

Will SDG4 achieve environmental sustainability?

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Abstract

Sustainable Development Goal (SDG) 4 is widely promoted as essential for achieving sustainability. However, we argue that serious discussion of the potentially negative interactions between education and other SDGs related to environmental sustainability are largely omitted in SDG statements. Meanwhile, leading international organizations continue pursuing gains in access and quality in much the same way as the past. This omission and “business as usual” approach leaves the current paradigm of education unquestioned. In contrast, we examine globally representative data on CO₂ emissions, awareness/risk perception, literacy, numeracy, and several cultural indices, finding that promotion of education based on the current paradigm can have negative impacts on the achievement of other SDGs related to the environment (e.g., alleviation of climate change). We then discuss the missing dimensions of the current education paradigm and approach to achieving sustainability, underscoring that culture, which encodes our attitudes and values, strongly affects human environmental impacts on Earth. Our purpose is to initiate deeper reflection on the core cultural assumptions of the dominant paradigm, whilst inviting researchers, practitioners, and policymakers alike to begin the discussion of what comes next.

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Introduction: Extension or Difference?

The Sustainable Development Goals (SDGs) include targets for education, with SDG 4 explicitly seeking to achieve “quality education for all” through a combination of increasing access, raising quality, equalizing existing inequalities, and promoting the knowledge and skills needed for sustainable development (United Nations, 2015, Table 1). Although SDG 4 is promoted as essential for achieving sustainability, its potential effectiveness has already come under scrutiny. First, it has been pointed out that the SDG 4 “emphasises education in terms of its potential economic and social benefits” rather than its environmental consequences (Sterling, 2016, p. 211). Second, the overall logic of the SDGs is that “the goals depend on each other—but no one has specified exactly how” (Nilsson et al., 2016, p. 320), leading some to raise a warning flag: “[i]f countries ignore the overlaps [between SDGs] and simply start trying to tick off targets one by one, they risk perverse outcomes” (p. 320). Third, and in support of the point made above, extensive analyses of major United Nations’ and World Bank reports revealed “weak coverage of linkages between education and SDGs 12–15” (Vladimirova & Le Blanc, 2016, p. 5). These latter goals are precisely those directly related to the environment.

Table 1. Targets of SDG 4 (United Nations, 2015).

| Number | Targets |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1 | By 2030, ensure that all girls and boys complete free, equitable, and quality primary and secondary education leading to relevant and effective learning outcomes |
| 4.2 | By 2030, ensure that all girls and boys have access to quality early childhood development, care, and pre-primary education so that they are ready for primary education |
| 4.3 | By 2030, ensure equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university |
| 4.4 | By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills for employment, decent jobs, and entrepreneurship |
| 4.5 | By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples, and children in vulnerable situations |
| 4.6 | By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy |
| 4.7 | By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture’s contribution to sustainable development |

The official vision is that the SDGs are interdependent and mutually supportive, although the precise nature of these interactions is often unclear within SDG statements. Similarly for education, the agencies of the United Nations, including UNESCO and other international organizations, frequently suggest the interactive nature of SDG4 and other SDGs. However, and as we detail below, when these interactions are considered, they are virtually always imagined as positive: improving existing forms of education will positively impact environmental sustainability. We find this implicit, overarching assumption surprising, given that the world is the most educated it has ever been and yet the nearest to environmental breakdown (Rappleye & Komatsu, forthcoming; Turner, 2012).

Against this backdrop, our objective herein is three-fold. First, we confirm that negative interactions between education and other SDGs are dismissed largely in SDG statements and by major international organizations seeking to operationalize the SDGs (Section 2). This dismissal of potentially negative interactions between education and other SDGs means the problems and limits inherent in the current education paradigm remain unquestioned. Second, we examine globally representative data that suggests the possibility that promoting education based on the current paradigm can have negative impacts of the achievement of other SDGs (Section 3), highlighting the interaction between promoting education access and quality (SDG 4.1 and 4.6, Table 1) and alleviating climate change (SDG 13). Third, we seek to spotlight dimensions of the current education paradigm that go largely undetected, i.e., culture (Section 4). We suggest that culture, which encodes our attitudes and values, strongly affects our environmental impacts on the Earth. Through these three steps, we underscore the pressing need to reflect deeply on the “modernist Western paradigm” (Sterling et al., 2018) now promoted as the solution to sustainability. We hope our interruption can contribute to researcher, practitioner, and policymaker attempts to imagine something radically *different*, rather than promote a mere extension of what has come before.

The Current Educational Paradigm: Should We Leave It Unquestioned?

Analyzing the SDG targets and interpretation of the SDGs presented in major reports published by UNESCO, the OECD, and the World Bank, this section confirms that the potentially negative interactions between education and other SDGs goes unquestioned. This results in a de-facto prioritization of business-as-usual in education: the continued prioritization of economic growth and social equity over the environment.

SDG targets

The SDG 4 comprises seven targets (SDGs 4.1–4.7, Table 1) and three means of implementation. The first six of the targets (SDGs 4.1–4.6) primarily focus on improvement of access and quality of education. Nothing within these six targets suggest a need to reconsider the current education paradigm, but instead advocate for more thoroughgoing implementation based upon it. The implicit assumption here is that contemporary problems, including environmental ones, are largely the result of incomplete implementation, not a consequence of the current education paradigm itself.

This strong belief in the current education paradigm is more clearly expressed in the United Nations' announcement of the SDGs (United Nations, 2015). The Preamble relates:

The 17 Sustainable Development Goals and 169 targets which we are announcing today ... seek to build on the Millennium Development Goals and complete what they did not achieve. They seek to realize the human rights of all and to achieve gender equality and the empowerment of all women and girls. (United Nations, 2015, p. 1)

Here it is clear that SDGs are viewed as an extension of the Millennium Development Goals (MDGs), and seek more thorough implementation of what came before, rather than affect a deep change of course.

In contrast with the SDGs 4.1-6, some suggest that the last target (SDG 4.7) questions the current education paradigm itself and hints at possible negative interactions with other SDGs. It includes the phrase “education for sustainable development and sustainable life styles ...” Is this a call for an approach to education that goes beyond the current education paradigm? Unfortunately, the simplicity and ambiguity of the wording of SDG 4.7 makes it unclear. We return to this issue later, having first analyzed reports provided by international organizations.

UNESCO

UNESCO has recently published several major reports focusing on the SDGs. In reviewing these reports here, we examine how much UNESCO recognizes the possible negative interactions between education and other SDGs, finding that negative interactions rarely feature.

UNESCO's flagship report *Education 2030* (2015) suggests the positive and unequivocal interaction between education and other SDGs:

education can accelerate progress towards the achievement of all of the SDGs and therefore should be part of the strategies to achieve each of them. (UNESCO 2015, p. 24)

In contrast to this wholly positive appraisal, a subsequent 2017 report entitled *Education for Sustainable Development Goals* elaborates in a bit more detail. The report admits “not all kinds of education support sustainable development” (UNESCO, 2017, p. 7), perhaps a signal of UNESCO’s awareness of the need to pursue new forms of education. However, the report unexpectedly continues that the education for achieving sustainability (i.e., Education for Sustainable Development, ESD) is “now well-established”, describing it as follows:

ESD is holistic and transformational education that addresses learning content and outcomes, pedagogy and the learning environment. Thus, ESD does not only integrate contents such as climate change, poverty and sustainable consumption into the curriculum; it also creates interactive, learner-centred teaching and learning settings. What ESD requires is a shift from teaching to learning (p. 7)

Disappointingly, this “interactive learner-centred teaching and learning settings” is exactly what the dominant education paradigm has long valorized. The report assumes that such education practices based on the current education paradigm “make possible the development of the key competencies needed for promoting sustainable development” (p. 7). It is not difficult to find similar examples dotted around other UNESCO reports (e.g., UNESCO, 2014, p. 30).

What precisely is “the current education paradigm”? We can partially infer the assumptions underlying the paradigm based on the UNESCO’s own explanation of key competencies for achieving SDGs:

As societies around the world struggle to keep pace with the progress of technology and globalization, they encounter many new challenges. These include increasing complexity and uncertainty.... A rapidly proliferating amount of information is available to them. All these conditions require creative and self-organized action because the complexity of the situation surpasses basic problem-solving processes that go strictly according to plan. People must learn to understand the complex world in which they live. They need to be able to collaborate, speak up and act for positive change.... We can call these people “sustainability citizens...” (UNESCO, 2017, p. 10)

Here two implicit assumptions prevail. First, “sustainable citizens” must be able to process and analyze increasing information to understand the world around them. Second, “sustainable citizens” must organize their own behaviors individually and rationally based on their understanding and desired course of action (“positive change”), instead of, say, learning to adapt to difficult circumstances, lessen desires, and/or find new ways of living. “Sustainable citizens” are here largely indistinguishable with the ideal of European Enlightenment man, which also valorizes the use of rationality in the service of progress of the conditions of human society (Duignan, 2018). The progressive education undertones in this statement and earlier ones also ring of the European Enlightenment education (Thomas, 2012), as does the notion that sustainability will be achieved politically (“citizens”) rather than culturally. In this context, it also makes sense why SDG4 discussions explicitly promote student centeredness learning, an approach derived from the Western experience wherein students are expected to individually and rationally organize their actions, working to achieve their own self-designed projects (Komatsu & Rappleye 2017b).

In contrast with these UNESCO reports we reviewed here, some might argue that the webpages of UNESCO go one step further (UNESCO, 2018). These pages address the necessity of “reorienting education” to “transform

society” mainly through SDG 4.7 and “help people develop knowledge, skills, values and behaviours needed for sustainable development” (UNESCO, 2018). This statement seems to implicitly suggest that the current education paradigm is problematic, yet this never explicit and remains unelaborated.²

The OECD and World Bank

Reviewing the official OECD web page about SDGs and two reports uploaded there, i.e., *Better Policies for 2030* (OECD, 2016a) and *Measuring Distance to the SDG Targets* (OECD, 2017), we found no explicit elaboration of the SDGs. OECD webpages state only that “the OECD supports the United Nations in ensuring the success of the 2030 Agenda for Sustainable Development by bringing together its existing knowledge, and its unique tools and experience” (OECD, 2018). It becomes clear that this support will be two-fold: (i) more thorough implementation of the current paradigm, and (ii) more effective monitoring.

Better Policies for 2030 report states that the OECD “support[s] countries as they identify where they currently stand in relation to the SDGs” (p. 3), whilst the *Measuring Distance* report (OECD, 2016a) “uses the latest information on various indicators available in OECD databases to establish countries’ distances from individual targets” (p. 1). We come back to touch upon this approach to global indicators in conclusion.

A similar picture emerges from the World Bank web pages about the SDGs and three major reports uploaded there. The World Bank simply interprets the SDGs as already aligned with the World Bank’s existing goals: “the SDGs ... are fully consistent with the World Bank Group’s own twin goals to end poverty and build shared prosperity in a sustainable manner” (World Bank, 2018a). The same interpretation of SDGs is found in other reports (World Bank, 2016, 2017). Considering this take on SDGs, it is unsurprising that the World Bank repeatedly declare its intention to improve access and quality of education without pausing to contemplate the possible negative impacts of the current form of education (e.g., World Bank, 2016, p. 8; World Bank, 2017, p. 21).

It is worth mentioning that although both the World Bank and OECD have discussed the SDGs, the major foundation of their education-related work in recent years has remains an extremist version of human capital theory, one largely predicated on an infinite growth paradigm (Komatsu & Rapple, 2017a; OECD, 2015; World Bank, 2011). While recent official statements might suggest alignment with SDG policies, there is little change from the “status quo” since the 1990s. Particularly at the country level, policies predicated on an extreme version of human capital theory such as international-benchmarking exercises and competency-based performance monitoring (e.g., PISA) have simply been repackaged as “humanitarian assessment” (Auld, Rapple, & Morris, 2018).

² We find promising and problematic the discussion developed in the 2016 Global Education Monitoring Report (see Komatsu, Silova, & Rapple, 2019). However, in reviews of that manuscript we were admonished that the report did not represent the official UNESCO position, thus we have omitted that discussion here.

Education and Environment: An Empirical Confirmation of Potentially Negative Impacts

The previous section outlined the lack of recognition among leading international organizations about possible negative interactions between education and the environment. This section shifts to an empirical account, underscoring the presence of negative consequences between the improvement of education access/quality and, as one example, climate change (arguably the most urgent piece of the environmental sustainability puzzle).

Data and methods

We examine the relationships between the lower-secondary completion rate and CO₂ emissions per capita and between the percentage of students having a “fixed level of proficiency” in literacy and numeracy skills (OECD, 2015, 2017) and CO₂ emissions per capita for various countries. We assumed that the lower-secondary enrolment rate and the percentage of students having a fixed level of proficiency were major indicators for SDGs 4.1 and 4.6, respectively. Indeed, these indicators are widely recommended and used in major reports concerning SDGs (e.g., OECD, 2017; UNESCO, 2016; World Bank, 2016).

Results and discussion

We observed positive correlations between the lower-secondary completion rate and per capita CO₂ emissions (Figure 1a) and between the percentage of students having the fixed level of proficiency and per capita CO₂ emissions (Figures 1b and 1c). That is, countries having “better” education tended to have more detrimental impacts on climate change.

What is important from the climate change perspective is that few countries having “good” education satisfied the Intergovernmental Panel on Climate Change (IPCC) target to limit the global mean temperature increase below 2 degrees relative to the pre-industrial level (van Vuuren et al., 2011). Assuming that the current population holds³, by 2050 per capita CO₂ emissions need to be reduced to 1.61 t (dotted lines in Figure 1) or lower to meet the target. Only seven countries among the 61 having a high lower-secondary completion rate (>90%) had per capita CO₂ emissions lower than 1.61 t (Figure 1a). Furthermore, no countries having a high percentage of students having the fixed proficiency (>70%) had per capita CO₂ emissions lower than 1.61 t (Figures 1b and 1c).

Advocates of SDGs might wish to argue that our analysis described above ignores the interdependent nature of SDGs and their targets, and mistakenly assesses the impact of selected targets of SDGs on the environment. This argument is understandable, but our intent here is not to empirically verify the impact of education on the environment as a whole. Rather, the analysis is aimed at opening current discussions to the plausibility of potentially negative interactions between targets in SDG 4 and the environment—a perspective largely ignored at present.

³ In truth, this is an impossibly optimistic starting point. Currently the projection for global population by 2050 is 9-11 billion (depending on the model utilized). This is an increase of 2-4 billion since 2012.

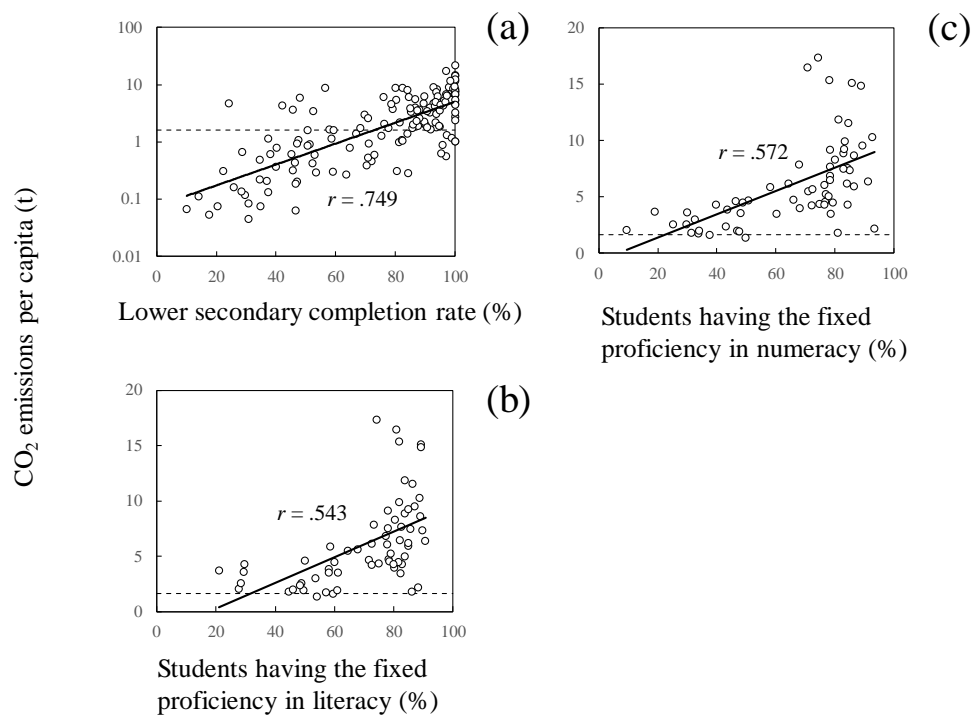


Figure 1. Relationship of (a) the lower-secondary completion rate with CO₂ emissions per capita. Relationships between the ratios of 15-year-old students having (b) basic literacy and (c) numeracy and CO₂ emissions per capita. A dotted line denotes the CO₂ emission per capita in 2050 in the IPCC scenario leading to 1.3–2.1 Celsius degree temperature increases (van Vuuren et al., 2011). Data for the lower-secondary completion rate were derived from the World Bank Open Data (World Bank, 2018b). Data for the ratios of students having basic literacy and numeracy were derived from PISA 2015 (OECD, 2016b).

What's missing? Empirical Links Between CO₂ emissions and Culture

In Section 2 we encountered the belief that the current education paradigm assumes that if people are equipped with the skills to reason, empowered to act, and are knowledgeable about the problems they face, they will solve pressing global problems, most of all climate change. This section suggests that knowledge and skills alone would be insufficient to achieve environmental sustainability. Instead, we suggest that culture, which encodes our attitudes and values and sets the pre-theoretical starting point for interactions with the world, strongly affects human impacts on climate.

Data and methods

We examine the relationships of awareness and risk perception of climate change with CO₂ emissions for various countries. Data for awareness and risk perception of climate change were derived from the Gallup Poll 2007-2008 (Pugliese & Ray, 2009). The Gallup Poll includes data for the percentages of people who were aware of climate change and who viewed climate change as a personal threat. We then examine the relationship between one of Hofstede's cultural dimensions (i.e., the individualism vs collectivism dimension; Hofstede et al., 2010). An individualism score, which represents the degree of individualism for a given country, ranges between 0 and 100 with higher values indicating more individualistic. In our analysis, we use data only for countries having a sufficiently long life expectancy (i.e., no less than 75.5 years). This threshold of 75.5 years allowed us to include all the core members of the OECD and to eliminate potential arguments about the trade-off between long life and environmental sustainability.

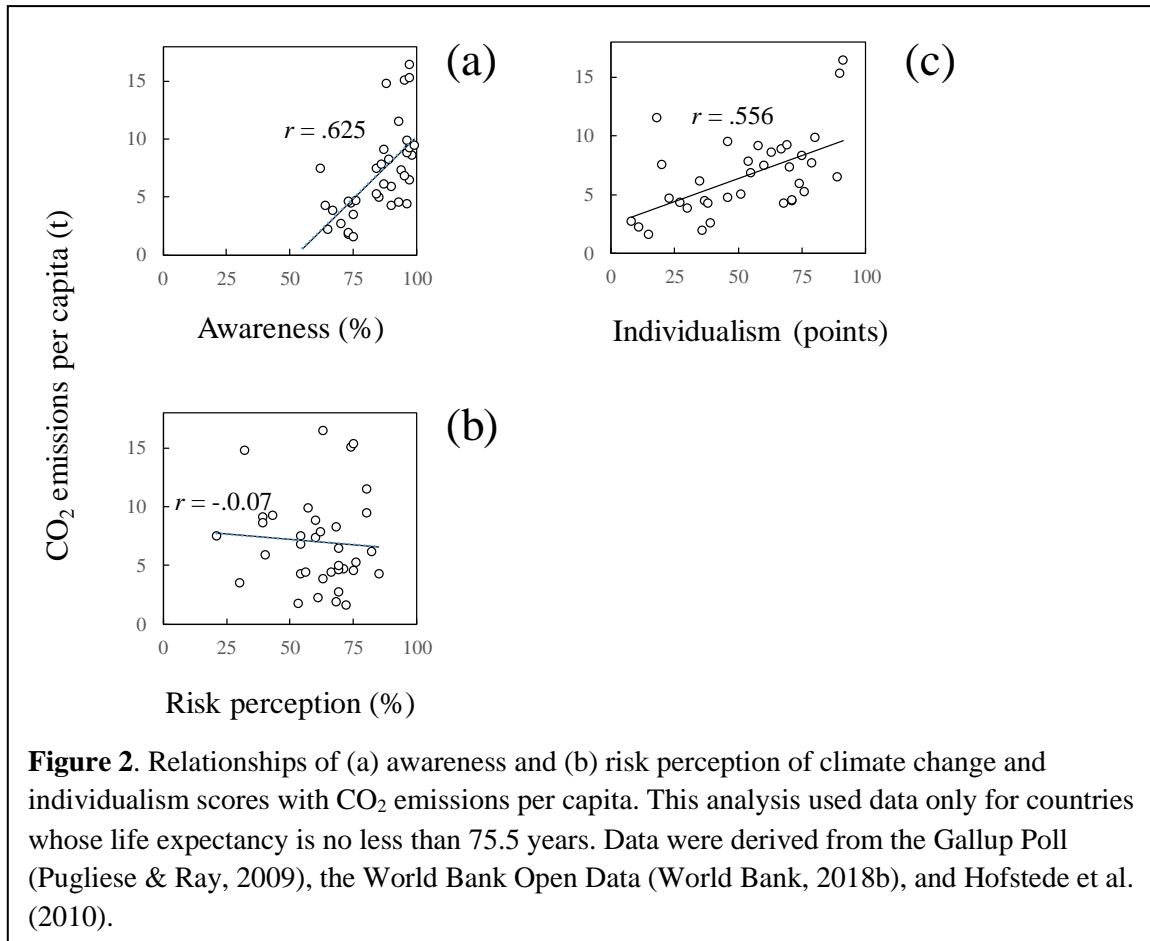
Results and discussion

We did not observe negative correlations between awareness and CO₂ emissions (Figure 2a) and between risk perception and CO₂ emissions (Figure 2b). That is, countries whose people were aware of climate change and perceive the potential risks of climate change did not always have lower per capita CO₂ emissions. These findings suggest that knowledge alone would not be sufficient to achieve environmental sustainability. Many previous studies found that people with more knowledge of environmental science tend to have higher concern for environmental problems (Chankrajang & Muttarak, 2017; Meyer, 2015). But our findings suggest the uncertainty of whether or not this higher concern leads them to successfully reduce their *actual* environmental impacts.

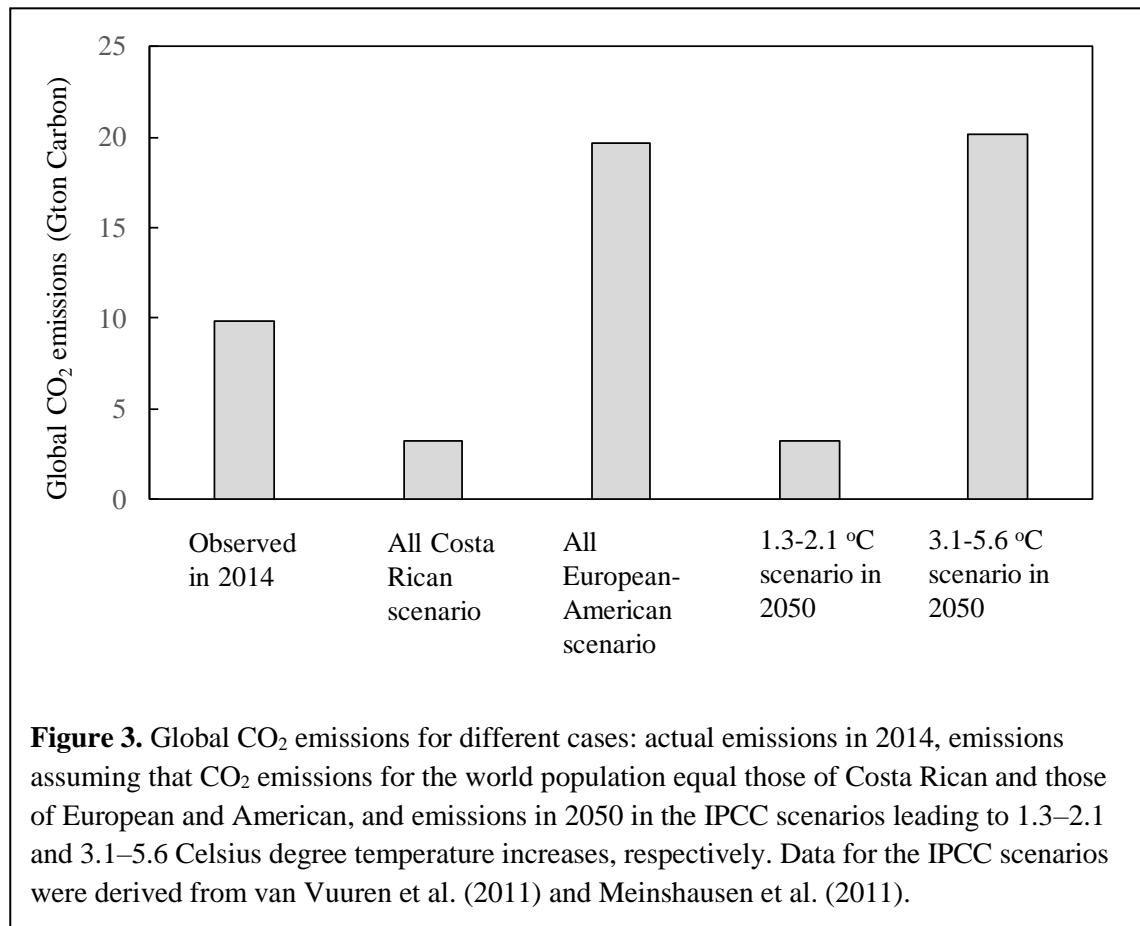
Figure 2c shows the relationship between individualism scores and CO₂ emissions. The correlation was clear and positive. That is, countries where individualist orientations are stronger tended to have higher per capita CO₂ emissions. On the contrary, countries where collectivist (or what we call interdependent) orientations is dominant tended to have lower per capita CO₂ emissions. We are fully aware of that correlation does not prove causation. Still these results raise the possibility that culture affects actual human impacts on climate.

Our finding agrees with previous studies in environmental psychology. Adger et al. (2013) and Chuang et al. (2016) reported that people having interdependent selves, those fostered in more collectivist cultures, were more prone to exhibit pro-environmental behaviors than independent selves. The novelty of our findings is thus that a specific dimension of culture concerning selfhood could be a major factor explaining not only within-country but between-country variations in people's environmental actions (Komatsu, Rapple, & Silova, forthcoming). More importantly, our analysis revealed that cultural dimensions are strongly related to actual human impacts on the

earth. To date this point has not been sufficiently addressed in environmental psychology (e.g.,Chuang et al. 2016; Schulz 2001).

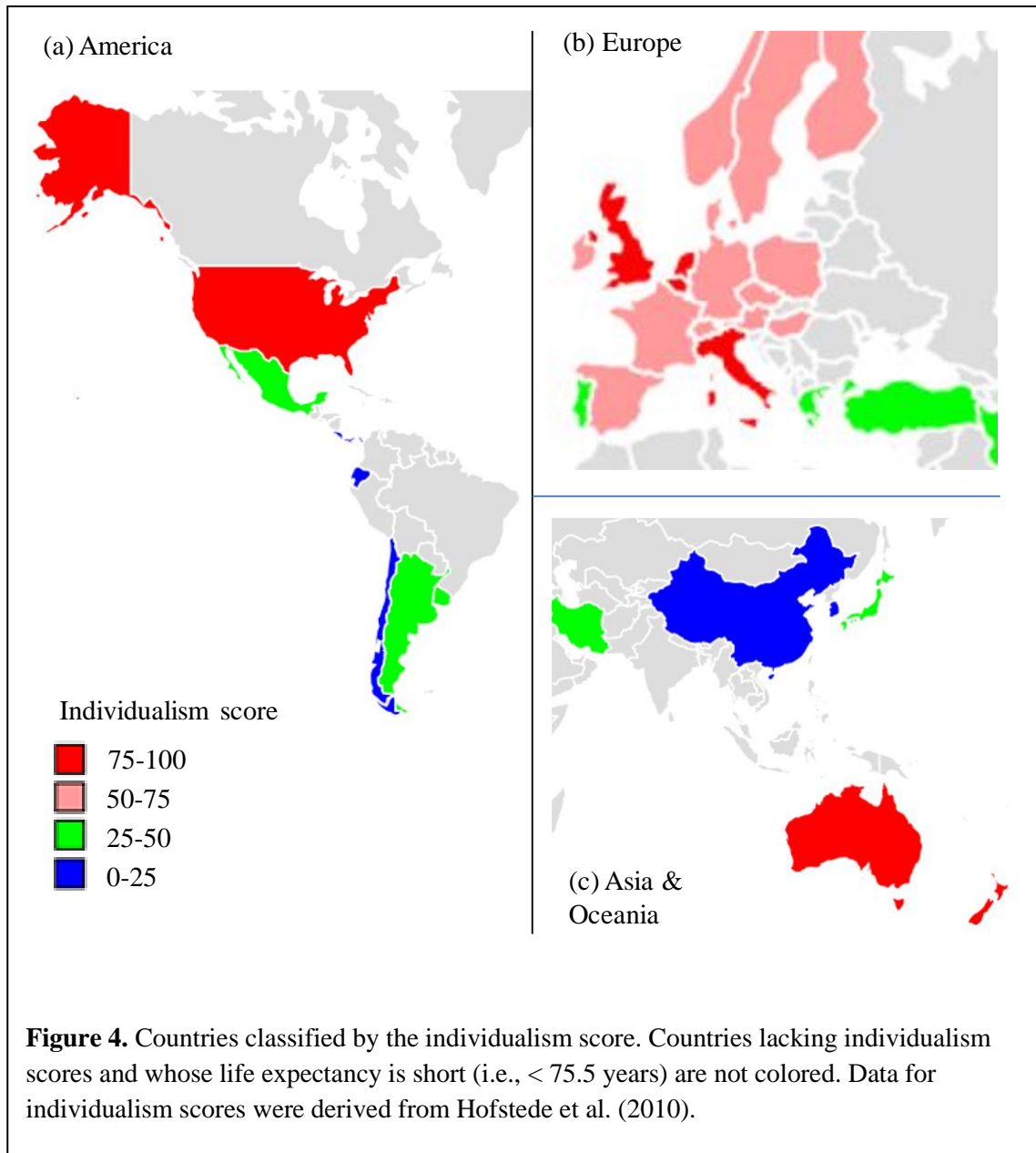


We then ask whether the variation in per capita CO₂ emissions with the cultural dimension is large enough to affect the possibility of meeting the IPCC target. If per capita emissions for the world population is equal those for Costa Rica (whose per capita CO₂ emissions and individualism score were low), the global CO₂ emission is estimated to be 3.23 Giga t carbon (Figure 3). This value is 33% of current global emissions and almost equivalent to the global emission in 2050 to meet the IPCC 2 degree Celsius target. What then happens when assuming that the per capita CO₂ emissions for the world population equals to those for the mean per capita CO₂ emissions for countries having individualism scores higher than 75. Note that all of these countries are located in Europe or North America (Figure 4). The global CO₂ emission under this assumption is estimated as 19.7 Giga t carbon. This value is approximately the same as the global emission in 2050 in the scenario assuming 3.1-5.6 degree temperature increase (Figure 3). If the correlation in Figure 2c does represent causality, the effect of cultural factors is quite large from an environmental standpoint.



The results described above have serious implications for SDG 4. Although SDG 4 and related discussions mention the need to change behaviors and their underlying culture, stronger emphasis on knowledge/skills and individuals is still apparent. It is true that ESD seeks to changes people’s behaviors and culture. Yet, as currently conceptualized ESD seeks to promote learner-centered education. Learner-centered education promotes independent selfhood rather than interdependent selfhood; places the pursuit of knowledge and successfully carrying out self-defined projects as the ideal (Rappleye & Komatsu, 2017b). One clear articulation of the desired “subject” of the current educational paradigm has been provided by the OECD when designing the competencies underpinning PISA:

Individuals must act autonomously in order to participate effectively in the development of society...This is because they need to develop independently an identity and to make choices, rather than just follow the crowd. Acting autonomously is particularly important in the modern world where each person’s position is not as well-defined as was the case traditionally... It assumes the possession of a sound self-concept and the ability to translate needs and wants into acts of will: decision, choice, and action. (OECD, 2005, p. 14) (see Rappleye et al., forthcoming)



We would argue that this conceptualization is not fundamentally different than that actively promoted by other international organizations as the solution to environmental problems. This alignment makes sense when considering that the emphasis on learner-centered education practices traces its origin in the West where individualism and independent selfhood are dominant (Markus & Kitayama, 1991, 2010; Thomas, 2012). If interdependent selfhood is one key for achieving sustainability, it is unlikely that the OECD-turned-World Bank PISA exercise or even UNESCO's ESD approach will contribute to the progress of achieving sustainability: all leave the fundamental cultural assumptions unquestioned.

Conclusions: Recommendations for (Re)Thinking

Based on this, we make the following three recommendations for scholars, practitioners, and policymakers:

- Policymakers and practitioners should be duly cautious about the effectiveness of ESD as currently proposed (to mention nothing of the PISA approach of the OECD and World Bank)
- Scholars and practitioners need to attune to the deeper assumptions underlying different practices
- Scholars and international organizations should consider ontological assumptions when developing scales to measure ‘degrees of distance’ from sustainable approaches

Cautiousness with the Regards to the Effectiveness of ESD

ESD has been championed by major actors, such as the United Nations and several international organizations. Yet, our findings suggest that national policymakers and practitioners should be duly cautious about the effectiveness of the ESD in its current form. While it is certainly true that the current approach to ESD initiates some movement in the direction of sustainability, the underpinning assumptions about subjectivity and selfhood of the ESD approach are largely indistinguishable from, and too easily fall into complementarity with, the currently dominant education paradigm. It becomes too easy for ESD to become a curricular ‘add on’ rather than affect a deep change in worldview (what term ‘ontological’ below).

Attune to different assumptions underlying different practices

Because the effectiveness of the currently proposed ESD is uncertain, scholars and practitioners need to look for educational practices based on different assumptions than those of the “modernist Western paradigm” (Sterling et al., 2018). One promising means to do so is to look to non-western countries where the current education paradigm has not been fully internalized. Here we should note that the IPCC’s October 2018 *Special Report on Climate Change* explicitly mentions that “education, information, and community approaches, including those informed by indigenous knowledge and local knowledge, can accelerate the wide scale behavior changes consistent with adapting to and limiting global warming” (D5.6).

As but on example, let us introduce an example of such divergent practices from a non-western country we are most familiar with. Japan has been officially promoting Food Education through school lunch, which is served in virtually all elementary schools (MAFF, 2017). Food Education in Japan aims to promote students’ understanding of interconnections that are largely rendered invisible in modernized society: (1) “food production is impossible without nature such as land and water”, (2) “to eat food is to inherit lives of animals and plants”, and (3) “our lives are fully supported by the efforts of producers and other various people” (Government of Japan, 2006). Japanese schools not only use locally sources food for students’ lunch and explicitly teach students the interconnections above in a classroom setting, but also provide complementary programs to directly experience agricultural productions and fisheries. Moreover, this knowledge is turned into embodied practice: elementary students serve each other meals everyday as a regular part of the school curriculum (Cave, 2007; Tsuneyoshi, 2001). Here Japanese schools are now teaching students the interdependence of individuals with wider society and nature. The selfhood promoted through these teachings is contrastive with the independent selfhood promoted

via the current education paradigm, particularly its more extreme Anglo-American variants (the contrast is also apparent, of course, in American approaches to school lunch, see Story, 2009).

To promote exchanges of information around non-Western practices, it is urgent to set up an arena for this specific purpose. We know that several academic journals have been playing a limited role in this regard. Yet this means the exchange is still limited to very narrow academic circles, usually working on the periphery of mainstream research and faces considerable obstacles in a Western dominated linguistic and publishing world. Is it not possible that international organizations could play this role? Isn't this work now a more urgent priority than monitoring access and quality in pursuit of the "modernist Western paradigm"?

Consideration of ontology to develop relevant scales of sustainability

We are highly skeptical about the effectiveness of establishing a "universal scale" to measure the distance to sustainability, although several international organizations seem to be intent on doing so. Using scales in such a way implicitly assumes that the current world lacks something important and therefore it should be overcome by *progress*. We need to pause and recognize that this assumption and its policy impacts is exactly what led us to our current world: increasingly dire environmental challenges met only with continued economic growth, technological innovations, and extension of "progress" targets (Uchiyama, 2010).

If we still insist on some sort of scale, we suggest that the scale should be (re)organized to measure how much we have forgotten. Human being has (or perhaps originally had) various relationships, including religious and spiritual ties with nature, but modern people tend to forget this fact and see nature as mere standing reserve of commodities (e.g., water, timbers, minerals, and others). White's (1967) critique is now a half-century old but remains unaddressed in education. Like others, we too see excessive consumption as correlated with what has been forgotten; capitalist excesses and catastrophic consumption run freest where the amnesia about other ways of being is most acute (Mita, 2018). Thus, relevant scales should be redirected to "measuring" ontological and psychological dimensions. This is clearly not an easy task, but fortunately various subfields of psychology (e.g., environmental, social, and cultural psychology) have already accumulated useful knowledge and preliminary tools to guide us in the task (e.g., Nisbet et al., 2009; Stroink & DeCicco, 2011). Connecting approaches found in cultural psychology with education policies and actual embodied practice here become an urgent task for education scholars and international organizations alike.

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