Human Nature and the Emergence of Social Institutions

Tom Roeper

Connecting Cognitive Science, Species Self-Knowledge, and Maladaptive Institutions

1.0 Anarchist Background

"It's not human nature that is the problem, it is institutions" Noam Chomsky has remarked several times in talks (MIT Press interview). We will explore what that comment may mean. It is a commonplace to assert that every political philosophy has an implicit (or explicit) vision of human nature. Are our institutions not in fact and intentionally reflections of human nature – of the human beings who created them?

Anarchism – from many angles – asserts the impossibility of an adequate State, hence adequate institutions, because, from one perspective, the nature of individuality is such that we do not share the same goals – we really are all different. So every institution will elicit strong resistance from those whose interests it fails to include.

This is anarchism as the ultimate libertarian individualism. And yet elsewhere in anarchist thought there are strong commitments to community, to the quest for consensus, and mutual aid in spontaneous forms of organization – like those that surrounded public outpourings of generosity after the 911 attacks, or those manifested in the Occupy Wall St movement in New York and throughout the USA, or the Black Lives Matter movement. Nonetheless, terrible problems remain. Why do societies find it difficult to let go of policies the majority dislikes – to acheive gun control when 90% of the population wants it?

Other strands of anarchism highlight workers' rights, ownership of the means of production, and an important insight that we must rid ourselves of "obsolete institutions". Here the idea is that institutions themselves are wedded to the circumstances in which they arise and they easily become a negative force when they no longer fit the population and people they are designed to govern, but leave behind powerful administrative structures.

Let us first look at some traditional anarchist views and then ask how a modern view of Cognitive Science and the biology from which it must spring can lead us to a different vision that begins to explain (somewhat) why we are the way we are and why we inevitably create the quandries and new sorts of calamities from which we suffer. In a book on child grammar (Prism of Grammar (2007)) I entitled a chapter "Who are we?" and recent work by Chomsky has a similar title What kind of creatures are we? Both titles aim to acknowledge that fundamental aspects of human na-

ture remain a mystery which we do not even know how to think about, and which apparently rational methods, such as vast domains of "social science" fail to grasp or acknowledge. Our answer – which reflects anarchism – is built around the question of how to see that creativity and the exercise of Free Will[1]should be the core of human dignity. Cognitive Science can offer us a model of ourselves which holds the promise of making this vision more explicit. Nevertheless our formulations below remain inadequate and under-articulated as well.

1. 1 Anarchist Perspectives on Individuals

Early views go back to Rousseau and his vision of man in nature. Bakunin and Marx also ruminated about where human nature fits into their view of society. Another early advocate is William Godwin who presents the classic anarchist argument that authority is against nature and that social evils exist because men are not free to act according to reason. Godwin also sketches out a decentralized society composed of small autonomous communities, or parishes. Within these communities, democratic political procedures would be dispensed with as far as possible, because, according to Godwin," they encourage a majoritarian tyranny and dilute individual responsibility."[2]

Marx himself, particularly in his early work, criticizes "the traditional conception of human nature as a species which incarnates itself in each individual, instead arguing that human nature is formed by the totality of social relations [https://en.wikipedia.org/wiki/Social_relations]. Thus, the whole of human nature is not understood, as in classical idealist philosophy, as permanent and universal: the *species-being* is always determined in a specific social and historical formation, with some aspects being biological."[3]

When Marx sought to integrate his vision of the human being into a community, he recognized a critical ambiguity:

> "[It is] ...a community to which these individuals belonged only as average individuals, only insofar as they lived within the conditions of existence of their class — a relationship in which they participated not as individuals but as members of a class. With the community of revolutionary proletarians, on the other hand, who take their conditions of existence [...] under their control, it is just the reverse; it is as individuals that the individuals participate in it. [...]"

Here again we have a sense that the uniqueness of individuals must be accommodated in an adequate theory of society.

1 See Why Free Will is real by Christian List (2019).
2 See his biography in Wikipedia.
3 *Theses on Feuerbach* (1845)

1.2 John Dewey had a positive view of human potential which he believed could naturally exist in a community that realized ethical ideals. For him "democracy is a form of moral and spiritual association "with personality as the first and final reality" with "the infinite and universal possibility within each person not for "mere self-assertion" an "individualism of freedom, of responsibilty, of initiative to and for the ethical ideal" – an optimistic view which presumed the harmony needed for a successful community and did not imagine the means of resolving conflicts. The goal is "securing and maintaining an ever-increasing release of the power of human nature in search of a freedom that is cooperative and cooperation that is voluntary"

Behind that vision of community was a view of the individual and *human thinking*:

> "human thinking is not a phenomenon which is radically outside of (or external to) the world it seeks to know; knowing is *not* a purely rational attempt to escape illusion in order to discover what is ultimately "real" or "true". Rather, human knowing is *among* the ways organisms with evolved capacities for thought and language cope with problems. Minds, then, are not passively observing the world; rather, they are actively adapting, experimenting, and innovating; ideas and theories are not rational fulcrums to get us beyond culture, but rather function experimentally within culture and are evaluated on situated, pragmatic bases. Knowing is not the mortal's exercise of a "divine spark", either; for while knowing (or *inquiry*, to use Dewey's term) includes calculative or rational elements, it is ultimately informed by the body and emotions of the animal using it to cope." (from Stanford Encyclopedia of Philosophy)

This view adumbrates the current interest in body language and "embodied cognition" (Wilson and Golonka (2013) that captures the fact that our whole body responds to our mental state even when it is largely unconscious. We blush, tremble, blink or turn away from situations, words, or possibilities whose content is abstract, like the mere sight of someone with whom we have disagreed. This illustrates that the whole body can incorporate subtle aspects of mind.

While the notion of creativity and infinite potential is clearly present here, there is no effort to actually specify a mechanism of thought or social adaptation.

1.3 Paul Goodman ruminated for years on the question of what the ideal form of community would be for individuals who each have a unique perspective and generate unique goals. He finally arrived at the view that anarchist philosophy succeeded ideally only in fact-to-face communities. It required real specific interactions among people to achieve an adequate community. Colin Ward (a community organizer) commented: "Paul Goodman brought a new invigorating stream into American anarchism, simply through his insistence that in all the problems of daily life we are faced with the possibility of choice between authoritarian and libertarian solutions . ."

What is noticeable in various anarchist works is the precision of many negative concepts (hierarchy, paternalism, authoritarianism, dictatorship, autocracy, organizational rigidity) and the vagueness of positive visions. Consider the American declaration of independence which champions “life, liberty, and the pursuit of happiness” or the anarchist doctrine of “free association among people” or Dewey's vision of an " ever-increasing release of the power of human nature in search of a freedom”. These are obviously noble and laudable goals but why are they so broad and imprecise? Why should what is essential and important to us be so difficult to formulate? Why does the word “freedom” itself seem negatively defined – it means “not bound” by anything?

2.0 Background to Modern Cognitive Science

Human Nature is the most challenging scientific quarry ever pursued. Science has always sought principles and abstractions. Many of the abstractions lay in the recognition of patterns. The great insight of modern Cognitive Science, which emerged from Russell's philosophical ruminations on what it means for a set to contain itself and then Chomsky's work on developing algorithms that would generate unbounded grammars. shows that we can specify forms of creativity as precise mechanisms formulated as mathematical rules. The further claim is that our mind uses these algorithms to generate unique sentences with unique meanings in milliseconds. In a word, these algorithms are psychologically real and serve as the foundation of modern linguistics and cognitive science.

The physicist Steven Weinberg has articulated a similar view:

> “I do think that we will have an understanding of behavior...in the path laid out by Galileo and Newton: the discovery of increasingly comprehensive mathematical laws”

And Paul Churchland in his presidential address to the American Philosophical Society shares this vision of mental representations:

> “Suppose also the internal character of each of the representational spaces is not fixed by some prior decree, either divine or genetic, but is slowly shaped or sculpted by...extended experience... So we begin by expanding the number of representational spaces, into the hundreds and thousands... And we reach out to include motor cognition and practical skills, along with perceptual apprehensions and theoretical judgment, as equal partners in our account of human knowledge.”

2.1 Humanism and Social Science

On the other hand, we have no shortage of humanistic claims about self-discovery, self-actualization, self-fulfillment, and governmental goals like “life, liberty, and the pursuit of happiness”. They are inspiring but quintessentially opaque. The scientific question “what is a human being?” is a descendant of the 19th century search for the “life force” which was eventually abandoned in favor of the highly illuminating but reductionist exploration of microbiology. Yet the core question remains and part of the answer ordinary intuition tells us – has something to do with whatever constitutes “human dignity”.

What we have come to call “social science” offers seemingly endless further reductionist accounts that seek to explain us to ourselves. They seek to explain human behavior in terms of known subsystems. They usually lead to “the goal of an organism is reproduction” or “the satisfaction of urges and desires” or 'achieving dominance” in a world governed by self-interest and competition. Or the purpose of life is a fight to survive over others with the same goal. Many of these “scientific” approaches are enshrined in capitalist thinking. They also make crude connections with mechanistic claims about biology and observeable phenomena of how we pursue food and reproduction.

Typical approaches to governmental institutions either entail reductionist views of human nature as well, or they once again enshrine ill-formulated humanistic goals like “freedom”, “the rights of man”, or visions of “rationality” (scientific marxism) as the basis of governmental organization and a justificiation for governmental power.

2.2 Democracy

The dominant tradition in the 20th century has been a vision that governments should be “democratic” as the ideal with the actual form of organization quite variable but usually linked to some form of voting. Nonetheless, the level of complexity of modern life has now led large forces, popular and coercive, to claim that the problems generated in modern society make that ideal of democracy impracticable, such as the current Chinese communist doctrine which is explicitly authoritarian.

What the future holds is impossible to know. So we should do our best to understand why institutions generate policies and programs that are both enriching of society and individuals and very threatening at once.

One question is what new dimensions of humanity emerge with technology? The internet has created a new constellation of potential human relationships – and diffi-

culties of course: how important is face-to-face interaction compared to email? Does "the internet diminish us" as Chomsky (pc) once suggested.

Chomsky has been a primary force in the modern field of Cognitive Science through the development of generative grammar, its most advanced example. He has also offered social commentary on current politics from a broadly anarchist perspective. We shall try to draw some connections between them. Basic questions remain very much alive: Why do we not understand the implications of institutions we create? Could the failure of institutions be inevitable? And are we capable of learning from failures with some legitimate optimism?

Our approach may offer insight, but no ready solutions for how to reform institutions. Nevertheless if we can identify one crucial missing ingredient, the social computational power of mind – like Mendel's postulation of an invisible gene – it might help us see where we can envision a viable future.

3.0 Cognitive Science and Recursive Rules

Cognitive Science evolved in close association with theories and mathematical formulations that enabled computer software to develop. Chomsky's formulation of Generative Grammar is the first and leading example of how creativity can be captured by a well-defined and finite system. The stunning claim was that these structures were psychologically real and a mental attribute. One example is the use of Phrase-structure-rules to generate a form of Category-recursion that is potentially infinite. It uses finite rules to generate an infinite output. Here is an example that involves potentially infinite prepositional phrases (arrow => = rewrite as, and parentheses = optionality):

1) Nounphrase or NP => Noun (Prepositional Phrase) (or PP)
   PP => Preposition (NP)

The re-appearance of NP inside PP allows it to cycle infinitely. These two rules generate the infinite loop that can produce (2):

2) the dog next to the cat next to the horse next to the alligator...

The rules work beautifully and operate in any language despite variations in word-order and auxiliary operations of case-assignment, intonation assignment, and the substantial challenge of associating a compositional semantics with the syntax. Chomsky claimed these abilities were innate and language acquisition has shown that 2yr old children exhibit virtually every one of the most sophisticated abilities we have, as we shall provide some examples of.

3.1 Children's Exhibition of Innateness

An example of generative complexity lies in our capacity to project other minds, attribute propositions to them, and embed those propositions again in syntax with recursive sentences like the nounphrases above. Two-year olds can treat themselves as having two minds as when one says (2.11 years):

3) “I thought I was lost” (from Childes)

implying that she is not now lost and can recognize both her current mind and an earlier one.

A 5yr old is explicit that her thought and reality are at odds:

4) “when we went lookin(g) for it , we thought it was upstairs but found out that it wasn't”

Or a 6yr old who said:

5) “so she knew that I thought she thought that Easter was only three days and I told her Easter was one day”

This child uses embedded clauses to represent independent mental states of herself and others utilizing a form of semantic composition that, in philosophical parlance, integrates three Possible Worlds, one in each clause, into a complex social thought. To be more specific think (I thought) takes an opaque (uncertain truth) complement which has another opaque complement (she thought) all of which is inside a “factive” complement (she knew).

The factive complement must refer to an independently true proposition, but interestingly, the true proposition contains an indeterminate opaque one. The compositional mechanics of this syntax-semantics interface has not been theoretically stated thus far. These complex embeddings are so natural for adults that we do not immediately recognize how amazing it is that a child could command them with no instruction.

The self-reflective capacities of a child is transparently clear in an utterance like:

6) 6yr old: " My mind is very angry, and so am I”

Or locutions from a 4yr old like:

7) “I thought I forgot”

which entails a previous (forgotten) state of mind that refers to a proposition in a still earlier state of mind when it was not forgotten.

These are both sophisticated syntactic and social embeddings built upon the same edifice.

3.2 Beyond Grammar: the Structure of Emotions

Now let us take some steps beyond grammar. Are our emotions generated in the same manner? Are the complex social relations that we not only experience but create woven from the same combinatorial powers that enable language to carry a precise intricacy? We generate not only unique sentences with unique meanings, but unique emotions never before experienced (like perhaps the emotion we have about holding an election within a pandemic).

If we listen to conversations we find endless complex relations described much like the "Easter" discussion, as in this artificial one:

8) "because he felt if she felt bad about him then he would feel unsure about her sister who feels that they are a perfect couple."

Where we find feelings that are generated within a web of other feelings that presuppose the existence of other ones. The architecture looks like the same kind of generative mechanism could be behind it and if so, then the feelings in fact entail propositions with logical properties. All of this says that not only grammar but the structure of emotions can be embedded and such emotional structures are available in nursery school. Moreover they can be composed, expressed, and understood in milliseconds.

The claim is that these capacities are not only available to what one can call "slow thought"[4] where complex rumination occurs, but it is also part of a mechanical mental system for generating complex objects in milliseconds. Another case: physical activity entails the same dimensions of creativity. For a basketball player to plan moves that involve feinting, dodging, and throwing in one complex motion is much like the complex emotions we just alluded to.

3.3 Social Creativity

Now we can take a further step. If human beings are capable of linguistic and emotional creativity, then social creativity is the next obvious mental projection which humans can project where we embed social relations inside of each other:

9) [town [school [class [friends]]]]

and we can project emotions that systematically build up our perspectives by embedding them inside of each other. This is a crude picture, but it entails pivotal connections that we use to construct emotions, attitudes, and plans, again with self-embedded structures:

4 Kahneman (2011) for an economic view, see also Roeper (2007) for a linguistic perspective.

10) [Situation 1 [Situation 2 [Situation 3]]]
[Situation1: Individuals – emotional connection- organization
[Situation2: Individuals – emotional connection- organization
[Situation 3: Individuals – emotional connection- organization]]]

And we may have emotional algorithms that can create a composite – a version of semantic compositionality – that can combine these emotions in a logical and transparent way that enables us to generate propositions with cause and effect logic. We formulate sentences that mirror the emotional pattern of situations like:

11) the students reacted negatively to the half-hearted teacher's directions which were a reflection of poorly thought out new school policies created to fit overcrowded conditions created by local government reactions to restrictive budget policies.

And we can generate an emotion to cover the complexity: “the situation was disheartening”.

Computation across complex kinship relations are known to be unusually complex from numerous anthropological studies. Cultural patterns and norms presumably vary in much the same way, for instance, the structure of caste systems must be taught to children in order for people to calculate how policies work. Although they have arisen through complex historical circumstances, they contribute to a unified conception that are the basis for further social thought: programs, policies, and systematic political thinking, and familiar organizational charts. In many respects the charts resemble complex sentences with units, subunits, and defined interactions.

Thus we have government bodies, with committees and subcommittees and the defined transmission of modified information (reports from the chairman) from one level to another, much like a question word is fed from one clause to another [what did this committee say their subcommittee claimed the expert said__]. Members of those bodies can, because they have a social imagination “think” in terms of these units and subunits helped by a thought-syntax similar to question sentences. Nonetheless, of course many arrangements are not captured by hierarchical structures. How does our social imagination work? Are there limits on social creativity?

How well do we compute the impact of a new idea upwards, downwards, and sideways or in terms of discontinuous social units?

Although preferred metaphors for social organization have often been biological over the centuries – we hear about the “branches” of government – modern science has turned to the mechanical models which physics introduced (the Chicago “political machine”).

Our hypothesis is that our social imagination – whatever its ingredients – has algorithmic computational powers like the rest of our mind. We are capable of projecting unique social relations across unique dimensions. One might observe that Zoom meetings held with participants around the world are generating unusual new social patterns in our minds which dictate both words and actions. Why is remote teaching a challenge? It is because it calls for subtle configurations of social relations, different for nursery schools and nursing homes, that we do not yet know the best ways to "think" in.

4.0 Independent Evidence of Universal Perspectives and Awareness of Community in Children

Does the structure of language reveal our biases toward community? The deepest reflections of mental attitudes lie in automatic assumptions – particularly those embedded invisibly in our behavior.

A powerful example lies in the interpretation of unpronounced subjects of infinitives, Children as young as 1.9 years use infinitives ("to have") linked to ("Mom") the subject of going:

12) "mom going to have tea"

These invisible subjects vary systematically, but they always include a more abstract option with, I argue, a community connection. It has never been observed before, to my knowledge, to have political implications. In technical terms the invisible subject is called Pro-arb, which means an "arbitrary pronoun", but the term may hide an important reality about how we think not just for ourselves but for and about everyone in the details of life. Consider these sentences which entail a Universal perspective on action and therefore entail the capacity to view the world through a generic notion of (for) *everybody*:

13) a. it is good to get exercise [= good [PRO-arb to get exercise]
    b. it is easy to ride a bike
    c. it is unwise to ignore the weather forecast

PRO-arb has a systematic interpretation is as a universal generic reference: anyone or everyone. It is evidence of an automatic innate political bias to conceptualize situations from a universalist perspective. It seems to presuppose an egalitarian posture because it entails a typical, generic human being. If that is true, then Everyman famous in Medieval literature, is a concept available to all human beings, even 2yr olds, without explicit instruction (and minimal inference from situations).

Note that it is not totally open, it refers to Humans:

14) a. it is not good to eat dog food

Obviously this is not true if the subject were a dog. And we can overtly modify it:

b. it is only good for dogs to eat dogfood

Or it can be modified to a subgroup:

c. it is good for children to go to bed early

although it can involve even more abstract expletives as in:

d. it is going to rain.

Again it is found among 2yr old children who use adjectives like "easy" or "hard" with implied complements that have a universalist PRO-arb subject even before they command the syntax of infinitives which vary from language to language. "easy" shows up with 1.7 yr olds and often with 2yr olds:

15) 2.1 "easy"
2.5 "that is easy"
2.8 "because it's easy"
2.9 "it's not quite easy"

It seems to contain a hidden complement: easy/hard to do, which means exactly easy for anybody to do.[5] And the infinitival complement can be present too at the age of 2yrs:

16) 2.5 "that's hard to do"
2.5 "it's hard to open"
2.7 "hard to get in"
2.8 "hard to take it out"

Or in this conversation:

17) Adult: he couldn't take it apart
Child: Why? It's hard to take apart?

This universalist perspective is the exact opposite of the Piagetian claim that children are "egocentric" and only see things from their own point of view. Studies of all kinds of empathy from 2yr olds suggest the opposite as well.[6].

5 See C.Chomsky (1969) for original experimental evidence and Roeper (2016) for experimental evidence on PRO-arb readings in anti-pragmatic environmentst. ("is it easy to eat the tops of trees? "yes, if you are a giraffe").

6 see https://psychcentral.com/lib/how-children-develop-empathy/.

4.1 Overt Universal Quantifiers

It should be no surprise that children easily acquire overt words like everybody or with their own creativity “all-body”, or “nobody” and “anybody” Again the term is compatible with the notion that there is a proto-sense of community entailed.

18) 2.10 that scares everybody
    2.2 I want show allbody...everybody my puppy
    2.2 everybody don't like the fan
    2.5 everybody can't hit me.
    3.5 and everybody can do it too

Nobody:

19) 1.10 “nobody”
    1.1.11 “and get diapers for nobody”

    2.4 nobody take my cheese away
    2;10 nobody's gonna get the blocks.

    2.8 “so nobody can get in”
    2.10 “not for nobody go in”

20) Anybody:
    2.10 “not let anybody in this house
    2.0 “anybody can put it away”
    3.0 “anybody didn't do it”

The variety of terms suggests that the child has easy access to both inclusive (everybody) and exclusive (nobody) terms where the child or a group can be not included, but no one else:

21) 2.5 “nobody can eat our food, but ourselves”

This remark from a 4yr old (Roeper diary, Maria Roeper) clearly alludes to universality:

22) “I love everybody, even that I don't know”

The rudiments of political conceptions can be found in very early grammars. And to hammer home a claim that runs against popular thinking born in academic work: these utterances are clearly not governed by ego-centricity, but more than that. They involve social and ethical reasoning from a general point of view. Another clearly universal case:

23) “ everybody sleeps at night”

4.2 Fair

And social words that contain complex egalitarian judgements also exist, entailed in terms like “fair” again found with 2yr olds, which may seem elementary but any philosophical examination immediately reveals that they entail a complex interaction of morality and aesthetic proportion.

24) 2.6 “it's not fair”
2.8 “not fair”
3.3 “that's not fair”
3.6 “that's not fair”

4.9 “that wouldn't be fair if only girls had diarrhea”
4.6 “it's not fair to boys”
4.8 “next time I'm gonna make it fair”
4.8 “I'm just trying to be fair”

While what lies behind a term like “fair” remains a topic of vigorous philosophical and legal debate, its core meaning is instantly recognized because, we argue, it is a part of innate knowledge of social relations that may be as easily connected to concepts as the equally complex word “mama” (although it is true that “fair” is much more common over the age of 3, which is still younger than many people think children have such notions).

4.3 Referential Systems and Cooperation

The intricacies of syntax and semantics with pronouns provide a substantial challenge for children. They can misunderstand him as himself and himself as him. But a more interesting error which was discovered in work by Green (2008) and (Gulzow (2011) in experiments with children and their bias toward symmetrical readings of reciprocals. It is found with empty objects in English:

25) the boys are fighting or pushing

where they receive an implicit “each other” interpretation. In many languages like German a simple reflexive, like sich, can also be a reciprocal. In experiments in English and German, we found that even unambiguous reflexives (they kissed them-

selves) were interpreted reciprocally (they kissed each other) for a number of verbs like:

26) wash, shave, hug, kiss

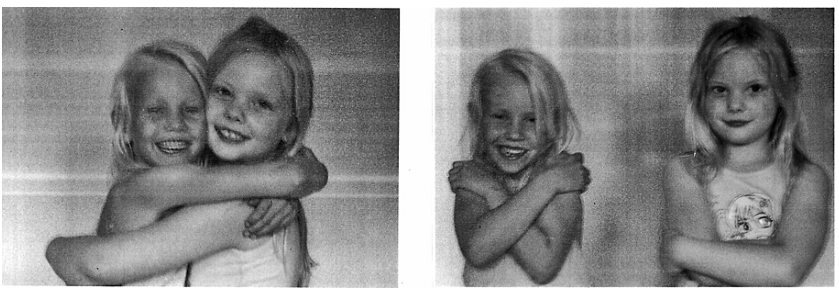
that is: they hugged, they hugged each other, and they hugged themselves or in German sie umarmen sich selbst, were all interpreted with a strong bias toward the reciprocal reading among children, but not adults, who differentiated the meanings. That reciprocal bias exists for adults for a verb like kiss: it is possible, but odd to say he kissed himself. The opposite bias exists for wash: they washed themselves is naturally interpreted distributively (each washes himself).

In both English and German experiments we found errors were all in the direction of taking a reflexive [themselves, sich selbst] as a reciprocal, with little effect for lexical bias:

27) English:
26 children, 3- 5, 13 adult controls.
Age Group 1 3;0 through 3;11.
Age Group 2 4;0 through 4;11.
Age Group 3 5;0 through 5;11

only 22% of three-year-olds chose the reflexive picture for verbs *shave, dress,* and *wash*, *hug, kiss* when given both alternatives and instead they preferred reciprocal over reflexive readings. Thus they took picture A over B for they kissed, washed or hugged themselves (Gulzow (2011):

A *B*



HUG

wash

The bias was always toward the reciprocal reading (A) and not the self-referential reading (B). The so-called reciprocal is most often really a joint reading or it is called a symmetrical reading (Gleitman and Partee (UMass talk)). We prefer the "joint" description because it fits the claim that a notion of cooperation, critical to anarchist theory, has innate psychological roots.

4.4 Collective Reading

There is a similar bias toward the collective and away from distributive readings for children. If you ask them to "circle all the turtles" in a picture of turtles, they will at first put a circle around the whole group, not the individuals. And in general the word all is one of the first acquired as in "allgone" in English and "alle" in German.

In sum from a variety of perspectives we have seen that social attitudes are built into language vocabulary (everybody, fair) but also formal structures, (Arbitrary PRO control) and reciprocals in a way that suggests innate social biases and not intricate concept learning.

What this indicates is that it is arguable that the ingredients for egalitarian social philosophy are inborn and natural. They are compatible with early Marxist views but not with his claims about "historical materialism" which veers away from a cooperative vision with innate roots.

While modern psychology has extensively defended the notion that children are ego-centric and self-interested much like a capitalist view of human nature would expect, a close look at the language of 2yr olds has shown that the acquisition of concepts that are oriented toward community and equality are available without explicit instruction at a surprisingly young age.

This optimistic view of human nature does not deny other biological capacities that run in the opposite direction and produce conflict: self-defense and hoarding of resources. Most of civilization suggests that the impulse toward egalitarian principles is the stronger one.

It may be that it is precisely in the intricacy of complex institutions that unfairness seems to have a much too secure haven. Then they become a threat to us. This situation is, to invoke a common metaphor, why we say "watch out for the small print" in contracts. It is there that less generous and less egalitarian goals find a home.

5.0 Biological Background: the Missing Dimension

We have argued, essentially, that all rapid computation must have a mechanical basis like the generation of sentences. It is not only sentences and their meanings, organization of physical activity, but also our emotions and conceptualization of our social environment that participate in virtually instantaneous computations through generative rules. These are all essentially innate.[7]

Modern biology – working from its reductionist perspective – has a view of evolution which dominates the field (as far as a non-specialist can tell). The idea is that mutation is random – although this is mathematically dubious – and each new organism succeeds if it fits into some unoccupied environmental niche in nature. Unanswered in this perspective is why evolution persistently creates ever more complex creatures with new and unusual powers. Consider now a radically different perspective which runs absolutely against the survival-of-the-fittest doctrine and the ethic that goes with it. We argue that the Cognitive Science perspective that promotes well-defined algorithms of creativity also entails the notion of expanding environments via generative processes. That extension includes the projection of new Possible Worlds in the mind – and its consequences – like the existence of virtual worlds through the creative capacity of computers. We need to see these steps as logical consequences of an enriched theory of evolution.

We argue that biology follows principles like those in physics and has goals that are not reductionist. We suggest that simple observation is compatible with the view that the goal of evolution and the persistent mutation toward greater complexity is:

7 See M. Hauser and J. Watumull (2017) who consider a theory of a Universal Generative Faculty in a similar vein to apply to all thought. If there are domain-specific constraints on the formulation, for instance of Category-recursion, then it can explain why many properties of recursion are not found in animal languages.

28) Freedom from the environment.

In other words, organisms evolve with ever-greater powers of motion to:

29) Escape their environments

No doubt determined scientists can redefine "environment" to capture this observation as if 29) means "compatible with environment". Nevertheless the intuition that we are not bound by our environment should be clear.

This is the opposite of the claim that organisms mutate in order to fit a small "niche" in their environments, hopefully safe from the aggression of other organisms. We think that freedom should be the pivotal concept here – not environment nor the role of other creatures.

There are hints of this perspective in political discourse. Lyndon Johnson in his graduation speech in Swartthmore College (1964) said that "the truth is, far from crushing the individual, government at its best, liberates him from the enslaving forces of his environment".

One biological story after another suggests that organisms evolve to be free of environmental constraint. Ambulatory fish migrated onshore and occupied the earth. Dinosaurs turned into birds, evolved wings and the capacity to fly, which means to fly from their nests to anywhere. Monkeys jump from tree to tree.

Overt biological evidence exists as well – neurologists can explain everything about motion but the voluntary aspect – what enables us to decide to do something. This has been pointed out by two MIT neurologists Bizzi and Adjemian (2015) who observe that they can explain every detail about how one moves a finger – what is co-ordinated, how electrical impulses carry instructions from the brain, but one ingredient remains a mystery: the "voluntary" part, the *decision* to lift a finger. The fact that it is exercised in milliseconds means that we must ultimately assimilate the voluntary (Free Will) part to biology in a mechanical system. The idea that free will is present in microseconds means that it belongs to the realm of "fast thought" in the terms of Kahneman. Slow thought – how to decide who to marry or where to go on vacation – is another free will mystery, which our approach might also eventually address, but it is not done in milliseconds. We intuitively prize our free will and hold the belief that it is essential to our notion of responsibility and the core of human dignity.

From that perspective, occupying a "niche" in traditional biology misses the essence of what organisms are up to, while the exercise of Free will is the key to human dignity and those concepts like "self-fulfillment". Christian List argues in a compatible vein [(Harvard 2019)] that a supersystem allows personal Agency to play a role when selecting between alternatives and that agency is real and not an illusional epiphenomenon of a deterministic body. He extends a traditional philosophical perspective which we intend to push a step further.

In sum, we suggest that our biology has purposes, a teleology which includes: the pursuit of freedom. This statement lacks the mechanical precision, which would be desireable, but it still lies within the realm of mechanical creativity championed by Cognitive Science. We can make a further claim about teleology: Freedom is a path to Knowledge.

5.1 Species-Identity and Creative Freedom

We can now ask a further question: how does this affect humans and perhaps animals as a species?

We have argued above that organisms have a self-conception which includes the society of which they are a part – so evident, for instance, in the organization of ant colonies. And we claimed that it was present in the earliest uses of grammatical devices like PRO-arb for the unspoken subjects of infinitives that can assume the role of anyone or perhaps everyone.

Once again, the fact that we can exercise Free-Will in micro-seconds means that there must be an explanation at the mechanical level. Let us suppose that it is not quite so mysterious: it is another version of the recursive system that generates sentences, but now at a level up, which is in part what computational theory is about. It is, to seek a new metaphor, what automatic programming or meta-programming is like which is the theory that allows a program to generate new programs by treating a program as just another object in a generative system. It is not in principle a system of a different kind, although we might be wrong here.

Thus we can generate new theories of ourselves by taking whatever system we have generated as an object of the same kind. Grammars generate a set of sentences and a higher system that then generates a set of grammars in the same way, and a yet higher human system that can imagine these systems. This is probably wrong, and certainly too simple, but it may not disturb the further edifice I would like to build over it.

If we invent a new system which generates outputs, like a system of voting that generates a set of representatives, we then generate a set of consequences many of which are unanticipated. The representatives have their own motives and dynamics beyond those of the voters. It is in the nature of generative systems that we have only an abstract sense of what they can generate but not a reliable system to see their consequences when they encounter a novel environment. That is, we can generate sentences of unbounded length which therefore have unique meanings whose character we do not know in advance.

These generative outputs interact with a world – an environment – which we do not understand perfectly. They will generate unanticipated consequences (For in-

stance, like the fear over Y2K that made many people afraid that innocuous dates in the programs of many systems would fail in the year 2000 and many dependent systems, like airplane flights, would then crash). Thus we claim that the consequence of creativity is:

30) Every system or action engenders unanticipated consequences

We can then recalibrate our goals as we see the output of our actions, including their unanticipated implications and consequences. We are aware that we necessarily do not understand the implications, the full consequences, of our actions, because they are an inherently unanticipateable side-product of an infinite system.

5.2 Unintended Consequences as Species Education

Our societies are built around interpersonal actions which carry both carefully conceived intentions and an awareness – because we are dealing with other minds that have the same freedom – that we cannot anticipate consequences beyond a limited degree. If we give a birthday gift, we calculate that it will surprise and gratify the recipient, but we must wait and see how another free person reacts in order to know. And the interpersonal event, the moment of discovery of the unknown consequence, gives "meaning" to the experience. All of our actions – the result of a higher-order Free Will – has this mystery and then discovery as part of its purpose. In effect, every act is an experiment leading to new knowledge.

This is formulated in humanistic language, but a real scientific claim is being made. Actions have unanticipated consequences that teach us about the free variables in the machine – teach us about ourselves. From this perspective the teleology of life is self-knowledge.

Life then consists of small experiments, delivering new knowledge, via actions designed by Free Will, with both intended and instructive unintended consequences.

In sum, every action is a source of self-enlightenment about who we are individually. Now we propose an extension that is part of the biological teleology:

31) Every action reveals who we are as a species.

So we, quite sensibly, learn about the power of any system by seeing what it does. Can this get us from the domain of individual freedom to a point where we can address the emergence of new institutions? The ancient adage "know thyself" may contain not only wise advice but an implicit engine of both individual and social growth, that is, collective experience provides a form of Species-self-knowledge which is gratifying to know.

Now in effect we argue that Creativity is a source of Explanation: self-realization leads to self-knowledge which leads to species-self-knowledge.

Unanticipated implications are then a form of explanation of the system that generates the implications. Consequences are explanations of the greater power of free organisms in miniature. Actions provide explanatory insights into human nature that constitute forms of collective self-discovery.

We see self-knowledge itself as a goal for a society. At the material level, if we generate new environments, as Climate Change has begun to do, we will always need the Creativity to cope materially with the consequences of our actions. We have succeeded in going to the moon, climbing mountains, and socially integrating other cultures, or failing to do so, creating plastics for ever-new purposes. And we generate utterly unanticipated consequences: oceans full of plastic waste, turtles with plastic straws in their noses, and pollution from almost every handy invention that endangers us and our children. There are many paths to self-destruction (like nuclear weapons) but while unanticipated consequences are inevitable, neither our success nor failure to surmount them is inevitable. The fault is not in human nature, nor are our imperfect institutions at fault for being inevitably inadequate.

Over time new systems reveal undeniable improvements in social welfare and organization of material existence – which became the focal point that Marx pursued.

Traditional anarchism argues that:

32) (1) individual diversity means that there is no ideal system for everyone.
    (2) that each new system may apply to a specific set of historical circumstances, and therefore over time becomes obsolete and therefore requires a new system.

The argument here is that new forms of social organization are independently successful or failures not simply in terms of their efficacy for particular situations, but for the sense of community success that they create as a result of their originality. Consider sports. A new pass play in football that leads to a winning game is independently gratifying even if the game could have been won with old pass plays. Or elections: The introduction of rank-ordered voting may not change the outcome of many elections, but it is a gratifying success because it seems to be a superior form of democracy, an example of "a more perfect union" as it says in the US constitution.

The computer revolution and the existence of virtual worlds both enrich and diminish our experiences – compared to the face-to-face world that Goodman advocated. Computers, via social media, offer a source of new forms of human organization and communication, as well as profound dangers, which are not automatically positive or negative. The fact that a programmer can imagine the positive effects on society of his program provides a knowledge-based source of satisfaction which now

motivates thousands of programmers. The individual is in effect partaking of a collective experience, and the scientist who discovers a new vaccine does the same, so species-knowledge can profoundly penetrate and fulfill our personal experience. We are each other. The introduction of a new level of social self-knowledge for society – in our view an expression of biological teleology, is a much richer and humane goal than traditional notions of reproduction or self-preservation.

5.3 The Inevitability of Institutional Failures

Now let us return to the question of why institutions so often fail us. The serious downside of these ruminations is that new forms of social organization will always outpace our capacity to understand their unintended consequences. There is a doctrine that that we are a "failed mutation" because the species may self-destruct from unanticipated or poorly anticipated consequences, like much of what has happened during the Coronavirus pandemic.

While our minds operate in milliseconds, our social constructs rarely do. The speed of our inventions, planes and computers, quickly create consequences which cannot be democratically absorbed and evaluated. Much of what we value highly calls for rumination or "slow thought" which in turn must be shared through discussion in order to achieve mutually sought and cooperative goals. The speed of technology is, in a sense, inherently anti-democratic.

Can we grasp this consequence of our creativity and reverse it so that there is room for the evolution of a culture that does not take precipitous action? It is definitely possible that we can succeed and certainly possible that we can fail. A recent call for a law that would prevent any president from launching a nuclear weapon alone – without consent from other societal representatives – is an obvious move in this direction. It is a form of unilateral disarmament because it would mean that if weapons were already launched against a society, it could not react quickly. Countries that have renounced nuclear weapons experience a form of societal self-knowledge that other countries do not have.

The failure to grasp or anticipate the consequences of creativity are true for animals as well as humans. That notion follows from the fact that the environments in which creativity occurs are never fully knowable in advance. An animal that is caught by a trap has the same experience of an unknown territory as we do by our invention of nuclear weapons. Animals perform experiments as well, deciding if other animals (like humans) are trustworthy or should be avoided. Such experimentation, and then knowledge, is part of the animals' teleology.

It entails some form of Free Will as well.

Many have also pointed to the fact that the earth will not last forever. That is not a fault of humans and our efforts to seek other civilizations in the universe show our efforts toward surmounting those dangers. Others have placed their faith in the astonishing "innovation" modern economies have exhibited – and yet there is nothing inevitable about their continued success either.

6.0 The State

The State is a conglomerate of institutions and the source of enforcement power. Therefore it is an institution of a different order – one toward which we must be wary and imagine methods to protect ourselves. Typically states are either overpowerful or immobilized by the gridlock of opposing forces.

Here is where the anarchist approach to freedom of association and movement becomes important. Either liveable compromises or independent communities must be sought. The notion that our societies will be dominated by neutral spaces is unlikely.

Personal liberty can be obtained in many ways and often is. Once again, it is the creative power of algorithmic thinking in the social sphere which may allow hitherto unimagined forms of organization which provide both solutions and the psychological satisfaction of social creativity. These formulations, like many in this essay, remain vague and unsatisfying because there is no deeper formula for a peaceful and prosperous society. Marx's sensible goal of a rational theory of society seems attractive, but with human creativity always producing more unintended consequences, it is both unrealistic and undesireable.

The perspective we have advocated here – a view of human nature that includes awareness of society and community from the earliest years in children's lives – and accepts that our fundamental mental creativity has consequences we cannot easily control, should be seen as a reality and not a criticism.

Instead of expanding current institutions, we are in the process of creating a galaxy of new informal institutions which exhibit gargantuan new powers in the form of online communities, online monitoring, and even new financial organizations (bitcoin). These as well have both positive and malevolent capacities.

What is a possible goal of this evolution? It is that we establish a community of institutions that voluntarily work toward co-operative action, To do that we will have to fire up our institutional imaginations, not deny the necessity of organization, as some who are often called "anarchists" from a rightwing perspective are tempted to do.

If we can prevent environmental catastrophe, then a culture for a community of institutions can evolve through our extraordinary new communicative capacities. The UN is a first example of this kind of effort since it largely organizes but does

not really control its members. It is rare that one encounters someone in favor of a complete "world government" with absolute enforcement powers. At a macro-level the UN experience demonstrates that voluntary cooperation must be the goal of a community of institutions.

It is clear that one-man-one vote democracy cannot work on a global scale. We cannot have an election for president of the UN with 6 billion voters speaking several thousand languages. Nonetheless intermediate forms of democracy are very possible. The current UN is an experiment with many failures as well as successes. Its overpowerful Security Council is perhaps a lesson in how not to organize a community of institutions.

The Black Lives Matter movement has spontaneous leaders, but not elected ones. Will it work? It is an experiment whose consequences we must still appraise.

6.1 Conclusion

In sum we have argued that all organisms have a teleology. It is a teleology that leads to increased complexity and mutations that allow Free Will and seek freedom from the immediate environment. This freedom then creates the opportunity for mental, social, and physical creativity, using the kinds of mechanical algorithms that are the heart of Cognitive Science. Such creativity can apply to its own output – often called recursive operations. Systems with infinite generative capacity inevitably generate unanticipated consequences, good and bad, which both instruct us about ourselves as a species and lead to new systems.

A constant effort to create new social organizations provides not only self-knowledge for individuals but a kind of social self-knowledge for societies which is independently fulfilling for individuals and communities. And it creates dangers that we are confronted with every day via unintended consequences. Yet it is even more dangerous if the world community loses faith that there can be an eventual world order that has room for everyone to prosper.

Acknowledgements: thanks to Noam Chomsky for laying the groundwork in both Cognitive Science and social commentary for this easay, and for relevant personal communication over the years. And to Günther Grewendorf for providing a forum where the larger social implications of Cognitive Science are welcome.

Also: Manfred Bierwisch Jill devilliers, Bart Hollebrandse,Wolfram Hinzen, Steven Pinker, among many, many others all provided stimulating perspectives, although they might not recognize any connecctions in the text..

There are other real sources in my education, family history, and career as a cognitive scientist doing linguistics and language acquisition.

These include my grandparents (Max Bondy) and great-uncle (Curt Bondy) who were leaders of the Jugendbewegung in Germany in the 1920's (a part of the Socialist Party Jungsozialisten). They created impressive democratic communities (Schule Marienau, Gross-Breesen, Windsor Mountain School, and the Roeper School). Their progressive educational philosophy contained the seeds of this approach to Cognitive Science, where individuality, Free Will, and systematic unconscious computation have a basis in sophisticated views of the human mind.

They and other institutions like them prove that communities that follow the essence of these principles can and do exist.

Bibliography

CHILDES (Child Language Data Exchange System) ed. Brian MacWhinney, 1990 Carnegie-Mellon, https://childes.talkbank.org/

Chomsky, Carol, 1969: The acquisition of Syntax from 5 to 10, MIT Press

Chomsky, Noam, 2019: MIT Press interview "On Language and Humanity: In Conversation With Noam Chomsky", https://thereader.mitpress.mit.edu/noam-chomsky-interview/

Chomsky, Noam, 2016: What kind of Creatures are we? Columbia University Press, New York

Dewey, John, 2000: entree in Stanford Encyclopedia of Philosophy (1995) Wikipedia

Hauser, Marc and Jeffrey *Watumull*, 2017: The Universal Generative Faculty: The source of our expressive power in language, mathematics, morality, and music, Journal of Neurolinguistics 43, DOI: 10.1016/j.jneuroling.2016.10.005

Gleitman, Lila and Barbara *Partee*, 2020: UMass talk on symmetrical predicates

Godwin, William, 2000: entree in Stanford Encyclopedia of Philosophy, Wikipedia [https://en.wikipedia.org/wiki/William_Godwin]

Goodman, Paul and Perceival *Goodman*, 1990: Communitas: Ways of Livelihood and Ways of Life. NY: Columbia University Press/Morningside.

Gulzow, Insa, 2011: ms. Acquisition of Reciprocals in German, Leibniz Institute (Berlin)

Green, Danny, 2008: Acquisition of Reciprocals in English, UMass Honors Thesis

Kahneman, Daniel, 2011: Thinking, Fast and Slow, Farrar, Strauss, and Giroux, Macmillan, New York

List, Christian, 2019: Why Free Will is real, Harvard University Press, Cambridge, Mass.

Marx, Karl, 1848: Theses on Feuerbach, Progress Publishers, Moscow, USSR.

Roeper, Tom, 2007: The Prism of Grammar, MIT Press, Cambridgee Mass.

Roeper, Tom, 2016: "Propositions carry implicit arguments with a general point of view" in Subjective meaning: Alternatives to relativism (2016) eds. Janneke van Wijnbergen-Huitink and Cecile Meier

Weinberg, Steven, 2001: The future of science and the universe, New York Review of Books 48, 18

Wilson, Andrew and Sabrina *Golonka,* 2013: “Embodied cognition is not what you think it is” Front. Psychol., 12 February 2013 | https://doi.org/10.3389/fpsyg.2013.00058