

Comparing and Integrating Biological and Cultural Moral Progress

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Abstract Moral progress may be a matter of time scale. If intuitive measures of moral progress like the degree of physical violence within a society are taken as empirical markers, then most human societies have experienced moral progress in the last few centuries. However, if the development of the human species is taken as relevant time scale, there is evidence that humanity has experienced a global moral decline compared to a small-band hunter-gatherer (SBHG) baseline that represents a lifestyle presumed to largely account for 99% of human history. A counter-argument to such a diagnosis of moral decline is the fact that the living conditions of the modern world that emerged since sedentariness and the beginning of agriculture are completely different compared to those of SBHG due to cultural and technological developments. We therefore suggest that two notions of moral progress should be distinguished: a “biological notion” referring to the inherited capacities typical of the evolutionary niche of mammals and that unfold in a specific way in the human species; and a “cultural notion” that relates moral progress to dealing with an increasing diversity of temptations and possible wrongdoings in a human social world whose complexity accumulates in time. In our contribution, we describe these two different notions of moral progress, we discuss how they interact, how this interaction impacts the standards by which we measure moral progress, and we provide suggestions and justifications for re-aligning biological and cultural moral progress.

Keywords Moral progress · Small-band hunter gatherer · Culture · Biology · Moral development · Parenting

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1 Introduction

The idea that humanity is changing (or should change) towards the good has been deeply embedded into a modern understanding of human history, particularly shaped in the West since about 1500. The new scientific and technological developments of that time inspired writers of the Enlightenment like for example Anne-Robert-Jacques Turgot, a minister to Louis XVI, who wrote the influential work *A Philosophical Review of the Successive Advances of the Human Mind*.¹ Many other leading thinkers of that time, like David Hume and Immanuel Kant, reflected on the notion of progress; and although the concept involves various different facets – technological, social, political, etc. – it usually includes a “moral” component, in the sense that some general moral principles or values provide justification for why a certain type of societal change is considered to be “good”.

This sketchy observation points to two basic types of understanding of “moral progress” – namely “indirect” progress that concerns *approaching a certain moral standard* due to, for example, technological or social change (e.g., setting up a socio-technological change that increases access to drinking water in a society, thus decreasing harm caused by polluted water); or “direct” progress that involves *changing the standard* itself by which progress is measured (e.g., the introduction of the notion of human rights). This conceptual distinction between approaching a standard and changing a standard certainly makes sense, but there are underlying mechanisms that influence both direct and indirect moral progress. For example, it is well known that cultural factors induce changes in society. Early on, industrialization (with accompanying mobility, urban concentrations and other factors), for example, changed many different processes in (western) societies and in parallel led to a change in evaluation standards (e.g., partly replacing religious standards of the “good life” to more secular, individualistic, rights-based evaluation). This complex set of changing cultural factors – science, technology, education, politics, and so on – is often understood to equally contribute to both indirect and direct moral progress.

However, the notion of progress should not merely be understood as a purely cultural phenomenon. The emergence of evolutionary thinking since the scholarship of Charles Darwin and of others points to the role of biological factors in providing some kind of “foundation” for human behavior. But these biological factors are subject to change, although usually on a larger time-scale, leading to the question of *how these two levels (culture and biology) can and do interrelate*. This is one of the two questions we address.

The second question concerns *how one should measure moral progress*. This question involves both the issue of identifying indicators that will be the object of a measurement as well as determining the appropriate time scale over which progress can be observed. Or, in other words: To what extent has the current dominant culture experienced moral progress compared to earlier times? We note that this question is ripe for ideological controversy and conflicting data. For example, some authors, particularly from politically conservative circles, have interpreted societal change of the last century as moral decline (Herman 1997; Spengler 1918). We, however, are not interested in this ideological controversy. Our topic is how the interrelation of biological and cultural factors shapes the understanding of moral progress.

We start by taking two exemplars to explain more closely what is meant by indirect and direct moral progress. On the one hand regarding human-on-human physical violence, Steven

¹ A concise overview on the philosophy of “progress” is available at the Stanford Encyclopedia of Philosophy: <http://plato.stanford.edu/entries/progress/> (last access: October 31 2015).

Pinker (2011) recently argued that most global societies have experienced moral progress in the last centuries if one measures the observable number of persons killed in conflict (relative to the total population).² Pinker's approach represents a mainly indirect notion of moral progress based on a fixed evaluation standard; namely that the number of human casualties should be reduced. On the other hand, there is ample evidence that "violence against nature", the purposeful and also accidental extermination of other-than-human life has increased on a global scale in the last centuries as measured, for example, by the number of species that are endangered or extinct, the amount of toxic pollution in air, land and water, and the decreased biodiversity in most areas of the planet. The extermination process is usually not the result of a deliberate aim to reduce the number of species (though killing off pests and predators are often aims) but is a general side effect of the current type of exploitation of nature for human purposes.³ This issue reflects a potential change of the evaluation standard.

Most human societies since the dawn of humankind and all sustainable ones have treated the other-than-human as members of the community of concern based on a worldview that does not separate humanity from the rest of nature (Highwater 1981). Hunter-gatherer societies and those that followed generally upheld what is called an "indigenous worldview," where everything in the world is related and sacred and other-than-human entities are valued as persons deserving of respect (e.g., whose permission is sought for life taking; Kimmerer 2013; Cooper 1998; Nelson 2008). In what we will call the "western worldview",⁴ a sense of superiority and condoning of human supremacy in relation to the rest of the natural world has been developed, resulting in a clash between the two worldviews, indigenous and "western", that are disparate, like oil and water (Four Arrows and Narvaez 2016). The dominant culture's sense of superiority may thus be a significant source of both a sense of progress in the West and the ecological crises that plague the planet (Jensen 2016).

This picture is arguably a simplification of both the cultural diversity of indigenous and western cultures – but in the following argumentation, we will use this duality as a framework for outlining the difficulty of conceptualizing the notion of moral progress. A first observation is that these conflicting views may be due not only to definitions (violence against humans versus violence against other-than-human life), but may also be an indication that moral progress is a matter of time scale. If the last few centuries are examined and an intuitive measure (estimated numerically) for moral progress, like per capita physical violence towards humans within a society, are taken as empirical markers for moral progress, then most human

² We note that these analyses are disputed by experts on empirical and categorization grounds (see Ferguson 2013a, 2013b; Fry 2013). For example, small-band hunter-gatherers, who represent 99% of human genus history, are relatively peaceful and not war-like, but Pinker mixes them together with complex hunter-gatherers, who can be war-like.

³ We note that human use of natural resources is not *necessarily* linked to the destruction of nature and decrease of biodiversity. For example, Europe today without human intervention would be wooded to a large degree, with a likely lower degree of biodiversity compared to a Europe with bounded and non-mono-cropping agricultural activity, because boundary zones between forest and acres increase the number of ecological niches.

⁴ It is important to clarify that we do not use this term with a specific geographic focus (i.e., focus on Europe or North America) or racial implication (i.e., focus on "white" culture). The term "western" just denotes that the conceptual origin of the idea that humans are special in a normative sense and that this special status provides the legitimization of exploiting nature has its historic origin mainly in assumptions about human distinctiveness (Biblical theology) which undergird the rationalization of thinkers of the western world (e.g. Francis Bacon or René Descartes). As the example of contemporary China shows, exploitation of nature and environmental pollution are not bound to specific geographic regions or racial boundaries. And, as the example of the Easter Island civilization has shown, destruction of nature can also happen without the presence of a "western worldview" in a culture (Diamond 2005).

societies, under burgeoning populations, have indeed experienced moral progress (Pinker 2011). However, if the time frame of the human *species* is taken as the relevant time scale, the situation can be evaluated differently: Small-band hunter-gatherers (SBHG), who represent a lifestyle presumed to largely account for 99% of human genus history, and who emerged over 2.5 million years ago (Bicchieri 1972), have lived in a strikingly cooperative social world in the face of a difficult and sometimes unpredictable physical world (Fry 2006, 2013; Narvaez 2013, 2014). Even Darwin (1871) noted how so called “uncivilized” peoples showed a morality more like his female compatriots (sensitive, tender) than the selfish rivalry his male compatriots demonstrated. Human morality may thus have evolved as an advanced adaptation to enable the uniquely derived lifestyle of human foragers, which requires generosity and sharing due to extreme mutual interdependence for survival, thriving and dispersal (van Schaik et al. 2013). Compared to such a SBHG baseline, the current mode of human existence involves a considerable degree of organized emotional and psychological violence to humans, and destructive behavior towards other-than-humans, which can be interpreted as an expression of moral decline.

These observations point to a second observation, namely that the existence of two timescales related to cultural vs. biological change complicates measuring moral progress. Moreover, as we will see later, recent findings in epigenetics even indicate that the biological and cultural timescales might be less separable than thought initially.

Accordingly, measuring moral progress necessitates the consideration of a variety of factors: Are we aiming to measure direct moral progress, indirect moral progress, or both? Will we also include underlying factors in our measurement? How and to what extent do cultural and biological factors of human behavior that underlie the changes expressed in moral progress interact? What is the content, topic or domain for which we want to ascertain whether moral change has taken place? What time scale do we include? Should concerns for other-than-human life (e.g., animals, plants, land, rivers) necessarily form part of the moral calculus for moral progress? Those are questions that should be addressed when disentangling the interrelations between biological and cultural moral progress.

These guiding questions refer to very fundamental and difficult scientific and philosophical topics; and we do not claim to provide definite answers to them. Our aim is to point to some issues that help to clarify these questions and to discuss the interplay of biological and cultural factors. The philosophical goal of this paper is to show that the notion of “moral progress” *requires the integration of a cultural and a biological perspective* – and this integration comes with a price: namely that there is no “objective” measure of moral progress independent of what we call “worldviews”, because cultural and biological change interact in ways that affect the evaluation standard of moral progress, which is expressed in these worldviews. This does not mean, however, that it is impossible to reasonably discuss whether moral progress took place or not in a certain amount of time. However, this discussion should take into account arguments referring to the worldviews themselves – and the arguments will add to our understanding of biocultural values both with respect to a certain notion of (individual) “flourishing” and with respect to the protection of biodiverse earth communities. These arguments should not be simplistic in the sense that e.g., just replacing a “western ideology” with an “indigenous ideology” would save the world. Yet we believe that a deeper understanding of how cultural and biological moral change influence one another helps us to uncover some unquestioned foundations of how we evaluate moral progress.

This is not a mere theoretical exercise. We refer in our argumentation to one specific example: human parenting practices. We believe that this example is relevant because early

childhood is a critical phase in human ontogenesis where the “biological foundations” of the individual are particularly sensitive to cultural influences in such a way as to lead us to expect consequences for the moral behavior pattern of the individual. It thus serves as an exemplar on how the biological and cultural levels interact. Furthermore, parenting and education have been seen as key mechanisms contributing to human and moral progress, and they have an impact on the evaluation standard of moral progress through this interaction between biology and culture.

In what follows, Section 2 provides some conceptual clarifications related to cultural and biological moral progress. In Section 3, we demonstrate the interplay of cultural and biological factors with respect to the formation of evaluation standards using the example of parenting practices. In Section 4, we sketch (in an arguably simplified form) how two worldviews resulting from this interplay of biological and cultural factors influence our understanding of moral progress. Finally, in Section 5, we discuss whether changes in parenting practices have an effect on the biological-cultural interplay that forms the foundation of worldviews, such that an orientation towards living with other-than-humans can be promoted, which would support a moral progress that we consider indispensable for overcoming destructive elements in the dominant culture.

2 Conceptual Clarifications

2.1 What Is “Moral Change” and “Moral Progress”?

A more elaborated discussion on the notion of moral progress needs some conceptual clarification. The notion of progress involves the idea that an entity changes in time and that this change is considered positive; i.e., any notion of progress needs a *measurement procedure* to detect the change of an entity and an *evaluation standard* based on which the detected outcome is considered to be better than before. This notion of progress becomes evident in the context of technology. The entity might be, for example, a computer, and progress is measured by increasing computing power. Or, the entity might be a socio-technological system like “train travel”, and progress could be measured by saving time when going from A to B. Certainly, already in these examples there might be discussions about which standards to use and which side effects to take into account. For example, although computing power has increased, so have the computing requirements due to the increasing complexity of the software, and extracting the rare minerals used for the construction of technological items has destroyed ecological and cultural systems; i.e., the overall gain might be less than the measurement suggests.

These practical problems are complemented with a conceptual problem when the entity of progress is morality itself – very broadly construed as a system of norms, rules, virtues and justification systems that determines for a community of humans (groups, societies) what the “good life” or the “right action” is. In human societies “morality” understood in this way is reflected in verbalized accounts that are either transmitted orally or in written form within a community and that show up in specific behavioral patterns of individuals (moral agents).

The analogy involving technology still works well in the case of what we call “indirect moral progress” where no change in evaluation standard occurs. For example, when the standard is “killing humans is wrong” and the homicide rate in a society has decreased from $x\%$ to $y\%$ with $y < x$, this would be a reasonable account of indirect moral progress. Certainly,

considerations whether the way that the homicide rate has been measured was adequate or what side effects should be taken into account (e.g., although fewer people are killed or die due to medical intervention, many more might be injured, or whether abortion rates are included in the calculation) are still the objects of discussion. However, when morality itself – i.e., the system of norms, values and virtues – becomes the progressing entity, things become more complex, *because the evaluation standard is itself part of the moral system*. This means that the ethical assessment of moral evaluation standards will partly rely on those standards themselves. For example, when assessing the standard change from “all *free* human beings must be treated fairly” to “all human beings must be treated fairly” in the course of the abolition of slavery, the ethical argument will refer to the moral core of the new standard, that is, that humans *qua* being human deserve being treated fairly.⁵ Thus, there are different ways how morality itself could be the object of change:

- Some norms, rules, virtues, and so on, change in importance or are even replaced by others (e.g., norms related to sexual behavior)
- The meaning of norms changes (e.g., from a distributional to a procedural understanding of “justice”)
- The application of norms to specific groups or contexts changes (e.g., a more extended group of humans falls under a specific norm as in the case of slavery abolition)
- Norms are sometimes not evaluated as equally valid, important, applicable etc. by various subgroups within a society, addressing the issue of inner-societal agreement
- Norms are no more considered to be “moral” norms (e.g., religious duties), because standards of justifications with respect to what counts as a valid moral argument may change, addressing the issue of evaluation stability

These changes often go hand in hand with more elaborated ethical theories – the core business of normative ethics. In what follows, we do not address these extensive debates regarding the nature and justification of “good” standards and how the development of major ethical theories of the deontic, teleological and virtue traditions relate to moral progress – this would be far beyond the scope of this contribution. Rather, we will focus on cultural and biological moral progress. In doing so, we will sketch the interrelation of three levels – namely the moral system of norms, values etc. (*moral_N*) that serves as the evaluation standard of moral progress; the cultural practices (*moral_C*) that represent expressions of these standards (either fulfilling or not fulfilling these standards); and the biological systems (*moral_B*) – mostly on the genetic and neuronal level⁶ – that enable an agent to express moral behavior, as well as the dynamics on each of these levels. In this way, we aim to contribute to a more theoretically sound and empirically informed notion of moral progress.

⁵ This problem points to fundamental questions of moral philosophy: the quest for the universality of moral norms and the quest on how to “ground” ethical theories (foundationalism vs. coherentism). We will not outline these questions further.

⁶ We do not claim that the biological systems *determine* the behavior of the agent, nor do we claim that we have complete knowledge how biological systems enable moral behavior – actually, an individual’s biological systems might be much more complex than initially thought. There are for example indications that even the type of microorganisms that populate a human body may have an effect on moral behavior (Kramer and Bressan 2015).

2.2 Cultural Moral Progress

It is plausible to assume that moral diversity is a product of social complexity (and may also undergird social complexity) – and the emergence of moral diversity necessarily means that moral change happened in all the ways outlined in the paragraph above. This reflects the fact that morality is situated within a social world, in which social beings generate actions, judgments, negotiations, and many other kinds of expressions – and as this social world has a history, so has morality. This also means that acts, norms, and virtues that we may call moral are subject to fuzziness in two respects: First, within a society, there are for example actions that are undisputedly either moral or immoral, whereas other actions are less clear in that respect. Second, across societies and during history, the moral condemnation of some behaviors seems to have been stable, whereas others have been subject to remarkable changes. Thus, the moral evaluations of given actions differ both with respect to inner-societal agreement and evaluation stability over time (Christen and Müller 2015). For example, condemning the murder of innocent people (apart from newborns) has been relatively stable both within a society as well as over the course of time. For a long time, slavery had been morally acceptable within (complex) societies but lost acceptance in a relatively short time span and is now regarded as unacceptable in (almost) all societies (Appiah 2010). Abortion has had a long history of moral disagreement, while each position has been relatively stable over time. Finally, the degree of moral acceptance of homosexuality has shifted several times in history, and to date the inner-societal disagreement is still high in many countries (actually, in several countries a backlash against the acceptance of homosexuality can be observed).

Many of the current debates within ethics – e.g. in business ethics or bioethics – refer to problems that result from the cultural complexity of our time with its technological possibilities and its large variety of institutions. Even the basic issue of slavery requires an institution of property and property rights that were not present in this form among human foragers. Given the “baseline” of early human history (see Section 2.3), it seems that cultural evolution came at a “moral price”, that is, many societies became significantly more unequal, causing and fostering violence, and thus requiring (more) cultural moral progress in order to bring down violence (Fry 2006). Accordingly, it is difficult to establish cultural moral progress on a general or global scale – and the aim of generating moral progress is basically understood as a “cultural task”, for example by setting up global institutions like Human Rights Watch. Seen from this perspective, the “biological grounding” of human morality is perceived as unimportant, as it is overruled by the cultural component.

Thus, the problem is construed as a “two-level-problem” (see Fig. 1), where the evaluation standard $moral_N$ is used to judge expressions of these standards $moral_C$. If these expressions develop towards this standard, then we see indirect moral progress.⁷ Vice versa, the inner dynamic in the cultural system (e.g. inventions of machines and different ways of production that decrease the economic efficiency of slavery) could support (in diverse and complex ways) changes in the evaluation standard. Many different social and psychological processes will be needed to ensure that such a change will be seen as progress – and this may rely on some rather unexpected moral

⁷ With respect to indirect moral progress, one has to be aware that political declarations of progress are not the same as actual progress. For example, slavery is nowadays technically illegal throughout most of the world – but according to some global watch-dog groups (e.g., <http://www.freetheslaves.net/>), we still have millions of people that live under slave-like conditions. Thus, the removal of institutional racism may not address the persistence or growth of other, less institutionalized, forms of systematic oppression [we thank an anonymous reviewer for this observation].

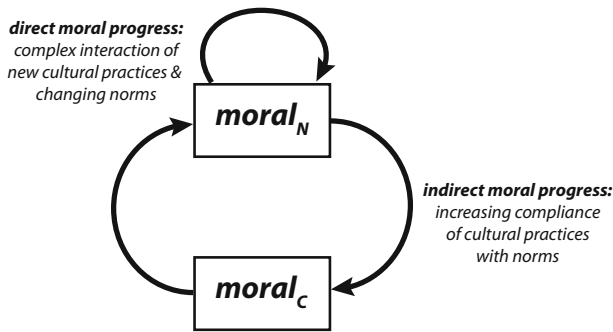


Fig. 1 The interrelation between an evaluation standard and a cultural moral system seen merely from a cultural perspective

elements such as honor (Appiah 2010), or in changing the moral sensitivity for the suffering of others and for the question who counts as a full human being (as in the case of slavery).

2.3 Biological Moral Progress

The notion of “biological moral progress” presumes that human moral agency is somehow grounded in an agent’s biological processes and that these processes have an evolutionary history – that is, changes on the biological level show up as changes on the moral level. Postulating such an interconnection has long been a central topic for scholars interested in morality and its origin; and, since the groundbreaking work of Charles Darwin and his prominent followers (Herbert Spencer, Julian Huxley and others), empirical approaches to this question have referred to the concept of evolution when looking for answers (Joyce 2006). This search for the “phylogeny” of morality requires a specific framing of the problem and goes along with several well-known questions and problems that have been discussed intensively by evolutionary biologists and philosophers (e.g., Boyd and Richerson 1985; Caplan 1979; Kitcher 2011).

In the following, we will not further expand this debate (for an overview, see the contributions in Christen et al. 2013, in particular Christen and Alfano 2013); we only briefly sketch major points for our argument. With respect to the relevant context for the phylogeny of human morality, there is little disagreement among researchers in the field: The specific environmental conditions and the lifestyle of human foragers – that is, the spatial scale of the (small band) group with strong mutual interdependencies and relations – shaped (human) moral agency in a decisive way. For example, van Schaik et al. (2013) have presented an extended hypothesis building on a large body of research in anthropology, ethnology, and related sciences. They propose that moral emotions are the subjective side of the proximate rules (motivations) that regulate human cooperation, which in turn is an evolutionarily novel adaptation to enable the uniquely derived lifestyle of human foragers. This lifestyle required generosity and sharing due to extreme mutual interdependence that were accompanied by a strong sense of egalitarianism among group members. On the (larger) time scale of the evolution of the human species, the biology (i.e., affective systems, brain networks, etc.) developed in such a way as to give rise to a specific behavior pattern which survived in groups of humans that gained moral importance. Those groups could flourish under these conditions, that is, they considered this moral system as positive (as far as we can extrapolate from the observations of SBHG in the last century to human genus history generally; Fry 2013).

An important point is that the associated biological processes do not necessarily work on much larger time scales compared to cultural processes. In particular, epigenetic changes in gene expression that affect parents in one generation (e.g., due to high environmental stress at critical time points) have been shown to impact epigenetics and parental behavior across generations (for a brief overview see Powledge 2011) – thus biological changes can have effects on smaller time scales that contribute to the “collective history” of a group. In this way, biological change can influence moral change – and creating an environment that increases the likelihood of positive biological change implies the possibility of biological moral progress.

Thus, adding the biological level complicates the picture sketched in Fig. 1: The biological level interacts both with $moral_C$ and $moral_N$ (see Fig. 2). Epigenetic changes are of particular relevance for the interaction between $moral_B$ and $moral_C$ – and through these alterations, changes in the evaluation standard also are possible (we will show this for the example of parenting in Section 3). Whereas the understanding of indirect moral progress (comparing standards with actual cultural practices) does not change, direct moral progress becomes a more complicated issue, because changes in the cultural practices can change the evaluation standards of an agent’s behavior via its influence on $moral_B$.

Here, one may object that due to the large time scale of biological evolution the human groups themselves were unable to perceive this emergence of morality as “progress”. To some extent, this is certainly true – but one has to take into account that the behavioral patterns of the SBHG were/are not solely determined by their biology. Rather, their behavioral patterns were co-determined by the interaction between their biology and their natural and social environment, giving rise to cultural practices that supported SBHG flourishing. Although evil behavior of individuals was possible (e.g., murder), this could in the worst case lead to the exclusion of an incorrigible individual from the group (de facto a “death penalty”, as long-term survival as an individual was very difficult), or in some cases of dangerousness, execution (Fry 2006). Large-scale natural disasters may also have had an impact on group morality (although this is almost impossible to assess empirically), as would have new types of innovation. Thus, it is plausible to assume that some moral change due to cultural change (because of innovations, partly needed for adapting to changing environmental conditions) also occurred in SBHG societies, making moral progress possible.

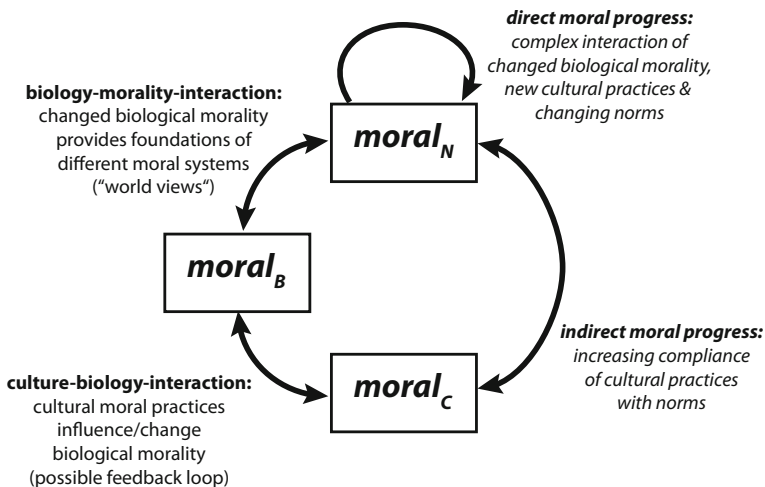


Fig. 2 The interrelation between evaluation standard, biological and cultural moral system

This biological perspective on moral change points furthermore to an additional problem: Sedentariness and the beginning of agriculture (the Neolithic revolution that happened about 12,000 years ago) created a major shift away from the lifestyle of SBHG for many people (but not all). Already, some complex hunter-gatherers (with cultivation of plants or domestication of animals) and early societies displayed significant amounts of violence and war (Fry 2006).⁸ This leads to a whole set of difficult questions: For example, one may ask whether this fundamental change in lifestyle led to or was accompanied by changes in the biological foundation of human (moral) behavior, for example, on the epigenetic level (e.g., which genes were turned on or off during critical periods in early life). Or, one may ask whether this transition generated a “gap” between the biological foundation emerging from our genus history as SBHG and current (now quite disparate) lifestyles and moral behavior patterns.⁹ Answering these questions is beyond the scope of our contribution – but the question points to the fact that since the beginning of agriculture, cultural evolution has become a major force in the development of human societies due to the accumulation of wealth, division of labor and other facets of increasing social complexity.

This is of particular importance with respect to the understanding of flourishing, as based on the ancient Greek concept of “Eudaimonia” or the good life (Cloninger et al. 2012; Narvaez 2014). This concept includes more than (mere) survival and not necessarily an increase in population, wealth, or power. Instead, it is related to the optimal realization of one’s potential in the sense of leading a meaningful life and enjoying positive social relationships from a position of self-acceptance and self-transcendence, that is, caring for others, nature, and the biocommunity. Moreover, as a holistic concept, it involves “physical, mental, social, and spiritual aspects of health and wellbeing”, which are inseparable (Cloninger et al. 2012, p. 3). Flourishing can be distinguished from an “egocentric outlook of separateness” including an emphasis on materialistic concerns. “Stressors associated with a materialist outlook of separateness and the resulting social inequity elicit concomitant increases in a wide variety of mental and physical disorders, which can be likened to the debilitating effects of an aggressive virus or meme” (Cloninger et al. 2012, p. 3). Thus, if a moral system fostering flourishing (and therefore happiness) leads to mentally, physically, socially, and spiritually healthier individuals and societies, we may speculate that it is likely to result in (better) evolutionary success in the long run, whereas the moral system embodied by westernized societies has endangered the survival of other-than-human and human life in the long term (cf. Narvaez 2014).

One may object here that – although morality can be construed as an adaptation that developed as a way of promoting the survival and reproduction of evolutionary units – there is no guarantee that, once established, the conception of the “good life” or “right action” that is embedded in moral systems will necessarily align with what is required for the future evolutionary success of individuals (or groups). Thus, the moral change that accompanies the neolithic revolution could be interpreted as “overcoming” an outdated moral system for the massive societal alteration, i.e., an “evolutionary failure” of SBHG *moral_B* given the increasing complexity of *moral_C*. One could interpret this as a kind of a social Darwinism argument,

⁸ Another interesting question to ask would be: Why did these complex societies emerge, given the high “moral price” that resulted from this change in lifestyle? In addition, other problems resulted from this transition, for example a higher vulnerability for epidemics, decreased health from worse nutrition. The causes for this change are still a matter of scientific controversies; see for example Cochran and Harpending (2009).

⁹ A similar argument has been put forward regarding nutrition. Some suggest that the human metabolism is not adapted to the modern feeding pattern, which would partly explain the increasing obesity problem in many countries once the “western” diet is introduced.

which however would be hard to defend given today's very critical judgments with respect to this theory tradition (Claeys 2000). We will discuss a less radical interpretation if this argument in Section 4. Moreover, we do not aim to reduce biological moral progress to mere evolved changes in the biological basis underlying moral functioning. Rather, biological moral progress refers to such changes that meet some evaluation standard.¹⁰ A key point in our paper, however, is that changes in the biological basis also have an effect on those standards – this will be outlined in the next section when referring to parenting practices. Furthermore, we note that the current ecological crisis indeed puts into question the long-term evolutionary success of the current lifestyle.

3 Interrelations between Biology and Culture: Parenting Practices

The focus on either evolution or social/cultural trends often misses the critical understanding that humans are dynamic systems whose early experiences shape their dispositions and capacities. Born up to 18 months early compared to other animals, babies need an intensive caregiving environment – what we call below the evolved developmental niche – for species-typical development.

Parenting is a good example to demonstrate the interaction of the cultural and the biological level for understanding its impact on moral progress. At birth, humans are immature, educable and ready for cooperation. Like all animals, humans have an early nest that matches up with the maturational schedule of the offspring. The mammalian nest became more intense for social mammals and even more so for humans because of human immaturity at birth and extensive biopsychosocial needs (Narvaez 2014; Trevathan 2011). As humans are complex dynamic systems, with more epigenetic consequences from experience after birth than for any other animal (Gómez-Robles et al. 2015), caregiver behavior interactively shapes the rapidly growing biopsychosocial nature of the child. However, there are complex interrelationships between biological and cultural factors. Culture influences childrearing practices through beliefs about the nature of children and their needs, beliefs about parents' responsibilities as well as the support parents receive. The parenting practices sanctioned by the culture in turn have an influence on children's biopsychosocial functioning, which in turn impact the child's trajectory, influencing wellbeing as an adult. Optimally, this developmental course expresses itself as flourishing. Its negative expression is languishing or suffering (physically, mentally, socially, and spiritually; Cloninger et al. 2012). Adults' wellbeing in turn impinges on the type of culture they construct. Accordingly, cultures and their associated childrearing practices that vary in the degree of matching up with children's basic biopsychosocial needs may be expected to lead to differential outcomes both on the individual and on the social/cultural level (Narvaez 2015).

The evolved developmental niche of humans unfolded in the course of small-band foragers with their specific morality as outlined in Section 2.3. What has occurred over time since the agricultural revolution and more rapidly recently in some places like the USA is that the evolved developmental niche has deteriorated, necessarily forming species-atypical individuals who are less socially agile and less receptively intelligent to earth's creatures, rhythms and communications and more self-oriented, stress-reactive and destructive. As societies became more complex (e.g., complex hunter-gatherers, tribes, chiefdoms, etc., see Fry 2006), adults became preoccupied with raising crops and animals, providing decreased care to babies and

¹⁰ We thank an anonymous reviewer for this observation.

young children, apparently shifting human dispositions and capacities over generations. Overpopulation also increased stress on individuals, societies and the planet. Toxic early stress and excessive stress in adulthood result in a human nature less capacious and more destructive to the other-than-humans. The pattern of child under-care and subsequent misguided development, thwarting human moral potential, is evident in the USA where data suggest that the components of Darwin's moral sense (e.g., empathy, social pleasure, prosocial habit development and concern for the opinion of others) have deteriorated (Derber 2013; Narvaez 2016a, b).

We therefore suggest that two perspectives on moral progress should be distinguished with respect to parenting: (a) a "biological perspective" that refers to the inherited practices typical of the evolutionary niche of social mammals and which influence epigenetics and plasticity, and that unfolds in a species-typical way in the human species (i.e., a strong impetus of generosity, sharing, egalitarianism, and cooperation) as part of a community of humans and other-than-humans; and (b) a "cultural perspective" that relates moral progress to successful shielding of children from an increasing diversity of dangers, temptations and possible wrongdoings in a human social world whose complexity accumulates in time compared to the SBHG baseline (although the modern world certainly involves very different lifestyles in that respect). These two notions show up – to simplify matters – in two distinct worldviews that provide two different reference frames for judging moral progress. We will discuss the implications of these two perspectives on indirect and direct moral progress in Section 4. But first, we will outline the concept of the evolved developmental niche (EDN) in some more detail.

Developmental psychobiologists West and King (1987) introduced the concept of an ontogenetic niche as a way to describe how parents reliably influence the phenotype of their offspring. Evolutionary systems theory (Oyama et al. 2001) identifies multiple extra-genetic legacies that accompany genes, including the developmental niche. Konner (2005) described the niche for humans by reviewing SBHG parenting practices across groups worldwide, calling it the hunter-gatherer childhood model. Narvaez and colleagues call it the evolved developmental niche (EDN). Because of its universality, the EDN appears to provide a cultural commons for the development of human biology and sociality. Indeed, converging evidence indicates that when the evolved caregiving practices are provided to children, their wellbeing, social and moral development are fostered (Narvaez et al. 2013a, 2013b).

Biological morality refers to the neurobiological foundations of cooperative, social morality, which develops with the EDN embedded in the natural world. Narvaez (2014) described the development of biological morality from the perspective of evolutionary systems theory. Humans evolved with the extra-genetic inheritance of the EDN, the intensive caregiving that matches up with the maturational needs of the child. Although the EDN emerged with social mammals over 30 million years ago, small-band hunter-gatherer societies around the world demonstrate in similar fashion the human form of the EDN: intense parenting due to the greater sociality of human beings, the greater immaturity of the neonate, and the extended length of maturation. The human EDN includes soothing perinatal experience, extensive breastfeeding and positive touch, responsiveness to keep babies from becoming distressed but also positive companionship throughout early life with a community of caregivers, as well as high autonomy and free play in nature with multi-aged mates.

In her triune ethics theory (Narvaez 2008, 2014, 2016a, b), Narvaez describes how early care shapes neurobiological functioning (e.g., stress response, vagus nerve) that impinges on moral functioning. With the EDN, sociality is well developed with an engagement ethic (relational attunement) and communal imagination predominant. However, when stress is too extensive in early childhood from lack of the EDN, the stress response system establish itself

to be hyper-reactive. The stress response necessarily draws blood flow away from higher order thinking and results in survival systems being in control (Arnsten 2009). When one's neurobiology is established as threat reactive, self-protective ethical orientations can become dispositional. Without intervention, EDN-inconsistent early life brings about greater reliance on self-protection ethics (social opposition, social withdrawal, vicious imagination, detached imagination; see Narvaez 2014, 2015, 2016a, b). Developmental research from a lifespan perspective has consistently shown that even on a small time-scale (including only a few generations), violence, maltreatment, abuse and many more negative childrearing behaviors are perpetuated, a process called intergenerational transmission (e.g., Black et al. 2010) but also the epigenetics of mistreatment are transmitted across generations. Species-atypical developmental systems lead to species-atypical individuals and germ lines that are less likely to outcompete their rivals from species-typical systems, undermining fitness over generations (Narvaez et al. 2016).

Although culture has increasingly trumped biology in the last several millennia in many regards, humans are still social mammals with basic needs (e.g., belonging, autonomy) that are often thwarted in modern lifestyles. Alongside these changes, adults have shifted their baselines for what constitutes normal child rearing, as well as expectations for wellbeing and even morality. Instead of expecting (and promoting) communal imagination and relational attunement found in SBHG, modern societies assume self-protectionist ethics to be "normal" and part of human nature, rather than realizing how aberrant they are in the context of human history.

Shifted capacities include self-regulation and sensitivity to social signaling, expression and interpretation, which become less developed because of a degraded EDN. But also, unlike SBHG where the natural world's gift economy operates (cyclical giving-receiving-giving), complex societies have firm notions of ownership and have rules based around property, class and interaction with strangers (Gowdy 1998; Hewlett and Lamb 2005; Lee and Daly 2005). These notions are typically taught through coercion and punishment of children, whereas among SBHG there is no coercion of others, except in the case of preventing significant physical harm. As a result, SBHG children do not fear punishment from adults, seemingly circumventing Kohlberg's pre-conventional level of moral judgment. Instead, young children exhibit concern for group welfare from a young age (for illustrations from a more complex society, see Bolin 2010). In contrast to the development of an *internal, biological* morality from neurobiologically experienced patterns of intersubjectivity and relational attunement, morality is (and must be) imposed *externally*, from the culture of a modern society.

In summary, we can sketch a picture that outlines – both on the level of direct progress (culture: the evaluation standards; biology: the (mostly) neurobiological system that is enabling or promoting the evaluation standard) and indirect progress (culture: the general type of social organization; biology: parenting practices that directly affect the neurobiological system) – those elements that could become the object of an evaluative statement whether progress has taken place or not (Fig. 3). The double arrows in each cell of Fig. 3 indicate the possibility that the change can go in either direction, and the standards used to evaluate which change counts as "progress" is entangled with the changes in the other three cells. This is arguably a simplification, but the Figure indicates that one cannot decouple the evaluation standard from changes that happen in the other three components.

This leads to mainly two questions: First, one may ask whether moral progress is "corrupted" by cultural developments in complex societies and/or modern, "westernized" lifestyles, respectively, a corruption which in turn needs to be counteracted by cultural forces. Second, one may ask whether the current situation is just an expression that morally worse groups (in terms of matching the SBHG moral baseline) may be more successful from an

	biological	cultural
direct	brains adapted to responsive care, supporting a „engagement ethics“ ↔ brains adapted to stress exposure, supporting a „self protection ethics“	standards focus on generosity, equality, „oneness“ with nature, etc... ↔ standards focus on wealth (distribution), individualism, control of nature, etc.
indirect	parenting according to evolved developmental niche of mammals ↔ parenting as an instrument to control „temptations“ resulting from cultural complexity	simpler forms of social organization, stronger interaction with nature ↔ complexification of societies (social institutions, new technologies etc.)

Fig. 3 Outlining “direct” and “indirect” changes both on the biological and cultural level exemplified for parenting practices. The double arrows indicate directions of possible changes

evolutionary fitness perspective and will tend to persist despite the high “moral cost”. Thus, any idea of moral progress that could work in culturally complex human societies would have to establish a new baseline, which includes the degraded EDN and its impact on generating a self-protectionist ethics. Of course, it matters what baseline is used for judgment and what scope of analysis is desired. This will be the topic of the next section.

4 Is there an Inevitable Conflict Inherent in Evaluating Biological and Cultural Moral Progress?

Here, we critically analyze the argument that the claim of biological moral decline is inadequate given the cultural complexity of the modern world. Obviously, the living conditions of the modern world that emerged since sedentariness and the beginning of agriculture are completely different compared to those of SBHG. Culture and technology have led to a rich differentiation of the social world as well as to an enormous increase of humans that inhabit the earth (the number of humans that populated the world around 12,000 B.C. is estimated at 2 million).¹¹

There are basically two stories to describe these processes of social differentiation and population growth, which we call the “anthropocentric story” and the “global flourishing story”. The anthropocentric story can be summarized as follows:

- 1) Human morality has been shaped by the biological history of the species. In this story, however, primate selfish and aggressive tendencies are emphasized, and so morality becomes “preventing the bad”.
- 2) However, since settlement, we have started an accelerated cultural evolution (institution building, social inequality, focusing on human survival, etc.) that counteracts several important elements of “biological morality”, but also allowed (unequal) accumulation of wealth, leading to groups that “evolutionarily outperformed” those living according to the SBHG moral baseline despite the imposed moral costs. Those with more wealth were on average healthier and more likely to survive, and so wealth became a goal in itself, and a competitive world was assumed.

¹¹ This information emerges from the HYDE (History Database of the Global Environment) database that presents (gridded) time series of population and land use for the last 12,000 years: <http://themasites.pbl.nl/tridion/en/themasites/hyde/> (last access: October 31 2015).

- 3) However, wealth differences, increased population and population density amplified the potential for and occurrence of violence, towards humans and other-than-humans. The evolution of new norms to deal with guarding wealth was needed. Nevertheless, wealth is seen as an indispensable foundation for securing moral progress (in terms of social security into the future). This might be a reason why a strict “is-ought-distinction” is enforced with respect to these norms – the moral system is seen as something that is logically decoupled from the actual practice of living.
- 4) Parenting thus becomes a practice that – with respect to morality – puts a focus on explicit interventions aiming to enforce norms. Instead of trusting biological built-in needs in the child for affection, responsiveness and play matched by EDN-consistent practices that foster an independent, self-confident individual, the culture pressures children to conform to non-biological processes, those of cultural norms. This requires coercion and neglect, increasing a sense of insecurity and, thereby, a lifelong dependence on cultural norms.
- 5) Current generation of wealth is associated with damaging the planet but at the same time considered necessary for survival (see #2). However, the anthropocentric story sees moral progress as a technological problem: the evaluation system does not have to be changed, but humans have to change their impact on the planet. The eco-modernists take up this position and argue that a technological fix is needed and possible, fostering a techno-optimism (see <http://www.ecomodernism.org/>).

The “global flourishing” story can be summarized as follows:

- 1) Same starting assumption as story 1—human morality has been shaped by the biological history of the species – but with the addition of a different focus: the biological origin of human morality goes along with a certain understanding of flourishing and happiness. Morality is not primarily seen as something that “forbids the bad” but that “enables the good” – a matter of virtuous, right living on and with the earth.
- 2) Cultural evolution led to a change of the evaluation system. Humans started to believe they were separate from and superior to nature and made nature into dead objects (de-personified) (Merchant 2003). Morality became thin and not centered on living a virtuous life but focused on preventing worst-case outcomes for humans (e.g., death of an innocent other). The natural world was to be exploited, and its control was seen as a sign of progress.
- 3) Considered from this perspective, moral evaluation standards and cultural evolution are more closely coupled: there is no clear “is-ought-distinction” in the SBHG moral baseline. That is the culture that fosters flourishing is best, and it includes the EDN. The supporters of this position are thus more inclined to accept justifying ethical standards by referring to appeals to statistical normalcy over the course of human history. This also means that if the conditions of human living were changed in some way it would affect what people consider to be the good life.
- 4) Parenting becomes an important element here: Children that systematically grow up under conditions that deviate from our evolved development niche will have a different evaluation standard than those who are raised with the EDN intact (as seen in the contrast Darwin draws between “civilized” and “uncivilized” peoples). When one is raised outside the EDN, one becomes alienated from nature and one’s own nature, disposing one to move *against* nature instead of *with* it. Parents who do not respect the built-in needs of the baby (e.g., to be physically close to the caregiver most of the time through the first year

and longer) teach the baby to disrespect the needs of self, others, and nature (as well as undermine optimal development of the child's neurobiological systems).¹² The species-typical life course goes awry: Instead of children becoming engaged adolescent members of the community, then committed adult members and, later, wise elders who guide younger generations, children become adults who are self-centered and reckless, who perpetuate a culture that spirals downward over generations toward less and less ecological wisdom and communal morality.

- 5) According to the “global flourishing” story, it is therefore not sufficient to focus on indirect or even direct moral progress, but we have to understand how biological aspects shape our worldviews and what we consider to be moral progress. At least some drawn to this worldview are rather pessimistic with respect to technological fixes. For example, deep ecology and similar theory consider the humans even to be a “weed” species (which imbalance an ecosystem and then die out when species that are more cooperative take over) (Naess and Rothenberg 1989). In light of the sustainable SBHG societies, it seems that the dominant culture of the last centuries is a weed culture.

There is no “experimental way” to determine which of the two stories is right, nor can we turn back the wheel of time. The stories presented are worldviews that shape how we see the world – and these worldviews are at least partly related to differences in the *moral_B* level. This means that an ethics theoretician is possibly not assessing different versions of the same thing when she makes inter-cultural moral progress judgments concerning two groups, because one group may be biologically dissimilar to the other. Furthermore, these worldviews lead to different suggestions regarding what should be done with respect to indirect and direct moral progress. The first story would understand direct moral progress as a reaction of cultural change and put an emphasis on indirect moral progress – one would develop new evaluation standards in response to increasing cultural complexity strongly triggered by technological progress, and one would advocate for more technological progress in order to align cultural practice with the evaluation standard. The biological perspective would be seen mainly as a constant (setting aside clear pathological cases, e.g. due to brain damage) that is not accessible for shaping moral progress.

In contrast to this, the second story would put an emphasis on the biological perspective as the pivotal point for direct moral progress. It would consider evaluation standards as an emergent property of a complex interaction between culture and biology that is amplified in certain cultural domains such as parenting. It would make a less strict distinction between is and ought in the sense that it would take the interconnectedness between, e.g., human and other-than-human as a sufficient moral reason to change cultural practices that affect *moral_B* and thus *moral_N*. One would put an emphasis on shaping direct moral progress, and one would consider indirect moral progress as a result of this change. Thus, both stories include a mutual interplay and interdependence between direct and indirect evaluation standards, but with a different emphasis on one or the other.

To our understanding, however, an additional point should be considered when contemplating the two stories: Unlike SBHG who have lived sustainably on the planet (extant groups like Australian Aborigines and the Ju/Huansi, for tens of thousands of years) the future of the species *Homo sapiens sapiens* is under threat because dominant cultural practices are

¹² A highly topical instance of this disrespect towards others in children and adolescents is the systematic, targeted and ongoing power abuse characterizing bullying in both its normal (offline) and online forms (see for example Hymel et al. 2010 for an overview of the moral dimensions of bullying).

undermining the health of biological systems on the planet. Perhaps this type of empirical evidence should be included in an assessment of moral progress. It means that the scope of concern is widened to include the other-than-human. In other words, other-than-humans should be part of any moral equation. Now that we know by every measure that the ways of the dominant culture are undermining biodiversity on the planet, is it possible for us to have an adequate moral theory or set of evaluative standards without taking these facts into account?

5 Conclusion: the Broader Picture

In this arguably sketchy overview, we do not intend to replace one “ideology” with another or to promote a “pre-civilization ideal” (“back to nature”). Rather, we suggest to take a closer look at how our evaluation standards depend on the living conditions of a given, targeted society or group, in particular as related to parenting. Thus, we start to reframe the initial problem of assessing moral progress by focusing on the interaction of cultural and biological systems and the way it impacts the necessity for and interplay between evaluation standards.

We can broaden our circle of concern from humans alone and their treatment of one another (e.g., Pinker 2011) to earth lifeforms, human and other-than-human, and their wellbeing. This indeed requires a change in worldviews, as self-interest, the belief in it and the flavoring of life by it, has become a pervasive force in many societies across the globe, so much so that alternative perspectives are considered impossible, naïve, or romantic ideals. Such is the power of culture.¹³ But, as the anthropologist Marshall Sahlins (2008) pointed out:

“For the greater part of humanity, self-interest as we know it is unnatural in the normative sense: it is considered madness, witchcraft or some such grounds for ostracism, execution or at least therapy. Rather than expressing a pre-social human nature, such avarice is generally taken for a loss of humanity.” (p. 51)

All these considerations seem to culminate in a position that might see culture and biology as conflicting, contradictory views when trying to measure moral progress. However, framing the problem from only one perspective (biology or culture) is not helpful. Culture and biology do not represent a dichotomy or irreconcilable frameworks but interrelate. Moreover, we should avoid simplistic statements like “Our current culture is so far removed from our heritage that this heritage does not provide any orientation at all” or “Let us go back to nature and then everything will be fine”. Our biology may be maladjusted to modern life conditions; but what are the implications of this maladjustment? We believe that investigating the way that the interplay of biology and culture shapes our morality should become a major topic of research in order to re-align biological and cultural moral progress. Moreover, moral assessments may change once we have an inclusive (of other-than-humans) worldview. In this case, humans are viewed as not superior to nature, but as part of it. Humans cannot flourish without the thriving of biodiversity and wellbeing on the planet. Bringing in a SBHG perspective could promote a humbler, sustainable human orientation to living with other-than-humans as a moral ideal.

¹³ However, too, peoples exist worldwide who have a legacy of or adopt the indigenous worldview.

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