

The Genesis and Evolution of Concepts Within the Evolution of Cognition: Reflections on Concepts in the Context of Merlin Donald's Work on Cognitive Evolution

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1 Introduction

No truth appears to me more evident, than that beasts are endow'd with thought and reason as well as men. (? , p. 126)

Humans are undoubtedly unique in their spontaneous invention of language and symbols; but, as I have argued elsewhere. . . our special advantage is more on the production side than on the conceptual side of the ledger. Animals know much more than they can express. (? , p. 185)

I will, perhaps controversially, begin by taking concepts to be units of structured thought, where "structured thought" is roughly any thought that meets Gareth Evans' Generality Constraint on systematicity and productivity (?), on what I take to be a standard reading of Evans. This means that concepts can be deployed *systematically* by an agent across many different contexts without substantially changing their meaning; and a finite set of them can be used to produce a potentially unbounded number of complex concepts and, in linguistically capable agents at least, propositions.

Concepts require an agent: i.e., they cannot exist independently of an agent actively possessing and employing them; and they likewise require something (such as an abstract or physical object, an action or event, or a property) to be about: i.e., they are always attached to some aspect of the experienced world. Putting this another way, their syntax (structure) cannot be separated from their semantics (meaning), a position endorsed by Peter Gärdenfors (?) in his conceptual spaces theory of concepts (and one that, as he notes, is anathema to the Chomskyans).

Concepts are, in Kant's terms, *spontaneous* as opposed to *receptive*: that is, they are part of the agent's active intellectual engagement with its environment; they are under the agent's *endogenous control* (?). On the one hand they are identifiable as concepts to the extent they are relatively stable across time and contexts, and on the other, they are useful only to the extent they are amenable to change as circumstances change beyond their original scope. This latter point is the most controversial (perhaps the only controversial one among the set I have listed) but is consistent with e.g. Gärdenfors' (?) and Prinz's (?) accounts.

It is not enough to talk about the properties of concepts; one must talk as well about how they are used: what role they play. I would suggest that concepts are the means by which certain agents are able to establish reliable patterns in their perception, patterns in those patterns, and so on, at increasing levels of abstraction away from the base level of perception. They allow the conceptual agent to step back from strict experience-in-the-moment to take a wider view, seeing the present moment and context in the light of previous ones and others yet to come – an idea we can find in e.g. (?) and echoed in many places since.

1.1 Putting (Theories of) Concepts Into Context

It is as unwise as it is common to talk about the nature of concepts in philosophy of mind without considering both the advent and the evolution of concepts: i.e., the genesis of conceptually structured thought from its nonconceptual origins, and its development from that point forward. When these matters are considered at all, it is usually in the context of the individual conceptual agent and not the species. Yet unless one is prepared to grant conceptual abilities to even the simplest organisms, at some point conceptual genesis must have taken place; and unless one believes that all conceptual abilities are equivalent, some account must be made of the way conceptual abilities, if not concepts themselves, change.

Such discussion is, I believe, overdue for a number of reasons. Like other advocates of so-called “animal concepts” (e.g., (??)), I believe there are good grounds for counting many non-human animals as conceptual agents, or as existing within what John McDowell calls (following Wilfrid Sellars) the “space of reasons” (?). That is to say, conceptual thought in its simplest form appeared earlier in evolution than humans did – possibly much earlier. At the same time, there are aspects of human cognition in general and conceptual abilities in particular that seem quite distinct from other species. Without a proper discussion of how conceptual abilities first arose and how they have evolved, it is too easy to limit conceptual abilities arbitrarily to the human animal and to miss an important part of what non-human and human have in common.

Closely related to this is the relationship between concepts and language. Many philosophers seem inclined either to stipulate that concepts require language – a position I find not very interesting – or to take it as a matter of empirical fact that there are, to date, no credible instances of concepts without language. I believe that e.g. Sellars (?), McDowell (?) and Jerry Fodor (?) take the latter view without doing so much to argue for it. Sellars may well have moderated his views over time (?), but the “early” Sellars position that non-linguistic agents lack not just concepts but thoughts and minds – if it is to be distinguished from the later Sellars – is far from dead: it is the position Adrian Torey has taken in his recent book (?).

I suspect that many other philosophers take a similar position of linking concepts tightly to language without explicitly saying so. On the other hand, although there is good reason to believe that language fundamentally *transforms* our experience and deployment of concepts, it is far from clear that it makes them (as I have defined them above) possible in the first place.

Finally and closely related again there is the question of whether conceptual abilities are an all-or-nothing affair. To advocates of “animal concepts” and those like myself who believe concepts pull apart from language, it seems clear that they are not. Rather I would argue for a continuum from the uncontroversially non-conceptual to the equally uncontroversially conceptual. No one wants to attribute concepts to amoebas. Some people might want to attribute concepts to some insects. Many people want to attribute them to mammals and several species of birds. No one questions their attribution to humans. This is not to say that one should not or cannot draw a line between

conceptual and non-conceptual abilities, nor that there are not more and less appropriate places to draw it, but only to suggest that where that line precisely lies is a pragmatic choice, subject to revision depending on the particular questions being asked and the context of application.

Merlin Donald's work on the evolution of cognition provides an excellent foundation on which to begin such a discussion while providing support for the positions I myself want to take. Donald is keen to stress the continuity between non-human and human cognition, the better to highlight those aspects of human cognition that *are* distinctive. His four stages of "cognitive-cultural development" – episodic, mimetic, mythic and theoretic – show how a conceptual foundation common to many species is progressively transformed and becomes, in humans, itself a means toward cognitive evolution.

1.2 Enactive Concepts

Enactivism, as I intend the term, follows from the work by Francisco Varela, Evan Thompson and Eleanor Rosch, who collaborated on (?). It should not be confused or equated with the twin notions of embeddedness (or situatedness: i.e., an agent is located in a particular spatiotemporal context) and embodiment (i.e., an agent takes a particular physical form), as much as it does embrace them. Enactivism goes beyond embeddedness/embodiment by:

- Understanding cognition as a *skillful activity*, as well as a lived, dynamic process and not a static entity;
- Typically perceiving continuities as underlying that which (conceptually) appears individuable and discrete, most notably the continuity between agent and environment;
- Taking an agent/environment, internal/external distinction to be both conceptually necessary and, at the same time, meaningful *only with respect to an observer*;
- Giving a foundational role to phenomenology and emphasizing the essential contribution to be made by first-person methods.

Enactive concepts then are neither internal (cf. discussion of "internal representations") nor external to the agent but arise out of the interaction of the agent with its environment. To the extent they are understood as mental representations they must also be seen as abilities: bridging Gilbert Ryle's knowing that/knowing how distinction (?). Just as concepts cannot be understood in isolation from the agents who possess and employ them, they cannot be understood or discussed without giving credit to the role of an observer, reflecting on his own concepts or considering those of another agent. More importantly for this paper, one should not attempt to take them out of context – a context that crucially includes not just their current application by individual agents but their evolutionary development by species.

Although Gärdenfors' conceptual spaces theory (?) is not explicitly enactive, I take it to be highly compatible with an enactive account of concepts. In conceptual spaces theory, concepts allow an intermediate-level account of cognition between low-level, sensorimotor-based, association-driven accounts and high-level, sensorimotor-remote, symbolic or language-oriented accounts. Concepts are, in the first instance, describable as geometric shapes within a "conceptual space", an analog to physical space. A particular conceptual agent's conceptual development proceeds by the successive partitioning of that space into finer and finer categories of experience and, in some agents at least, the mapping of distal parts of the conceptual space onto one another.

1.3 Advent and Evolution Within the Individual

Minds like ours start out with an innate inventory of concepts, of which there are more than none but not more than finitely many. (? , p. 131)

I should also say a little about the advent of concepts and evolution of conceptual abilities in the individual conceptual agent, the better to compare and contrast later with the equivalent developments in the species. Fodor takes his claim to be uncontroversial – i.e., that at least some concepts are innate – and from my survey of the philosophy of mind literature, I would say that he’s right. On the other hand, I would prefer to talk of innate proto-concepts rather than concepts, because they may be too few in number (as they are e.g. on Prinz’s (?) account) to be productive in any practical way, in the sense of productivity described earlier: i.e., their number may be below “critical mass”; and because, being somehow pre-given, they are not properly speaking under the agent’s endogenous control, not least because they may well be foundational and so not subject to revision in the way that other things properly called concepts are. On the one hand, Fodor is right that *something* must kick-start off the process of acquiring and becoming proficient with concepts; on the other, it seems intuitively right to say that hard-wired “concepts” are not properly concepts at all.

It is consistent with the child development literature in psychology to say that in all likelihood, children possess concepts (e.g. object permanence¹) before they are able to express them; that they are able to express them through gesture before they are able to through language²; that they are able to express them appropriately through language before they are able to reflect upon *them* rather than their objects. Indeed this later aspect of cognition – standardly expressed as being between first- and higher-order concepts (??), may, for many particular concepts, persist throughout the agent’s life. As Cyril Barrett notes, I may well be able to say what time it is and in other ways talk reliably about time without any understanding of what (the concept of) time itself is.

2 Advent of Concepts in the Species: A Baseline

Once one lets go of the assumption that concepts are or should be tied to language, it becomes much easier to think of members of others species as candidates for being conceptual agents, given the properties I have listed in Section 1.2. It is also easier to see a continuum of conceptual abilities (as I would like to suggest) rather than, as is more typical, a binary opposition between possessing and not possessing them.

Following what is a standard premise in the animal concepts literature, I wish to hold that it is a separate matter *what* it means for something to be a concept (or for someone to be a conceptual agent) from *when* one should attribute concepts to an agent or a species. For the latter, Albert Newen and Andreas Bartel (? , p. 291) offer the following criteria. (A similar list may be found in (?).)

- Evidence of an ability to derive novel general classes from specific instances.
- Demonstration of a flexible pattern of behaviour based on this ability, especially when confronted with novel situations.

¹Jean Piaget, who coined the term, famously located this ability at nine months (?); more recent research (e.g. (?)) has shown reliable evidence for an expectation of object permanence at less than half that age.

²“The first evidence of intentionality in children comes with pointing behavior.... Intentional pointing first emerges at about fourteen months, following a period during which children have learned to direct their gaze toward a point in space where their mother’s gaze is fixed.” (? , p. 171)

- Demonstration of surprise upon making a mistake.

Of course any behaviour, up to the most sophisticated human behaviour, could, in principle, be explained in terms of an inflexible stimulus-response mechanism. (Consider the standard philosophical example of a giant look-up table.) So to put these criteria another way, one should attribute minimal conceptual abilities to an agent when the simplest explanation for that agent's behaviour is that, when presented with the *same* circumstances on *different* occasions, that agent makes different choices based on some (to greater or lesser degree) intentional reflection by that agent³ on its past experiences.

Although Donald writes within a very different terminological sphere from the literature on concepts, nonetheless I think it clear that, on these criteria, some and possibly many individuals and species qualify as conceptual agents who have not passed through any of Donald's stages of "cognitive-cultural" development, which Donald wishes to limit more or less (and I think correctly) to the social mammals. An example is the parrot Alex. In their paper, Newen and Bartel offer what I find a convincing analysis of Pepperburg's experiments with Alex (?) to conclude, with Pepperburg, that Alex is indeed a conceptual agent according to the criteria above. At the same time, Alex does not show any signs of the episodic memory that is a necessary pre-condition to the first of Donald's four stages: i.e., an ability to identify and recall a series of events over a period of time as an episode. It is to those stages I will now turn, to see how each one extends the conceptual agent's conceptual repertoire.

3 Conceptual Transformations

The stages of Donald's model are about not just the progressive transformation of cognition (specifically, per my interests, conceptual cognition), but at the same time the progressive emergence of culture out of the most basic social elements. So the cognitive transformations – at first strictly genetic, in the end strictly social/cultural – are from the beginning dependent on a social context and would not arise (or at least, would take an entirely different route) in a non-social species. They are *cultural* transformations. The key features of this model are:

- The conservation of previous gains. Each stage builds upon rather than replaces the last.
- The greater stability of older over newer cognitive systems.
- The important position of mimesis as the oldest of the uniquely human adaptations.

Again, my interest here is in how conceptual abilities are progressively transformed, and how new concepts and new classes of concepts arise that could not have done so before.

3.1 Episodic Culture

Episodic memory is, as the name implies, memory for specific episodes in life, that is, events with a specific time-space locus. Thus, we can remember the specifics of an experience: the place, the weather, the colors and smells, the voices of the past. . . . Such memories are rich in specific perceptual content. By definition, episodes are bound in time and space to specific dates and places. (? , p. 150)

³This is to rule out any pre-programmed, fixed learning mechanism.

The social mammals show significant conceptual advances over other agents we might consider conceptual agents, such as Alex, in several key areas. The great apes in particular are able to:

- While not creating tools of their own, show great readiness to take advantage of tools that they find;
- Invent solutions to problems, such as how to get at some food;
- Solve so-called delayed reaction tasks, where the agent must wait for a reward;
- Recognize themselves in a mirror. (? , pp 124-126)

... All of which suggest a move from more passive toward more active, more intentional cognition. What ties all of them together is, Donald argues, significant advances in *event perception* and in *episodic memory*.

Event perception “is, broadly speaking, the ability to perceive complex, usually moving, clusters and patterns of stimuli as a unit.” (? , p. 153) Event perception can be placed along a continuum: “Animals that we call intelligent are those that respond to events of increasing complexity and abstraction. Apes can discriminate hand signs that are too complex or subtle for dogs; but dogs can read aspects of behavior that are missed completely by rats.”(? , p. 153)

Episodic memory, then, ties objects and events together. Episodic memory has an interesting dual nature: on the one hand, it is highly specific to a particular occasion; on the other, it allows agents who possess it to relate the objects and events comprising an episode to each other in ways that agents without it cannot. Indeed, Donald places the ability to conceptualize about actions or events as being higher order than conceptualizing about physical objects. So episodic memory carries on this progression, allowing objects not only to be successfully re-recognized but associated with each other through various actions or events and for actions/events to be associated both with other and all the objects they involve. In terms of the conceptual spaces theory mentioned earlier, episodic memory vastly extends the partitioning of the conceptual space that has been taking place already by allowing mapping of distal parts of the conceptual space onto one another, showing how, with respect to specific episodes, they are more generally interconnected.

I believe this is the first clear sign of meta-cognitive abilities (reaching their pinnacle, at this stage, with the mirror test), at the onset only implicit, not yet explicit: the first sign of thoughts about thoughts without necessarily any awareness by the agent of such thoughts. It is the difference between recognizing e.g. a tree *as* a tree (insofar as being able to re-identify it reliably) and recognizing it *as* a tree *in the context* of a wider setting that involves other plants, other agents, various activities involving that tree, and so on.

It is with the advent of episodic memory that the first recognizable animal *cultures* emerge, or what Donald refers to as *social intelligence*. The cultures of the higher mammals are distinguished from so-called social insects by the flexibility that is the hallmark of conceptual abilities in contrast to hard-wired stimulus-response. On the one hand, they could only arise once those basic conceptual abilities were in place; on the other, they make possible the progressive transformation of those abilities far beyond their starting point, in part by blurring the lines of where one agent’s concepts stop and another’s begin, or between where one agent’s concepts stop and those of the social group begin.

3.2 Mimetic Culture

Cognition is traditionally identified at the level of single individuals – this might be termed the assumption of the ‘isolated mind’ – and in other species, this assumption seems largely justified, since non-human species do not have a capacity for intentional representation, and are thus unable to transmit acquired knowledge across generations. (? , p. 11)

If I see somebody use a stone as a tool to crack open the shell of a nut, I may do the same thing, not to bring into mind the act of the other person I have observed, but to obtain the same effect. (?)

Mimesis (the second stage) begins the social transformation of concepts, which oral and written language then carry much further. It is, on Donald’s account, the first of the strictly human stages. Donald distinguishes mimesis from imitation or mimicry by its intentionality and its representational nature. As Göran Sonesson notes, imitation is necessary but not sufficient for mimesis.

Key to intentional representation is *explicit* metacognition, which Donald offers as a necessary pre-condition for mimesis. This is directed reflective thought, enabling the agent to go beyond merely abstracting on pre-existing concepts to wider and wider contexts, to possessing concepts of concepts: higher-order concepts. It is directed reflective thought *in a social context*, where agents are actively a part of each other’s conceptual learning process.

Indeed, I will agree with those like Inman Harvey at the University of Sussex, UK, that it is only with intentionality that one should speak of representation *from the viewpoint of the agent* (as opposed to e.g. the external observer) at all. Representation is an *active* process requiring an aware observer. Failure to acknowledge the role of the observer in the act of representing leads to confusion. And yet, “the underlying assumption of many is that a real world exists independently of any observer; and that symbols are entities that can ‘stand for’ objects in this real world in some abstract and absolute sense. In practice, the role of the observer in the act of representing something is ignored.” (? , p. 5) Again: “The gun I reach for when I hear the word *representation* has this engraved on it: ‘When *P* is used by *Q* to represent *R* to *S*, *who is Q and who is S?*’ (? , p. 7) I believe that taking Harvey’s approach to representations can clear up a lot of the outstanding confusions around the term (and eliminate much of its misuse).

With mimesis, the representations are largely if not entirely *iconic* as opposed to *symbolic representations*: a standard distinction in the literature. Iconic representations are picture-like. They are meant to resemble, in some substantial way, their representeds, in a way that symbolic representations typically do not. Putting this another way, iconic representations retain a discernible link back to their sensory-motor origins and so are easy to reproduce and communicate by sensory-motor re-engagement.

There are many in the enactive community who would eschew all talk of representations and cognition, and many among theorists of concepts – Ruth Millikan for example (?), or Alva Noë (?) – who insist that concepts are not representations at all but abilities (if, perhaps, “abilities to form representations”⁴) That, to me, is a mistake, telling at most half of the story; for when humans reflect on their concepts, representations are what they see; when they are consciously employing concepts, they do so *as representations*. If the representational aspect of concepts is an essential aspect of concepts for humans – as I believe it is – one must give some account of where those representations come from, and what they do.

⁴Ruth Millikan, personal communication.

As important as the self-representational aspect of mimesis is, there is, an even more profound affect that it has on conceptual abilities, as Donald would attest and Harvey affirm: that is in the social sphere. Mimesis makes possible the *sharing* of concepts, thus enabling a corporate conceptual space that is the mapping together of the individual conceptual spaces of all of a society's members. In so doing it creates, for the first time, a distinction between *private* (individual) and *public* (corporate) aspects of concepts – with a non-trivial mapping from one aspect to the other. The sharing of concepts could then have profound effects back on the cognitive abilities of individual agents, allowing them to understand without having directly to experience. "... Knowledge, by the fact that it is *shared* in a language community, imposes *constraints* on individual cognitive representations." (? , p. 190)

Of course the advent of language makes much of this easier. "A desire for successful communication will... lead to a gradual alignment among the members of a linguistic community of the image schemas as well as their underlying conceptual spaces." (? , p. 164) But all of the groundwork for a nascent corporate conceptual space has been laid.

Unlike episodic culture, there are no extant examples of mimetic culture, making it impossible to prove even that it ever existed as a separate stage in cognitive-cultural development. Yet it fills very conveniently a gap in the story, so that abstract concepts and language abilities do not appear out of nowhere. One can speculate that here, for the first time, one finds:

- Rehearsing and modeling of society, where children can act out not only their own roles but those of others in their society;
- Structured games, with rules;
- The emergence of ritual, including dance;
- Complex acculturation of the young resulting in pedagogy. (? , pp. 174-176)

3.3 Mythic Culture

The mind has expanded its reach beyond the episodic perception of events, beyond the mimetic reconstruction of episodes, to a comprehensive modeling of the entire human universe. Causal explanation, prediction, control – myth constitutes an attempt at all three, and every aspect of life is permeated by myth. ? , p. 214

... Language has had a privileged place in human culture and human thought, as shown by the fact that the name of a given language and that of the people speaking it are nearly always the same. (? , p. 187)

The most striking observable difference with mythic cultures – which, unlike mimetic cultures, have survived in some form into modern times – is the appearance of oral language. The affect of language on both social and individual cognition is difficult to overstate: "... Thought and language are so closely related as to be two sides of the same coin; there are many forms of thought that are literally unthinkable without language and other semiotic devices." (? , p. 233) At the same time, it would be a mistake, on Donald's account, to see language as leading the cognitive changes (as it does, for example, for Torey (?)). Rather, "... symbolic thought is *primary*; it is the driving force, the invisible engine, behind word use."

Clearly, symbols do not make structured thought possible, but they do radically alter it. With the invention of symbols, one finds a shift in representational strategy and the advent of a conceptually quite different kind of representation. The hallmark of symbolic representations is their apparent arbitrariness: form need bear no discernible relation to function. This need not mean that symbols truly are arbitrary – whatever that might mean; symbols, as Stevan Harnad pointed out twenty years ago (?), still need to be grounded somehow, and there is no *prima facie* reason to think that symbolic representations are not grounded in the same sensory-motor engagements as iconic ones. All that is required is for the link back to those sensory-motor origins to be lost, in many if not most cases not re-constructable. (Indeed, Harnad has argued more recently (?), in line with Noë (?), that *all* mental content is ultimately grounded in sensory-motor engagements, and I am strongly inclined to think that that is right.)

Other properties associated with symbolic representations is that they are:

- Discrete, as opposed to (as with iconic representations) continuous;
- Arranged linearly, as opposed to any two- or three-dimensional arrangement;
- Manipulated according to rules that need not be explicit but can be made so.

Language is paradigmatically symbolic. It is probably not surprising therefore that “simultaneously with the appearance of speech there appeared a whole constellation of thought skills that are associated with language and are, broadly speaking, linear, analytic, rule-governed, and segmented.” (? , p. 212)

It is worth remembering that humans are not alone in the ability to learn symbols, to understand the arbitrary relationship of sign to signified, and therefore to be able to employ symbols appropriately. Such ability has been shown quite dramatically in studies with apes and baboons. What seems unique to humans is the ability to invent symbols spontaneously – something that, according to Donald, requires a mimetic foundation. He writes, “the most likely initial source of arbitrary symbols in mimetic culture would have been in the standardization of mimetic performance – that is, in gesture.” (? , p. 220) So symbolic representation preceded, and made possible, both mythic culture and language.

On Donald’s account, the changeover from mimetic to mythic culture was not based on the piecemeal elevation of an iconic to a symbolic representation *here*, the elevation of an iconic to a symbolic representation *there*. Rather, symbolic representation in general and language in particular served a primarily *integrative* function. “The most elevated use of language in tribal societies is in the area of mythic invention – in the construction of conceptual ‘models’ of the human universe.” (? , p. 213) Again: “. . . although language was first and foremost a social device, its initial utility was not so much in enabling a new level of collective technology or social organization, which it eventually did, or in transmitting skill, or in achieving larger political organizations, which it eventually did. . . . Its function was evidently tied to the development of integrative thought – to the grand unifying synthesis of formerly disconnected, time-bound snippets of information.” (? , p. 215)

So the integrative role of concepts, which we first saw at the level of episodic culture, tying together the different components and aspects of an episode, mapping distal parts of the conceptual space onto one another, reaches its apex, perhaps, in mythic culture, where it is the entire world and one’s place in it that is being structured. The scope of concept application expands dramatically, to arbitrarily many remembered past or imagined future contexts.

At the same time and in contrast, with each stage in cognitive-cultural development, the concepts themselves – or rather, their most visible aspects – become increasingly structurally impoverished, *even as they become more visible to the agent*. After all, representations of any kind are generally, if not uniformly, simplifications; and symbols, in the limit, take that simplification to an extreme. This is just the natural extension of a process that concepts-as-structured-thought began:

The prime problem is that the information received by the receptors is too rich and too unstructured. What is needed is some way of transforming and organizing the input into a mode that can be handled on the conceptual or symbolic level. This basically involves finding a more *economic* form of representation: going from the subconceptual to the conceptual level usually involves a *reduction of the number of dimensions* that are represented. . . . (? , p. 221)

3.4 Theoretic Culture

This, again, would seem to be a breaking point on the way to human beings: the possibility of memory as an external record, which perdures independently of the human organism. (?)

Writing is really a way of transferring the storage of an idea from the brain (its natural resting place) to a non-biological medium. Ideas started in the brain, where they traditionally resided through most of human history. (? , p. 559)

The last of Donald’s four stages of cognitive-cultural evolution, and the last of the three distinctively human ones, is also the *first* that is not genetically but strictly culturally mediated, arising not spontaneously (as oral language appears able to do) but only with the appropriate pedagogical enculturation. It is also the first to introduce, not new conceptual machinery, but what would seem (if the account offered above is correct) a conceptual fiction: the idea of conceptual knowledge as detached from any particular agents and perhaps *from any agents at all*. Mythic culture is unabashedly subjective, its conceptual model of the world straightforwardly human-centric. Theoretic culture lays claim to “true” objectivity, elements of human perspective corrected for and removed. Mythic culture is occupied with telling stories, and aims for the “big picture”; theoretic culture is occupied with revealing logical truths, and concentrates on the details.

Besides the externalization of memory – which Donald means quite literally, in the spirit of Andy Clark and David Chalmers’ “extended mind” hypothesis (?) – Donald sees two other significant cognitive deficits in oral-mythic culture: *graphic invention* (the creation of visual images with symbolic intent) and *theory construction* (the development of carefully constructed arguments based on logical analysis and empirical discovery). “The major products of analytic thought. . . are generally absent from purely mythic cultures. A partial list of features that are absent include: formal arguments, systematic taxonomies, induction, deduction, verification, differentiation, quantification, idealization, and formal methods of measurement.” (? , p. 273)

All three deficits are, of course, closely related. Although early cave art is quite different from writing and preceded it by thousands of years, nonetheless they are both graphic inventions that create an external record capable of surviving far beyond the lifespan of any individual, one that permits verification in a way that oral narrative does not.

The analogy Donald makes for the increasing reliance of the individual agent’s cognitive abilities on those of the group is between a standalone and a networked computer: unlike the standalone, the specifications on the networked computer (in terms of random-access memory, hard drive capacity and so on) may not tell you very much. By “plugging into, and becoming a part of, an external

symbolic system” (? , p. 274) agents could offload many cognitive tasks, particularly those involving memory, onto external resources. Humans have incredible memory capacities: apparently ordinary people can, with relatively minimal training, perform feats of recall (e.g., long lists of numbers) that seem far outside the capacity of the untrained.⁵ It is not unheard of for people to memorize entire books such as the Quran. Most of the time we do not exploit these resources because there is no apparent motivation to: why memorize what you so easily (especially in the age of Google) can just look up? “The mnemonic arts and rote learning, once a major part of education... have receded into the background as the reliance on biological memory for storage has faded.” (? , p. 323)

As Donald writes, written language is not about replicating spoken language in visual form but directly sharing ideas. If mimesis made possible the sharing of concepts and the mapping of individual conceptual spaces onto a common societal conceptual space, and oral language extended that capacity, then written language takes concept sharing to a point where one might forget that concepts are, or might be, anything *other* than shared, public entities. After all, much if not most modern communication proceeds on the basis that my concepts *precisely are* your concepts, and both are precisely expressed in the spoken or written language we use. It is only where breakdowns in communication occur that we take a closer look, and the distinction between private and public aspects re-appears.

The free marketplace of concepts has profound effects back on the private conceptual life of the individual. One can acquire many new concepts merely by reading about them. Even for the many more concepts that are shaped by direct personal experience can be further shaped, and re-shaped, through the new media. So for example my concept of dog is shaped not only by all my direct interactions with dogs but also by all the dogs I have ever read about, or seen on television or in the movies, and so on.

A more subtle effect on the individual is the cultivation of increasing levels of self-reflection. “. . . The human mind began to reflect upon the contents of its own representations, to modify and refine them” (? , p. 335)— something that it had been doing to some extent all along, but here it becomes much more explicit and much more pervasive. Reflection proceeds from the more clearly first-order concepts (that is, concepts of things that are not concepts) to our (conceptual) understanding of those concepts (now second-order) to our (conceptual) understanding of the thoughts in which those concepts are themselves embedded (higher-order). “The shift was away from immediate, pragmatic problem solving and reasoning, toward the application of these skills to the permanent symbolic representations contained in external memory sources.” (? , p. 335) So there is a further stepping back from the particulars of the moment, from perhaps even the possibility of practical application, to respect and appreciation for “reflection for its own sake”. (? , p. 341)

⁵Perhaps the best comparison here is to juggling, which again looks difficult to the untrained; and yet the average person requires less than half an hour to learn to juggle three similarly weighted and shaped objects.

Stage	Development
episodic	implicit metacognition
	concepts take on integrative role
mimetic	explicit metacognition
	iconic representations
mythic	private/public distinction for concepts
	symbolic representations
theoretic	oral language
	integrative role for concepts reaches its apex
	concepts as externally “free floating”
	written language
	public aspect of concepts dominates

Table 1: Stages of cognitive-cultural development and corresponding conceptual innovations.

It will be useful at this point to summarize what conceptual changes I have derived from Donald’s account for each of his four stages of cognitive-cultural development. These are summarized in Table 1.

4 The Difficulties of Looking Backward

It might be tempting to see each stage of the cognitive-cultural development as an improvement over the last, but a more sober analysis might see the process as rather presenting a succession of trade offs. If it is indeed in the nature of *all* concepts and all conceptual abilities that they permit the agent to step back from strict experience in the moment, to consider the present moment in light of past or future moments – as I suggested in the introduction – then the first trade-off with concepts is flexibility of response in exchange for a loss (literally) of sheer impulsiveness. It is the loss of spontaneity in the precise opposite of Kant’s sense. If this is right, then Donald’s statement that apes’ “lives are lived entirely in the present” (? , p. 149) should be understood with the caveat that that “present” has already been stretched far beyond its pre-conceptual boundaries. Rousseau (?) was neither the first nor has he been the only writer to suggest that our lives might have been better off if we had held onto that un-Kantian spontaneity. But as Rousseau himself acknowledged, if regretfully, having moved on, we cannot go back. The alienation from the present moment only becomes more pronounced with each further stage of development.

Representations, appearing with mimetic culture, likewise suggest a trade off. What representations gain us, argues Richard Shusterman in response to anti-representationalist Merleau-Ponty, is the capacity for explicit reflection and among other things the consequent ability to recognize and to modify patterns of behavior, including our bad habits. “. . . In order to effect . . . improvement, the unreflective action or habit must be brought into conscious critical reflection (if only for a limited time) so that it can be grasped and worked on more precisely.” (? , p. 63) He could as well be responding to Rodney Brooks when he says, “The claim that we can do something effectively without explicit or representational consciousness does not imply that we cannot also do it with such consciousness and that such consciousness cannot improve our performance.” (? , p. 68) Indeed, the increasing role of representations through mimetic, mythic and theoretic culture point to their power. At the same time, representational cognition is costly, and it is slow.

Iconic representations are meant to evoke, directly, a certain sensory-motor association in the recipient, a sense of resemblance to their representeds. With symbolic representations, that link back to sensory-motor-grounded origins is lost, the form apparently arbitrary in relation to its function.

Symbolic representations can be viewed as an impoverished version of iconic ones. Their simplified structure both makes them extremely efficient in terms of storage space or amenability to rule-based processing and at the same time critically dependent, far more than iconic representations, on a shared context for understanding, a common conceptual space. Until the Rosetta Stone came along, many hieroglyphic texts remained unreadable. Without the one known script on the stone (classic Greek), the other two (hieroglyphic and Demotic) would have remained likewise unreadable.

Finally, the new conceptual apparatus provided by theoretic culture has been fantastically effective at systematizing and preserving knowledge beyond the lifetime of the individual or the lifetime of a society to the level of the entire species. At the same time, it is founded on the fiction that conceptual knowledge can be made independent of the agents possessing and employing it and of the influence of their perspective. However useful that fiction is, it is not one that should be taken as atemporal fact. Harvey's comment comes to mind: "the underlying assumption of many is that a real world exists independently of any observer; and that symbols are entities that can 'stand for' objects in this real world in some abstract and absolute sense." (?, p. 5)

By being so successful with the details, theoretic concepts have, perhaps, lost sight of the "big picture". Individual agents become increasingly specialized within the corporate conceptual structure. Who, even among climate scientists, has the "big picture" on human-mediated climate change? And who, if anyone, is qualified to assemble all the pieces that would constitute a sustainable relationship with the environment? Too, not all human knowledge fits into an analytic mold. It can be easy to ignore, or downplay, or disparage, that which does not fit the requirements of logical argument or empirical discovery. In modern society, "myth" has become a pejorative.

There may be a simple reason why it is easy to perceive gains and difficult to see the trade offs. With each stage of cognitive development we pass through – individually or as a species – it becomes at the least difficult and in the limit impossible to imagine what cognition was like previously. Once we have written language, it is difficult to imagine being illiterate; once we have language of any kind, it is difficult to imagine e.g. thoughts without words; it is impossible to take a non-representational view on pre-representational thought as it is to imagine structured thought outside the confines of episodic memory; and so on. The more we become comfortable with each new conceptual tool, the more it comes to feel like an essential part of us and not an extension of us at all: that is, we integrate it into our core self-image.

5 Conclusions

First of all, there is empathy: we spontaneously "attribute" feelings and perceptions to animals that behave like us in similar occasions. (?, p. 181)

In much of the English-language philosophical literature, the discussions are, revealingly, of "humans" and "animals" rather than e.g. "humans" and "other animals". This may be an intellectual holdover from the religious doctrine that saw humans as a separate creation from all the rest of biological existence. It does not help our sense of isolation that there are no other surviving subspecies of humans, so strikingly observable with most other species of mammals. The gulf between human and non-human cognition may seem uncrossable.

At the same time there is another risk, which Zlatev alludes to. Where we observe similar behavior it is easy to attribute similar underlying cognitive causes, when in fact the underlying causes may be quite different.

It is likewise tempting to assume of other animals no conceptual sophistication precisely because, for the most part, we cannot ask them, and they cannot answer. The word “dumb”, which in its origins means unable to speak, has come to be synonymous with being stupid. If Donald – or at least, my reading of him – is correct, then language was a late-arriving player in the conceptual game. Linguistic meaning captures only a small part of conceptual meaning, which itself captures only a small part of potential meaning.

Concepts, at heart, are persistent mental structures with certain properties including systematicity and productivity. To the point of view of a conceptual observer and to certain conceptual agents, they take on a representational aspect, forming a dyad of sign and signified.

At the same time they are shapes within a conceptual space, whose partitioning constitutes an agent’s conceptual schema. Remember that, on conceptual spaces theory, concepts are an *intermediate* level of describing cognition, sitting between low-level, directly sensory-motor-based, strongly associational cognition and high-level, symbolic cognition. Depending on which level of cognition is being emphasized, concepts will look more like associational structures or abilities on the one hand, or more like symbols (or words of a language) on the other. But on a conceptual spaces account, the “natural” home for concepts is not at either extreme.

So on this account, there is but an imperfect mapping between one’s concepts and the words/symbols that come to mind as their most visible aspect; between one’s concepts and those of any other conceptual agent; between one’s concepts and those occupying the corporate conceptual space for a society or species; and finally, between the concepts occupying the corporate conceptual space and the words/symbols of social exchange. Gärdenfors writes, “A fundamental assumption of this analysis. . . has been that the conceptual structure belongs to some *individual* language user: the meanings of words reside in the heads of individuals. On the other hand, it is also obvious that language is a *social* phenomenon. . .” (? , p. 189) So in conceptual spaces theory there is an uneasy relationship between the private and public aspects of concepts and language. “. . . The social meaning of a language emerges from individual meanings.” (? , p. 198)

I have attempted in this paper to put conceptual development into an evolutionary perspective that is often if not usually lacking in theories of concepts, which more frequently consider only ontogenetic development, if that. My model has been Donald’s four stages of cognitive-cultural development. I have shown how the grounds for attributing concepts put forward by Allen, Newell, Bartels and others in the “animal concepts” camp are prior to the first of Donald’s stages, and how each of Donald’s stages makes new conceptual machinery available, and therefore new concepts (and new types of concepts) thinkable, in ways that make it difficult, and perhaps in the limit impossible, to imagine what “life before” was like. Nonetheless, concepts are far more than words of a language or “symbols in the brain”, with a long history whose earliest entries continue to shape our conceptual nature today.

References