

The Moral Brain as Content and Context for Educational Innovation in Southwestern Madagascar

Dustin Eirdosh

The Positive Education Action-Research (PEAR) Laboratory, University of Toliara, Madagascar

KEYWORDS

Service-Learning, Moral Psychology, Contextual Behavioral Sciences, Program Development, Madagascar, Africa

INTRODUCTION

Madagascar is a country rife with challenges not only to human flourishing, but to basic levels of human development (UNDP 2013). This article reports on an emerging model of educational innovation at the University of Toliara, in the atsimo andrefana (southwestern) region of the country. Based on the EvoS Program (www.EvoStudies.org); this experimental programming utilizes evolutionary sciences to explore positive and moral psychology at individual, group, and socio-cultural scales for the first time in an African nation. What is described here is a synthesis of both established best practices along with emerging theoretical advancements that show promise in this challenging environment.

Madagascar is an Indian Ocean island located to the east of Mozambique and to the west of the Mascarin islands, Mauritius and Reunion. The UNDP Human Development Report (2013) ranks Madagascar at 151/186 in terms of Human Development Potential, with the atsimo andrefana region considered among the most challenging on the island nation. Despite these harsh socio-economic and ecological conditions, the capital city of Toliara is home to the oldest academic institution in the south: the University of Toliara (UoT). With a student population of ~ 3000, UoT offers undergraduate through doctoral degrees in both life sciences and social sciences. The national Universities of Madagascar follow the French academic tradition; including a decentralized “Ecole Normal Superior” or Secondary Teacher Training program; at UoT, this is the home of the nation’s first university-level psychology department – focusing on educational psychology.

In October 2012, UoT become the first African nation member of the international EvoS Consortium for Evolutionary Studies (requiring a minimum of one interested faculty member). Originating at the University of Binghamton by Biologist

AUTHOR NOTE: Please direct correspondence to Dustin Eirdosh, The Positive Education Action-Research (PEAR) Laboratory, University of Toliara, Madagascar. E-mail: Dustin@UniToliara.info

and Anthropologist, David Sloan Wilson, EvoS seeks to bring the leading edge of evolutionary sciences to our understanding of the human condition in Higher Education. This initiative offers significant resources for course and programming development in the human sciences (see www.EvoStudies.org). Yet, these resources were developed for institutions with vastly different resources, cultures, and even language than is available at UoT. During the winter of 2013, a new core-course was adapted from the *Evolution for Everyone* course as documented in O'Brien, Wilson, and Hawley (2009). While significant challenges remain, this course was officially adopted and run for a second time in the spring of 2013. Additionally, interest sparked during the EvoS class led to the development of a new applied research group at UoT; the *Positive Education Action-Research (PEAR) Laboratory*. Reported here is a brief overview of the emerging research agenda within the PEAR Lab; followed by examples from our actual programming for both Social Sciences and Life Sciences students. Directions for future research and conclusions are offered.

SERVICE AS EVOLUTION; EVOLUTION AS SERVICE

The on-line resources developed by the EvoS consortium are vast, easy to use, and provide a clear plan for programming development that greatly eased adoption at UoT. Despite these impressive resources, exactly *how* EvoS programming connects with myriad other institutional objectives is not always clear to many academics. Is EvoS another dreaded “add-on” to already overloaded Professorial duties? Or, is it actually a better way of accomplishing what Higher Education already may see as its mandate?

Benson and colleagues (2007) make a compelling case for the moral imperative of achieving “Dewey’s Dream”: the vision of John Dewey of the University as an applied community-learning center. A place that engages the whole community in finding workable direction for the pressing challenges at the local, regional, or global scales. As well, EvoS founder David Sloan Wilson (2011) echoes and adds to this sentiment in his “Whole University – Whole Community” approach within the Binghamton Neighborhood Project. In making workable adaptations to the EvoS model for the unique environment of UoT, what is beginning to emerge is a new synthesis that connects the established pedagogy of *Service-Learning* to modern evolutionary theory; both in terms of course content and educational context. The section that follows offers a brief preview of theoretical advances that may constitute claiming Service-Learning as “evolution’s lost pedagogy.” Examples from PEAR Lab coursework are then discussed.

Evolution’s lost pedagogy

Service-Learning (SL) is a method of teaching that tightly integrates community service as a context for authentic learning. The *KIDS Consortium* for SL emphasizes a three-component model for effective program development:

- Academic Integrity
- Student Ownership

- Apprentice Citizenship

Research into the benefits of this pedagogy clearly represents these broad categories, yet no research has been found interpreting SL practices from a modern evolutionary perspective. What is offered here is an argument for reinterpreting both the historical development and current practices of SL in light of the current state of evolutionary theory as applied to human affairs.

First, the theoretical development of SL is reviewed in light of recent claims regarding the Darwinian influence of educational psychologist and philosopher, John Dewey (Popp 2009). Viewing SL as '*evolution's lost pedagogy*,' it is then argued that SL practices and the integration of evolutionary sciences (e.g. Big History) can function as a curricular engine. A formula of "Big Content" plus "Applied Context" is offered as a general framework integrating theories of the moral brain as both content and context in educational settings.

Finally, educator resources and experimental course designs are briefly reviewed from the efforts of the PEAR Laboratory at University of Toliara. Educator resources include two non-profits actively advancing evolutionary perspectives within a moral psychology context for the advancement of human (and non-human) flourishing. Examples are drawn from courses designed to utilize the resources of these non-profits as launching pads for SL course development.

A Mindful Commitment to Action: Service-Learning in an Evolutionary Paradigm

Various incarnations of the *community school movement* have risen and fallen throughout most of the century since John Dewey's influential career; most strikingly and enduringly – in the set of practices known as Service-Learning (SL). In folk terms – it might be said that SL challenges students and communities to "evolve" their preferred future; and while the literal truth of this statement should not be underestimated – without proper theoretical backing, such a "soft" usage of *evolution* may hinder rather than help efforts to develop a serious applied field of evolutionary studies. What is needed is a more precise understanding of exactly what kinds of evolutionary processes are being impacted by this pedagogy. It is argued here that just such an understanding is well underway from diverse and often disparate disciplines. As well, the implications of this emerging understanding are significant and may serve to more strongly validate SL from its current formulations all the way back to its theoretical roots in John Dewey. We will begin with Dewey.

"Since in reality there is nothing to which growth is relative save more growth, there is nothing to which education is subordinate save more education." - *John Dewey (1916)*

In Popp's (2007) *Evolution's First Philosopher*, the work of John Dewey is reinterpreted as having a deceptively strong Darwinian influence. Dewey was born the year *On the Origin of Species* (Darwin 1859) was published, and he died the year before Watson and Crick discovered DNA (1952). Popp provides an in-depth and provocative re-analysis of Dewey's conception of "growth" and "education" as a

“naturalized theory of meaning” - in light of his clearly under-emphasized evolutionary perspective. Critical to understanding the above quote is an understanding of Dewey's (1916) definition of education as “that reconstruction or reorganization of experience, which adds to the meaning of experience and increases the ability to control subsequent experience.” Dewey saw the function of education as fundamentally empowering a meaningful and directed life through the repeated reorganization of experience. This perspective is clearly central to basic SL practices (Eyler & Giles 1994); yet it is as well, a foundational (if unrecognized) concept of the growing branch of cognitive behavioral sciences known as *functional contextualism* (itself a form of *pragmatism*). Among the major advances coming from this field is *Acceptance and Commitment Therapy* (ACT); an approach to *Mindfulness* training that emphasizes *acceptance* of emotion and cognition; as well as *commitment* to acting on identified values (Luoma et al., 1999; Kashdan & Ciarrochi, 2013). This idea is encapsulated in a concept Dewey would surely endorse: *psychological flexibility*.

It is from this *functional contextualism* that we are now seeing the rise of a strong evolutionary theoretical framework for SL practices (Wilson et al., In Press). Because functional contextualism is an expansive approach beyond the scope of this article – emphasis here is limited to ACT. This line of cognitive behavioral interventions has garnered an explosion of empirical support in the past decade (Kashdan & Ciarrochi, 2013), and may be on the verge of resolving longstanding tensions between Skinnerian behaviorists and evolutionary psychologists (Wilson et.al in press). Core to the functioning of ACT is the conception of human cognition as a “Darwin Machine”: a process of evolution that itself uses evolutionary processes to produce a combinatorial explosion of diversity (e.g. an explosion of cognitive capacities - in the case of the brain). While this cursory summary requisitely simplifies the work, ACT views behaviors, emotions, and cognition all as processes of selection and inheritance across multiple adaptive systems (*Sensu*, Jablonka, & Lamb, 2006). The actual interventions that make up ACT can thusly be understood as linguistic tools to elevate states of *Mindfulness*; an intentional alteration of these selection pressures toward the aim of advancing the values of the individual, institution, or culture (Wilson et al., In Press). *Mindfulness* is a form of consciousness in which, that which is out of one's control is more easily *accepted*, and in which we more ably commit to acting on our reflected values. This practice of mindfulness applied towards selecting for the values of an apparently unending adaptive peak of human flourishing can easily be argued as empirical validation of Dewey's conception of “education.” While much work is needed to expand this idea; it is becoming clear the SL offers educational researchers an incredible opportunity to study the applied management of evolutionary processes from a previously unimaginable theoretical foundation. Classrooms employing SL can be seen as the logical curricular location for deploying interventions from the intertwined fields of Positive Psychology and ACT (Kashdan & Ciarrochi, 2013). Yet, far more broadly, many common SL projects revolve around processes of reflective moral reasoning. Viewed from the insights of ACT and contextual functionalism, these classrooms can be seen as managing multi-level selection processes of emotion, cognition, and behavior relating to an almost infinite domain of locally relevant community needs. The *context* of the SL classroom has the clear potential to lay claim as “evolution's

lost pedagogy.” But what about content? In the section that follows, past and in-progress reports from PEAR Lab classrooms are offered that specifically integrate EvoS *content* as a launching pad for the development of engaging and meaningful SL projects.

•*Curricular Examples from the PEAR Laboratory*

The PEAR Lab is housed within the UoT Department of Educational Psychology and the Faculty of Life Sciences. As such, the current educational objectives are well established within traditional boundaries. Despite such set objectives, the work of turning EvoS into a set of on-going SL projects has been well received in terms of outcomes and program acceptance. Two projects are described. First, the EvoS core-course as adapted for this community which focuses largely on the teaching of *Positive Psychology*. Second, an in-progress course for Biology and Agriculture students connecting *Moral Psychology* and *Public Policy* in ways that are both relevant and repertoire expanding for students in these disciplines.

The EvoS Core-course at University of Toliara

While the PEAR Lab places high emphasis on *student ownership* of the research agenda, there is no pretense that EvoS comes from anywhere but “outsiders.” Specifically, strong majority of EvoS members could be classified as coming from WEIRD (Western, Educated, Industrialized, Rich, Developed) nations as described by Heinrich et al. (2010). This presents both obvious cross-cultural communication challenges, as well as significant research opportunities. Within this cultural context, ENS-Psychology students reported being (n>80%) “very religious,” primarily Catholic and Evangelical. Great sensitivity was taken to be respectful of local beliefs, while ensuring the clear communication of a modern scientific perspective. Indeed, what at first seemed like a challenge, became a curricular focal point that added a strong element of authentic learning.

Rather than presenting EvoS in terms of essentialist, “truth” claims (*Sensu “The New Atheists,” e.g. Dawkins 2008*) science, more generally, was presented in purely anthropological terms. A definition was crafted based on the psycho-social *functioning* of science as a cultural adaptation. That is, the claim was made that:

“Science functions as the mythology of those cultures that, in part,
sacralize convergent naturalistic evidence”
- The PEAR Lab functional definition of *Science*

This definition was adapted from Wilson's (2011) description of science as “a religion that worships truth as it's god,” re-worked in two important ways. First, “religion” was replaced with “mythology” - not as a token olive branch for religious students, but rather for practical reasons of specificity. Students were presented with Joseph Campbell's (1976) four functions of mythology, which outlines the psychosocial functions that effective cultural story telling serves. Second, the term “sacralize” replaced Wilson's “worship,” again for reasons of specificity. This term is used in the sense of Jonathan Haidt's (2012) moral psychology claim that the

sacred ideas of a group or culture “bind” them into cohesive groups and “blind them” to the potential truths of others (moral out-groups). Armed with this definition, PEAR Lab students could now begin the first ever SL project at UoT. Importantly, every SL project must start by investigating a community need.

The community need that this first class was to investigate logically became was: “Is the EvoS program valuable for UoT and the Toliara Community?” Informal hypotheses were made as students embarked on the “literature review” phase of this course (O'Brien, Wilson, and Hawley, 2009). Students were introduced to the Universities limited (n<10) computer resources, and a variety sampling of EvoS concepts were reviewed. Critical to this review was the mapping of *moral diversity* on the question at hand. In the United States, UoT Students learned, “evolution in education” is often divisive and controversial – especially at the secondary school level. Yet, Haidt and colleague’s *Moral Foundations Theory* (Haidt & Graham, 2007) allowed students to accurately predict that we should see complex moral diversity rather than a clear-cut dichotomy on this issue. To delve into this diversity; one class was devoted to looking at some “species typical” specimen from across the moralistic ecosystem. Noted scientists, science activists, scientific theologians, and religious fundamentalists were studied in light of our functional definition of *science* (notably: *Richard Dawkins, Zack Kopplin, David Sloan Wilson, Jonathan Haidt, Michael Dowd, Connie Barlow, Ken Hamm, and Kent Hovind*). Discussion ensued; “In what ways is this individual functioning as a scientist when he/she makes this claim?”; “Is it possible other sacred values are distorting how observable evidence is

Figure 1

	Proximate Explanations [Explications Proche]		Ultimate Explanations [Explications Ultime]	
	Mechanism [Mécanisme]	Development [Développement]	Function [Fonction]	History [Histoire]
Molecular [Molécule]				
Cellular [Cellule]				
Organ / Brain [D'organes / Cerveau]				
Individual [Individuel]				
Group [Groupe]				
Socio-Cultural [Socio-Culturel]				

Figure 1. A Unified Human Sciences Framework. This basic, bilingual framework is offered to all students in PEAR lab courses or projects. Adapted from Medicus (2005) and based on Tinbergen's (1963) four questions, it serves as a map to looking at *the moral brain* from across any and all human science disciplines. Importantly, the continuity of nature is emphasized, both explicitly in classroom content, and theoretically through an evolutionarily informed *service-learning* design.

interpreted?"; and lastly - "Is there a fundamental distinction in the disagreements between those who sacralize convergent naturalistic evidence" (i.e. function, in part, as scientists) – and those who don't?" Various controversial disagreements were contrasted with disagreements between religious fundamentalist Ken Hamm and scientific theologian Michael Dowd – the former believing biblical authority trumps fossil evidence; the later believing that "truth seeking" from an evidential basis is among the highest of Christian virtues. Over the course of this work, students were exposed to an impressive array of cutting edge evolutionary science in a non-threatening way – and even more importantly – they were given a practical and sophisticated understanding of the scientific process from a psychosocial perspective that many western students are not yet afforded. Rather than forcing "western truths" into their belief systems, they were offered a clear and compelling understanding of global scientific culture, and given a road map to entering that culture should they so choose. Students unanimously recommended to UoT Administrators that the EvoS program and PEAR Lab should be integrated and expanded. Numerous (n=47) students are now working under the PEAR Lab to develop Positive Psychology and Evolutionary Education classroom interventions as Action-Research projects in local Public and Catholic High Schools.

Upon the recommendation to expand the program, a course titled *The Moral Sociology of Biopolitics* was developed during the spring of 2013, and is currently in progress for (n=75) Biology and Agricultural Sciences undergraduates. Similar to the work in the core-course, these students are beginning to explore the moral diversity pertaining to Genetically Modified Organisms (GMOs) in Malagasy agricultural and food systems. Madagascar has a strict ban on such biotech crops for agricultural production, experimentation, as well as import. Hailed by Anti-GMO activists as an intelligent "precautionary" approach, and decried by others as "anti-science" - and potentially immoral given the human development challenges faced in the country (Paarlberg 2001, 2009). Students will use modern and emerging tools of moral psychology; namely Moral Foundations Theory (Haidt & Graham 2007), and Moral Vocabularies Analysis (Lowe 2006, 2010); each of which, respectively, evoke evolutionary processes as central to both ultimate and proximate explanations of moralistic behaviors. Rather than a standard "debate" format, students are encouraged to "slow down" their judgment. Students study both the biology of biotechnology, but also are presented with modern conceptions of "the moral brain," as an evolved emotional agent dealing with problems at a geographic scale (global) and rate of change (exponential) that our biology simply wasn't designed to perfectly manage. Borrowing on concepts from ACT, Students are invited to experience their moral intuitions as "context" rather than "reality" (what ACT practioners call *self-as-context*). In small groups students are mapping out the moral diversity (and specific moral vocabularies) of this heated debate. By viewing *self-as-context* and cultivating the development of perspective taking skills with-in student groups, it is hoped that a multi-level selection process may emerge that more fully reflects action towards values. The final project aims to result in a guide for policy makers on creating a healthy and evidentially-informed, on-going public policy discourse for biotechnology in Madagascar.

•*Big Content; Applied Context*

Human knowledge and technological capacity is growing at exponential rates, yet our wisdom in applying this knowledge for universal flourishing does not clearly track such a steep curve. For education to become proactively adaptive, it must meet the needs of both students and society in meaningful ways. Developments from the PEAR Lab suggest an approach (at the Secondary and Higher Education levels) that integrates *Big Content* within an *Applied Context*.

The term *Big Content* here refers to an emerging educational concept of *Big History* as well as to a more general conception of *Future Studies*. *Big History* (Christian, 2011; Smail, 2012) is an interdisciplinary effort to bring continuity to the story of Humanity. *Big History* emphasizes the deep time (~13.7 billion years) continuity of change; and places Humans squarely within an expansive evolutionary framework. *Big Historians* also frequently glance into the future (Spier, 2011); and indeed; creating a preferred future is a core aim of SL classrooms. In this context, the role of emerging technologies and the existential threats to humanity (global warming, cultural conflict, pandemic disease, etc.) are placed within the continuity of evolution in cosmic, genetic, epi-genetic, behavioral, and symbolic systems. The PEAR Lab has placed specific emphasis on “the *Big History of the Moral Brain*” - telling the story of the deep-time evolutionary emergence of human morality in continuity with the historical and proximate stories of the *moral sciences*.

Applied Context simply means that, as *Big Content* is woven through the curriculum, Students should also have opportunities to apply their knowledge at the local, regional, or global scales. SL is clearly the most established and empirically researched pedagogy to accomplish such an applied context. Where SL combined with advancements in the practice of ACT can constitute an emerging methodology for promoting the conscious selection of emotions, cognitions, and behaviors toward shared values, this applied context itself is now being explicitly taught to undergraduate Educational Psychology students at UoT as a new twist in “the big history of the moral brain”.

While this article documents only two cases in which such *Big Content* and *Applied Context* are being tightly woven together (to varying degrees), there is no shortage on the topical diversity this approach can take. Indeed, the PEAR Lab utilizes resources from two innovative NGO's that excel in mapping the leading edge of an applied evolutionary perspective.

The Evolution Institute is a non-profit organization dedicated to using modern evolutionary sciences to improve the human condition. Their work in networking *evolutionary educational psychologists* has been pivotal in advancing much of the science described in this article and employed by the PEAR Lab; yet this is far from the full scope of their work. With projects spanning: *Quality of Life, Play, Evolutionary Mismatch, and Evolutionary Medicine*, the Evolution Institute offers a treasure trove of applied topics where evolutionary studies are rapidly making valuable contributions. The work of the PEAR Lab suggests a role for local Universities globally to digest and further explore the work of the Evolution Institute through innovative SL Projects (perhaps SL projects that also build bridges with local secondary schools).

The Institute for Ethics and Emerging Technologies (IEET) is the fiscal agent for the PEAR Lab, but also serves as a source of limitless social media content

regarding emerging technologies and ethical issues, often from multidisciplinary and evolutionary perspectives. As the pace of technological growth expands exponentially, many educators are able to stay on top of current ethical issues resulting from emerging technologies. IEET provides numerous resources to support classroom discussion around both specific technologies as well as *biopolitical orientations* (Hughes 2004). In the PEAR Lab, these biopolitical orientations are then mapped onto Moral Foundations Theory, Moral Vocabularies Analysis, and ACT. Thus – students are able to examine both ultimate and proximate explanations for diverse biopolitical orientations; and given tools to more intentionally align their emotions, cognitions, and behaviors with their values.

CONCLUSIONS

The moral brain has served as both content and context for educational innovation at the University of Toliara in southwestern Madagascar, yet there exists no logical reason the same could not be accomplished in any academic setting globally. Using service-learning as a foundational pedagogy and infusing this practice with the leading edge in evolutionary sciences from multiple disciplines holds virtually unlimited promise to develop a richly applied evolutionary psychology of *education* in the truest sense that Dewey imbued to the term. A “Big History of the Moral Brain” can encompass a broad range of curricular content objectives; and provides a logical keystone to bridging content with context as a multi-faceted strategy for educational innovation. As Wilson et al. claim, “we are closer to a theory of intentional change than it may appear” (In Press). We can use this science of positive intentional change to *design* our classrooms, yet there remains an untapped efficiency gain if we do not concurrently update and *explicitly teach* this science as the newest chapter in the unfolding big history of our moral brains. Both “evolution” and “moral issues” are challenging yet critically important topics for secondary schools and even for many higher education institutions. The work of the PEAR Lab suggests a bold approach that engages Higher Education in partnership with regional High Schools to strongly integrate these topics under a strongly supported theoretical framework previously thought impossible.

ACKNOWLEDGMENTS

The PEAR Lab wishes to thank the staff and contributors to the EvoS Consortium, the International Big History Association, and the Institute for Ethics & Emerging Technologies for content and technical support. As well, the *Good Nature Institute* of Delaware, USA has provided seed funding for some of the described activities.

REFERENCES

Benson, L., Harkavy, I., & Puckett, J. (2007). *Dewey’s dream: Universities and democracies in an age of education reform*. Philadelphia, PA: Temple University Press.

- Campbell, J. (1976). *Occidental mythology: The masks of god*. New York, NY: Penguin books.
- Christian, D. (2011). *Maps of Time: An Introduction to Big History*. Berkley, CA: University of California Press.
- Darwin, C. R. (1859). *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*. J. Murray (Ed.). London.
- Dawkins, R. (2008). *The God Delusion*. Boston, MA: Mariner Books
- Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education*. NY: Mcmillan.
- Downey, G. & Lende, D. (2012). *The encultured brain: An introduction to neuroanthropology*. Cambridge, MA: The MIT Press.
- Giles, D.E. & Eyler, J. (1994). The theoretical roots of service-learning in John Dewey: Toward a theory of service-learning. *Michigan Journal of Community Service-Learning*, 1(1), 77-85
- Haidt, J. (2012). *The righteous mind: Why good people are divided by politics and religion*. New York, NY: Pantheon Books.
- Haidt, J.; Graham, J. (2007). When morality opposes justice: Conservatives have moral intuitions that liberals may not recognize. *Social Justice Research*, 20, 98-116.
- Heinrich, J., Heine, S.J., & Norenzyan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 22(23), 61-83.
- Hughes, J. (2004). Overview of biopolitical orientations. Retrieved from <http://ieet.org/index.php/IEET/biopolitics>.
- Jablonka, E. & Lamb M.J. (2006). *Evolution in four dimensions: Genetic, epigenetic, behavioral, and symbolic variation in the history of life*. Cambridge, MA: The MIT Press.
- Lowe, B. M. (2006). *Emerging moral vocabularies: The creation and establishment of new forms of moral and ethical meanings*. Lanham, MD: Lexington Books.
- Lowe, B. M. (2010). The creation and establishment of moral vocabularies. In S. Hilton & S. Vaisey (Eds.), *Handbook of the sociology of morality* (pp. 293-312). New York, NY: Springer.
- Luoma, J. B., Hayes, S. C., & Walser, R. D. (2007). *Learning ACT: An acceptance & commitment therapy skills-training manual for therapists*. Oakland, CA: New Harbinger Publications.
- O'Brien, D. T., Wilson, D. S., & Hawley, P. H. (2009). Evolution for Everyone: a course that expands evolutionary theory beyond the biological sciences. *Evolution: Education and Outreach*, 2(3), 445-457.
- Paarlberg, R. L. (2001). *The politics of precaution: genetically modified crops in developing countries*. Baltimore, MD: Johns Hopkins University Press.
- Paarlberg, R. (2009). *Starved for science: How biotechnology is being kept out of Africa*. Cambridge, MA: Harvard University Press.
- Popp, J. (2007). *Evolution's first philosopher: Dewey and the continuity of nature*. Albany, NY: State University of New York Press.
- Seligman, M.E.P. (2011). *Flourish*. New York, NY: Free Press, a division of Simon and Schuster

- Smail, D.L. (2008). *On deep history and the brain*. Berkley, CA: University of California Press.
- Spier, F. (2011). *Big history and the future of humanity*. Malden, MA: Wiley-Blackwell.
- UNDP (2013). The united nations human development report 2013 summary; the rise of the south: Human progress in a diverse world. Retrieved from http://hdr.undp.org/en/media/HDR2013_EN_Summary.pdf .
- Wilson, D.S. (2011). *The neighborhood project: Using evolution to improve my city, one block at a time*. New York, NY: Little, Brown and Company
- Wilson, D.S., Hayes, S.C., Biglan, A., & Embry, D.D. (in press). Evolving the future: Toward a science of intentional change. *Behavioral and brain Sciences*.
- Kashdan, T.B. & Ciarrochi J.V. (2013). *Mindfulness, acceptance, and positive psychology: The seven foundations of well-being*. Oakland, CA: The Context Press, an Imprint of New Harbinger Publications Inc.

Received July 17, 2013; Revision received Nov. 5, 2013; Accepted Nov. 16, 2013

APPENDIX A

Abbreviations & Vocabulary

ACT: Acceptance and Commitment Therapy

Evo-Edu: Evolutionary educational psychology

EvoS: The Evolutionary Studies Consortium

SL: Service-Learning

UoT: University of Toliara, Madagascar