

DOI: 10.26319/6916

Tibor Solymosi
Department of Philosophy
Case Western Reserve University

Affording Our Culture: “Smart” Technology and the Prospects for Creative Democracy

Abstract:

John Dewey, as Sidney Hook characterized him, was the philosopher of science and freedom. Dewey, as Larry Hickman has demonstrated, was also a philosopher of technology. And, as most people familiar with Dewey know, he was a philosopher of education and democracy. The complex of technology, science, freedom, education and democracy requires re-examination, not only because of our contemporary cultural political situation but also because of our growing insights into the human condition thanks to the technosciences of life, especially human life. Dewey’s philosophical method of reconstruction, equipped with insights from evolutionary neuroscience and ecological psychology, offers means of reconceiving and thus reevaluating our conception of tools and technology within our cultural context. I begin to take up Mark Tschaepé’s challenge to neuropragmatism to counter what he calls “dopamine democracy” – Plato’s critique of democracy resurrected in neural garb coupled with a critical examination of how social media and other so-called “smart” technologies undermine healthy democratic life. Central to this neuropragmatist approach are *cultural affordances* – opportunities for action humans have created initially for specific purposes and later retrofitted for other ends-in-view. Dewey’s reconstruction – as method as well as the reconstruction of technology, science, freedom, education and democracy as an entangled complex – is thus imagined as our best strategy for achieving the culture of creative democracy.

Keywords:

digital devices, social media, democracy, neuropragmatism, dopamine, affordances, neuroscience

1. Introduction

Mark Tschaepe has argued that the current cultural phenomenon of smartphone technology is not merely addictive but emphatically dangerous for democratic life. In resurrecting Plato's critique of democracy from the *Republic* and dressing it in contemporary neural garb, Tschaepe proposes that neuropragmatism is the best strategy for dealing with the so-called "dopamine democracy." In taking up his challenge, I bring together several threads within pragmatism and the sciences of life and mind to sketch a vision of how we can afford – playing on the quotidian sense of having the means and the ecological sense of having an opportunity for action – our culture of enlightened and creative democracy as both a personal and social way of life. In weaving together these threads in response to Tschaepe, I proffer a contemporary answer to the ancient question of how we should live our lives in light of our best knowledge such that our lives are significant. This concern for living significant lives is threatened by the dopamine democracy.

My argument proceeds by first articulating the problem as Tschaepe sees it, while exemplifying it with more recent research from Sherry Turkle, Jaron Lanier, and Robert H. Lustig. From his challenge to neuropragmatism, I further describe this neologism. The central ideas to be reviewed include John Dewey's conception of democracy as both a personal way of life and a creative enterprise, the role of intelligence and valuation in the reconstruction of experience, the conception of experience as the life function of an organism-environment transaction (symbolized as *CE*), the natural-cultural evolution of technology, and the notion of *cultural affordance*. An early step in combatting dopamine democracy is to sketch a vision – the details of which to be filled in later as inquiry continues – of what a creative democratic way of life could look like in light of what we know about ourselves as evolving and en-brained bodies living in an evolving and global technological culture.

2. The Dopamine Democracy

"[Democratic people] aren't filled with that which is and never taste any stable or pure pleasure. Instead they always look down at the ground like cattle, and, with their heads bent over the dinner table, they feed, fatten, and fornicate."¹ Upon reading this passage in Plato, Tschaepe cannot help but think of his fellow citizens, looking down at their smartphones.² While it is technically true that people could be using their phones for purposes other than feeding, fattening, and fornicating, it is difficult to escape the growing evidence that there is something deeply problematic with our current smartphone culture, specifically with social media. The distractions created by our digital devices are deliberately designed to exploit our dopaminergic systems. To keep us using them, to keep us believing that our current use – primarily focused on feeding, fattening, and fornicating, so to speak – is valuable and within our control, and to keep us from genuinely reflecting about our lives are among the characteristics of dopamine democracy. We believe we are free because we are regularly (if not constantly) sharing, without impediment, imagery of our pursuit of our base appetites, yet all the while we lose our ability to attend, to focus, to inquire deliberately into exigencies beyond our pursuit of immediate satisfaction of our lower desires. Dopamine democracy, as Plato warned about democracy generally, thus opens a people up to tyranny. Like Plato's, Tschaepe's solution is concerned with education. Unlike Plato, however, the focus on education must itself be democratic in ways envisaged by John Dewey. This begins with the ability to empathize with others, which requires conversation – an activity common to philosophy from Socrates to Richard Rorty.

1) Plato, *Republic*, trans. G. M. A. Grube (Indianapolis: Hackett Publishing Company, 1992), 586a–b.

2) Mark Tschaepe, "The Dopamine Democracy: Leaving Leadership to Tyrants," Philosophy Club Leadership Summit, Prairie View A&M University, 20 November 2013.

For sociologist of technology, Sherry Turkle, there has been a corresponding decline in empathy with the increased use of smartphones.³ This decline further indicates a corruption of conversation. People not only become less capable of empathizing with each other but also less capable of paying attention to one another, to themselves, and to complex arguments about politics at local, national, and global levels. Philosophical reflection – upon oneself, upon one’s place in the world, and upon the world generally – becomes ever more difficult in such circumstances, thereby undermining democratic life as well as the possibility of living significantly.

Tschaeppe and Turkle are not alone in their alarm about the detrimental effects of social media and smartphone use on democratic life. The polymath and cultural critic Jaron Lanier has also voiced extreme concern in his polemic, *Ten Arguments for Deleting Your Social Media Accounts Right Now*.⁴ These ten arguments revolve around what it means to live a significant life. The arguments address in turn the following concerns, which I list with a more positive connotation contrary to Lanier’s presentation: free will, cultural-political activism, being civil and decent (Lanier’s own choice of words is less kind), truth, meaningful communication, empathy, happiness, economic dignity, genuine political life, and one’s soul. For Lanier, each of these items is under attack by our current social media practice.

Tschaeppe, Turkle, and Lanier are not the only voices in this growing chorus of Cassandras about social media (another to be addressed shortly is Robert H. Lustig). What these three share (as I am sure others do too) is not just the concern for significant human lives but also the role the brain plays in the current exploitation of human life by social media companies. Turkle is the least specific, though her sociological interviews more than make up for the lack of neuroscientific data. Turkle and Lanier both point to the deliberate design of the digital devices to be in constant use, and the social media sites and apps to keep users continuously using them because that is how profit is made, predominantly through advertising revenue. For the user is the product, not the consumer. These “free” sites profit from collecting data about their users that they sell to advertisers.

This practice is not a by-product of overly generous programmers who want to bring people together for free. Lanier demonstrates quite the contrary when he quotes the first president of Facebook, Sean Parker:

We need to sort of give you a little dopamine hit every once in a while, because someone liked or commented on a photo or a post or whatever.... It’s a social-validation feedback loop ... exactly the kind of thing that a hacker like myself would come up with, because you’re exploiting a vulnerability in human psychology.... The inventors, creators – it’s me, it’s Mark [Zuckerberg], it’s Kevin Systrom on Instagram, it’s all of these people – understood this consciously. And we did it anyway... it literally changes your relationship to society, with each other.... It probably interferes with productivity in weird ways. God only knows what it’s doing to our children’s brains.⁵

As any student of Plato’s *Republic* should recognize, Parker is advocating the position of the sophist Thrasymachus, who argued that justice is to the advantage of the stronger, that the best people are those who get the better of the weak. (Whether Parker is familiar with Plato or Thrasymachus is of no concern here.) This *pleonexia*, as Socrates goes on to argue in response to Thrasymachus’ position, undermines the healthy and moderate operation of both a society and an individual person. Indeed, in a play on the charges against Socrates, Plato argues that a culture focused on appearances and reputations but not on truth and character is a culture that corrupts the youth. And so, for Plato’s just society and just person, the guarding of children from corruption is of the

3) Sherry Turkle, *Reclaiming Conversation: The Power of Talk in a Digital Age* (New York: Penguin Press, 2015).

4) Jaron Lanier, *Ten Arguments for Deleting Your Social Media Accounts Right Now* (New York: Henry Holt and Company, 2018).

5) *Ibid.*, 8.

utmost importance. Following this line of thought, one cannot help but be alarmed by recent reports that the children of Silicon Valley entrepreneurs are forbidden to use the very devices that make the parents rich.⁶

To recognize this, however, requires that humans receive the right education. Kara Swisher, a journalist and cultural critic focusing on technology, recently observes this point in the *New York Times*. She raises the following question about Zuckerberg and his ignorance of the effects, especially the vicious ones, that Facebook would have on humanity: "Was it because he was a computer major who left college early and did not attend enough humanities courses that might have alerted him to the uglier aspects of human nature?"⁷ Her answer: "Maybe." More recently, Swisher considers how and to what effect ethics can have on Silicon Valley in "Who Will Teach Silicon Valley to Be Ethical?"⁸

Swisher's general emphasis on the liberal arts is admirable, but it may not be specific enough. The right education – whatever we call it – must address the full spectrum of human experience, the good and the bad, the beautiful and the ugly, the true and the false. This is an education for democracy as John Dewey would advocate.⁹ This means not only learning about literature and history but also learning science, especially neuroscience, given its growing influence in our culture. That is, "the chief advantage of [such an] education is the assurance it gives of not being duped," as Dewey puts it, continuing that "...the profit of education is the ability it gives to discriminate, to make distinctions that penetrate below the surface."¹⁰ Such an ability is integral to living a significant life, to living democratically personally and socially. Parker's admission about his and other social media inventors and creators' intentions essentially asserts an attack on the profit of education of not being duped, for their profit requires the users of their social media to be duped via dopamine.

It may be impossible to know for sure about any of these powerful individuals in social media and technology. What is not impossible to know is their documented comments on deliberately exploiting human psychology and nervous systems for their own economic gains – comments often made only with the benefit of hindsight.¹¹

Tschaep's prescience on the threat social media and technology would have on democracy is well captured in his phrase, *dopamine democracy*. While many, like Lanier or Parker, recognize the role of dopamine in feeling

6) Chris Weller, "Silicon Valley Parents are Raising their Kids Tech-Free – and It Should be a Red Flag," *Business Insider*, 18 February 2018 Available at: <https://www.businessinsider.com/silicon-valley-parents-raising-their-kids-tech-free-red-flag-2018-2/> Accessed 27 October 2018; Shana Lebowitz, "Silicon Valley Parents are so Panicked about Kids' Screen Time that They're Having Nannies Sign 'No-Phone Contracts' and Posting Photos of Rule-Breakers Online," *Business Insider*, 30 October 2018. Available at: <https://www.businessinsider.com/silicon-valley-nannies-monitor-kids-screen-time-2018-10> Accessed 8 November 2018.

7) Kara Swisher, "The Expensive Education of Mark Zuckerberg and Silicon Valley," *New York Times*, 2 August 2018. Available at: <https://www.nytimes.com/2018/08/02/opinion/the-expensive-education-of-mark-zuckerberg-and-silicon-valley.html> Accessed 27 October 2018.

8) Kara Swisher, "Who Will Teach Silicon Valley to Be Ethical?" *New York Times*, 21 October 2018. Available at: <https://www.nytimes.com/2018/10/21/opinion/who-will-teach-silicon-valley-to-be-ethical.html> Accessed 27 October 2018.

9) Bill Bywater, "Tarrying with the negative: An interview with Noëlle McAfee," *Kettering Review* 29, no.1(2011): 53–58; Bill Bywater, "Becoming a Deweyan Apprentice: A Struggle Against White Supremacy," in *The Role of the Arts in Learning: Cultivating Landscapes of Democracy*, eds. Jay Michael Hanes and Eleanor Wiseman (New York and London: Routledge, 2018), 19–35; Bill Bywater, and Zach Piso, "Neuropragmatism and Apprenticeship: A Model for Education," in *Neuroscience, Neurophilosophy and Pragmatism: Brains at Work with the World*, eds. Tibor Solymosi and John R. Shook, (London and New York: Palgrave Macmillan, 2014), 185–214; Tibor Solymosi, "We Deweyan Creatures," *Pragmatism Today* 7, no. 1 (2016): 41–59.

10) John Dewey, "Education as Politics," [1922], in *The Middle Works of John Dewey*, Vol. 13, ed. J. A. Boydston (Carbondale and Edwardsville: Southern Illinois University Press 1969–1991), 329.

11) See for example: James Vincent, "Former Facebook Exec Says Social Media is Ripping Apart Society," *The Verge*, 11 December 2017. Available at: <https://www.theverge.com/2017/12/11/16761016/former-facebook-exec-ripping-apart-society>. Accessed 12 December 2017.

pleasure, Tschaepé situates the neurotransmitter within a richer neural context, within a still richer context of the pattern of inquiry, and within an even richer context of en-brained inquirers in democratic culture.

Central to Tschaepé's argument is the critical difference between the dopaminergic system and the endogenous opioid system. In a healthy person, these two systems work in harmony. The dopaminergic system is involved with the experience of effort and *anticipation*. In anticipating a series of events, an organism, like a human, strives for a goal or puts effort forth in transforming the situation in its favor. Upon achieving this task, the organism experiences reward or *consummation*, which is regulated by the endogenous opioid system. The dynamic equilibrium between these two systems may be disrupted when activities non-essential to basic life function start to predominate a life. Such activities include common addictions to drugs, to food and drink, or to sex. But we should also consider more recent addictive activities that fit with Tschaepé's description of "synthetic situations" – a concept proposed by Karin Knorr Cetina to characterize "electronically transmitted on-screen projections that add informational depth and new response requirements to the 'ecological huddle'."¹² The most extreme of these have resulted in the deaths of gamers – people who sit at a computer or similar digital device for hours on end immersed in the activity mediated on and by the screen.¹³

These activities are diverse but share a common characteristic: the activity disrupts the healthy dynamic equilibrium between the dopaminergic system and the endogenous opioid system. The rhythm between anticipation and consummation that yields both motivation and reward becomes further out of synchronization, where greater effort is put forth for ever less reward, creating a vicious cycle of more for less. That is, the greater the anticipation, the less the consummation.

Robert H. Lustig has taken a similar perspective as Tschaepé to addictive behavior, dopamine, and reward. In *The Hacking of the American Mind* – a telling title, given Parker's admission above – Lustig writes:

Up until recently, the reward pathway was thought to be a one-way express lane to pleasure. But new studies have revealed that the experience of reward is actually two intertwined and conjoined pathways and experiences, with two sets of neurochemicals and two sets of receptors. Although science can piece the two apart, we humans tend to experience them either simultaneously or in quick and rapid succession. The two phenomena can be summed up as: (1) *motivation* or *desire*, mediated by the neurotransmitter dopamine and its receptors. Dopamine is responsible for the outward manifestations of "seeking" behaviors. This is then followed by: (2) *consummation* or *pleasure*, mediated by a class of neuromodulators called endogenous opioid peptides (EOPs, specifically beta-endorphin, enkephalin, and dynorphin) and their receptors, collectively known as opioid receptors. These pleasurable sensations that EOPs generate in the consummation of reward are all experienced inwardly. Thus, on the outside looking in, it's the dopamine effect you see.¹⁴

12) Karin Knorr Cetina, "The Synthetic Situation: Interactionism for a Global World," *Symbolic Interaction* 32, no. 1 (2009): 61. After: Mark Tschaepé, "Undermining Dopamine Democracy Through Education: Synthetic Situations, Social Media, and Incentive Salience," *Pragmatism Today* 7, no. 1 (2016): 32.

13) Abigail Elise, "Gamer Dies In Internet Cafe After Three Day Gaming Binge, Hardly Anyone Notices," *International Business Times*, 19 January 2015. Available at: <https://www.ibtimes.com/gamer-dies-internet-cafe-after-three-day-gaming-binge-hardly-anyone-notices-1787936> Accessed 27 October 2018; Ben Guarino, "Prominent gamer died during live-streamed attempt to play 'World of Tanks' for 24 hours," *The Washington Post*, 23 February 2017. Available at: https://www.washingtonpost.com/news/morning-mix/wp/2017/02/23/va-man-died-during-marathon-attempt-to-play-video-game-for-24-hours/?utm_term=.79ac6663e3b0. Accessed 27 October 2018.

14) Robert H. Lustig, *The Hacking of the American Mind: The Science Behind the Corporate Takeover of Our Bodies and Brains* (New York: Avery, 2017), 47.

For both Tschaepe and Lustig, dopamine is central to the problem. But it and EOPS are not the only neural factors to consider in the dopamine democracy.

Tschaepe writes that “[t]here are multiple neurochemical systems implicated in the processes of liking, commenting, and sharing within social media activity. For instance, the opioid, endocannabinoid, and GABA-benzodiazepine neurotransmitter systems are all involved in the pleasure associated with making choices.”¹⁵ Tschaepe also explores *incentive salience* – “the immediacy of wanting and seeking, without critical reflection or deliberation.”¹⁶ Incentive salience complements what Lustig characterizes as metabolic syndrome: “the smorgasbord of chronic metabolic diseases from which America, and indeed the entire world, now suffers.” Among these diseases, Lustig lists “heart disease, hypertension, blood lipid problems such as hypertriglyceridemia, type 2 diabetes, non-alcoholic fatty liver disease, chronic kidney disease, polycystic ovarian disease, cancer, and dementia.”¹⁷ Lustig ties metabolic syndrome not only to the Western diet, but also to our contentment, the significance of our lives. Central to understanding a meaningful life, for both Tschaepe and Lustig, is understanding the role of both dopamine and serotonin in the nervous system, and how our activities, from diet to social media, affect and are affected by these neurotransmitters.

Our diet – food and information – determines our life function, for we are as much informavores as we are omnivores.¹⁸ As Tschaepe and Lustig review, our current cultural behaviors involving smartphone and social media as well as sugar consumption and processed foods have created a neoliberal dystopia in which humans are encouraged primarily if not exclusively to concern themselves with feeding, fattening, and fornicating. Lustig’s proposal for getting better is rather practical in what he calls the Four Cs: connect (with other humans directly), contribute (value to oneself and to one’s communities), cope (via commonsensical activities like sleep, exercise, and meditation), and cook (real food for oneself and others).¹⁹

While I take no issue with Lustig’s suggestions, my interest is in the philosophical underpinnings of such recommendations. Indeed, my focus here is to take up Tschaepe’s challenge. Tschaepe “suggest[s] implementing a strategy of neuropragmatism as advocated by Tibor Solymosi. Neuropragmatism takes ‘seriously the insights, tools, and techniques developed by the neurosciences as achievements in a living context of growth’ (Solymosi 2011, 356).”²⁰

3. Neuropragmatism

One of the central guiding principles of neuropragmatism is Dewey’s prescription that “[to] see the organism *in* nature, the nervous system in the organism, the brain in the nervous system, the cortex in the brain is the answer to the problems which haunt philosophy. And when thus seen they will be seen to be *in*, not as marbles are in a box but as events are in history, in a moving, growing never finished process.”²¹ Mark Johnson recognizes, however, that neuropragmatism is not yet a readily recognizable philosophy, writing:

15) Mark Tschaepe, “Undermining Dopamine Democracy Through Education: Synthetic Situations, Social Media, and Incentive Salience,” *Pragmatism Today* 7, no.1 (2016): 35.

16) *Ibid.*, 32.

17) Lustig, *The Hacking of the American Mind*, 126.

18) Daniel Dennett, *Freedom Evolves* (New York: Viking Books, 2003); Clay A. Johnson, *The Information Diet: A Case for Conscious Consumption* (Sebastopol, CA: O’Reilly Media, 2012).

19) See: Lustig, *The Hacking of the American Mind*, Part V, especially 221ff.

20) Tschaepe, “Undermining Dopamine Democracy Through Education,” 39.

21) John Dewey, *Experience and Nature*, [1925], in *The Later Works of John Dewey*, Vol.1, ed. J. A. Boydston (Carbondale and Edwardsville:

Whenever I hear the term “neuropragmatism,” I am reminded of J. L. Austin’s opening words in his famous article “Performative Utterances,” where he says, “You are more than entitled not to know what the word ‘performative’ means. It is a new word and an ugly word, and perhaps it does not mean anything very much.” Likewise, you are more than entitled not to know what “neuropragmatism” means. It is, indeed, a new word, and it is perhaps an ugly word, but I daresay that it is not an inconsequential word.²²

He continues to characterize neuropragmatism in the manner by which good pragmatists have characterized pragmatism: by eschewing rigidity and strict frameworks in philosophy. That is, part of the problem pragmatists initially saw with philosophy was the risk – indeed, Johnson calls it a disease – of paralysis and fixity in philosophy.²³

Despite this caution, Johnson argues against the inconsequentiality of neuropragmatism. He rightly states that “[w]hat pragmatist philosophy has to offer is the broader philosophical context necessary for understanding the grounding assumptions of cognitive neuroscience, its fundamental limitations, and its place in a more expansive pragmatist framework for approaching both philosophy and our basic life problems. In short, pragmatism without neuroscience is (partially) empty, but neuroscience without pragmatism is (partially) blind.”²⁴ In other words, Johnson argues that it would be a mistake “to think that the work of neurophilosophy – or at least its important work – is done by the neuroscience alone, thereby denying any serious role for philosophical reflection.”²⁵ When Tschaepé suggests neuropragmatism as a strategy for dealing with dopamine democracy, I take seriously Johnson’s understanding of neuropragmatism as it is not simply an instrumental approach to neuroscience (i.e., the utilization of ideas developed by neuroscience appropriated to contexts beyond neuroscience itself) but as a full-bodied philosophy that provides a process ontology and an experimental methodology for living an aesthetically rich life. Dopamine democracy is thus well-addressed by this philosophical perspective because dopamine democracy is a direct threat to philosophy as such.

I have recognized this threat of dopamine democracy.²⁶ I have suggested reservations about neuropragmatism’s fitness to meet Tschaepé’s challenge as well as possible ways forward.²⁷ Yet none of these has been primarily focused on dopamine democracy. My aim here is to provide a brief introduction to neuropragmatism to serve as a frame for thinking about dopamine democracy. This introduction and subsequent reflection are not exhaustive, nor conclusive. Rather, they are introductory with regard to what solutions are possible or imaginable.

Southern Illinois University Press, 1969–1991), 224; Tibor Solymosi, “Neuropragmatism, Old and New,” *Phenomenology and the Cognitive Sciences* 10, no. 3 (2011): 347–348. DOI: 10.1007/s11097-011-9202-6.

22) Mark Johnson, *Morality for Humans: Ethical Understanding from the Perspective of Cognitive Science*, (Chicago: University of Chicago Press, 2014), 37; Mark Johnson, *The Aesthetics of Meaning and Thought: The Bodily Roots of Philosophy, Science, Morality, and Art*, (Chicago: University of Chicago Press, 2018), 96.

23) Johnson, *Morality for Humans*, 37; Johnson, *The Aesthetics of Meaning and Thought*, 96–97.

24) Johnson, *Morality for Humans*, 37.

25) Johnson, *The Aesthetics of Meaning and Thought*, 96.

26) Solymosi, “We Deweyan Creatures”; Tibor, Solymosi, “Recovering Philosophy from Cognitive Science,” in *Pragmatism and Embodied Cognitive Science: From Bodily Interaction to Symbolic Articulation*, eds. Roman Madzia, and Matthias Jung (Berlin: De Gruyter, 2016), 143–164.

Tibor Solymosi, “Dewey on the Brain: Dopamine, Digital Devices, and Democracy,” *Contemporary Pragmatism* 14, no. 1 (2017): 5–34. DOI: 10.1163/18758185-01401002.

27) Solymosi, “Dewey on the Brain: Dopamine, Digital Devices, and Democracy,” 28–32.

This introduction to neuropragmatism is presented in the following sequence. First, I discuss experience as organism-environment transaction or CE, revolving around the (human) brain-gut axis, emphasizing the role of regulatory mechanisms as the neurobiological basis of inquiry. Second, I turn to Dewey's postulate of continuity and Larry Hickman's Deweyan conception of nature-as-nature and nature-as-culture, in order to undergird the advantage of learning neuroscience in order to navigate better cultural activity. This continuity leads to the third step of connecting 4E cognitive science (via Johnson's modification of it as 7E) to Hickman's conception of technology. The fourth step is to introduce the ecological-psychological concept of affordances (opportunities for action), including invitations (to action), and the role of information in these relations within CE, from which I elaborate on what Johnson and I have independently characterized as cultural affordances. The fifth and final step here is to weave together the previous steps in a conception of education that promotes Dewey's ideal of creative democracy. At each of these steps, I pause to reflect on the import of each step for dealing with some aspect of dopamine democracy, so as not to lose the forest for the trees. Before these steps can be taken, however, I first note the role of valuation and growth at work in each of them (which I also elaborate through this sequence), that growth occurs in a historical and evolutionary context, and that the ideals by which humans today are measuring themselves (for better or worse) are democratic in a broad and narrow sense.

3.1 Democracy, Valuation, and Growth

The broad sense of democracy is the popular view that it is first and foremost (and perhaps exclusively) a form of government. This view Dewey challenged because he believed that in order for such a form of government to work the people themselves must first live their personal lives in a democratic fashion. For my immediate purposes, this way of life can be expressed by drawing on Dewey's "Creative Democracy – The Task Before Us" (1939) and his "Basic Values and Loyalties of Democracy" (1941). In the former, Dewey describes democracy as inherently educative, which complements his three basic loyalties named in the latter, communication, potentiality of each human being, and cooperation. To paraphrase synthetically, Dewey argues that to live democratically requires the free cultivation of the intelligence of every human being, regardless of their origin, creed, race, or gender. This cultivation requires free yet respectful communication so that people, not only despite of but also because of their differences, can cooperate together for a common good. This shared good can vaguely be described as growth, Dewey's only absolute, which is itself contingent to its relation to the past. That is, through education, of all people for all people, free communication with specific regard to on-going cooperation such that we all may benefit – so that we may all be doing better than we were before – is the mark of intelligence.

This way of life must be a personal way of life, yet it cannot remain so as it transforms each of its practitioners into engaged social beings. For such democratic people, educated for this enlightened form of democracy, life is not spent looking at the ground, focused only on feeding, fattening, and fornicating. Life is focused upon growth of individual and culture, with explicit effort at evading treason to democracy. As Dewey describes it, "[i]ntolerance, abuse, calling of names because of differences of opinion about religion or politics or business, as well as because of differences of race, color, wealth or degree of culture are treason to the democratic way of life."²⁸ As anyone familiar with trolling and the Gyges effect – Plato's influence is never far – on websites can attest, such treason to democracy is alive and well online. Intelligence,

28) John Dewey, "Creative Democracy – The Task Before Us," [1939], in *The Later Works of John Dewey*, Vol. 14, ed. J. A. Boydston, (Carbondale and Edwardsville: Southern Illinois University Press (1969–1991), 227.

for Dewey (and for Plato but in an importantly different way) is the means to combat this treason to the democratic way of life.

Intelligence is not simply a straight-line instrumentalism that gets a person from point A to point B without concern for the value of the ends nor the means themselves. Rather, intelligence includes valuation. This process is part of the deliberate reconstruction of experience people take to their situations by determining whether their more proximate ends-in-view cohere with both the means employed in their pursuit of said ends but also the greater ideals by which they claim to live their lives. Someone commenting on a blog post may believe that their saying something sexist or racist is democratic because it is an exercise of their free speech. Yet upon further reflection, such a person may realize that such sexist or racist language itself is at odds with the higher ideal of democracy as a personal way of life. Upon this realization, this person recognizes their inclination to say something bigoted is treason to democracy and either rejects the use of sexist or racist language, or, less valuably but nevertheless logically an option, rejects democracy as an ideal.

Such valuations are familiar to everyday human life that is the least bit reflective. This mark of intelligence – to select between different courses of action in light of variables (both determinate and indeterminate) and parameters specific to the situation²⁹ – has its origins in evolution. Understanding this evolution and the role of regulatory mechanisms in experience not only makes one more intelligent, it also opens up new possibilities for action (that is, it is itself an affordance for dealing with dopamine democracy).

3.2 Experience and Evolution

The nested hierarchy in neuropragmatism's guiding principle – the cortex in the brain in the body in the world – is a dynamic process of processes, of events, that are adaptive and regulatory. It should not be forgotten that the problems that haunt philosophy are not just the problems generated out of the insidious dichotomies of modern philosophy but also include the ancient problem of how to live a significant life.

This guiding principle, combined with Dewey's functional view of experience as organism-environment transaction, leads to the conclusion that the unit of evolution and the unit of experience are the same. Philosophers of biology Paul Griffiths and Richard Grey (2001) argue that the proper unit of evolution is not the genome, not the organism nor the environment but the inextricably entangled transaction of organism and environment. This entanglement is so entrenched that Griffiths and Grey contend there is no way to discern where one begins and the other ends. They thus propose the diphthong, *Œ*, to symbolize this unit.

Given the clear parallels with Dewey's conception of experience as a life function in which an organism both does something to its environment which in turn does something the organism must undergo – a view of experience in which the boundary between inner and outer is functional and not essential or fixed – I have taken up the *Œ* diphthong for thinking about experience, cognition, and consciousness from a neuropragmatist standpoint.³⁰ As Johnson describes the general point I am making, “the organism-environment development process... is evolutionary in nature, in response to changing conditions in ourselves and our environments over

29) John Dewey, *Logic: The Theory of Inquiry*, [1938], in *The Later Works of John Dewey*, Vol. 12, ed. J. A. Boydston (Carbondale and Edwardsville: Southern Illinois University Press 1969–1991).

30) Tibor Solymosi, “Neuropragmatism on the Origins of Conscious Minding,” in *Origins of Mind in Nature*, ed. Liz S. Swan (Dordrecht: Springer Verlag, 2013), 273–287; Tibor Solymosi, “Against Representation: A Brief Introduction to Cultural Affordances,” *Human Affairs* 23, no. 4 (2013): 594–605. DOI: 10.2478/s13374-013-0151-3; Solymosi, “We Deweyan Creatures”; Solymosi, “Recovering Philosophy from Cognitive Science”; Solymosi, “Dewey on the Brain: Dopamine, Digital Devices, and Democracy”.

vast spans of time.”³¹ He notes elsewhere that the origins of valuation begin with the evolutionary struggle to survive: valuation grows out of but is not identical to survival value.³²

Recent work on the human brain-gut axis sheds further light on an integral aspect of this dynamic regulatory process.³³ Recall the earlier description of humans as both *informatores* and *omnivores*. This means that humans take in both information and food in order to live. From a neuropragmatist standpoint, the commonsensical view that there is a fundamental difference between information and food is challenged. Both are transactional and energetic. For any organism, the ability to relate meaningfully with its environment is primary for its survival. At the literal core of an organism’s ability to do this is its internal milieu. The brain-gut axis is essential for the regulation of the internal milieu, a dynamic equilibrium that establishes the organism’s viability. Viability, I propose (without supporting argument), is the resilient coordination of precarious stabilities in CE.

Evolution created brains and nervous systems to aid in this coordinative task. This cybernetic perspective is at the heart of Dewey’s argument in “The Reflex Arc Concept in Psychology” (1896). It is also behind the pragmatist orientation in cognitive neuroscience in contrast to the cognitivist and materialist approaches. As Walter J. Freeman argues, these latter approaches presume the organism to be an inert machine upon which the environment initially acts, whereas the pragmatist views the organism as always already engaging its environment, seeking patterns that aid in its survival.³⁴ This coordination of the doings and undergoings of CE is felt by the organism because of the role of the internal milieu. Its regulation is dynamic in that it has both feedback and feedforward mechanisms.

This regulation with regard to the brain-gut axis specifically is integral to the nature of transaction. One way of thinking about the gut is that it is an opening through the torso of the organism. The commonsensical view is that the skin is the boundary between the internal and the external. The gut, from mouth to anus, both supports and undermines this commonsense. It supports it because both orifices can be closed, because the cells of these tissues are very similar to the epidermis, and because, regardless of whether an orifice is open or closed, the gut is distinct from the rest of the internal organs in that their access to the environment is not as direct – in fact, such access is often mediated by the gut. This mediation is where the gut begins to undermine the commonsense boundary between internal and external. The gut is at the core of the organism – at its innermost – yet it is where the basic metabolic transaction of energy begins: where parts of the environment are ingested and transformed for the sake of life function, leaving waste to be left in the environment. This metabolic transaction is part of larger life cycles that ideally maintain an ecological equilibrium.

Ingestion is not strictly about gaining energy but also about gaining information about the environment. By bringing parts of the environment “in” – but not all the way in as the gut still mediates between environment and other organs – the organism may learn about its environment, from where to find reliable food to where to avoid toxins. The brain-gut axis is thus vital for coordinative action; it should be unsurprising that

31) Mark Johnson, *Embodied Mind, Meaning, and Reason: How Our Bodies Give Rise to Understanding* (Chicago: University of Chicago Press, 2017), 34.

32) Johnson, *Morality for Humans*, 52–53.

33) Qasim Aziz, and David G. Thompson, “Brain-Gut Axis in Health and Disease,” *Gastroenterology* 114, no. 3 (1998): 559–578. DOI: 10.1016/S0016-5085(98)70540-2; John F. Cryan, and Timothy G. Dinan, “Mind-Altering Microorganisms: The Impact of the Gut Microbiota on Brain and Behaviour,” *Nature Reviews Neuroscience* 13 (2012): 791–712. DOI: 10.1038/nrn3346; S.J. Konturek, and J.W. Konturek, T. Pawlik, T. Brzozowski, “Brain-Gut Axis and Its Role in the Control of Food Intake,” *Journal of Physiology and Pharmacology* 55, no. 1 (2004): 137–154.

34) Walter J. Freeman, *How Brains Make Up Their Minds* (New York: Columbia University Press, 2000), 23ff.; Tibor Solymosi, “Neuroscience,” *Handbuch Pragmatismus*, ed. Michael Festl (Stuttgart, Germany: Metzler Publishing, 2018), 342–347.

there are more neurons in the gut than in the brain in order to convey such specialized information throughout the larger bodily circuit of activity.

This larger bodily circuit of activity grows into the complex transactions of humans that, at least for present purposes, I identify as culture. For the moment, however, the discussion has focused on humans' evolutionary past, our wormlike nature given the brain-gut axis, and the import of information for survival. From an evolutionary standpoint, adaptations of CE are the consequence of traits in a population that work well enough for procreation within that population's specific environment. Evolution, famously, does not require foresight. So evolution is not inherently or necessarily cognitive, as knowing is a very recent evolutionary adaptation. It follows from this that experience – after all, CE is the unit of both evolution and experience – is not inherently or necessarily cognitive. As Dewey understood all too well, the error of Western philosophy has been mistaking all experience or awareness as a knowledge affair. Experience, to put it another way, is had but rarely known.³⁵

The threat of dopamine democracy is to return human life function to nothing but a non-cognitive affair: to simply having experiences without reflecting upon them to learn from them. The more our digital devices distract us, the more tyrannical we become in that we become more and more focused on our basest appetites. But, just like Plato's tyrant, the less we know about how to meet those appetites the less able we are to satiate ourselves. We want more and more but know less and less about how to act even to achieve what we want – let alone evaluate it. This tie between information (as a potential form of knowledge) and resources (like food, drink, or sexual partner) has historically been presented along a distinction between the mind and the body. As the brief focus on the brain-gut axis suggests, however, the neuropragmatist perspective is not interested in a dichotomy between mind and body or information and resource but in understanding the continuities between them.

3.3 Continuity, Nature and Culture

The evolution of the human brain-gut axis illustrates the co-evolution of the brain and the gut and the entrenched entanglement of CE.³⁶ This evolutionary development continues with the evolution of culture. The difference between nature and culture has been characterized in Western thought in mutually exclusive terms. From Dewey's evolutionary perspective, however, there is not opposition but continuity. Understanding this continuity and its role in the regulation of CE is the next step in redressing democracy from dopamine toward creative.

According to Dewey's postulate of continuity,³⁷ there is continuity in at least three senses. First is phenotypic evolution: more complex species evolve out of simpler species. Second is ontogenetic development: within a particular organism its higher functions grow out of simpler ones. Finally, there is continuity between the interior of an organism and its exterior: there is no absolute boundary that defines inside versus out, as the distinction is functional – often made at the skin – for situational convenience. These three senses of continuity are at the core of CE. With regard to the brain-gut axis, we observe the evolution of quadrupedal animal life out of non-pedal animal life (in short, humans are worms with arms and legs); embryologically, humans begin as tubes, like the gut as well as the brain itself growing out of the neural tube into its more specialized differentiations; and, as discussed in the previous section, there is continuity (perhaps it's better to say “there are continuities”) between what is manifestly internal and external to the organism.

35) Solymosi, “Neuropragmatism, Old and New”.

36) Solymosi, “Against Representation: A Brief Introduction to Cultural Affordances”.

37) Dewey, *Logic: The Theory of Inquiry*, 29–65; Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding* (Chicago: University of Chicago Press, 2007), 122–123; Solymosi, “Neuropragmatism, Old and New,” 352–354.

Continuity is not only seen with species and within members of species. More generally, following Dewey's thought, Larry Hickman has argued that culture is continuous with nature. One reason is contrary to more traditional conceptions of nature. Namely, Hickman argues, nature is, never has been, and never will be fixed and final. Rather it is in the making, but not out of nothing. This evolution of nature has more recently led to the development of culture. Hickman elaborates the important distinction between nature-as-nature and nature-as-culture, writing:

Nature may be conceptualized in retrospect as nature-as-nature, an artifact or complex of ideas that has proven valuable and continues to provide grounds for successful action. Nature-as-nature may be, and often is, the source of romantic or mystical responses that are deeply satisfying in their consummatory moments. But nature-as-nature is nature experienced haphazardly; experienced values have not been secured because their meanings have not been worked out and linked to one another. Nature-as-culture, on the other hand, is the product of conscious attempts to extend and link the meanings of nature in ways that secure experienced values by testing them one against the other in order to determine what can continue to prove valuable.³⁸

Nature-as-culture is the result of the dynamic regulations of CE: experiences had but not known. Johnson has set this pragmatist conception of experience in recent work in 4E cognitive science and goes on to extend it to 7E (to be discussed in the next section). An important step is understanding the nature of the regulatory dynamics. Johnson draws on Jay Schulkin's work on allostasis and homeostasis.³⁹ The details go beyond the scope of this essay, but these two regulatory mechanisms are integral to the neuropragmatist strategy.⁴⁰ Johnson notes that "Schulkin uses the term 'allostasis' to emphasize that the process [of maintaining a... dynamic equilibrium] is geared not just to returning to a prior set state [what Schulkin sees as homeostasis], but also to constructing, in an ongoing fashion, the equilibrium necessary for life and growth."⁴¹ A dynamic equilibrium can be maintained by homeostasis, the returning to the same stable set point as before the disturbance (*homeo* "same"). Or dynamic equilibrium at a new set point can be maintained and achieved by novel means through allostasis (*allo* "different").

For Schulkin, the dynamic equilibrium orients the internal milieu, which includes the brain-gut axis as well as the rest of the body. But this internal milieu is not self-sufficient and requires an environment. And so, CE operates on these regulatory mechanisms of allostasis and homeostasis in order to remain and become viable in a precarious world of fleeting stabilities. The evolution from haphazard nature-as-nature to controlled nature-as-culture is an evolution from experience had to experience known. This evolution is an on-going modification of these regulatory mechanisms and the internal milieu along the lines of continuity outlined above. It is also the evolution of survival value to valuation.

38) Larry A. Hickman, *Pragmatism as Post-Postmodernism: Lessons from John Dewey* (New York: Fordham University Press, 2007), 139.

39) Johnson, *Morality for Humans*; Johnson, *Embodied Mind, Meaning, and Reason*; Johnson, *The Aesthetics of Meaning and Thought*; Jay Schulkin, *Rethinking Homeostasis: Allostatic Regulation in Physiology and Pathophysiology* (Cambridge, Mass.: MIT Press, 2003); Jay Schulkin, "Social Allostasis: Anticipatory Regulation of the Internal Milieu," *Frontiers in Evolutionary Neuroscience*, January 2011: 1–15. DOI: 10.3389/fnevo.2010.00111; Jay Schulkin, *Adaptation and Well-Being: Social Allostasis* (New York: Cambridge University Press, 2011).

40) Solymosi, "Neuropragmatism on the Origins of Conscious Minding"; Solymosi, "Against Representation: A Brief Introduction to Cultural Affordances"; Tibor Solymosi, "Recovering Philosophy from Cognitive Science," in *Pragmatism and Embodied Cognitive Science: From Bodily Interaction to Symbolic Articulation*, eds. Roman Madzia and Matthias Jung (Berlin: De Gruyter, 2016), 143–164.

41) Johnson, *Embodied Mind, Meaning, and Reason*, 32.

As briefly noted above, Johnson situates the origins of values in survival value. But he does not reduce all human values to survival value. Rather, along the lines of thought presented here, he shows how human values grow out of basic needs for food, security, sociality, and so forth.⁴² The growth of values from basic needs for all life to more specific needs for animal, mammalian, and human lives is thoroughly transactional. Through regulations of the internal milieu – beginning with our emotions, our feelings of struggle and effort for viability and stability amid the precarious – inquiry evolves. Inquiry is the deliberate and directed transformation of CE. Both organism and environment are thus affected.

Johnson emphasizes the strong parallel between this pragmatist conception of CE with recent work in 4E cognitive science. This parallel, when set in the context of the continuity between nature and culture, is integral to the neuropragmatist framework for dealing with dopamine democracy. Johnson elaborates the parallel, writing:

In recent years, this general orientation toward the grounding of mind in [... CE...] has come to be known as ‘4E cognition’: that is, cognition as *embodied*, *embedded*, *enactive*, and *extended*. Cognition is *embodied* in [the dynamic coordination of the nervous system with the body], it is *embedded* insofar as it arises from interactions with its environments (both physical and social), it is *enactive* in the way it creates meaning and thought in an ongoing fashion, and it is *extended* in the sense that we offload certain cognitive operations and contents onto (or into) aspects of our environment, such as books, computers, buildings, and signs.⁴³

I propose that dopamine democracy is problematic because, from this perspective of 4E cognitive science and pragmatism, each E is at odds with the others. This is not to say that any tension is itself inherently problematic. After all, the disequilibriums that effect allostasis can yield adaptation, evolution, and growth; but they may not. In this case, consider the example of gamers whose gaming is so extreme that they risk death. Their embodiment is put at risk because of an inordinate embedding in a synthetic situation, in which they have overextended their selves in their performative enaction. Take another example, less extreme but more familiar to more of us: the experience of using social media that distorts one’s sense of time (hours seem to go by in a blink of an eye), one’s sense of comprehension (starting to read one post leads to starting to read another and another but never actually finishing any), and one’s physical health (the inactivity of sitting, the neglect of healthy diet, the loss of sleep from the disruption of melatonin because of the digital device’s blue light screen). This cultural phenomenon, this practice of using digital devices to entertain, is detrimental to our life function just as much as a bad diet of junk food and other processed foods. Yet there are more resources for thinking about dopamine democracy that neuropragmatism affords, beginning with more Es.

3.4 Exaptation and Technology

Beyond these 4Es, Johnson lists three new ones: *emotional*, *evolutionary*, and *exaptative*.⁴⁴ Emotions are bodily states assessing the organism’s engagement with the world. Out of these assessments grow feelings, thoughts, and language. Allostasis is one such mechanism for this sort of assessment. As discussed above, the evolutionary unit is the experiential unit, CE. Finally, exaptation is “the use of evolutionary inherited traits for new

42) See Johnson, *Morality for Humans*, chapter 2.

43) Johnson, *Embodied Mind, Meaning, and Reason*, 34.

44) *Ibid.*

purposes.⁴⁵ Kevin Laland further characterizes exaptation as “a trait originally fashioned by natural selection [evolutionarily repurposed] for an entirely different role.”⁴⁶

Exaptation is the evolutionary ancestor of technology as Hickman has conceived it. Exaptation is the process of nature-as-nature-on-its-way-to-nature-as-culture, to use Hickman’s phrasing. (Given the view of continuity as a process, of nature and culture as both incomplete and in the making, there should be no surprise that there are degrees of difference along this spectrum from nature-as-nature roughly 15 billion years ago at the moment of the Big Bang to the emergence of human agricultural civilization around 10,000 years ago to the cosmopolitan information society of today.) Consider the following descriptions of technology from Hickman: “...technology ...is... an active method of generating and testing new skills, as well as reconstructing old ones”⁴⁷; “*technology [i]s a cognitive activity within the evolutionary history of complex organisms*”⁴⁸ (italics in the original); and, lastly, the Deweyan conception of technology is characterized as “*the invention, development, and cognitive deployment of tools and artifacts, brought to bear on raw materials and intermediate stock parts, with a view to the resolution of perceived problems,*”⁴⁹ (italics in the original). The reconstruction of old skills, the deployment of tools, artifacts, raw materials, and stock parts as employed by evolved organisms in the direction of their further evolution is technology. It is the deliberate direction of exaptation. It is allostatic: anticipatory of threats to on-going viability.

The evolution of technoscience – in which we should include the evolution of controlling fire and cooking, skills that are as much informational as they are dietary⁵⁰ – is the move from the happenings of thermodynamics to anticipatory bodily activities to either evade or quickly solve problems (disturbances in dynamic equilibrium of CE) given the skills and materials at hand – in other words, exaptation in a very general sense – to happenstance tool-use that opens up the possibility for technology as cognitive and deliberate inferential activity.

The luddite oversimplifies technology as inherently dangerous, so the dopamine democracy should not be a surprise. Such a view, however, is mistaken because it is inadequately evolutionary. In situating tools and techniques within an evolutionary context – by tying happenstance exaptation to deliberate inquiry into our tools and techniques in order to resolve the problems of life function – I am arguing that technology is not the problem but the solution to the dopamine democracy. What turns some tools and techniques into problems themselves is a failure of intelligence, that is, a failure of valuation, and thus a failure of education. The case of Sean Parker exemplifies the misappropriation of good science (the neuroscience of dopaminergic systems) for valued but not valuable ends (profit over justice). The penultimate step considered here is to continue situating together CE and developments of science and technology. From evolution to the brain-gut to 4E-to-7E cognitive science and technology, I now propose another E: ecological psychology and its concept of affordances.

45) George Lakoff, and Srinivas Narayanan, “The Neural Mind: What You Need to Know about Thought and Language.” Unpublished manuscript, last modified 2017, PDF, chapter 1, section 1. As cited in: Johnson, *Embodied Mind, Meaning, and Reason*, 34.

46) Kevin N. Laland, *Darwin’s Unfinished Symphony: How Culture Made the Human Mind* (Princeton: Princeton University Press, 2017), 286.

47) Larry A. Hickman, *John Dewey’s Pragmatic Technology* (Bloomington and Indianapolis: Indiana University Press, 1990), 19.

48) Larry A. Hickman, *Philosophical Tools for Technological Culture: Putting Pragmatism to Work* (Bloomington and Indianapolis: Indiana University Press, 2001), 21.

49) *Ibid.*, 12.

50) See: Richard Wrangham, *Catching Fire: How Cooking Made Us Human* (New York: Basic Books, 2009).

3.5 Cultural Affordances: Invitations and Information

The evolution and growth of CE can be further framed in terms derived from ecological psychology, namely the concept of affordances. Neuropragmatism is, as the name indicates, concerned with the brain and nervous systems. But, as its main guiding principle also indicates, understanding the brain requires understanding the body and the environment. CE is intended to capture the richness of this situated transaction in the evolution of nature and culture. Thus, ecology seems an appropriate eighth E to add to cognitive science in its entailing ecological psychology as well. My aim in this paper is to suggest how a neuropragmatist account of cultural affordances may aid us in fighting dopamine democracy. My aim in this section is to draw on the previous four steps to situate cultural affordances in this task. To do this, I first paraphrase the ecological ontology of James J. Gibson as presented by Stephan Käufer and Anthony Chemero⁵¹ to develop the transactional sense of affordances, partly as an effort to address the problem of which affordances are inviting or not. Central to this discussion is the concept of information, itself a nebulous idea. In addressing invitations, I connect Giulio Tononi's conception of information to Gibson's in order to propose that the neuropragmatist conception of inquiry and CE is able to make the valuations of information required for discerning which affordances are inviting and which are not. From here, cultural affordances are introduced as continuous with natural (or biological) affordances but deliberately produced for specific ends, which are nevertheless open to further repurposing in the technological and exaptive sense.

An affordance, simply put, is an opportunity for action. Käufer and Chemero characterize affordances following Gibson's ecological ontology. To paraphrase, perception is direct and is of information, which is ubiquitous in an environment. This information specifies affordances for an organism.⁵² Information is relational between the *substance* perceived (an object in the classical Newtonian sense) and the perceiver. Information is transmitted through a *medium* (typically, for humans, air is what light and sound travel through; but it is not strictly the only medium). The interface between a substance and a medium is a *surface*.⁵³ A set of stairs affords a human a path of locomotion between higher and lower grounds. But that substance – the stairs – does not specify such a path to an ant as its bodily orientation to those same stairs is not the same as an average human's. While there is a real world in which there are stairs, humans, and ants – that is, a world where there is the same information specified between stairs, humans, and ants – the paths available differ depending on the medium and the organism.

Prima facie, the use of information here is not difficult to comprehend. It is a relation between an organism and some aspect of its environment (that is, the substance, medium, and surface). Gibson, however, holds that information is part of the real world, independent of any specific organism. This ubiquity presents a problem for ecological psychology because any organism at any time in any environment is thus faced with an infinite plurality of affordances.⁵⁴ Yet only a few are considered, let alone taken. Käufer and Chemero present some affordances as more inviting than others but remain unclear as to how an organism distinguishes between the invitations and the uninviting affordances. I suggest that this is a problem of valuation within CE for which the above steps introducing neuropragmatism are well suited to address.

Two aspects of affordances are particularly relevant for neuropragmatism, the radical empiricism and the blurring of subject-object distinctions. Radical empiricism, as articulated by William James, has a clear influ-

51) Anthony Chemero and Stephan Käufer, *Phenomenology: An Introduction* (Malden, MA: Polity Press, 2015).

52) *Ibid.*, 156–157.

53) *Ibid.*, 157.

54) *Ibid.*, 164–166.

ence on ecological psychology through Gibson to Chemero. Its basic tenet is that relations are real and relations are primary, not secondary (so Gibson's ecological psychology is notably distinct from the commonsensical Newtonian view of primary objects and secondary relations). This view also influenced Dewey. "Dewey's radical empiricism," Hickman writes, "includes the claim that noncognitive experience is capable of grasping relations. This is very important for an understanding of nature-as-culture because it means that we can grasp what hangs together in all of nature – human and nonhuman alike and together – as features of our most immediate and basic aesthetic experiences."⁵⁵ Information makes happenings in CE adaptable without conscious agency directing the adaptation. But, as is characteristic of nature-as-nature, these are happenstance, chaotic at times, and undirected. Through the evolutionary process, valuation emerges initially through natural selection. Some affordances or the propensity toward them are weeded out; other affordances or the propensity toward them (that is, the more inviting opportunities for action) are further selected for.

CE raises further ontological questions for cognitive science broadly construed. For James – as both Gibson and Chemero have wrestled with – there is an inextricability between the subjective and the objective, such that there cannot be one without the other, implying an inherent plurality in the universe. For Dewey, this question is put in terms of experience as life function, as organism-environment interaction or transaction, and so forth, leading to Dewey's own misgivings about the word *experience* later in his career. I contend that neuropragmatism can move past these difficulties via CE. A crucial aspect of this move is situating information in our lives. As noted in the previous paragraph, the experiences had – the happenings in CE – that are not known make up the vast history of life function as well as the majority of time any human today experiences. With the evolution of nature-as-culture, however, deliberate and creative inquiry developed. This process of inquiry has been variously described as thinking, as minding, or as consciousness. The differences do not concern us here. The point is that a shift is made from mere feedback loops and anticipatory actions without symbols to symbolic processing that makes information more readily available and manipulable for further action. From neuropragmatism's Deweyan inheritance, this is the evolution of creative inquiry and experimentalism.

Creative inquiry, however, requires more than the regularities or stabilities that culture provides. More precisely, creative inquiry requires conscious attention and action. This form of minding is more than habitual; it is deliberate, it takes effort. As such, it is not something we are always doing. The majority of CE is not spent in conscious deliberation, even for humans. Conscious minding is a rare and highly complex phase of CE brought about by (often unexpected) disturbances in nature-as-culture. These disturbances create the doubts and uncertainty experienced by humans, for these are instances of wariness in the internal milieu's transaction with the world (especially along the brain-gut axis). To resolve these difficulties, to restore or establish dynamic equilibrium, deliberate and focused attention is required. This focusing and attending is informing. It is the active utilization of information available in the situation – within the organism itself, the environment itself, and within the transaction between them.

"Evolution itself," as James Gleick puts it, "embodies an ongoing exchange of information between organism and environment."⁵⁶ Just what is information then? Giulio Tononi's Integrated Information Theory of consciousness is influenced in part by both James and Gregory Bateson. For Tononi, information is "a difference that makes a difference."⁵⁷ Information is, to use James's phrase, the cash value.⁵⁸ Information is the difference that makes a difference in how the organism's transactions go within its environment. Information can be vital

55) Hickman, *Pragmatism as Post-Postmodernism*, 137.

56) James Gleick, *The Information: A History, A Theory, A Flood* (New York: Pantheon Books, 2011), 9.

57) Giulio Tononi, *PHI: A Voyage from the Brain to the Soul* (New York: Pantheon Books, 2012), 172.

58) William James, *Pragmatism* (New York: Longmans, Green, and Co., 1907).

as well as destructive; hence the necessary distinction between information as knowledge and information as falsehood (or, simply, misinformation). We say that we're well informed when our understanding of our relations within CE are ameliorative and that we're poorly informed when our opinions about such relations are detrimental to living well.

This cognitive approach, however, is not all there is to information and life function. We do not have to be consciously aware, understanding, or knowledgeable about the effects information has on our activities. In nature-as-nature, there is an abundance of natural affordances, most of which are never taken, though some are. Of those opportunities that are acted upon, natural selection takes its course, weeding out the bad choices for survival in specific circumstances. Iteration after iteration of CE yields greater complexity and more possibilities for growth. But this growth is never guaranteed, given the contingencies of the world. Nevertheless, evolution has thus far tended toward complexity and intelligence. With the evolution of neural networks, then brains, and the human brain-gut axis, ever greater coordination of the informational exchange between body and world – CE – becomes possible.

This transition, from nature to culture, includes the transition from affordances we come across that may be more or less inviting to affordances we create to invite us to new opportunities. Johnson writes, “the affordances provided by any object, person, or event are not based only on our sensory or motor capacities, but equally on our makeup as social beings with cultural habits and values.”⁵⁹ He goes on to suggest an extension “of affordances beyond physical objects and environments to include possibilities for social interactions in a cultural context. We could thus say that a certain interpersonal or social situation affords, for creatures like us with our cultural upbringing, a certain range of possible modes of response and action.”⁶⁰

I independently named such affordances, *cultural affordances*. I introduced them as “[a]ny human artifact or by-product of human activity that becomes a means of affording humans new opportunities for action... Like biological affordances, cultural ones make possible new ways of engaging the world. But they do so in a way that does not require nor does it restrict the organism to the immediacy of the merely biological.”⁶¹ Indeed, this view of affordances includes the valuation of possibilities that are aimed at cultivating invitations for enriching experience. I continue:

There is more to lived experience than active perception of one's surroundings – at least for humans. When that surrounding is a culture, filled with symbols, words, images, etc., there is a multiplication of information available for making a difference in action. But that information is only available to those organisms who have been cultivated to engage intelligently in those specific environments.⁶²

As previously discussed, intelligence makes valuations in its efforts to reconstruct CE for the better. We are born into cultures but our cultivation is not always geared to making us comfortable with the struggle of inquiry, especially with regard to critical reflection upon that culture – specifically its stated ideals and current actions. Intelligent cultivation must be explicitly at odds with incentive salience.

This cultivation, moreover, is education and technology in the evolutionary and exaptive sense. Dopamine democracy is a directed attack on nature-as-culture because it seeks to exploit (for the financial

59) Johnson, *Morality for Humans*, 95.

60) Ibid.

61) Solymosi, “Against Representation: A Brief Introduction to Cultural Affordances,” 602.

62) Ibid.

profit of the few) the living well of the many by disrupting the healthy harmony of dynamic equilibria that are characterized by each of the eight Es described here. A ninth and final E – education – is already presented. Now I consider it within the neuropragmatist framework thus far sketched.

3.6 Education: The Choice Before Us, Creative or Dopamine Democracy

With the emergence of intelligence, as characterized in neuropragmatism, the ability to anticipate and create solutions to problems before they actually arise becomes an essential feature of successful life. For Dewey, intelligence was unique to humans because of their language capacities and what that affords. Indeed, that is the motivation for cultural affordances. As numerous studies have shown, significant parts of the non-human animal world are intelligent insofar as they can communicate (though not clearly or definitely with language at the scale of human complexity), can use tools to solve problems, mimic others' tool use for their own use, and even exhibit behaviors that are at least proto-cultural. Such intelligent behavior is somewhere between nature-as-nature and nature-as-culture. To deny intelligence or meaningful experience to nonhumans is to deny evolution and information.

We must not, however, deny humans uniqueness, even if the previous characteristics thought to be unique to us never were. For the ecological niche construction theorist, Kevin Laland, what makes humans unique, including our capacity for culture, is education. He writes:

There is no compelling evidence that other apes will go out of their way to teach their friends or relatives anything at all, let alone build elaborate institutions that dispense vast amounts of knowledge, skills, and values to hordes of children with factory-like efficiency. Teaching, by which I mean actively setting out to educate another individual, is rare in nature. Nonhuman animals assist one another in alternative ways, such as provisioning with food or collaborating in an alliance, but they mostly aid their offspring or close relatives, who share their genes and hence also possess their tendency to help. Yet in our species, dedicated teachers devote vast amounts of time and effort with children entirely unrelated to them, helping them to acquire knowledge, in spite of the fact that this does not inherently increase a teacher's evolutionary fitness. Pointing out that teachers are paid, which might be regarded as a form of trade (i.e., goods for work), only trivializes this mystery. The pound coin or dollar bill have no intrinsic value, the money in our bank account has a largely virtual existence, and the banking system is an unfathomably complex institution. Explaining how money or financial markets came into existence is no easier than explaining why schoolteachers will coach unrelated pupils.⁶³

Education is information sharing, insofar as information is understood as the difference that makes the difference in acting in the world. Education is putting dynamic form to phases of CE to promote greater viability and growth. As Dewey himself well understood and as others well know about Dewey, education and democracy mutually support each other.

Laland's description of humans deliberately constructing ecological niches for teaching the young of the entire community resonates with the introductory sketch of neuropragmatism thus far and does so in a way amiable to addressing dopamine democracy. Educational institutions and practices are paradigmatic cultural affordances. In making explicit this ecological connection between education and affordances, I also note the

63) Laland, *Darwin's Unfinished Symphony*, 5.

further connections with evolution and democracy. As Laland discusses, only humans engage in education beyond immediate relations. As education itself has evolved, from being a luxury for the rich to being available to more and more people, this expansion is inherently democratic. However, it is not so simply because more people have access; it is also because the expansion is the result of critical reflection by educators and by people. As such, education is a form of technology.

Hickman notes that Dewey “regarded education as one of the most important human activities: it is the means by which children are enabled to develop their own talents and interests in ways that take into account environing social conditions.”⁶⁴ This cultivation, Hickman considers further, is ideally one in which the transactions between teachers and students is mutually informative, especially with regard to new ideas and tools.⁶⁵ Digital devices and social media are such tools. Children have taught their elders about them. Yet the education, with these specific tools, has been half-hearted because further valuation has been neglected. The revolutionary rhetoric coming out of Silicon Valley, when combined with increasingly tight education budgets for many communities, has exhibited the incentive salience Tschaepé attributes to dopamine democracy.

Years before the release of smartphones, Hickman warned that in order to avoid cultural splintering – that is, the new tribalism that smartphones and social media have effected, keeping most people only communicating with people like themselves – educators must find ways to situate the developments in science and technology in larger historical and cultural contexts.⁶⁶ Such contexts afford the informational means necessary for intelligent valuations. Without such a context, students and teachers alike become ever more concerned with simply feeding, fattening, and fornicating. As the technological exaptations become undone thanks to synthetic situations and incentive salience, the ordered richness in growth advocated by Dewey is not only stifled but regresses. Nature-as-culture devolves into nature-as-nature.

Coinciding with this risk of devolution is the duping of the people by other industries, from big pharmaceuticals to big sugar to big oil. Without the critical reflection and memory necessary for such valuation, people are not able to make the connections that Lustig makes between information, food, and social and individual health. People become incapable of wondering what a significant life is. They cease to value, let alone consider the valuableness, of free action, free expression, cultural-political activism, civility and decency, truth and meaningful communication, empathy and happiness, political and economic dignity – in brief, people become incapable of simply considering that the unexamined life is not worth living. Without such philosophical reflection, dopamine democracy can run amok, making depraved the transactions of humans with each other immediately as well as with the past and with the future (such transactions with past and future are enriched if not made possible by cultural affordances, such as books).

Such emptiness is the mark of the tyrant for Plato. Similarly, for Dewey and neuropragmatism, the uneducated, the uninformed, the unintelligent human loses the distinctiveness of culture and civilization. Only through the investment in genuine education for democracy can such tyranny be evaded. Drawing attention to this need is essential for challenging dopamine democracy. The danger of which is not merely theoretical but aims straight at the gut.

Lustig’s four Cs – connect, contribute, cope, and cook – are practical suggestions for dealing with the threat Tschaepé describes as dopamine democracy. These four Cs are complemented by the 9Es of CE as I have sketched above. In engaging in the 4Cs, being mindful of cultivating creative dynamic equilibria, we have an opportunity to act intelligently in light of what we are learning about ourselves as evolving organisms living in

64) Hickman, *Philosophical Tools for Technological Culture*, 56.

65) *Ibid.*, 62–63.

66) *Ibid.*, 63.

technological cultures, so that we may live significantly together, aware of yet reflective upon our core ideals, such as justice and democracy.

4. Conclusion: Looking Forward

If I have managed to characterize dopamine democracy such that people are not only properly alarmed but also emboldened to act, then I have been successful. If I have done more by inspiring further inquiry via neuropragmatism, then I am encouraged to keep inquiring myself. The challenge Tschaepé has diagnosed is as nebulous and complicated as it is dangerous and frightening. Further work from neuropragmatism that I could not address in the space here but nevertheless fits with what I suggest includes further pursuit of the science of consciousness,⁶⁷ consideration of the interface between brains and culture,⁶⁸ as well as neurosociology⁶⁹ and neuroanthropology⁷⁰, and dual-process theories of mind as popularized by Daniel Kahneman.⁷¹ Regardless of these specifics, the threat of dopamine democracy is a call to arms for philosophy generally and pragmatists especially.

Acknowledgements

Many of these ideas I have presented to audiences at the Pragmatism, 4E Cognitive Science, and the Sociality of Human Conduct, School for Advanced Studies in the Social Sciences (EHESS) in Paris, France, and at the Department of Philosophy Speaker Series, Case Western Reserve University. I thank the audiences for their feedback. I also thank Bill Bywater and Mark Tschaepé for their thoughtful remarks on earlier drafts of this paper.

67) For more see: Tibor Solymosi, "Cooking Up Consciousness," *Contemporary Pragmatism* 10, no. 2 (2013): 173–191.

68) Tibor Solymosi, and John R. Shook, "Neuropragmatism and the Culture of Inquiry: Moving Beyond Creeping Cartesianism," *Intellectica* 60, no. 2 (2013): 137–159.

69) David D. Franks, *Neurosociology: The Nexus Between Neuroscience and Social Psychology* (New York: Springer-Verlag, 2010).

70) Daniel H. Lende, and Greg Downey, eds. *The Encultured Brain: An Introduction to Neuroanthropology*. (Cambridge, Massachusetts: The MIT Press, 2012).

71) Daniel Kahneman, *Thinking, Fast and Slow* (New York: Farrar, Straus and Giroux, 2011); Solymosi, and Shook, "Neuropragmatism and the Culture of Inquiry: Moving Beyond Creeping Cartesianism,"

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