, human language differs from artificial language in that: *"human 'possible languages' are based on a hierarchical order, whereas 'impossible languages' are based on a flat, linear order"* (Chomsky and Moro, 2022, p. 24-25). Linguist Andrea Moro demonstrates the boundaries between artificial human and non-human languages, starting from the structural relationships between syntax and brain. Children, as young as two years old, apply linguistic rules to create and interpret sentences, paying attention only to what they never hear. What they ignore is the linear order of words that is evident and recurrent. They pay attention to the *"hidden structures that have created their minds"* (Chomsky and Moro, 2022, p. 23-24).

The concrete examples examined show boundaries that give structural stability to relations between human and artificial non-human. The human has natural and innate characteristics that enable him to recognize possible rules, based on linguistic structures and insurmountable hierarchies.

Moreover, if we extend the discourse to interhuman behaviour, we can define social action as always being shaped by structures, by which we mean: *"mutually sustaining cultural patterns and sets of resources that (...) constrain social action because they are reproduced by such action"* (Sewell, 1992, p. 29[7]).

[7] This dynamic definition of structure is shared by most contemporary sociologists who reject static definitions of the term.

In contrast, the Transhumanism of Nick Bostrom (2016) and the neo-evolutionary sociology of John Harris (2007) oppose the concept of limits and boundaries, but without clear and concrete evidence.

They speak of unlimited enhancing, based on improvement co-administered by factors unrelated to the natural evolution of the human. Transhumanism is an eudaimonistic movement; in that it is based on the scientific maximization of happiness that aims to improve bodies and minds and combat the predisposition to disease: a return to Bentham's thought.

Trans-humanism proposes an anti-humanism that regards techno-poiesis as the only process capable of emancipating man from the biological: this current sets no limits to abstraction and re-proposes a separatist Cartesian dualism based on the res-cogitans/res-extensa logic, projecting it into a future in which it will be possible to extract the typical characteristics of the mind and implant them in a non-human device. Transhumanists call this 'mind uploading'. It is based (on a theoretical level) on the transfer of neurons and their connections onto a silicon medium. This thought was already present in the philosophy of Daniel Dennett (2023), influenced by Dewey's pragmatism. Yet, mind uploading is dismissed by cognitivists as 'a-scientific' naivety. Human intelligence is embodied. This is proven by authoritative scholars in cognitive science (Noë, 2010), neurology[8] and social neuroscience (Ehrenberg, 2019). If I remove the body, I remove creative processes from the cognitive system[9]: *"all abilities, even the most abstract, arise as bodily practices"* (Sennett, 2009, p. 19). Transhumanists do not observe relationally and realistically, which is why they do not understand limits, proposing a path based on unlimited flows, transactions, and hybridisations. To deprive the mind of a hand that allows it to manipulate; or to deprive it of the movement and finitude of physicality, is to deprive the subject of awareness, the result of a dialogue between ego, alter, and context. The grafting of the brain into another medium does not take root: in fact, mind uploading has failed. Attempts to improve humans by nullifying the deficits of his paleo-cortical system have also failed. According to cognitive

[8] Aleksandr Lurija (1966), after explaining how since Greek times both locationalists and antilocationalists had made contributions to our understanding of the brain, notes an error common to both theories. They regard mental functions as a phenomenon to be linked directly to the structure of the brain, without an intermediate physiological analysis. Both theories disregard the body as a whole.

[9] For phenomenology, intelligence depends on how I experience the body. Merleau-Ponty asserted: "the body thinks" (1945). Later, the cell biology expert Michael Gershon (1999) discovered the 'second brain' in the human viscera (enteric nervous system), while an embryologist named Yen (1994) called the placenta the 'third brain in gestation'.

science, the dialogue between palaeo-corticality and neo-corticality constitutes the founding characteristic of the human, the limit that cannot be crossed. Breaking down the sense of instinct, the sense of belonging, pain, and habits achieves something totally other than humans.

5. Conclusions and comparative tables

What constitutes the 'absolutely other' in relational terms for the human? How do nature and culture enter into a relationship with the human, orienting its constitution? Are there insurmountable limits that distinguish humans from non-human (natural or artificial)? Starting from these research questions, this article has examined theories and paradigms, in the sociological and anthropological fields, that from the 19th century to today have constructed different interpretations and relationships between the natural (human and non-human), cultural and artificial. From a comparative perspective, we have tried to highlight the limits, contradictions and originality of anthropocentric and anthropodecentralized theories. We have also highlighted differences between dualist, conflationist (or hybridist) and relational theories. Below we highlight the main differences that emerged, through tables no. 1 and no. 2. Table 1 schematically describes the relationships between nature and culture developed by the authors examined, underlining the open questions. Table 2 describes the boundaries between human and non-human according to the different theories examined. Each theory presents limits, but also useful ideas for further research.

Table 1. Relationships between Nature and Culture.

Authors	Relationships between Nature and Culture
Durkheim	Nature is governed by laws of evolution and instincts. Culture is governed by collective ritualised norms. Nature versus Culture (A versus B). Nature has a stable and predictable relationship with itself and its laws (A=A). Cartesian dualism. Contradictory link between the extensive dimension of the body (res extensa) and the intensive dimension of thought (res cogitans). Reason should dominate instinct, but it is unclear how and what laws it should follow to repress instincts that in turn are dominated by laws of nature. It is not clear whether reason belongs to the world of nature or the world of culture since evolution has its own logic. These contradictions are present in most of the authors in the table. For convenience, when we consider others, we will only repeat the expression 'Cartesian dualism'. No emergent effects between nature and culture are captured. Only the emergent effect of the social collective is captured. Society is a sui generis reality from which the cultural dimension springs. Human beings individually are instinctive and anomic. ***Unanswered questions*** If instinct has its norms as culture has its conventions, how do the two logics differ and how do they relate? What ontological foundations does symbolic mediation have?

Weber	Nature: dimension of order, but also of values. Culture as a symbol of unpredictability determined by individual decision. Distinction between value-oriented and means-oriented rationality oscillating between nature and culture. The concept of vocation is cultural in the technical sense (profession) and spiritual-natural (inclination). Nature versus culture. Cartesian dualism. No emergent effects between nature and culture are captured. Weber does not speak explicitly of the 'creativity' of human nature, but his definition of discontinuity refers to the creative and generative act (Weber, 1958). ***Unanswered questions*** How do we explain human natural vocation (Beruf) to seek meaning? Is it an innate property? Is it a natural law that cannot be understood by human sciences? Is it a transcendental reality that cannot be scientifically explained?
Marx	Nature is deep, material and concrete. Culture is symbolic and ritual superstructure generated by dominant ideology. Nature modified by cultural/technical actions that react by influencing (in turn) culture. ***Unanswered questions*** If culture is a consequence of a deep structure, does this mean that nature possesses the codes for possible emancipation from itself? Is nature constructed to produce culture and artificiality?
Simmel	Nature Subject/Noumenon/Mediation. Culture Subject/Phenomenon/Mediation. Kantian approach**.** Synthesis of subjective spirit and objective spirit. Contradictory attempt to overcome Kantianism. ***Unanswered questions*** If culture is a process of mediation, does nature preserve the content of this mediation?
Park	Nature: routine, status quo, repetition. Culture: creativity, transformation, unexpected. Cartesian dualism and binary oppositions. Caught only in cultural aspects: the relationship and integration of rituals, symbols, and techniques can give rise to forms of excess. ***Unanswered questions*** How can we define predictable nature and unpredictable culture? If a rule creates recurring expectations, the first time it is generated it produces an unforeseen effect. Consequently, is it natural or cultural to transgress? Is it natural or cultural to build habits?
Raymond Williams	Nature: instinct, pre-logical activities, unconscious creativity. Culture: symbolic construction of meanings; conscious, exploratory, and generative creativity. Cartesian dualism and binary oppositions. Emergent effects are captured in cultural aspects: the relationship and integration between rites, symbols, techniques can give rise to forms of surplus. ***Unanswered questions*** What is the relationship between natural creativity and cultural creativity? What limits can we place on the interpretation of meanings to avoid the risk of unlimited semiosis? How can permanent hermeneutics explain time-stable rituals, beliefs, norms, and values?
Parsons	Nature: Order, stability. Culture: maintenance of values through latent pattern. Functional and hierarchical relationships between nature and culture.
Luhmann	Nature is the environment understood as chaos, disorder, entropy and complexity to be reduced or reordered. Culture is subsystem in charge of classifying, ordering and reducing symbols, rituals, techniques according to a previously disturbed systemic balance. Exclusive bonds for binary oppositions. Emergence is confused with structural coupling. Luhmann contradicts himself when he tries to reconcile his systemic paradigm based on system/environment differentiation with constructivism and complexity theories. The binary approach of 'differenz' excludes the circular approach of complexity and the unlimited fusions approach of constructivism.

Alexander	Human nature as homeostasis, balance and repetition. Culture as unpredictability, difference and transformation. Binary oppositions, but also hierarchical and functional relationships. Culture is autonomous not only with respect to human nature, but also with respect to other dimensions of society. Culture can transform nature and society if the change is functional to its survival. Emerging effects are captured in cultural aspects: the relationship between rituals, symbols, and techniques can give rise to emergent processes that change society in progressive or regressive forms. ***Unanswered questions (Parsons, Luhmann and Alexander)*** Is the disordered impulsiveness that generates change (or chaos as in the case of social revolutions and catastrophes) natural, cultural, or the emergent result of a complex relationship between the parties? Does instinct only follow laws? Is it only functional? Do crises and disasters always fulfil functions? In that case, the concept of emergency, which is linked to the unpredictable, is not considered!
Plessner/ Gehlen/ Scheler and epigones	Human nature characterised by unfulfilled/deficient instinct and despecialised/vulnerable body. Culture as technique, artifice, device capable of complementing, specialising, and making human possibilities efficient. Relations between nature and culture through the relational bridge of deficiency. Emerging effects are captured in the cultural dimension of the mechanism of exoneration activated by techno-poiesis that creates surplus: machines, tools, and recursive language enable expansion of the human brain, abstract thought, change in physicality. ***Unanswered questions*** Is there a law of nature that makes human nature part of the process of incompleteness or, on the contrary, does it intervene to complete deficiencies? Does it start from a lack or is it created as the complexity of cultural forms increases? In conclusion, on the 'deficiency' dilemma as cause or effect, epigones have created two different schools of thought, giving greater weight to the cultural or natural variable according to specific theoretical perspectives.
Keller/ Wilson/ Latour/ Socio-biologists	There are no stable boundaries between nature and culture. Symbols constructed to differentiate and distinguish are considered unproductive. Potentially unlimited connections, fusions, and hybridisations. Emerging effects are captured in its essence, but not fully understood and confused with fusions that are always possible. Aspects are reported here that unite paradigms and theories that from other points of view are absolutely divergent. ***Unanswered questions*** Is the human being born naturally artificial and predisposed to technological construction? Is society naturally cultural and is culture a symbolic construction of artificiality? The authors answer these questions 'partially'.
Bostrom/ Harris	Nature and culture must be overcome because they are an obstacle to human evolution. One can and must eliminate the instinctive and corporeal part of the human being in order to evolve. Mergers, integrations, and substitutions. Transformation by progressive elimination of elements proper to the human. The limits of emergence to such phenomena are not captured, nor are the limits of implant rejection. ***Unanswered questions*** Why do transhumanists not consider failures such as the slowness of neural networks, the impossibility of mind uploading, the predictability of algorithms and the rejection of certain artificial implants?
Archer and Donati	Nature is distinguished from Culture not by binary oppositions, but by degrees of differentiation. There are structural limits that cannot be crossed between the natural human and the artificial non-human and the animal. Connections by distinctions, not mere binary oppositions. Renunciation of dualism and radical anthropocentrism. Neo humanism opens to transformations bound by the phenomenon of emergence.

	Emergent effects are captured also in its limits. Emergence is not always possible, there are elements that do not trigger excess generativity. ***Unanswered questions*** Will it always be impossible to understand the enigma of the relationship? Will it be possible, in the future, to reduce the limits and distinctions hitherto existing between human and non-human? Theory remains open to the understanding of other theories, but by setting realistic limits to hybridisations.

Table 2. Impassable boundaries between human and non-human to date.

Impassable boundaries between human and non-human to date		
Non-human animal	**Human**	**Non-human artificial**
It is social and collaborative, not autonomous with respect to group logic.	He is social, collaborative but also altruistic. Gifted with individual behavioural autonomy with respect to group logic. On the concept of altruism there is a debate between anti-humanist functionalists who interpret altruism as a form of cooperation necessary for survival and humanists who include the concept of selflessness in social actions.	Collaborative on the basis of programmed human input.
It has a linear proto language.	He has a reflexive, recursive language, neither linear nor flat, but based on hierarchical order. Human language has syntax, semantics, and pragmatics.	It has a formal language with syntax. It does not understand semantics, it simulates it.
It decides by instinct	He or she makes decisions even in the absence of information or unclear, distorted, and ambiguous information. He or she can also do without the context of reference to decide and act.	If it has no information, it stops or defines a scenario as undecidable.
It is impossible to prove the Turing test	Human being passes inverse Turing test	It fails inverse Turing test
It is endowed with transformative but low-intensity creativity.	It is endowed with exploratory and transformative creativity	It only has exploratory creativity
It cannot voluntarily decide to err. If it errs, it does so unintentionally.	He voluntarily decides to be wrong or to change his point of view by reversing, combining, separating ideas or elaborating paradoxes.	It cannot decide to err. It errs because of a system error.
There is currently an open debate on the concept of consciousness and reflexivity in the animal world. In this essay, we have deliberately not introduced the debate on plants (non-human and non-animals), which would merit further research work.	He or She has reflective and conscious awareness	It proceeds by trial and error without conscience

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