LANGUAGE, FANTASY & STORYTELLING

How Humans Became Creative

Volume 1 of 2

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Abstract

The thesis I try to develop here hopes to contribute to some recent discussions on the evolution of human creative cognition. In particular, it is a response to the view that pretend play was a primary driver of the evolution of human creativity, a position defended in Carruthers (2002), Picciuto and Carruthers (2014) and elsewhere. This thesis doesn't directly address what we might think of as a traditional philosophical puzzle. Instead, my concern here is with a puzzle that has its origins in palaeoanthropology. While it might not be 'our' puzzle, it nonetheless touches upon areas which have long been the concern of philosophers: the nature of thought and its relationship to language, the nature of representation in art, and more recent concerns with our understanding of concepts like the imagination and creativity and what their relationship might be. It appears as though the emergence of our species saw a rapid (in evolutionary terms) development of material culture, from new hunting techniques to the production of representational art. Because of its dramatic contrast with the relatively stagnant material culture of pre-cursor *hominids* this has sometimes been described as a 'creative explosion'. One of the central questions this dramatic change prompts is *what drove this explosion?* Many answers have been posited, including the emergence of language, the appearance of pretend play in childhood, and the accumulation of material wealth in the form of skills and improved tools that allowed our ancestors the time to be creative. I develop an alternative thesis which sees a co-evolution of language, a tendency to engage in fantasy, and the externalisation of this tendency in storytelling as the explanation.

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Author's Declaration

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

INTRODUCTION

An Overview

Introduction

The thesis I try to develop here aims to contribute to some recent discussions on the evolution of human creative cognition. In particular, it is a response to the view that pretend play was a primary driver of the evolution of human creativity, a position defended in Carruthers (2002), Picciuto and Carruthers (2014) and elsewhere. This thesis doesn't directly address what we might think of as a traditional philosophical puzzle. Instead, my concern here is with a puzzle that has its origins in palaeoanthropology. While it might not be 'our' puzzle, it nonetheless touches upon areas which have long been the concern of philosophers: the nature of thought and its relationship to language, the nature of representation in art, and more recent concerns with our understanding of concepts like the imagination and creativity and what their relationship might be. It appears as though the emergence of our species saw a rapid (in evolutionary terms) development of material culture, from new hunting techniques to the production of representational art. Because of its dramatic contrast with the relatively stagnant material culture of pre-cursor *hominids* this has sometimes been described as a 'creative explosion'. One of the central questions this dramatic change prompts is *what drove this explosion?* Many answers have been posited, including the emergence of language, the appearance of pretend play in childhood, and the accumulation of material wealth in the form of skills and improved tools that allowed our ancestors the time to be creative. I develop an alternative thesis which sees a co-evolution of language, a tendency to engage in fantasy, and the externalisation of this tendency in storytelling as the explanation.

The first two chapters of this thesis function as a survey of a wide range of relevant literature on the topics of creativity, the imagination, language, and their evolution. This includes both philosophical literature and empirical research from palaeoanthropology, comparative psychology and linguistics. The subsequent three chapters develop the key claims of this thesis: that the evolution of creativity was driven forward when a capacity for language evolved in a species with a predisposition to engage in fantasy and to share interesting things. When language 'got into place' in our species, we began to externalise our fantasies, sharing them with our conspecifics for mutual enjoyment. In turn, the most useful (evolutionarily speaking) and most entertaining fantasies were developed into stories that became deeply

embedded in the culture of the groups telling them, even shaping the lexicon available to these groups. As these cultures became more sophisticated as their members bonded ever closer through their esoteric shared lexicon and mythology, and their stories took on increased significance, these stories began to manifest themselves in other mediums, specifically as cave art.

Chapter 1: Imagination & Creativity

The first chapter deals specifically with literature analysing creativity and the imagination, as well as their connection. It begins by re-examining the traditional analyses of creativity: the *Inspiration View* and the *Derangement View*. The Inspiration View sees the creator (specifically, an artist or poet) as divinely inspired, or a mouthpiece of the gods. I argue in the first chapter that such a view is the result of the 'flash phenomenology' of creativity – it often appears as though our creative insights come out of nowhere, creating a sense that we must have taken inspiration from some outside source, such as a muse or a god (perhaps, I suggest, as helpful an explanation as any in the absence of an adequate naturalistic explanation). This feeling has some similarities to cases of thought insertion in schizophrenia, but a key difference is the accompanying sense of authorship in creative inspiration which is absent in cases of thought insertion.

Creativity is drawn even closer to cases of mental illness via the Derangement View, though, which elucidates a view that still has traction in popular ideas of genius: that there is a fine line between genius and insanity. Although Schopenhauer's version of the Derangement View sees madness as a result of genius (caused by the artist's insight into a world beyond our own), I suggest that the opposite causal relationship holds: mental illness allows the artist to flout social, moral and cultural conventions (perhaps because they are simply unable to comprehend them), unleashing creativity. That mental illnesses like schizophrenia have not been weeded out through evolutionary processes is something of a puzzle, and I come to examine this puzzle in Chapter 6.

The chapter moves on to modern analyses of creativity, which attempt to unpack the concept of creativity into necessary and sufficient conditions. A range of views from the last few centuries (from Kant to Boden) are analysed to reveal their common ground: each advocates for a version of two necessary conditions: *originality* and *value*. A process or product is creative

only if it is novel, i.e. the invention or innovation is new either to all agents or to some particular agent. However, originality alone is not sufficient for creativity – the invention or innovation must also have value to all or some agent(s). Original nonsense would not be considered to be creative on such an account. A third criterion, highlighted by Berys Gaut, is also included in our understanding of creativity: *agency*. Gaut recognises that some new product or process cannot be considered creative, even if it is novel and valuable, if it was created entirely accidentally or by simply following some mechanical procedure of discovery.

With an understanding of creativity in place, Chapter 1 moves on to consider the nature of the imagination and its connection to the accounts of creativity just outlined. What emerges is the difficulty of providing any comprehensive taxonomy of the imagination. I outline here only a small amount of its purported variants and uses. We see that imagination can be *propositional* in form ('imagining that') or *objectual* ('imagining X'), that it can be *spontaneous* or *deliberate* (the latter being consciously controlled and the former casting the imaginer as a spectator), and that it can be *solitary* or *social* (one imaginer *vs.* imaginings involving two or more collaborators). I argue that the significance of social imaginings, in particular, have been neglected in the literature, and develop the argument here and in Chapter 5 that storytelling (especially in the oral tradition) is a particularly important form of social imagining in that it has a great explanatory role to play with regard to the evolution of human creativity. The practice of storytelling necessarily depends upon propositional imagining too, which I argue in Chapter 3 either emerges, or takes on distinctive features, with the evolution of language.

The link between imagination and creativity is fairly clear in cases where our imaginings become manifest as creative products, such as the stories mentioned above, or technological innovations where we use objectual imagining to mentally rotate a stone as we craft a hand axe (See Chapter 2). Imaginings themselves can also be creative where they have originality and value. However, given that something's originality and value can be relative to cultures, groups, and even individual agents, we must be cautious not to conflate being imaginative with being creative. One kind of imagining has been repeatedly singled out by authors as lacking in creativity (perhaps entirely, on some accounts): *fantasy*. Yet it is my contention in this thesis that fantasy is actually an important driver of the evolution of creativity. My first chapter therefore begins to build the case for the defence of fantasy.

Examining the thoughts of Freud, Currie and Ravenscroft, Gaut, Walton, and Scruton on fantasising, I suggest that many philosophers have been led to underestimate its significance to the evolution of creativity because of the ease with which it can be done, and the pleasure so closely associated with it. I argue (beginning in Chapter 1 and continuing in Chapter 4) it is, in fact, because of this that it marks itself out as an ideal candidate for everyday creativity in the form of stories, jokes, and many other ways. As such, fantasy needs to be given closer examination in the literature on imagination.

Chapter 2: The Evolution of Human Creative Cognition

Chapter 2 gives us further reasons to focus on the role of fantasy, but it arrives at these reasons via an analysis of the evolution of human creative cognition. The chapter begins with a puzzle: given that the cognitive basis for human creativity, including fully-syntactic language, got into place around 100,000 years ago, why did human beings apparently not begin engaging in widespread creative behaviour until some 60,000 years later? This is the supposed 'puzzle of the Creative Explosion'.

I detail in this chapter evidence and argumentation from palaeoanthropology and linguistics that tracks both the evolution of our species and of our capacity for language. A number of scholars have attempted to solve the puzzle of the creative explosion by saying that this explosion takes place only after language appears, but evidence about human migration patterns suggest that such a basis must have been in place before human beings began leaving Africa, ultimately inhabiting the rest of the world, around 100,000 years ago. Moreover, if there is a strong connection between the imagination and creativity, as I suggest there is in Chapter 1, then an analysis of our evolutionary ancestors suggests that even before the basis for language got into place we already had relatively rich imaginative resources available to us. This is what makes the puzzle so, well, puzzling! Why didn't language immediately trigger an expansion in creative output in our species?

To address this issue, I detail the imaginative basis available to us prior to language by examining the imaginative capacities of non-human animals and pre-cursor *hominids*. It is possible that non-human animals have some (limited) capacity to imagine the future, and they also appear to be able to demonstrate some ability to imagine alternative solutions to a problem. These capacities suggest some underlying capacity for episodic memory (the ability to

mentally relive past events) and some capacity for objectual imagination, perhaps using percept-based mental representations to hold in mind possible sequences of actions to be tried out to solve a problem. More controversially, there is some evidence of apes engaging in episodes of pretend play, which would seem to require a capacity for secondary representation: being able to represent some object in thought both as the object itself, but also simultaneously as something else e.g. mentally representing a banana as both a banana and a phone.

Whatever the imaginative capacities of non-human animals, it seems safe to suggest that those capacities would be outstripped by those of the earliest *hominids*. Evidence from the archaeological record, such as their ability to rapidly adapt to new ecological niches and their stone-knapping techniques suggest advanced objectual imagination capacities and analogical reasoning skills. It is also possible that precursor hominids were also engaging in creative activities such as dancing and singing (an idea I return to in Chapter 5). Language, it is generally thought, would provide an additional capacity for generating new ideas which would enhance any pre-existing capacities we can identify. Yet the puzzling 60,000 year gap remains. Clearly, then, something in addition to language is required to kick-start human creativity. But what?

I outline in Chapter 2 a recent attempt to address this question, that of Picciuto and Carruthers, 2014. According to their account, the missing ingredient was *pretend play*. Clearly, if the non-human animal evidence for pretend play is taken at face value, then this explanation might seem initially unlikely, but it is worth keeping in mind that evolution is rarely linear. Traits sometimes emerge at (effectively) the wrong time, and thus are not selected for, but emerge again later in the lineage and demonstrate their adaptive advantageousness; sometimes they emerge as spandrels (by-products of some other adaptation that later turn out to have adaptive benefits of their own when environmental circumstances change). Moreover, we might conclude that the evidence for pretend play in non-human animals is simply inconclusive or implausible. It is something like this position that Picciuto and Carruthers take, asserting that the kind of play observed in non-human animals does not involve pretence.

Pretend play, then, according to Picciuto and Carruthers is a uniquely human phenomenon that utilises experiential and propositional imagining. It utilises the capacity for secondary representation to generate suppositions for imagined scenarios, and children act as though these suppositions were true. Imagined events and scenarios actually carry with them some of the rewards of their real-life counterparts: a child imagining calling up their favourite

grandparent on the telephone (by 'dialling' a banana) will actually get some of the enjoyment that the real thing would have brought them. Our imaginations are hardwired to our reward systems, meaning that we're naturally motivated to engage in episodes of fantasy and imagination. But there are adaptive advantages to pretend play too: the cognitive basis for pretend play in childhood is essentially the same basis for creativity in adulthood, so exercising these particular cognitive muscles in infancy should make us more creative in later years. As such, pretend play in childhood should predict creativity in adulthood.

However, examination of the empirical evidence fails to bear out Picciuto and Carruthers' hypothesis. In a review of the relevant literature, Lillard et al., 2012 arrive at the view that there is no conclusive or persuasive evidence to support the suggestion that pretend play in childhood enhances creativity in adulthood. If the evidence draws any picture at all for us, it is that pretend play is the result of some other selected-for capability involved with creative cognition. As such, whatever explains the evolution of creativity would best fit the evidence if it could also account for the emergence of pretend play in childhood. I argue that my own solution to the puzzle of the Creative Explosion does just that.

Picciuto and Carruthers do give us some valuable insights on how to approach the task of solving the puzzle at hand. We need to explain the emergence of some trait that utilises the biological basis that was in place prior to human beings leaving Africa 100,000 years ago, and their observation that imagination is hardwired to our reward circuits is an incredibly useful starting point. I suggest that Picciuto and Carruthers are too quick to dismiss fantasy as a useful driver of creative cognition, and return to this suggestion in Chapter 4. However, an important task remains to be done at this point, which is to set out precisely what language is in the sense relevant to this thesis, and what it might contribute to the imaginative capacities we inherited from our evolutionary ancestors. It is this task that I turn to in Chapter 3.

Chapter 3: Language and Human Creative Cognition

My third chapter attempts to show how the evolution of language in our species changed creative cognition. It begins by outlining a distinction between language as a cultural object and language as a natural object. Natural languages, such as English, German, Mandarin etc. are cultural objects consisting of arbitrary conventions developed over a number of

generations. However, underlying these conventional systems are a series of biological adaptations that make up the *faculty* of language. These adaptations might be thought of as a natural object. Study of the evolution of language could focus on language as either a cultural or a natural object, in the former case tracking the changes to the conventions of a natural language over time and in the latter case tracking the emergence of the various biological traits that language depends upon (those for vocalisation, grammar etc.)

Though both language as a cultural object and as a natural object are relevant here, the primary focus of this thesis is the emergence of our capacity for language and its impact on human creative cognition, and thus the main focus in this chapter is on its underlying biological basis. The human language faculty appears to be a universal trait across our species, and *Generative Grammarians* like Noam Chomsky have sought to investigate the computational constraints that appear to operate on all human languages. A theory of these constraints is called *Universal Grammar*. Universal Grammar accounts for every possible combination of rules governing language, and thus every possible (permissible) utterance. Each natural language selects from Universal Grammar the rules governing its syntax, semantics and phonology, and Universal Grammar itself functions as a 'language acquisition device', allowing us to identify which rules are in play in the languages we acquire as children. Studying Universal Grammar, therefore, allows generative grammarians to establish the basic computational processes involved in generating linguistic utterances in every language.

Chapter 3 presents a particular view on the computational process underpinning language, that of Wolfram Hinzen. Hinzen rejects the long tradition in the philosophy of language that assumes that thought is logically and explanatorily *prior to* language (a view termed *Nominalism*). Instead, Hinzen suggests that 'narrow syntax' – the computational path which generates a meaningful sentence by categorising a lexical root as nominal, verbal or clausal – *gives rise to* propositional thought. On Hinzen's view then, when the biological adaptations for full language get into place (specifically those for grammar), a new kind of thought emerges – one which has subject-predicate structure, that is truth-bearing, and can refer to objects, events and propositions.

Narrow syntax is explained as a three phase computational cycle, which at its fullest generates a proposition which refers and can be evaluated as true or false. Moreover, the computational cycle operates 'blindly' over the symbols the system utilises (words) as these

symbols are decoupled from their semantic and conative content. As such, the output of the system – a referential, truth-bearing proposition – is arrived at without any commitments to truth or falsity, or to its desirability. This gives us a capacity to 'imagine that' something is the case without having to believe that it is the case, or that it is desirable for it to be the case. Propositional imagining, as described in Chapter 1, depends upon thoughts with these distinctive features, thus the emergence of language coincides with the emergence of a new, powerful kind of imagination.

I argue that the computationally minimal process that Hinzen describes offers us a 'cheaper' alternative to the imaginative capacities we share with animals and precursor hominids (though we still possess those capacities as well), and that this new capacity for propositional imagination would be favoured by evolution for a number of reasons. Chiefly is its unbounded and creative nature: there is no (theoretical) limit to the number of propositions we can generate, and because the proposition is generated independently of concerns about its truth or desirability, we can generate freely and assess usefulness later. This is crucial in building thoughts about possible worlds, in theory-making and so on. Because of the advantages this would confer in terms of planning, I argue that we would come to prefer a linguistic cognitive style, leaning ever-more on propositional imagination over its evolutionary ancestors. And given that imagining certain kinds of things brings with it the rewards of actually attaining their real-life counterparts (as discussed in Chapter 2), I ultimately suggest that we would be predisposed to use our new capacity for propositional imagination to engage in fantasy. With that, I turn to the issue of fantasy in Chapter 4.

Chapter 4: Fantasy & Language

Fantasy, I argue, has been overlooked in terms of its significance for our understanding of the imagination and for its role in the evolution of human creativity. I therefore begin the fourth chapter by re-examining some of the claims made about it in the literature identified in Chapter 1. Specifically I look at the connection between fantasy and desire, and fantasy and escape.

In most discussions of fantasy, the focus is on fantasy as connected to our personal desires (for sex, for work, etc.) The suggestion is that fantasy concerns itself with imagining getting what we want in order to receive some of the feelings of happiness, satisfaction, joy,

and so on, that we would ordinarily receive if we attained the real thing. I suggest that this connection to desire has often led us to think of fantasy as mere wish-fulfilment, and therefore of less intellectual value than imagination proper. However, even if this is true of personal fantasy, I suggest that it has been overlooked that there might be such a thing as impersonal fantasy: fantasies in which we don't play a direct role in what is imagined i.e. fantasies which are from a third-person perspective, or involve someone else's desires rather than our own. Fantasies of this nature, I suggest, might be useful for promoting social bonds as they give us a better understanding of what motivates our conspecifics (whether they are friends or rivals).

Other discussions of fantasy focus on the idea that it involves escaping reality. However, whilst I agree that much fantasy does involve severing the bonds with reality in terms of what we imagine, it isn't always the case that what we imagine is more desirable than what we have. Moreover, I reject the suggestion that fantasies differ from imaginings on the grounds that imaginings are intended to give us a better understanding of reality than escapist fantasies (Scruton's view). I present evidence in Chapter 4 that creating fantasy worlds unlike our own is actually part of a process of gaining a better understanding of our own world by drawing conclusions about other possible worlds. Fantasies are rarely lawless; they, in fact, tend to follow much the same set of rules as our own. As such, we are able to join the dots from our fantasy world to our own in order to discover new understandings about the real world.

Whilst the social and practical benefits of fantasy are suggested above, neither connect directly to what we have said about language in the preceding chapter. I therefore turn my attention to this connection in the remainder of Chapter 4. I begin by looking at the way in which we use language: to request, to inform and to share. Our communicative intentions differ from non-human animals that we teach sign-language to, who tend to use what they have learned only to request. Instead, even as pre-linguistic infants, we display a tendency to inform our conspecifics about the presence of interesting things and to share emotions and attitudes. And given that our imaginative acts are closely linked to the brain's reward circuits (as discussed in Chapter 2), and that 'spontaneous' imaginings like fantasies are more 'fun' (Chapter 1) and connected closely to desires, then fantasies seem like just the kind of thing that a co-operative, informative species would want to share at the earliest available opportunity. So what is required to do this?

The major restriction to sharing fantasies is the lack of an established 'fantasy lexicon'. The cognitive basis for language (narrow syntax) might be in place at the onset of our species but, as the cultural aspect of language, the lexicon of natural languages must build over time. It is harder to express the (precise) idea of a half-woman-half-fish without the label 'mermaid'. Yet once that label is introduced into common parlance we can construct sentences expressing all kinds of things about mermaids. So developing a fantasy lexicon both makes the process of externalising fantasies easier, and it makes richer and more varied fantasies possible. As different lexicons develop across different groups, so those ideas become shared and take on cultural significance. And the time taken to get this lexicon into place, I argue, partly explains the puzzle of the Creative Explosion. The rest of this explanation comes in the cultural significance of externalised fantasies, particularly fantasies presented in the form of *stories*. I address this portion of the explanation in Chapter 5.

Chapter 5: Storytelling & Creativity

Storytelling, it turns out, is a much older practice than most people realise. Recent research from Julien d'Huy suggests that many of the ancient stories we're familiar with – for instance, the ancient Greek myths of Callisto and the story of Odysseus and the Cyclops – are actually much older than the versions we're familiar with from the works of Hesiod and Homer. Using a mix of methodology and data from evolutionary biology, mathematics, sociology and palaeoanthropology, d'Huy has attempted to trace back the origins of these stories. To do so, he identifies key 'mythemes' (the core themes and story elements within the myths) and tracks their journey with human population groups as they make their way around the world. His suggestion, ultimately, is that these stories are as ancient as much of the cave art we have found (older, in fact). If this is the case, then it is very probable, I argue, that these stories are part of one of the earliest examples of a common creative practice: storytelling.

We have seen in previous chapters that we are naturally predisposed toward storytelling because of the enjoyment that fantasy brings us and our tendency to share interesting information. Precursor *hominids* may even have engaged in storytelling-like activity before language was in place, through dance and music. Presenting narratives (of all kinds) are useful for both social bonding and for transmitting information. Presenting a narrative in a certain way can allow us to manipulate conspecifics by prompting in them an emotional

response. We can also present to them information that we want them to have. Clearly, once language is in place, any capacity we have for doing this is infinitely enriched given that language computationally operates blindly on its constituent symbols, thus allowing us to construct narratives without prompting ourselves to have any particular emotional response. So, for example, we can create a story about a bear attacking and killing a loved one without necessarily feeling the anxiety that the actual event would bring. However, telling the story can prompt those emotions in others (even in ourselves), and so storytelling can be used to strengthen (or weaken) social bonds by utilising this capacity to stir up emotional responses.

The idea that narratives exist as a social bonding tool is suggested in Robin Dunbar's account of the evolution of language. For Dunbar, language evolved as a kind of 'vocal grooming' – a cheap way for us to maintain social relationships in large social groups. Our evolutionary ancestors used physical grooming for this purpose, but with large social groups it becomes impossible to maintain all of the relationships by physically grooming conspecifics. As such, vocal sounds could come to replace physical grooming because they allow us to service multiple members of our group simultaneously (as well as freeing up our hands for other purposes) – as a form of 'gossip'. However, Dunbar's account suggests that grammar falls out of this practice, whereas I argue that it predates and shapes gossip. Instead, I suggest that our lexicon might emerge from an established and ritualistic set of expressions – sounds we may have been making for quite some time in order to signal to conspecifics (similar to the complex signalling system we see in non-human primates). Once the biological adaptations for grammar get into place, they allow us to parse this set of expressions into what we would now recognise as words, and then combine and recombine those words as propositions.

This new capacity for propositional thought and communication functions as an imagination-instructing system, particularly once it reaches the level of externalisation. If I say 'The large yellow dog bit the small orange-faced man', the linguistic utterance directs your imagination toward a certain set of ideas and images. Given that the computational system used to generate this expression operates blindly on the symbols within it, such a system can pair symbols with unlikely partners i.e. ones with which the 'typical' emotional or semantic associations have been decoupled. For instance, we might attach a predicate like 'is evil' to an inanimate object incapable of *actually* instantiating that predicate in reality, such as a hammer, creating the notion of an 'evil hammer'. This sentential element can be fully embedded into a proposition and spoken of in exactly the same ways as real entities. As such, it is possible to

generate an infinite number of ideas without regard to their truth (or their usefulness). This makes our linguistic system the perfect tool for expressing our natural tendency toward engaging in fantasy and sharing the interesting bits with our conspecifics.

So how does this connect with the kind of creativity we see at the point of the Creative Explosion? I argue that we can draw a line between the practice of storytelling and the practice of cave painting. Given that stories can (with some convincingness) be traced back to the same time period as some of the cave art we have found, we can begin to reanalyse the images we find at the Creative Explosion in the light of the myths being told at that time. What we find when we do this are representations of stories that are still with us today. This, I argue, tells us that these stories pre-date these artworks and provide inspiration for them. And while stories don't fossilise, making it hard to evidence this suggestion, a *Storytelling Hypothesis* for the evolution of human creativity does better explain the evidence connecting pretend play and creativity (the same evidence that undermines Picciuto and Carruthers' *Pretend Play Hypothesis*). It seems that play emerges as an epiphenomenon of some other trait. Storytelling appears to be a strong candidate for explaining a tendency to play – play often involves acting out some existing story (e.g. pretending to be a heroic figure), and in a sense is similar to representing a story through the visual medium of cave art. This, I suggest, lends credibility to my own solution to the puzzle of the Creative Explosion. However, with such an explanation seemingly necessarily sitting out of the reach of direct empirical evidence, I turn in Chapter 6 to a range of evidence that I suggest lends itself to the claims made in this thesis.

Chapter 6: Testing the Thesis

Chapter 6 begins by considering a potential challenge noted earlier in the thesis: the narrowing gap between evidence for the emergence of our species and the emergence of our species' creative behaviour. I suggest that, rather than being a problem for my thesis, recent evidence found to suggest that creative behaviours might have begun much earlier than we initially though could actually be evidence in favour of some of the claims of my Storytelling Hypothesis. For instance, the fact that we see symbolic tally markings on, and use of, red ochre around 70,000 years ago might actually just be considered further evidence in favour of the Out of Africa Hypothesis which my thesis adopts. The fact that tally marking and use of red ochre persists for some 30,000 years more where it appears in Europe is just another case, I say, of

cultural traits migrating with human populations. This, I have argued, is also the case with the stories we told. With that in mind, I turn again to the idea that human beings are biologically geared toward storytelling.

We see further evidence of the claim that we're storytellers by nature in the way we perceive the world, not only in the way in which we describe it. Our perceptual system is a hypersensitive agency detection device, honed by evolution to seek out the presence of agents in our environment. An interesting side-effect of this is our tendency to *over-identify* agents; that is to say, we see agency where none is present. This can be seen in a range of phenomenon, including Pareidolia (seeing patterns, such as faces, in things) and other kinds of apophenia. For instance, we see the movement of non-agents like geometric shapes in terms of agency – as chasing and running away from one another, as demonstrated in the Heider-Simmel effect. As such, we're naturally inclined toward telling explanatory stories which sometimes cast non-agents as agents, providing a fertile ground for the imagination. We even see this reflected in cave art, through animal-human hybrid figures.

But what if such hybrid figures could be produced in the absence of language? I address in Chapter 6 just such a challenge, posed by Nicholas Humphrey. Humphrey cites the case of Nadia, an autistic savant, who appears to be able to produce an original photo-realistic hybrid image, not dissimilar to those we see in the caves at Chauvet. However, I suggest there is reason to doubt this claim of Humphrey's based upon more detailed examination of Nadia's case. The evidence collected by Lorna Selfe, the psychologist who studied Nadia in detail at various points in her life, suggests that Nadia's supposed hybrid figure is actually nothing more than a replica of an image she has seen in a Ladybird book (much like her replica of Toulouse-Lautrec's jockey). However, Nadia's case does give us pause to consider the connections between language deficits and imaginative deficits, which I take up in the next sections of Chapter 6.

Looking as cases of acquired aphasia presents, I suggest, further evidence that language was co-opted by the imagination for some specific purposes. One of those appears to be music. Trained musicians who acquire aphasia find that their musical abilities are impaired where they depend upon the imagination, yet their graphic or visual abilities are not. This, I suggest, is to be expected given what I have suggested about the evolution of the imagination in Chapter 2. Williams syndrome cases should present one of the strongest challenges to this thesis, since

they suggest that imagination can be impaired even when someone has prodigious linguistic talent. However, closer analysis of these cases reveals that there are, in fact, notable linguistic impairments associated with Williams syndrome, specifically relating to grammar. These same impairments might also explain why Williams syndrome patients underperform on false belief tasks, given that narrow syntax is responsible precisely for generating thoughts with a propositional structure – beliefs are, after all, typically held in philosophical circles as the archetype of propositional attitudes.

As a final consideration of pathological cases, I turn to the issue of psychosis. In this instance, I suggest that we find evidence relating to the evolution of language that again supports the claims I make in this thesis. Psychosis is typified by its linguistic nuclear symptoms – hearing voices, thought insertion and so on. One suggestion, from Crow, is that psychosis is actually the price we paid for language, and this is why psychosis isn't removed by evolutionary forces. Language is so useful that it permits the negative side-effect of psychosis (in a small number of individuals). However, I suggest that our analysis of creativity in Chapter 1 might offer another reason as to why psychosis persists – because of its connection to creativity. Both the Inspiration View and the Derangement View can be tied to the nuclear symptoms of psychosis, and in Chapter 1 we saw that there is an overrepresentation of psychosis in creative populations. I argue in Chapter 6, then, that a common cause of both psychosis and enhanced creativity could be the linguistic cognitive feature of hearing voices – our inner monologue. Clearly, in cases of psychosis, this process has gone awry, but I suggest we depend heavily upon our inner narrator in the generation of fantasies and, ultimately, stories.

And, once again, we have reason to think that stories are useful to us. Further evidence is called upon in this chapter showing that creating and interacting with paracosms (fantasy worlds) has a strong correlation with the ability to tell and comprehend stories. This, I suggest, might be because even hearing stories requires extensive use of the imagination to 'fill in' missing information when we attempt to recall what we are told. This is perhaps why, we see, encouraging children to play based upon structured stories correlates with enhanced creativity. The common theme which emerges from this evidence is that the more we engage with fantastic narratives, the more likely it is that we will be creative adults.

Summary

The position I advocate for – that of the co-evolution of fantasy, language and storytelling – is, I suggest, a better solution to the puzzle of the Creative Explosion than that of Picciuto and Carruthers. My *Storytelling Hypothesis* coheres with the evidence relating to pretend play more than their Pretend Play Hypothesis. Moreover, there are independent reasons to favour the story I tell in this thesis.

Chapter 1:

IMAGINATION & CREATIVITY

What is the imagination and what is its connection to creativity?

Introduction

As stated in the Introduction, the aim of this thesis is to outline the view that a co-development of the complex relationship between language, fantasy and culture was (and perhaps remains) the evolutionary driver of human creative cognition. I have indicated that fantasy is an often underestimated variety of imagination, and I begin to build this argument in the current chapter by outlining the relevant notions of imagination in the current literature and their connection to creativity. I develop the argument in favour of fantasy further in Chapter 4. This chapter, more immediately, will seek to establish an account of the imagination which specifically *includes* fantasy in order to later demonstrate the explanatory benefits of such an account when it is applied to the problem of the evolution of human creative cognition. Specifically, I argue that a broad account of the human imagination (which includes not only fantasy, but various forms of mental imagery and propositional thought) will allow us to better understand its evolutionary ancestors, both in pre-cursor hominids and non-human animals (see Chapter 2). Moreover, it helps makes sense of the lofty ambitions that many philosophers and linguists once held for language as the explanans for uniquely human creative capacities.

Before outlining this account of the imagination, however, we must first say something about the thing to which it is said to significantly contribute – creativity. §1 and §2 are dedicated to this purpose, firstly outlining the traditional analyses of creativity – the Inspirationalist and Derangement views found in Plato – and recasting them through the lens of the imagination. Doing so, I argue, preserves some useful phenomenological and explanatory features of these accounts of creativity. I then turn to modern attempts to set out the necessary conditions for creativity, adopting the common suggestions with little opposition so that we might have some specific criteria by which we can assess imagination's contribution to creativity. I turn to this issue in §3, identifying and describing several varieties of imagination (though I do not attempt to offer an exhaustive taxonomy) and examining their relationship to creativity. What emerges from examining the philosophical literature on imagination here is the frequent attempts to distinguish it from fantasy. In §4, I introduce an alternate way to view fantasy, found in Currie and Ravenscroft 2002, which sees it as another variety of imagination. I

begin to make a case in this section that this particular variety has been unfairly denigrated when considering its role in human creativity, an idea that I will revisit and continue to defend in subsequent chapters.

§1 Traditional Analyses of Creativity

Although they have fallen out of favour in recent years, there are two particular analyses of creativity that historically recur in the philosophical literature and, to some extent, remain in the popular imagination today (Gaut, 2003). Although these were initially intended to describe poetry, they might be easily extended to cover creativity in other domains of human activity. The analyses are (i) the *Inspiration View*, which takes the poet as the mouthpiece of the Gods, and (ii) the *Derangement View*, which suggests the poet is (in some way) a 'madman'. Despite the fact that they have fallen out of favour, I argue below that re-examining these views through the prism of imagination (with its myriad construals in the philosophical literature) reveals important aspects of creativity that we ought to retain in contemporary analysis.

§1.1 The Inspiration View

Inspirationalism is expressed by Plato as follows:

> [Homer's gift] is not an art, but… an inspiration; there is a divinity moving you, like that contained in the stone which Euripides calls a magnet, but which is commonly known as the stone of Hereclea. This stone not only attracts rings, but also imparts to them a similar power of attracting other rings..; in like manner the Muse first of all inspires men herself; and from these inspired persons the chain of other persons is suspended, who take the inspiration. For all good poets… compose their beautiful poems not by art, but because they are inspired and possessed (Plato, Ion: 533).

Gaut's interpretation of Plato's view here is that the originator of the creative act is a supernatural agent and human creators are merely 'mouthpieces of the gods' (Gaut, 2003). Whilst it may seem that the quote might be suggesting that it is *Creativity itself* that is imparted to us by the Muse, it is important to keep in mind the particular case Plato has in mind. Many scholars assert that Homer was not a single individual, but in fact a 'movement' (Graziosi,

2002). The suggestion here is that the oral tradition of Homeric poetry is a matter of a story being passed on from one generation of *reciters* to the next, with natural variations developing the story (thus not involving any substantive act of creativity at any point beyond the story's inception by the Gods). It has been suggested that the repetitive use of rhythmically formulaic epithets is indicative of the process of memorising and reciting an existing body of work, though clearly each performance will have demonstrate some variation (Parry, 1930). On this view, then, the other 'rings' attracted to the divinely inspired poet, therefore, are indirect mouthpieces of the gods.[1]

Stories about the involvement of supernatural agency in creativity (especially artistic creativity) persist across various cultural groups. For example:

> [I]n many Native American cultures human creation of the art is consistently denied… [T]he paintings and engravings are spirit objects. These by definition are believed to have an origin in the supernatural, not natural, world. (Whitley, 2009: 178)

Although a metaphysically unattractive picture (for a naturalist, at least), a link to the supernatural may have *explanatory* value for understanding creative products for which we lack any alternative substantial social or historical context. Given the limited archaeological evidence to help explain some of the images painted on cave walls during the Upper Palaeolithic, approaching these images from the perspective of Inspirationalism might allow us to better explain the connection between these images and, say, the collections of objects seemingly placed in the same caves i.e. given the apparent presence of deliberately placed objects on alter-like stones, and their co-occurrence with visual depictions of animals and human-animal hybrid figures, we might view these as part of a wider religious practice in which a shamanic figure acts in the belief that he or she 'channels the Gods' to create these paintings (the view favoured by Whitley). Or, more simply, *stories* about the Gods and the supernatural might have become prevalent and influential within Upper Palaeolithic culture by this point such that artists took to the caves to create a permanent record (the view I defend in Chapters 4 and 5). So, Inspirationalism shouldn't be dismissed out of hand because of any concerns about implied

[1] We can't be certain whether or not Plato shared this modern understanding of the authorship of Homeric poetry, and this question is not of great relevance here. Gaut's interpretation, which I happen to share, seems at least open to us, and not unreasonable.

ontological commitments, especially given the potential explanatory benefits of understanding human practices as at least motivated by *a belief in* divine beings.

Kant also defends a version of Inspirationalism in *The Critique of Judgement*, but one which moves away from the potentially worrying ontological commitments of the Platonic view. Specifically focusing on *genius*, Kant suggests that the genius

> …cannot indicate scientifically how [he/she] brings about [the creative] product… Hence, where an author owes a product to his genius, he does not himself know how the *ideas* for it have entered into his head, nor has he it in his power to invent the like at pleasure, or methodically, and communicate the same to others in such precepts as would put them in a position to produce similar products. (Hence, presumably, our word *Genie* is derived from *genius*, as the peculiar guardian and guiding spirit given to a man at his birth, by the inspiration of which those original ideas were obtained) (Kant, 1952: Ak. 308).

We can, if we so desire, read the suggestion of a 'guiding spirit' here as simply some innate and biologically-grounded set of talents predisposing a genius toward the creation of original products that stand apart from the rest in the domain (see §2 for further clarification of Kant on genius and creativity). Kant, then, points the way toward a naturalistic framework within which we can retain one of the intuitively appealing aspects of the Inspirationalist account: that great ideas appear to come out of nowhere. A more recent version of Inspirationalism along these lines i.e. minus the Platonic ontological concerns, has been defended by Kivy (2001). Kivy suggests that something like Plato's model of creativity is required to account for genius:

> Bright ideas are not generated by acts of will through application of some "method". Bright ideas just "happen" to people. People who get them are patients, not agents. That was Plato's (or Socrates') discovery. Insight is a kind of "infectious disease" that one succumbs to. One might well call it the "passive" notion of genius (Kivy 2001:11).

Kivy's suggestion includes the notion that there is a kind of phenomenological abruptness to some kinds of creativity: the idea seems to 'pop into your head' apropos of nothing. One (frequently cited) example to illustrate this notion is that of Friedrich von

Kekulé's account of his discovery of the ring structure of the benzene molecule (cited, for example, in Boden, 2004: 26). Von Kekulé describes a day-dream or reverie involving a snake swallowing its own tail (the ancient Greek symbol of introspection, cyclicality or self-reflexivity, *ouroboros*) as revealing to him the structure of the molecule (Read, 2011). Stokes (2011) describes this as bearing the *flash phenomenology* of inspiration. Perhaps this flash phenomenology isn't unique to creative thought – for instance, suddenly remembering something might feel similar to suddenly having a (creative) idea. However, the difference between the two cases is that inspiration reveals something *new*. Kivy's own view is qualified in two ways: firstly, the flash phenomenology is necessary but not sufficient for inspired creation; certain innate creative abilities and dispositions are also required. Secondly, geniuses require us to treat them 'as if' they have been divinely inspired because we (currently) have no naturalistic explanation for this phenomenon.[2] This is particularly the case for artists who produce a 'one off' – something for which there is no precedent. Stokes terms this 'as-if Inspirationalism'.

It is important to note that the Inspirationalist isn't simply hand-waving when she turns to the divine to explain works of genius. In fact, the Inspirationalist method mirrors that of the phenomenological arguments for free will. Campbell (1951), Lehrer (1960) and Searle (1984) all argue for free will from the basis that it *feels* as though we have a choice about what actions we pursue, and we can all be certain that we feel that way. In much the same way it is the phenomenological content that leads the Inspirationalist to the idea that (at least some) creativity is divinely inspired – it certainly doesn't *feel* as though it comes entirely from within, so we must work outwards to the best explanation available at the time, namely the divine. We might, however, wish to be cautious with how we characterise such experiences of divine inspiration. Whilst it does seem like some Inspirationalist accounts want to advocate for a rather extreme view of the role of the divine, others certainly do not. For instance, the description of Native American views of inspiration given by Whitley above seems to view the artist as an entirely passive conduit; Kant's view, by contrast, isn't committed to this notion for the genius at all. The Native American view of inspiration sounds almost like a case of thought insertion, as with schizophrenic patients. In cases of thought insertion, it feels as if the thoughts are not one's own, but instead belong to someone else and have been inserted into one's mind

[2] This problem is re-stated by Harold Osborne (1977). In Osborne's view, aesthetic properties are dependent upon non-aesthetic properties but not deducible from them in any rule-governed way. As such, artists cannot reason consciously about how to produce aesthetic properties, meaning that the source of the artistic works must ultimately be unconscious, thus explaining why the inspired person might feel as though he is guided by forces beyond his or her (conscious) self.

(Mullins, 2003). However, we might be reticent to say this of Kant's genius: she might not know how she came by the thought, but does not feel as though she is not its author.

For both Kivy and Gaut, then, in the absence of a naturalistic explanation it is important to treat geniuses as though they have been divinely inspired. However, this (supposed) lack of a naturalistic explanation doesn't mean as-if Inspirationalism is resistant to all further analysis. Recent philosophical literature on creativity emphasises *value* and *originality* (or *novelty*) as necessary conditions for creativity (see §2 below). Not just *any* idea that pops into our head is creative; in the very least, the value criterion means that the idea must serve some purpose, solve some problem, or some such thing. Von Kekulé's daydream seems to illustrate a process, conscious or otherwise, of working through knowledge, memories, images etc. and eventually discovering how these illuminate one another to solve a scientific problem of sorts. This seems to be at least one way in which we deploy the imagination (Wilson, 1971). The imagination can thus provide *insight* (the 'infectious disease' Kivy mentions above), which is surely typified by the kind of flash phenomenology described above in terms of *divine inspiration*. But this does not mean that we must regard the creative individual as a 'patient' under such circumstances: in von Kekulé's case we might think the imagination is operating 'behind the scenes', or unconsciously, on a problem he had otherwise been consciously wrestling with over an extended period of time.[3] Walton describes this as a kind of spontaneous imagining (see §3.3). That an unconscious kind of imagining is possible is, I believe, important to providing an evolutionary account of other varieties of imagination (see Chapter 2).

A more recent philosophical distinction may be useful to consider here. Gaut (2003) draws a distinction between *passive* and *active* creativity. Gaut cites the von Kekulé anecdote as an illustration of passive creativity, that is, creativity that:

> …occurs when the subject is unaware of the creative process, if any, which has occurred to produce the creative outcome. The outcome simply 'pops into the head' of the subject (Gaut, 2003: 156).

[3] There are good general reasons to be sceptical about the accuracy of the description of the creative process in such widely cited cases as this. The von Kekulé story in particular is now well-known in philosophical circles, with his first telling occurring in 1890 to describe a process which took place at some point between 1865 and 1872 (when he published two separate papers on the structure of benzeme). It's possible that von Kekulé's story is simply a re-telling of a similar analogy present in the parody journal 'The Journal of the Thirsty Chemical Society', which used the analogy of a circle of monkeys grabbing one another by the tail (Greenbaum & Wilcox, 1965).

Inspirationalism, then, is a passive form of creativity, to be contrasted with its active alternative, in which "the subject actively searches out various solutions, consciously trying out different approaches, and in the course of this activity comes upon a solution" (Gaut, 2003: 156-7). In Gaut's view, active creativity lacks the flash phenomenology associated with its passive counterpart.

One reason why ancient philosophers may have been quick to attribute the products of inspired creation to the gods rather than human imagination is because of their tendency to focus on works of genius rather than everyday creativity. Such works, especially, may seem 'otherworldly' because of the perceived 'impossibility' i.e. the great difficulty, of a 'mere' human being to be their author. But more recently, Kant, Kivy and Gaut also make genius their focus in varying degrees. However, I'm fairly confident that the flash phenomenology of the acts of creativity associated with genius by these authors will, in fact, be familiar to (almost) everyone: suddenly realising that we can fix the leaky tap by using the rubber stopper from a discarded beer bottle may have this 'feel' to it. This doesn't constitute an act of genius, nor is it a discovery of huge value (or, more precisely, 'agent-neutral' value – value which reaches beyond the agent and into an objective or communally-agreed value; see Picciuto and Carruthers, 2014), yet it shares many of the base features described for von Kekulé's case above. If someone were to tell us that they were a completely passive conduit for divine inspiration, contributing little of their own knowledge or understanding to the creative product, that they'd been spoken to by the Gods and were merely enacting their will, we would probably be more likely to think that they were mentally ill than we would be to regard them as a genius.[4] And this is perhaps why the Inspiration View shares its origins with the Derangement View, to which I turn in the next section.

In sum, then, there are particular aspects of the Inspiration view that are worth retaining:

> (i) The explanatory value of leaving open the option of viewing creative acts for which we lack contextual knowledge *as-if* they were divinely inspired (though there may be reasons to *prefer* other explanations) because this leaves open the possibility that some cultural story can be told to link together the scant contextual information we have;

[4] Such a view would also perhaps invalidate an 'agency criterion' for creativity i.e. that the act was deliberate, or originated with the person being described as 'a genius' in these cases – see §2 for a discussion of this.

(ii) The identification by the Inspiration view of the flash phenomenology of some creative acts and recognition of its importance to understanding creativity (though, I have suggested, this phenomenology has historically been too closely associated with acts of genius when, instead, it has a much broader application).

§1.2 The Derangement View

The origins of the Derangement View might also be traced back to Plato's comments in the *Ion*. As we saw above, not only does Plato speak of being inspired, but also of being 'possessed'. This kind of description also seems apt for the experiences of Shamanic artists, who also demonstrate numerous symptoms of mental illness (Whitley, 2009). Plato claims that a poet is 'never able to compose until he… is beside himself, and reason is no longer in him' (523b3-5), and the connection between genius and madness remains in the popular imagination to this day.

One of the more sustained treatments of this idea in the philosophical literature can be found in Schopenhauer's *The World As Will and Representation* (Schopenhauer, 1958). Schopenhauer sees the artistic genius as having some kind of imaginative access to a world beyond our own (essentially that of Platonic Ideas).[5] This powerful imagination elevates the artist beyond that which is given to him in sense perception, enabling him (for Schopenhauer thinks women to be incapable of this feat) to create works of art which represent pure Ideas to his audience in ways that make them accessible (Lewis, 2012). This has similarities to the Kantian view above, in that acts of exemplary creativity are somehow instructive to their audience. The audience's aesthetic experience also involves a disconnection from immediate experience: Schopenhauer takes seriously the idea that one can be *lost in contemplation* of a rose, for example, becoming aware of the 'essence of roseness' in the process. However, for Schopenhauer, the audience do not have the same imaginative powers as the artist: the non-artist tends to use the imagination to engage in 'mere' fantasy – imaginative acts that are designed to service the will i.e. selfish desire – whereas the genius uses his imagination to achieve objective understanding of reality. This denigration of fantasy is common throughout

[5] There are very close parallels with Schopenhauer's view of creativity in the Hindu tradition too. Chuadhuri (quoted in Chu, 1970) describes the Eastern view of the creative process as "a flash of aesthetic insight into the heart of the object… [T]he artist experiences intimate oneness, the spirit of the object." Note, again, the presence of flash phenomenology here.

the philosophical literature and, I will argue both in §4 and elsewhere in this thesis, that this contributes to its being overlooked as an important driver in the evolution of human creative cognition. Setting this aside for now, let us return to discussing the Derangement View.

The connection to derangement in Schopenhauer's account comes from the effect that access to pure Ideas has on the genius: artists are peculiarly prone to madness because their contemplative experiences put them in an increasing state of discord with the ordinary world. The more they access the world of pure Ideas, the harder it becomes for them to seamlessly reintegrate back into the world inhabited by the rest of us. Interestingly, there is an empirical correlation for this claim of the Derangement View. Studies by Kyaga et al. (2011, 2013, 2014) suggest that there is an overrepresentation of people with symptoms of schizophrenia or bipolar disorder working in creative occupations. This latter condition seems to be particularly strongly linked with creativity in literature: Jamison (1993) presents an extensive study of the link between bipolar disorder and the "artistic temperament". Although there is some dispute in the scientific community about the extent and the nature of the link between creativity and mental illness, there are a variety of studies that can be called upon as tentative support for some version of the Derangement View. As a result, I (tentatively) propose below an alternative to Schopenhauer's version of this view.

§1.2.1 Creativity and Constraint

On Schopenhauer's view then, derangement is eventually *caused by* the exercise of the imagination as it places the artist into a kind of experiential limbo between the world of pure Ideas and the ordinary world. However, I wish to suggest that the direction of causation could easily be reversed: a pre-existing mental illness may be the cause of enhanced creative capacities. Let us explore this suggestion before moving away from the Derangement View.

Because of the value criterion for creativity, it may be argued that creative acts must operate within an established framework for evaluation. One proponent of this view is Fred D'Agostino (1984, 1986). His account agrees with Gaut's that originality is also a necessary condition for creativity, and D'Agostino also endorses, though in slightly different terms, the value criterion: D'Agostino suggests that the created product should be *exemplary*, in that it can serve as a model for future productions in the same domain, by revealing some new standard for future productions or establishing some new set of constraints within which future

productions must operate (not dissimilar to Kant's description of works of genius). However, D'Agostino also suggests that 'the created product [should be] an appropriate, but non-random, response to the circumstances of its production' (D'Agostino, 1984: 91). Here, D'Agostino is reflecting the same sort of intuition as Briskman, who suggests that 'a scientific or artistic product is [creatively] valuable insofar as it constitutes or incorporates a solution to a problem' (Briskman, 1980: 95). Both accounts require some benchmark against which the value of the created product can be judged: the product must be responding to some circumstances or problem, and the value of the product is determined (at least in part) by how appropriately the product responds.

The implicit suggestion in these accounts is that creative activity can only be valuable if it takes place within an existing framework of constraints (expanded upon below) or set of rules that provide the context for its evaluation. D'Agostino makes this point explicit by saying that the degree of creativity:

> …depends on, and varies inversely proportionally with, the strength of the constraints on the problem [and] depends on, and varies directly with, the degree to which the production of the product reveals the existence and relevance of constraints on the problem for which it is a solution which were hitherto unknown (D'Agostino, 1984: 97).

There is much subtlety and detail in D'Agostino's account that is interesting but unnecessary for my purposes here. However, the broad picture of his view is one of a 'global', species-specific set of constraints on the kind of creative thinking that humans are capable of. For D'Agostino, this general set of limits is put in place by language (specifically by what Hinzen, 2013, terms 'narrow syntax'; see Chapter 3).[6] In addition to these global constraints are the 'local' constraints specific to the kind of creative activity in which one is engaged. To take one of D'Agostino's examples – that of jazz improvisation – the local limits or constraints are the key, tempo and mood of the piece against which the musician is improvising. In D'Agostino's view, the *stricter the constraints* upon creative practices, *the less creative the practice* – in the strictest cases the rules will provide a mechanical search procedure for finding a solution

[6] There is another point of connection worth noting here, but one which can't be explored within this chapter. If language provides some kind of global constraint on creative thought, then we might expect there to be a correlation between language deficits such as acquired aphasia and creative thought. I explore this correlation in Chapter 6.

to the problem at hand, ensuring that they are not creative at all (see §2). Something like jazz improvisation, he suggests, has very few rules and therefore is a highly creative practice.[7]

So how does this relate to imagination and the Derangement View? This is the question to which I now turn.

§1.2.2 Breaking Convention

One way in which mental illness could be the *cause* of enhanced creativity (thus reversing Schopenhauer's view) is if it somehow *liberates* the creator from constraints in place in mentally healthy individuals. We don't need to identify specifics for my purposes here, but certainly freedom from social inhibitions might permit more experimental creative acts. So it might not be that the mentally ill creator has some special insight or access in the way that Schopenhauer suggests, but instead has an increased willingness to push the boundaries when they create, or perhaps simply unawareness of where the boundaries are. The role of the imagination here is, perhaps, that where boundaries are absent, the agent may demonstrate willingness to engage imaginatively with a subject in ways other people might not. And if mentally ill creators do have special insight, it may be because they acquire a greater understanding of universal human emotions because their own experience lies at the extreme end of the spectrum. Consider, for example, Sylvia Plath's exploration of sadness and despair as someone who suffered from depression (for discussion of this, see Claridge et al., 1998). We might, not unreasonably, believe that it is precisely the extent and duration of the emotional distress caused by her mental illness that granted her the insights her works demonstrate. Her mental illness would provide for her both more opportunity and more reason to engage imaginatively with the emotional states it engenders. In this version of the Derangement View, mental illness is the cause of creativity rather than the effect – mental illness increases the creator's freedom from the rules or constraints of the creative domain in which they are operating.

[7] There are reasons to doubt that jazz improvisation really is as unconstrained as D'Agostino suggests. Hamilton points out that: "familiar patterns of notes are embedded in the performer's muscular memory as a result of countless hours spent with the instrument, and regurgitated when there is no restraining score. Improvisers express themselves less than they think because so much of what they play is what they are remembering, including things they do not even know they are remembering." (Hamilton 2000: 180) For Hamilton, we tend to over-value jazz improvisation because we aesthetically value spontaneity, even if that spontaneity is, in fact, illusory or pretend.

Precisely what the relationship is between constraint and creativity isn't entirely clear. There's some intuitive plausibility to D'Agostino's suggestion that highly constrained creative acts are less creative, and others such as Kant (1952, see §2) and Osborne (1979) also suggest that works of genius are such precisely because they go beyond current principles of excellence; yet there are also compelling accounts which claim the opposite. Boden, for example, argues that the presence of narrower constraints can actually lead us to judge something to be *more* creative:

> [S]ome musicians regard Mozart as a greater composer than Haydn *even though* they allow that Haydn was more adventurous, more ready to transform musical styles. Mozart's superiority, on this view, lay in his fuller exploration (and tweaking) of musical space, his ability to amaze us by showing us what unsuspected glories lie within this familiar space (Boden 1994: 114).

It also seems plausible to suggest that things like the domain of creativity, or the nature of the problem the creator intends to solve, might impact upon our judgement on this issue.[8] For instance, it seems that there are clearer and stricter constraints on computer programmers than there are on visual artists broadly construed, operating as they are with a defined and relatively narrow set of possible operations in their programming language. Yet, we may wish to praise the creativity of the computer programmer precisely for their ability to solve a highly-specified real-world problem while working within such constraints, whilst at the same time praising an artist for flouting the relatively fluid and few conventions governing their creative domain when they, for instance, tip a urinal on its side and sign it 'R.Mutt'. The precise relation need not be specified here for my version of the Derangement View to pass: it does not specify that derangement is necessary or sufficient for creativity, only that there are some instances where it *contributes to* achieving some other necessary condition for creativity, such as originality or value.[9]

This version of the Derangement View, then, is instructive in explaining *how* creativity develops or occurs. This is precisely the aim of this thesis, and it identifies a particular group of

[8] A similar view is offered by Csikszentmihalyi (1996) via his 'systems model' of creativity. Csikszentmihalyi sees degrees of creativity as dependent upon an interplay of the domain of creativity, the field of creativity (the people who are the 'gatekeepers' to the domain) and the creative agent.

[9] This, of course, might not be (and, in fact, *is not*) always the case – intense psychotic episodes, for example, might make creativity impossible.

persons as a potentially interesting focus. That things like psychosis and depression have not been phased out by evolution has puzzled evolutionary biologists, linguists, psychologists and philosophers alike (see, for example, Brune, 2004). A common suggestion is that these conditions must somehow co-occur with some evolutionarily desirable trait and, as mentioned above, the empirical evidence offers up creativity as a candidate. More interestingly, one proposed explanation for this co-occurrence is that both share a common cause in the form of the evolution of language in our species (Crow, 2000). Given the central argument of this thesis, this is a view of great interest here. However, I will return to this idea – and to other pertinent discussions about the connection between language disorders and creativity – at the very end of this thesis only after the prerequisite discussion of language in Chapter 3. I will, instead, now move away from traditional to contemporary analyses of creativity, before finally taking a more in-depth look at the imagination itself.

§2 Modern Analyses of Creativity

Whereas the traditional analyses of creativity discussed in §1 focused on the *source* of creative ideas i.e. whether they came from the Gods or a deranged mind, modern analyses of creativity have attempted to unpack the concept itself to provide a definition. Outlining necessary and sufficient conditions for creativity is useful to the discussion of imagination here, as well as its relationship to Inspiration and Derangement, by identifying particular criteria to which the imagination can be said to contribute during the creative process. As mentioned above, discussions of creativity have historically often focused upon genius, and this tendency has carried over into the definitional project, with many authors focusing on the concept of GENIUS rather than that of CREATIVITY. However, it has also often been the case that what is said of genius is easily transferable to what is generally termed 'everyday creativity'. Kant, for example, suggests that:

> Genius (i) is *a talent* for producing that for which no definite rule can be given: and not an aptitude in the way of cleverness for what can be learned according to some rule; and that consequently *originality* must be its primary property. (2) Since there may also be original nonsense, its products must at the same time be models, i.e. be *exemplary*; and, consequently, though not themselves derived from imitation, they must serve that purpose for others, i.e. as a standard or rule of estimating. (Kant, 1952: Ak. 308)

Kant therefore identifies two conditions that must be met for something to count as a work of genius: originality and exemplariness (setting a standard against which other similar works can be measured). Kant's remarks on genius here are actually very close to many more recent discussions of creativity more broadly. For instance, Simonton (1999) offers the following analysis of creativity:

> Creativity must entail the following two separate components[:] First, a creative idea or product must be *original*… However, to provide a meaningful criterion, originality must be defined with respect to a particular sociocultural group. What may be original with respect to one culture may be old news to the members of some other culture. Thus, Galileo's discovery of sunspots counts as an original contribution to European civilisation even though the Chinese had noted their existence for well over a thousand years. Second, the original idea or product must prove *adaptive* in some sense… An invention must not only be new, but it must also *work*… A scientific theory… must be logically coherent and factually correct… In the arts, finally, adaptiveness often entails the capacity to maintain interest through novel expression as well as through powerful emotional appeal (Simonton, 1999: 5-6, emphasis added).

Both Simonton and Kant use the term 'originality' here to label their first criterion, and many recent discussions of creativity adopt this same term. However, it isn't clear that Kant is using 'originality' in exactly the sense in which Simonton does, though there is, I suggest, a clear kinship. Kant's focus seems to be on the *process*, whereas Simonton's is on the *product*. For Kant, the genius creates in a way that isn't (at least obviously) rule-governed. Their process, therefore, is original in the sense that it defies (simple) replication. For Simonton, the important issue is that the output of the creative act is somehow new, even if it is only new in a culturally relative (or perhaps even agent-relative) sense. These two positions seem perfectly compatible with our intuitions about creativity. An unoriginal product can be produced in a creative way. For example, using solar parabolic concave mirror dishes to create fire seems, to me at least, highly creative, despite the fact that one could have created the same result by striking a match. However, repetition of this process (e.g. on the countless YouTube videos posted online and on TV magazine shows) does seem to warrant the assessment that not every instantiation of this process is creative. So what is being assessed in this case is the method of production, rather than the product. A lot of innovation is in finding more efficient ways of doing something we're already doing, and presumably the product is no more creative for

being the result of an original process. However, it is less clear whether an entirely unoriginal method could produce a creative product: presumably some variation on an old process must occur to produce a different result, and highly *original* products (we might assume, anyway) may require greater variation. Whether these products are creative or not would depend also on their value.[10]

There's another important point to draw out of Simonton's version of the originality criterion here: that originality is relative. Boden (2004) makes much the same point when she suggests that originality (or 'novelty', to use her term) can be relative even to a given person. Boden's distinction therefore isn't merely along sociocultural lines as with Simonton, but instead between that at the person-level ('P-novelty') and the historical level ('H-novelty'). 'P-novelty' involves originality "with respect to the individual mind which has the idea", whereas 'H-novelty' is original "with respect to the whole of human history" (Boden, 2004: 32). In terms of process and product, both could be P-novel, H-novel, or both P-novel *and* H-novel (if something is H-novel, it is necessarily also P-novel). Because we can distinguish between P-novelty and H-novelty, we can also make better sense of the notion of convergent thought i.e. where there are two independent discoveries of the same thing, such as a new method for safely storing meat (such as salting and burying it) or producing representational drawings of animals on cave walls. If these were geographically and temporally disparate discoveries, we wouldn't want to say that the chronologically later discovery *wasn't* creative simply because it lacks H-novelty. Nor are we forced to say, even, that it is *less* creative: we might decide that the temporal disparity was a result of the absence of pre-requisite cultural accretions that explain the delay, but still be separately impressed by the rate of cultural development that enabled the chronologically earlier case. For instance, if it is a prerequisite of cave painting that there be a rich culture of storytelling, and that a prerequisite of a culture of storytelling is a particular group population density, then the absence of these preconditions would explain the absence of cave painting. If the first cave paintings were produced by a group who achieved the prerequisite population density 10,000 years earlier than another group, and thus beat them to the production of cave paintings by up to 10,000 years, we wouldn't say the second group's cave paintings were any less creative an innovation than the first group's.

[10] We might think of the many artworks produced using much the same method by drip painting artists like Jackson Pollock as a possible counterexample, but presumably what is important about this process is the selection of which canvasses to keep and which to discard.

This first criterion, originality, is therefore applicable to both process and product and is relative to agents, culture, and all of history. It is taken also to be a necessary but not sufficient condition. Mere originality, it is suggested, is not constitutive of creativity. As Kant points out in the passage above, much 'nonsense' is original but not creative. Although Gaut points out that we might be sympathetic toward the view that original nonsense appears to have some merit over received nonsense, it is generally accepted that creativity depends further upon the second criterion identified above. For Kant, the criterion is *exemplariness*, and for Simonton it is *adaptiveness*. Considering the disparate focus of each author, I suggest that both have in mind some version of the *value* criterion adopted by most contemporary accounts of creativity.

Kant's concern, as I have said, was with genius. For Kant, then, the creative products he is concerned with are those at the upper-most level of creativity. The products of genius, and their mode of production, must be models for all other would-be creators to follow. There seems to be little wrong with this assertion: it is precisely that their *work* astounds us that we tend to proclaim particular individuals as geniuses. Simonton's focus, meanwhile, is on giving a Darwinian explanation of creativity. 'Adaptiveness' is therefore a term borrowed directly from Darwin's evolutionary theory. A creative product is 'adaptive' inasmuch as it is well suited to the purpose for which it was created. Carter (2004) suggests a non-Darwinian alternative when he stresses the importance of 'appropriacy':

> By 'appropriate' is meant something that is normally fitted or adapted to the resolution of problems or difficulties existing within defined constraints. It should also have outcomes which are clearly valued as specific within a particular work or activity domain and which are approved and valued within the cultural community associated with that domain (Carter, 2004: 29).[11]

In each of these accounts, what is essentially at stake is whether or not the thing is *valuable*: as a model for others to aspire toward, as a solution to a problem, as somehow

[11] Greg Currie has pointed out that approval of the relevant community does not seem to be a necessary condition for creativity. In his example, the invention of a contraceptive device might be creative even if disapproved of in the relevant community. However, it seems to me that approval and value are going to differ depending upon how we draw the lines around a given 'community'. To take his example, the 'moral community' might disapprove of an invention the 'scientific community' approve of. The issue then is one of *domains of evaluation*: are we evaluating something as a moral innovation, a scientific innovation, etc? This is part of the problem with the value criterion – it is an incredibly vague stipulation.

culturally significant etc. That we value creative products seems obvious – as Dutton points out, "the persistent pursuit of creativity shows itself, for example, in the reluctance of careful writers to use the same word a second time in a sentence where synonyms are available; the thesaurus exists less for greater precision in writing than for the sake of pleasurable creative variety" (Dutton, 2009: 54). So, mere originality is insufficient for creativity: it requires originality with a purpose.

Gaut adds a third criterion to those outlined above. He points out that something could be original and valuable, but still not be considered creative. Such cases would include accidental creativity, where the agent has not deliberately created the product, but perhaps done so as a by-product of some other action. Gaut therefore recognises the need for an 'agency condition'. The problem is familiar to discussions about agency in ethics: moral praise and blame can only be assigned to agents; surely, the thought goes, the same should be true of assigning value to acts of creativity. Consider the example of a man daubed in paint and locked in a dark room containing a canvas who, in his attempt to escape the room, unwittingly creates a stunningly good abstract painting (Gaut, 2003). The concern here is that the outcome is achieved purely by chance, and intuitively we lean toward the judgement that this was *not* a creative act. Similarly, if the outcome is achieved by mechanically and systematically working through the full range of relevant possibilities, such as the case (cited in Novitz, 1999) of Charles Goodyear's discovery of vulcanisation, then we share similar intuitions. Whether or not something is a creative act therefore seems to depend upon *how* the (original and valuable) product is made.

Gaut expresses this in terms of involving 'flair' on the part of the maker (Gaut, 2003: 151), and though this expression seems to imply something beyond the agency criterion described above, Gaut doesn't add anything to this description to suggest that this is anything more than an implicature effect – we might assume from the term 'flair' that, for Gaut, the act of creativity must be done in a particularly skilful way, but if this is what he means then it is not made explicit. The additional criterion is meant to rule out cases where an original and valuable product has been made either by a purely accidental process (presumably some luck is permissible e.g. when an artist makes a fortunate error), or by a purely mechanical process (though perhaps some creative acts *involve* mechanical ones, e.g. changing social policy by using a mechanical hacking process to steal sensitive government documents). Gaut expresses this by

suggesting that "creativity… is the kind of making that involves flair in producing something which is original (saliently new) and which has considerable value" (Gaut, 2003: 151).

So, creativity is generally thought to involve three criteria:

1. An 'originality criterion': for something to count as creative, it must be original, though originality is itself relative e.g. to individuals, to cultures, and to history.
2. A 'value criterion': for something to count as creative, it must have value. Again, value is relative e.g. to agents, to societies, etc.
3. An 'agency criterion': for something to count as creative, it must not be produced by a purely accidental process, nor by a purely mechanical one, though luck and mechanised processes may be permissible to an extent.

The final tasks of this chapter, then, are to outline the most relevant of the myriad available varieties of the Imagination from philosophy and psychology, and to show the connection between imagination and the understanding of creativity outlined above. This is the focus of §3. This will set up the groundwork for a discussion of how the imagination played a role in driving the evolution of human creativity and, in turn, how language fits into this picture. It is one specific variety of imagination that I will argue played a crucial role: fantasy. For some philosophers, there is a distinction in kind to be drawn between imagination and fantasy, but in §4 I attempt to demonstrate that there are reasons to avoid distinguishing between fantasy and imagination in this way.

§3 Imagination and its connection to Creativity

It is generally accepted within relevant philosophical circles, at this point, that the term 'imagination' covers such a broad range of notions that it is neither possible to conjure up a simple taxonomy, nor even a simple taxonomy of attempted taxonomies! Possession of great imagination has been credited with driving the evolution of human creativity (Carruthers, 2002) and lack of imagination has been blamed for its failure to prevent the 2001 attacks on the World Trade Centre (Morris, 2013), such are the varieties of its supposed uses in the world. Strawson neatly describes the difficulties of providing a plenary covering all understandings of the imagination:

> The uses, and applications, of the terms 'image', 'imagine', 'imagination', and so forth make up a very diverse and scattered family. Even this image of a family seems too definite. It would be a matter of more than difficulty to identify and list the family's members, let alone their relations of parenthood and cousinhood (Strawson, 1970: 31).

It is my contention here that this should not really worry us. And it is certainly *not* my intention to offer any kind of comprehensive taxonomy. Instead, what this section attempts to do is identify and describe accounts of the imagination that have specific relevance for the discussion in the chapters which follow. This should lay the groundwork for contrasting human and non-human animal imagination (Chapter 2), as well as establishing accounts for which I will later argue that language necessarily plays a central role (Chapters 3 and 4). I will also spend some time here examining the notion of 'fantasy' and its connection to the imagination, so that I might go on to argue that fantasy has been somewhat mischaracterised, and its role in driving creativity underplayed (§4 & Chapter 4). What should emerge by the end of the next two chapters is a picture of a diverse faculty employed by a range of species to assist them with a range of social and environmental challenges. However, what should also emerge by the end of this thesis is a uniquely human variety of imagining, one which employs the cognitive architecture put in place by the evolution of language, and that manifests itself in the distinctive and universal creative behaviours of our species - storytelling, music, dance and art.

§3.1 Creative, Propositional and Objectual Imagination

Most empirical work on the imagination has focused on what Currie and Ravenscroft (2002) term the 'creative imagination'. This variety of imagination involves putting together "ideas in a way that defies expectation or convention: the kind of imaginative 'leap' that leads to the creation of something valuable in art, science, or practical life" (Currie and Ravenscroft, 2002: 9). Currie and Ravenscroft speculate that non-human animals, as well as humans, may be capable of creative imagination to some degree, though they don't fully explore this suggestion (since it is not their intended focus). I pick up this suggestion in Chapter 2, drawing upon some of the empirical work just mentioned.

So what *form* does the creative imagination take? In other words, how might we put ideas together in the imagination so as to create something new and valuable? Other varieties of

the imagination that have been identified shed some light on this. For instance, Yablo (1993) draws a distinction between *propositional* and *objectual* forms of imagining. Propositional imagining is *imagining that P*. Yablo gives as an example imagining that there is a tiger behind the curtain. The distinctive feature of propositional imagining, according to Yablo, is its alethic content i.e. that it is *truth-evaluable*. *Only* propositional imagining is truth-evaluable. This is an important claim, and one I will return to after my discussion of language in Chapter 3. For now, I will say only that it has been consistently argued by Hinzen (2006, 2007, 2011, 2013, Hinzen and Sheehan, 2013) that this feature of propositionality *emerges with grammar*, so propositional imagining is the paradigmatic case of a linguistic form of imagination.

Objectual imagining, according to Yablo, is (perhaps obviously) *imagining some object*, such as the tiger from the previous example. Yablo's elaborations on this notion are interesting, though perhaps a little confused in places. He explains objectual imagining as imagining an object "endowed with certain properties" (Yablo, 1993: 27), so we might, for instance, imagine the tiger as *being striped*. This seems a fairly uncontroversial way of thinking about objectual imagining, and multiple similar accounts are given elsewhere (for instance, see Currie and Ravenscroft, 2002 on 'sensory imagination'). However, Yablo blurs the lines between propositional and objectual imagining when he suggests that we might imagine the tiger as being endowed with the property of 'being behind the curtain' and yet "also imagine *that* it has those properties" (*ibid.*); this seems problematic. For one, we might question whether 'being behind the curtain' is a property of the tiger or of the imaginary world the tiger inhabits i.e. it is an imagined world in which there is a tiger behind the curtain.[12] In other words, it sounds less like imagining an object than it does imagining a state of affairs.[13] If it is the latter, then this would seem to involve the alethic content Yablo states is unique to propositional imagining, and entirely absent from objectual imagining. Conversely, on Yablo's view only objectual imagining (that which purports to depict an object) has *referential* content. This seems similarly problematic, depending upon what Yablo means by referential content. Clearly, *propositions*

[12] I have in mind here the same sort of objection that Kant raises against the Ontological Argument by saying that existence is not a predicate. Being extended in space is a predicate, but having a fixed location in space might not be – it seems like this might always be relative to some other object, and thus not a property of any object but instead a property of the universe containing the objects.

[13] Nagel (1974) describes a kind of imagining that may be helpful here – *perceptual imagining*. The former includes what Yablo terms 'objectual imagining', but more explicitly also includes imagining states of affairs too. On Nagel's account, we take the position of an imaginary perceiver for either objects or states of affairs. Perceptual imagining is, therefore, broader than objectual imagining, and Yablo's account might be strengthened by drawing this distinction so as to avoid the concerns about alethic content creeping into examples he thinks illustrate objectual imagining, which is meant to eschew alethic content altogether.

refer. If we imagine *that* 'The tiger has eight black stripes' then we are clearly imagining relationships obtaining between representational tokens and objects (here, for instance, there is a relationship between a definite description 'the tiger' and an object, an *imaginary tiger*). Alethic content emerges here at least inasmuch as it is true or false whether the imaginary tiger being depicted has eight black stripes, and presumably this kind of concern is what motivates parallel discussions about truth in fiction.

Setting these concerns to one side, it is clear that we possess the capacity for objectual imagining, and Yablo's view that it is different to, and independent of, propositional imagining, seems fine. And it is also clear that we deploy objectual imagining often. Currie and Ravenscroft (2002: 11) describe this as a kind of 'imaginative projection' in which we have a perception-like experience in the absence of a corresponding real object. We might add to non-propositional varieties of imagining, cases of imagining doing or experiencing something - what Walton (1990) terms 'active imagining' or 'imagining *de se*'. In these kinds of case, for instance, imagining seeing a bear, the imaginings are first-personal, but do not include identifying ourselves in that imagining:

> When I imagine (myself) seeing a rhinoceros, there may be a sense in which I do not imagine that *Kendall Walton* sees a rhinoceros, or imagine *Walton's* seeing one, or imagin *of Walton* that he sees one. No verbal representation of myself (neither my name nor a description of myself nor a first-person pronoun) need figure in my thoughts as I imagine (Walton, 1990: 31)

§3.2 Are all imaginings creative?

So how do the propositional and objectual varieties of imagination relate to the creative imagination? It seems that we can combine propositional imaginings and objectual imaginings (both 'ideas') in ways that satisfy the description given for creative imagination above. For instance, we may string together propositional imaginings in the form of a story, or we might imagine previously unthought-of of objects (a tiger with three white stripes, one yellow stripe, and one fuchsia stripe). Given what we have said above about the relativity of the originality and value criteria for creativity, it's tempting to say that *any* imagining might count as creative. Gaut, however, specifically warns against the use of 'imaginative' as a synonym for 'creative',

claiming that this would entail a "true but analytic and trivial connection between imagination and creativity" (Gaut, 2003: 151-2).

For Gaut, the issue is that not every instance of imagining yields something that is both 'saliently new', his version of the originality criterion above (but seemingly operating with stricter standards), and valuable. He instead cautions against calling something creative simply because it goes beyond what is given to belief and perception (a view he attributes to Scruton). Gaut gives two examples of what he regards as uncreative imaginings: imagining a golden mountain and imagining falling off the edge of a cliff. He suggests that these are 'not in any even minimal sense' creative imaginings. Whether both (or either) of these examples pass will depend upon how broadly we construe the originality and value conditions. Most actual cases of imagining a golden mountain seem unlikely to meet a strict rendering of the originality criterion – most of us will imagine a golden mountain only when instructed to do so by Hume (or some other philosopher borrowing his example). As such, the *idea itself* doesn't originate with the reader's imagining. But if the reader is combining the distinct ideas of 'golden' and 'mountain' for the first time *without instruction*, there would be an agent-relative sense in which the imaginative product is original (though perhaps still not valuable) even if it uses a process that agent may have used many times before (mentally combining two images). It is important to remember that we can describe processes as well as products as 'creative' (see §2), and this must also be true of imagination: how we imagine can be creative, even if what we imagine is not, and vice versa. Consider, then, Gaut's second example. In Gaut's words:

> When I peer over a cliff's edge I may, with boring and predictable regularity, just like countless other people, imagine being hurled down to the rocks below (Gaut, 2003: 155).

What is Gaut's point here exactly? Is it that my imaginative act is not creative because many others have done the same under similar circumstances (thus failing to meet the originality criterion)? If so, this position would surely entail that, for instance, portrait painting is not creative because, when sat at an easel with oil paints and a subject before me, I do what countless other people do and paint the person I see. Moreover, our *actual* imaginings under these circumstances are rarely so dull as to simply imagine *that P* i.e. imagine the *proposition* that 'I am falling off a cliff' is true. Propositional imagining was introduced as a variety of imagination to describe the *form* that imagination takes, not the content. Nagel describes a kind

of imagining that seems to naturally come into play here, *sympathetic imagining*. This is imagining oneself as *undergoing a certain experience*. When stood at the cliff edge, our imagining is less likely to be a bland imagining *that* the proposition 'I am falling off a cliff' is true then it is to be an exploration of the emotional and perceptual experience one might have under circumstances in which that proposition is true. And such imaginings might perhaps be expected to vary drastically between individuals who are on that cliff edge with a view to making that fall a reality and those who are merely there to watch the sun set. These imaginings might even vary within a single subject imagining the fall in different moods. As such, the analogy with portrait painting extends beyond the fact that multitudes have undertaken the same process and into the fact that, when they do, they produce a variety of products too. It seems to me that a much more permissive rendering of the originality criterion wouldn't rule out these imaginings as original.

Whether these examples fail to meet the value criterion or not also surely depends upon the circumstances: both cases are potentially instructive to the agent (for example, either in learning about Hume's distinction between simple and complex ideas, or learning that, after doing some sympathetic imagining, we don't really wish to throw ourselves off a cliff). Rather mundane or routine imaginings like that in Gaut's second example might be most valuable as a prompt for further, more creative, imagining. As Walton (1990) points out, our imaginings are tethered to the world in some way – they either are about the world we live in, or involve (elements of) things from our world. But more creative imaginings might flout conventions or rules that govern our daily lives. If someone imagines falling from a cliff but, immediately before hitting the floor, sprouting eagle wings and beginning to soar upwards and over the ocean, their imagining might well be original (if they've imagined or heard no such story before) and possibly valuable too (at least inasmuch as it might be pleasurable, and serve as a form of psychological relief from the thoughts that drove them to imagine falling in the first place). Routine imaginings, therefore, might have value as prompts for fantasies.

Gaut's caution about conflating imagining and creativity should still be heeded though. It seems fair to suggest that *some* imaginings would fail to meet the criteria for creativity that we set out above. The originality criterion would not be met when, for the *n*th time, a weary philosophy postgrad is instructed by yet another philosopher to imagine a golden mountain and acquiesces in their request. By this point, even the value criterion might not be met under such circumstances. Another concern is whether the agency criterion is met when an agent imagines

under written instruction. This looks like a pretty mechanical way to produce creative output (with clear parallels with computer programming). I think, therefore, Gaut is correct to worry that we might reduce imagination and creativity to a trivial and analytic relation if we make the criteria for creativity too permissive, but given the arguments for their relativity of each criterion above I'm inclined to say that most imagining will turn out to be minimally creative. I don't think that this should concern us too much. As I will argue immediately below, discussions of creativity have been subverted by philosophers since Kant to focus specifically on genius or exceptional creativity (whether intentionally or accidentally), and only recently have philosophical discussions tried to re-orient themselves toward an understanding of the everyday creativity that is evident across the human population. Both phenomena are important here, since human creativity involves a wide range of behaviours.

§3.3 Other varieties of Imagination

Philosophers have usefully identified several other varieties of imagination that help us with our focus here. These include Walton's distinction between *spontaneous* and *deliberate* imaginings (Walton, 1990). The distinction Walton makes here is between acts of imagination that occur 'with or without the subject's conscious direction' (*ibid.*) This distinction is particularly useful when we turn to non-human animal cognition to look for evolutionary predecessors for the kinds of imagining we typically associate with human creativity (which I explore in Chapter 2). In Walton's view, the line between spontaneous and deliberate imaginings is not sharp, but spontaneous imaginings are characterised as rendering the imaginer as a 'spectator' rather than a perpetrator:

> Rather than constructing her imaginary world, she "watches" as it unfolds. It seems less her own contrivance than something created and existing independently of her. She may be surprised at how it turns out… Spontaneously created imaginary worlds are like the real world in their capacity to surprise us. Imagining spontaneously can be more fun, more exciting than doing so deliberately (Walton, 1990: 14).

Walton's observations about spontaneous imagining here are interesting in a number of ways. Firstly, Walton goes on to claim that dreaming is a kind of 'spontaneous, undeliberate imagining' (*ibid:* 16). Imagining, on this account, doesn't require conscious control. This opens up the possibility of at least one kind of imagining that can be done (or, probably more

accurately, experienced) by non-human animals (see Chapter 2). Conscious control need not be an all-or-nothing thing either: for Walton, daydreaming sits somewhere on the hazy line between spontaneous and deliberate imagining, because there are certainly elements of daydreaming which are consciously directed and elements which simply occur to us. The second interesting observation Walton makes above is that spontaneous imaginings might be *more fun*. Walton ties this to the suggestion that the more conscious we are of the falsity of a proposition, the harder it is to believe. If the facts are conspicuous, they might intrude into our imaginative experience and make a daydream or other kind of imagining less enjoyable. There is (arguably) an implicit suggestion here that imaginings which successfully take us further from the facts are more enjoyable, as is the case with fantasy (which Walton, perhaps in a throwaway remark, seems to suggest is also a kind of spontaneous imagining; Walton, 1990: 14), since the suggestion is that it is truth's intrusion on our imagination that makes it less enjoyable. This suggestion is important here because I will go on to argue that engaging in fantasy led us to begin sharing those fantasies once language was in place; and this is the very process that I argue accounts for the evolution of human creativity.

A further distinction from Walton is also helpful with respect to this thesis: between *social* and *solitary* imagining. Social imagining involves the joint participation of several subjects, with solitary imagining (self-explanatorily) involving a single agent. Walton's observation that such a thing as social imagining takes places actually marks a stark contrast to the parallel philosophical discussion of creativity. In his semantic and cultural history *Keywords*, Williams (1983: 82) argues that the shift away from the Inspirationalist view of creativity did not begin until the Renaissance period. Up until then, the word 'creation' was not used to describe human actions but, instead, only the divine. However, from the Renaissance onwards, 'creation' starts being used to describe acts of the human imagination – the creation of alternative worlds. Caution over the transition from divine to human creation is reflected in the use of the word 'creation' in Elizabethan literature, where it closely reflects a sense of the counterfeit, such as Shakespeare's description of Banquo's ghost as 'a false creation' (Carter, 2004: 25). The modern sense of creation as a human act only becomes established in the eighteenth century as the Enlightenment shifted us toward a Humanist conception of the universe and away from traditional religious teachings. It is within this context that the idea of the genius as an isolated individual emerges (Williams 1983: 143), and in turn becomes the focus of philosophical work from Kant. It is worth noting that the idea of the genius as an isolated individual is contrary to many contemporary practices (collaborative scientific work, or

the very new phenomena of 'hackathons' and 'game jams', for example). I wish to suggest that focusing on practices involving social imaginings might help us to explain the evolution of human creativity. In particular, storytelling involves social imagining in that it minimally requires an author and an audience, but (especially in the oral tradition) it typically also involves contributions from multiple agents.

However, most discussions of the imagination, Walton-excepted, follow the path toward the isolated individual. This is both understandable and forgivable, but in neglecting social imaginings, I argue, we have missed something fundamental in our attempts to explain the evolution of human creativity and its connection to language. As we will see in Chapter 2, many critics of the view that uniquely human creative thought somehow comes for free with language note that there is an apparent gap between the emergence of language in our species and the emergence of distinctively human creative behaviour (such as cave paintings). The thought, therefore, is that something in addition to language is needed. A promising route to solving the puzzle that this gap presents is to suggest that some cultural accretions must get in place in the meantime. However, there is (as yet) no discussion of social imaginings in the literature addressing this. This thesis takes the position that a very specific form of social imagining, storytelling, driven by fantasy, provides the precise kind of cultural scaffolding required to satisfactorily explain the uniquely human creative behaviour that emerged. I turn now to the kind of imagining that I claim drives this process of cultural accretion, fantasy.[14]

§4 Fantasy (and its Detractors)

When Sigmund Freud turned his focus to how works of literature come into being, the answer he came up with was fantasy (a term he uses interchangeably with 'day-dreaming'). Freud argues that authors, or at least the authors of the 'pop culture' of his day ('dime' novels, romances and short stories), are ostensibly adult mirror-images of their childhood self at play.[15] Whereas, according to Freud, children's fantasies are about being grown-ups, manifesting

[14] Creativity at the individual level would still be possible in the absence of such cultural scaffolding, but without an effective means to disseminate skills and information then those innovations simply wouldn't take hold. I argue (Chapter 5) that storytelling is a particularly effective way of disseminating skills and information. The archaeological record shows evidence of 'failed' innovations cropping up from time to time ahead of the 'Creative Explosion' (see Crow, 2002 for a review of such evidence; see Chapter 2 for details on the Creative Explosion).

[15] To some extent, the genre of fantasy literature is still seen as somewhat childish, and not as 'serious' artwork. Its purpose is seen as 'mere' entertainment, or as escapism. I discuss the connection between fantasy and escape below and in Chapter 4.

themselves as pretend play to that effect, grown-ups' fantasies centre on other ambitions and erotic desires (perhaps unsurprisingly for those familiar with his work, Freud claims that female fantasies are almost exclusively erotic in nature). Authors might take as their subject any set of ambitions and turn them into literature. Freud gives two examples to illustrate: (i) the invulnerability of the hero, who survives any number of dangerous situations against the odds, and (ii) being irresistible to 'all' of the women in the novel. In Freud's view, these works of literature are externalisations of the process of quasi-wish-fulfilment that is engaging in fantasy. Authors differ from everyone else only in their willingness to share their fantasies (the rest of us are too ashamed).

Gaut draws a sharp distinction between 'imagination' and 'fantasy'. In his view, imagination lacks any 'intrinsic ends' i.e. any end that makes it the state that it is. While belief has as its intrinsic ends *truth*, and intention has as its intrinsic ends *action*, imagination has no such ends. It would be paradoxical to say 'I believe that it is raining, but it isn't', or to say 'I intend to go trampolining, but I won't go when I can', but we can substitute 'imagine' for 'believe' and 'intend' in these sentences without any such paradox arising. It is this lack of an intrinsic ends that Gaut claims makes imagination 'peculiarly suited' to be the vehicle of active creativity, allowing us to try out different approaches without any entailed commitments to truth or action. Fantasy, by contrast, is goal-oriented in much the way Freud asserts. The goal in fantasising, in Gaut's words:

> … is to enhance one's own enjoyment, and the aim of this project determines what counts as a successful piece of fantasising. So, if despite my efforts, I keep imagining myself being embarrassingly humiliated, the fantasy has gone wrong (Gaut, 2003: 161)

Like Freud, then, Gaut sees fantasy as focused on enjoyment. Walton too, as mentioned above, seems to see fantasising as a kind of spontaneous imagining, which he sees as *more fun* than its deliberate counterpart. However, Gaut seems to stop short of Freud in that he doesn't see the project of fantasising as going beyond the mere enjoyment of an isolated imaginer; Freud, by contrast, suggests that we externalise fantasy as creative writing, and this is, I argue, an important realisation. Fantasy may *begin* as wish-fulfilment, but it doesn't always *end* there. If Freud is correct, then fantasies that begin in the imagination may manifest themselves as novels, in jokes, and (nowadays) television shows, movies and countless other media. What makes it peculiarly suited for externalisation is the fact that it is so enjoyable –

both for us to engage in, and to share with others as we direct their imagination toward our fantastic ideas.

Scruton too attempts to draw a distinction between fantasy and imagination, though along different lines (Scruton, 1983). For Scruton, the artist employs imagination in order to get a better grasp of reality, whereas fantasy aims at escapism. However, Currie and Ravenscroft (2002: 38) suggest that, rather than being two distinct things, this is really a matter of one thing, imagination, being put to two different uses. It is Currie and Ravenscroft's view that, I believe, is more appealing. This requires a perhaps broader and more permissive account of the imagination than Gaut, Scruton and others are willing to grant, but I will argue in Chapter 4 that permitting us to see fantasy as part of the faculty of imagination gives the imagination a more prominent and specific explanatory role in the development of human creativity.

Currie and Ravenscroft's own account of fantasy is to see it as a kind of 'indulgent imagining' (*ibid.*) Indulgence, they note, can both admit of degrees and be exhibited in different ways, offering a non-exhaustive list of examples. The first way concerns *effortlessness*: "Our imaginings count as fantasy if they exhibit one's preference for comparatively effortless imagining over effortful imagining" (*ibid.*) Currie and Ravenscroft allude to Gombrich's (1963) comparison of Bouguereau and Botticelli's depiction of the birth of Venus to illustrate this notion. Gombrich suggests that the history of art can be seen as one of the interplay of artist and audience, a "balance between what one might call aesthetic activity and regressive pleasure" (Gombrich, 1963: 37). For Gombrich, because Botticelli lacked the technical skill of Bouguereau, evidenced amongst other things by the *pentimenti* in his depiction of Venus, and because later audiences were more visually literate, reading Bouguereau's painting is easy, perhaps effortless. However, because of this, the eroticism of the painting is entirely on the surface – it requires no real effort on the part of the audience to trace the artist's own imaginative effort; as such, Gombrich derides Bouguereau's Venus as a mere 'pin up girl' (*ibid.*)

For Gombrich, the artist does his audience a disservice when his work is too easy to read. The audience are taken for 'simpletons' when, in fact, the 'sophisticated' look for 'more difficult gratifications' (*ibid.*). Such sentiments characterise today's 'hipsters' quite well! However, Currie and Ravenscroft don't choose Gombrich as an example in order to side with Gaut in suggesting that fantasy is somehow creatively bankrupt because it is so easy that anyone

can do it, with little variation for content. Effortless imagining is just one way in which we can characterise fantasy. A second way is by agreeing with Scruton that escapism is a kind of fantasy (but not one somehow distinct from imagination). Escapist literature, they suggest, can often require imaginative effort, and constitutes "a preference for imaginings that protect us from uncomfortable truths" (Currie and Ravenscroft, 2002: 39-40). This is a second kind of fantasy, indulging us as it does in escaping a reality we want to avoid.

The third way in which imagining can be indulgent is more obvious: "by being an imaginative project the aim of which is to satisfy all, or as many as possible, or the strongest, of one's desire-like imaginings" (Currie and Ravenscroft, 2002: 40). They cite as an example the formulaic romances of Mills & Boon, which are renowned for their repetition of plots and plot devices and predictability. Feminist critique of these novels suggest that Freud's early description of fantasy manifested in pop culture's creative writing was perhaps accurate: helpless damsels invariably find themselves (willingly or unwillingly) paired with the male protagonist (Cummins and Bindel, 2007).

The common thread throughout all of these accounts is that fantasy involves the (imagined) fulfilment of desires. Employing the same arguments we saw above to suggest that not all imaginings are creative, Gaut is particularly scathing about Freud's account of fantasy:

> Fantasising is a kind of imagining, but is rarely creative. Indeed, perhaps the simplest but most telling objection to Freud… is that daydreaming, a kind of fantasy, is almost never creative, and thus is not a promising model for creative writing (Gaut, 2003: 155).[16]

Yet it is hard to see why commonplace fantasies would fail to provide a promising model for creative writing – and certainly not the pop culture that Freud was primarily concerned with. If we take the Freudian account seriously (more seriously than I think we really should), then externalisation of a commonplace fantasy would create the kind of positive

[16] In his rush to denigrate fantasy as uncreative, Gaut makes a puzzling assertion. Whereas fantasy aims at our own enjoyment, "creative uses of imagining, in contrast, need not aim at personal pleasure or at learning something. Nor need they aim at being creative: for one can be creative even though one does not aim to be so" (Gaut, 2003: 161). This is puzzling because it is Gaut, in this same paper, who suggests that we need to introduce 'flair' i.e. the agency condition, into our definition of creativity to rule out unintentional creativity. I'm far more convinced by the examples Gaut provides to illustrate the need for an agency condition than I am by his assertion that imagining aimed at pleasure is somehow not creative. Again, the arguments are that it lacks originality and/or value, but since these are relative, I fail to see how this can be the case.

feedback loop that would *actively encourage* creative writing. We are, remember, ashamed to let people know our fantasies, but in finding an audience affirming that such fantasies are acceptable, or even enjoyable, to them, the author can reduce the tension wrought by the shame felt at having those fantasies (tension-reduction being the purpose of the Freudian Ego). I worry that Gaut's concern about the lack of originality of our fantasies confuses process and product here. Just because the process of fantasising may be describable in those terms, that doesn't mean the fantasies themselves aren't highly original and valuable. Revenge fantasies might be very enjoyable and easy to engage in, but they might also be highly creative. Spanish and Elizabethan revenge tragedies are amongst some of the most highly regarded and discussed works of literature and, if the Freudian theory is correct, are the product of the fantastic imagination. Even our own revenge fantasies might involve incredibly creative ideas about how to get even with someone.

Despite agreeing with much of what they suggest, I still find much of Currie and Ravenscroft's discussion of fantasy unsatisfying because of its selection of examples (such as Mills and Boon novels). What is interesting about Freud's piece on fantasy is that he feels, at one point, the need to apologise for *not* focusing on literary creation, since it is his intended focus. Instead, he rightly points out, he has spoken more about fantasy in general; that is, fantasy in the experience of the normally-developing child and the average adult. The assumption from Gaut, and perhaps Walton, is that everyday fantasy lacks originality and value, despite these criterion being reducible to a subjective level. It would, I think, be more accurate for Gaut to say that everyday fantasy is *less* creative, rather than *rarely* creative. Rather than attempting to dismiss the everyday as uncreative, a more interesting approach would be to look at fantasy as it is externalised on a daily basis – in jokes, in improvised bedtime stories, and in so many other ways – rather than by comparison to imagination manifest as works of literature and art. Currie and Ravenscroft too might find greater value for fantasy by looking beyond the trashy novels that Freud thinks fantasy leads to, and instead to works of literature involving the creation of detailed imaginary worlds (e.g. fantasy novels; I return to this idea in Chapter 4). Doing so, I will argue, would make us less inclined to downplay the importance of fantasy, that is, fantasy as the indulgence of our desires in imagination, differing in degree, in nature, and whose externalisations differ radically depending upon the cognitive and cultural resources of the agent.

Concluding Remarks

We have seen, then, that fantasy (as a species of imagination) has been given less detailed consideration than it perhaps deserves. Connecting fantasy to creativity, via language, will be one of the central tasks of this thesis. We have made some important observations about the nature of fantasy here: that it is particularly enjoyable, and that it is can be externalised in the form of stories. I have suggested, also, that these fantasies might themselves be creative even before they become externalised – to do so they would need to meet the criteria for creativity i.e. they must be non-accidentally, non-mechanically produced imaginings that are original and valuable. The rest of this thesis will attempt to demonstrate just how valuable our tendency to engage in fantasy has been in the story of the evolution of human creativity. The starting point for doing so will be, in the next chapter, to track the evolution of creativity in our species, beginning with our non-human animal ancestors, through pre-cursor *hominids*, and eventually to modern *homo sapiens*. Examining creative behaviour makes good suggestions about the cognitive architecture that underpins that behaviour, and now that we have set out a variety of kinds of imagination, and elucidated imagination's connection to creativity, we can try to determine the imaginative capacities of our evolutionary ancestors. This, in turn, should allow us to pose questions about what, if anything, the evolution of language in our species did to transform the cognitive architecture utilised in human creativity.

Chapter 2:

THE EVOLUTION OF HUMAN CREATIVE COGNITION

How and when did human creative cognition evolve?

Introduction

In the previous chapter we examined traditional and contemporary analyses of creativity. We saw that the traditional accounts of creativity focused on the origin of creative ideas – did they originate with the gods (Inspirationalism), or did they originate with some kind of deranged mental state that takes the creator beyond the boundaries that normally developing human beings operate within (The Derangement View)? To some extent, this chapter continues the discussion of the origins of creative ideas, but switches the focus to finding an evolutionary explanation by examining the emergence of the cognitive basis of human creativity. Doing so provides the remaining groundwork required to start building my own story of the evolution of human creative cognition by indicating precisely what capacities were in place in our evolutionary lineage prior to the emergence of our species.

This chapter also has a further focus. One of the central aims of this thesis is to explore the role that language has played in the emergence of the distinctively human kind of creativity that we see across all human populations today. This chapter, therefore, also outlines relevant details of the evolution of the biological basis of the language faculty. In Chapter 6, once more detail has been given on the precise notion of language which is of interest to this thesis in Chapter 3, we will return to this discussion of the evolution of language and its impact on human creativity by examining some interesting evidence about the impact of acquired aphasia on human imagination and creativity. I will contend that this evidence supports my thesis that fantasy and storytelling are the crucial drivers of the evolution of human creative cognition, a position I outline over the course of the next three chapters.

The chapter begins in §1 by outlining a puzzle about the emergence of our species and the emergence of the creative behaviour that typifies it. I then turn in §2 to the story of the evolution of language, suggesting that while many aspects of the faculty of language are shared with our evolutionary ancestors, syntax is not, making fully-syntactic language unique to *Homo sapiens*. §3 makes some suggestions about what kind of imaginative capacities were in place

prior to the emergence of fully-syntactic language, clearing some space to identify the precise contribution that language makes. This section offers a broad overview of non-human animal imagination and precursor hominid imagination, before returning us to the puzzle set up in §1. §4 outlines an attempt to solve this puzzle by Picciuto and Carruthers (2014), an attempt that I argue in §5 is ultimately unsuccessful. This sets up the key issues to address in the remaining chapters of this thesis: the roles of language, fantasy and storytelling in the evolution of human creativity.

1. The Supposed Puzzle of the 'Creative Explosion'

§1.1 The Speciation of Modern *Homo Sapiens*

Our species came into existence during the Middle Pleistocene period. Fossil and mitochondrial DNA evidence suggests that 'anatomically modern humans' existed in Africa from perhaps as early as 200,000 years ago (Renfrew, 2007), but certainly by between 150,000 and 70,000 years ago (Stringer, 2002). Contemporary *Homo sapiens* are generally thought to be directly descended from these first *Homo sapiens*, perhaps from a single population of as few as 600 breeding individuals (Marean, 2010) who began to leave Africa and populate (ultimately) the rest of the world between 130,000 and 100,000 years ago. This has come to be known as the 'out of Africa' hypothesis (defended in Stringer, 2002), and this hypothesis holds the current consensus in the palaeoanthropological community. Other pre-sapient Hominids such as *Homo erectus* had first appeared in Africa much earlier, and their lineage saw the emergence of multiple hominid species such as *Homo heidelbergensis*, *Homo floresiensis*, with *Homo sapiens* and *Homo neanderthalensis* descending from the former. As these different Hominid species also began to inhabit other parts of the world, a rival to the Out Of Africa hypothesis posits that our species may have evolved independently in multiple locations from these different groups of Hominid explorers. However, given that species-specific traits such as language are universal across human populations and require a complex combination of biological traits that is unique to our particular hominid line, it is reasonable to assume that the biological basis for language originated with a specific group of hominids *before* they left Africa to populate the rest of the world, rather than coincidentally and separately evolving from multiple lineages all over the globe.

While it is possible to give an account of the emergence of *anatomically* modern humans without too much controversy by appealing to the fossil record, it is far more difficult to tell a story about the emergence of *behaviourally* modern humans i.e. ones that share our phenotypic behavioural traits, including fully-syntactic language and a wide range of creative behaviours across many domains of human life. Language doesn't fossilise, nor do certain kinds of creative behaviour such as oral poetry, song or dance. As a result, many of those attempting to track either the evolution of human creativity or the evolution of language have pointed to preserved examples of cultural sophistication such as cave art and technological innovation in human populations as evidence. This kind of activity most clearly occurs in various places in Europe somewhere between 35,000 and 43,000 years ago (Mellars 2002), and this occurs alongside a host of other changes (see Fig. 1 below) that suggest an increase not only in artistic creativity, but in scientific creativity too. This period has been referred to as the 'Upper Palaeolithic Revolution' (Gilman, 1984) and also described in terms of a 'Creative Explosion' (Pfeiffer, 1982).

The reasons to point to cultural evidence such as that in Figure 1 below as evidence of the presence of language in our species are fairly obvious. Language seems like a particularly efficient way of disseminating information between both between groups and generations, allowing for a 'ramping up' of cultural sophistication (Pinker, 1994, Mellars, 2002). Moreover, cultural practices such as cave paintings and the repetition of decorative motifs seem to indicate the kind of symbolic thought associated with language. As such, most academics discussing these issues are confident that fully-syntactic language was in place by this time.[17]

[17] One notable challenge to this comes in Humphrey 1998, who offers some reasons to think that cave art, specifically, should not be taken as indicative of *linguistic* thought. I will address this challenge in Chapter 6.

Fig. 1 Archaeological evidence for the Creative Explosion

1	Changes in tool manufacturing techniques, including an increased element of 'imposed form', with clear regional variation in style;
2	Introduction of new technologies (and at an increased tempo), e.g. for skin-working, projectiles for hunting; a shift from 'all-purpose' handaxes to specialised individual tools;
3	An enhanced diet (to include small game and fish) and new methods of cooking and storage e.g. pits dug into the permafrost acting as natural refrigerators; suggests improved understanding of the natural environment, including lunar/tidal patterns.
4	Increased population density, evidenced through an increase in the number of occupied sites;
5	Production of baskets, textiles, rope, fish nets and snares from plant fibres;
6	Tentative evidence for the first 'ceremonial' burials, evidenced by the presence of grave goods, some of which would have taken several man-years to manufacture;
7	The appearance of extensively and regularly notched bone artefacts, possibly representing systematic numerical notation;
8	The appearance of the first unambiguous musical instruments, such as the bird-bone flutes found at Geissenklösterle, Germany;
9	The creation of personal decorative adornments made from materials procured from sites up to several hundred kilometres away, reflecting changes in economic and social organisation (including, possibly, long-distance, inter-tribal trade);
10	The first appearances of representational or 'naturalistic' art, including small carvings made from bone, antler or ivory (reflecting the changes in hunting techniques in procuring these materials) and cave paintings at Lascaux, Altamira and the Grotte Chauvet.
Sources: Mellars (2002), Renfrew (2007: ch. 5) and Cochran and Harpending (2009: ch. 2).	

§1.2 A Puzzle?

However, taken together this information was, up until very recently, taken to present something of a puzzle: given that all of the relevant biological changes for fully-modern human cognition are thought to be in place and evolutionarily stable by around 100,000 years ago, *before* human beings first left Africa to populate the rest of the world, why didn't the kind of human creativity that abounds today show up until some 60,000 years later?[18] Or to put it another way, what else was needed besides language to provide the stimulus for the emergence of creative behaviour during the Creative Explosion? This is a question that this thesis seeks to answer, but the answer I will posit will actually contend that distinctive creative behaviours that simply would not fossilise emerged not too long after the development of fully-syntactic language, and thus the chronological 'gap' between the emergence of language and the emergence of sophisticated and uniquely human creative behaviour is shorter than the puzzle of the Creative Explosion suggests.

In fact, in recent years more and more evidence has been discovered that suggests much earlier beginnings of symbolic and creative behaviour in human populations. For instance,

[18] Colin Renfrew is concerned with a closely related puzzle – what he terms the 'sapient paradox'. Renfrew points out that we only begin to see significant and rapid cultural change as recently as 10,000 years ago, noting the glacial pace of cultural innovation in the preceding 90,000 years of our species' existence.

Henshilwood et al. (2009) discovered blocks of ochre at the Blombos Cave in South Africa that appear to contain symbolic notation. These are dated perhaps as far back as 80,000 years ago, and associated with anatomically modern human remains. Similarly, evidence from the Qafzeh Cave in Israel associates anatomically modern human remains with the possible use of ochre in a symbolic way at 92,000 years ago (Hovers et al., 2003). It might be the case, then, that the puzzle isn't really a puzzle at all – there was no significant 'gap' between the emergence of our species and the development of creative behaviour.[19] However, I think this response is too simplistic. The recent evidence is of a very different nature to the evidence associated with the Creative Explosion. Apparent symbolic (perhaps numerical) notation associated with these earliest discoveries is not of the same kind as the representational art that appears at Lascaux tens of thousands of years later, even if both draw upon similar cognitive capacities. The rate of technological change in our species still appears to speed up dramatically at the time of the Creative Explosion (and perhaps gains pace exponentially when we extend the time period to our own). These facts still leave us with some interesting questions to address: what cognitive or cultural developments are required for these changes to occur, and what prompted these developments? I will discuss a specific attempt at answering these questions from Peter Carruthers in §4, but highlight some difficulties with the answer he provides in §5. The remaining chapters of the thesis will develop an argument for alternative answers to these questions. First, however, I will briefly outline some key issues in the evolution of language.

2. The Evolution of Language

Human language today consists of a large and varied lexicon and a system of grammatical rules that allow us to combine lexical items in a (theoretically) infinite number of ways. These combinations are most commonly externalised as speech, though we have also developed fully-expressive gestural languages i.e. sign language, for cases where speech isn't appropriate. Writing is a relatively recent method of externalising language, having been around in a system which also encodes the grammatical aspects of language for around 4,000 years (though proto-writing systems and numerical notation systems have existed for longer; see Ifrah, 2000, Woods, 2015).

[19] Clearly, there isn't a one-to-one relationship between observed behaviour and cognitive capacities. While we can be fairly certain that in order to perform some particular (observed) behaviour, the underlying cognitive capacity for performing that behaviour must be present, we cannot infer from the absence of evidence for some behaviour that the underlying cognitive capacity for such behaviour was not present.

Working on the basis that speech was the earliest way of expressing linguistic thought, many biological developments needed to be in place before language could become a stable trait within our species. Some of these biological developments are shared with non-human animals, and obviously with pre-cursor hominids, yet there is a distinct absence of evidence that any species other than our own possesses fully-syntactic language. Precisely how it is the case that our Hominid line alone developed language in this sense is the subject of much debate, and I don't intend to lay out the merits of every theory here. What this debate aims to settle, though, is what mechanisms are involved in language, whether these are specific adaptations for language, and at what point in our lineage we acquired them. Some academics, such as psychologist Michael Tomasello, claim that human language emerges not from any language-specific adaptations, but instead from adaptations for cooperative behaviour that are unique to our species (Tomasello, 2010). Speech scientist Philip Lieberman, however, thinks that the core biological adaptations for language are those involving motor control of speech (Lieberman, 1968). Linguist Noam Chomsky, by contrast, believes that neurological adaptations specific to the highly abstract core of syntax are the final biological piece of the puzzle required to bring about our species' linguistic capacities (see Hauser et al., 2002 for discussion of Chomsky's view, and an outline of rival theses). Whichever theory is correct, it is clear that adaptations for speech, syntax and intention-reading (i.e. Tomasello) are all involved in the human 'language faculty'.

Fitch (2010: 142) identifies what he sees as an incomplete list of sixteen components that make up the human language faculty, with each component potentially having its own adaptive story. Aspects of the language faculty, as mentioned above, are shared with many other species. For instance, 'signal learning' – having an extensive vocabulary of learned signals – is shared with many non-human animals, from mynah birds to vervet monkeys. We therefore know that this mechanism appears in our own evolutionary lineage possibly tens of millions of years ago.[20] In our more recent evolutionary history we see the emergence of the FOXP2 gene, which is involved in the complex motor control required for speech (as well as other aspects of normal language development). Despite rather hopeful claims upon its discovery that we had found the 'language gene' (Pinker, 1994), it turns out that this is just one of many genetic traits making up the story of the evolution of language. The same variant of this gene was shared by

[20] The lines that led to humans and chimpanzees split 5.1 million years ago (mya), those that led to gorillas 6.3mya, and to orang-utans 13.8mya. The split between old-world monkeys (e.g. macaques, langurs) and these great apes was around 25.3mya.

Neanderthals, and therefore most likely mutually inherited from our common ancestor *Homo heidelbergensis* around 300,000 years ago. A variant of the gene has also evolved in some songbirds, and affects vocal learning in those species too (Scharff and Haesler, 2005).

In addition to the numerous biological adaptations required for language, child development studies make it clear that a certain amount of environmental stimulus is required in order to allow for the normal development of a child's linguistic abilities (Fitch, 2010). In this sense, cultural transmission of language also plays an important role in the evolution of language, and it has even been suggested that this might be the solution to the so-called puzzle of the Creative Explosion (Tattersall, 2002) (my own solution, in fact, offers a variation on this type of response). The cultural aspects involved in language learning and development are, in turn, underpinned by various biological adaptations for socialisation, complicating further the task of detailing the evolution of language.

What is clear is that, because these multiple adaptations appear gradually in our evolutionary history, our evolutionary ancestors would have also possessed varying degrees of communicative (or 'linguistic') ability. Studies in comparative psychology suggest that apes have an awareness of others as goal-possessing agents, and their natural gestural communication consists of flexibly-used intentional signals (Tomasello, 2010). This being the case, it seems fair to suggest that *Homo erectus* would have possessed abilities beyond these – perhaps, even, a 'protolanguage' allowing for complex communication with a closed-class vocabulary, but lacking fully-developed syntax with features such as tense and aspect (Bickerton, 2009). Ruhlen (1994) suggests that such a system might represent a 'mid-point' between extant primate communication systems and fully-syntactic human language. However, even prior to any discussion of possible protolanguages, philosophers such as Descartes have disputed whether or not human language lies on a continuum at all with other (non-human) communication systems given that our linguistic utterances are both stimulus-independent and capable of expressing an infinitude of thoughts (Descartes, 1637, Chomsky, 2009).

The basis of this expressive power is the grammatical system that language employs, and the biological basis for grammar is the central topic of debate currently in the evolution of language. Tomasello (2010) sees grammar as essentially 'falling out' of biological adaptations for shared intentions and cooperation, whereas others such as Hauser et al. (2002) suggest that syntax-specific adaptations (though not necessarily restricted to use in language) may be an

essential part of our evolutionary story. The desire to explain language within an evolutionary framework has put pressure on proponents of the latter view to minimise the number of mechanisms responsible for syntax, giving birth to the 'Minimalist Program' in linguistics that is primarily associated with Noam Chomsky. It has been suggested by those involved in the program that the computational basis for syntax might be as simple as a single operation working recursively. The attraction of this view is that a single neurological adaptation in the final stages of human evolution might be able to explain both the problem raised by Descartes regarding the difference in kind between human language and non-human communication (moving from a finite system to an infinite one through a single recursive operation) and also provide an answer to the supposed puzzle of the Creative Explosion by offering a dramatic shift in cognitive power in order to drive sudden and rapid cultural developments.

To some extent, the precise history of when and how these various adaptations appear doesn't seem hugely important to help us address the puzzle concerning us here. If fully-syntactic language requires all of these adaptations, plus some cultural input, then the only date that matters is when all of these co-occur. Language is, to my mind at least, our defining species-trait. As suggested above, it was most likely in place ahead of the diaspora of our species from Africa between 130,000 and 100,000 years ago, but there is (currently) no reason to think fully-syntactic language emerged as a behavioural trait any earlier than that (even if the biological adaptations were in place long before that point. The issue that is relevant here is not the chronology of the evolution of language, but instead what the implications of syntax are for human creative cognition. I turn to this specific issue in Chapter 3. The purpose of examining this will be to see what syntax brings to human cognition, and how this might be co-opted for the purpose of creativity. Now, however, I want to shift our focus to outlining creative behaviours that would have been available to us *prior to* the evolution of language, by examining creativity in non-human animals and pre-cursor hominids.

Specifically, I will focus on creative acts that appear to involve use of the imagination. This focus on the imagination is not arbitrarily selected. Chomsky (2007b) argues that the primary beneficiary of the evolution of syntax is *thought* (see Ch.3, §2.1). Any attempt to demonstrate the contribution of syntax to creativity will, therefore, be via whatever it brings to creative cognition. Some attempts to connect Chomsky's work to creativity have been made in the past (e.g. D'Agostino, 1984, 1986) but these have largely been focused on Chomsky's analysis of the ways in which language-use bears the hallmarks of creativity. As such, these

discussions focused on the definition of creativity rather than on creative cognition. I think this is something of an oversight given Chomsky's beliefs about the connection between syntax and thought. I, therefore, explore this connection in this thesis, focusing on a specific mode of thought which (as we saw in Chapter 1) is closely connected to creativity: imagination.

3. Origins of the Human Imagination

Examining the connection between the evolution of language and the imagination, then, requires that we first establish what kinds of imaginative capacities are possible and available prior to language getting in place. I begin this task by examining possible candidates for imaginative capacities in non-human animals in §3.1-§3.3, before moving on to pre-cursor hominid capacities in §3.4. This discussion sets up the opportunity to examine one attempt (that of Piccuito and Carruthers, 2014) to explain what was required beyond language to transform human beings into the creative beings we see at the point of the Creative Explosion.

§3.1 Non-Human Animals: Imagining the Future

It is fairly obvious how certain kinds of imagination are adaptively advantageous. Visually imagining, for instance, what may lay around an unexplored corner might helpfully lead to adopting a cautious approach in the subsequent exploration. This kind of (objectual) imagining has been referred to as a kind of 'mental time travel' by Suddendorf and Corballis (2007). For Suddendorf and Corballis, this kind of activity is dependent upon *episodic memory* – being able to mentally relive past events. Clearly, there is a difference between being able to relive past events and being able to make predictions about future ones, but on Suddendorf and Corballis' view it is this latter capacity, rather than the former, that would be evolutionarily advantageous. Being able to anticipate the future allows you to be in the right place at the right time, and thus take advantage of any observed regularities. Many animals have evolved behavioural predispositions that exploit long-term regularities, such as those that migrate or hibernate seasonally. However, these behavioural predispositions are often deeply entrenched and inflexible, which is why many species are at high risk of extinction due to the increasing pace of climate change. The kind of mental time travel described above, in the case of humans, is far more flexible: there is essentially no limit to the events we can imagine.

Whilst they are ultimately sceptical of evidence of the capacity for mental time travel into the future in non-human animals, Suddendorf and Corballis suggest that there may be some inconclusive but nonetheless favourable evidence of some degree of episodic memory in non-human animals. Scrub jays, for example, appear to be able to recall great detail about past food caching events, keeping track of what was stored, where it was stored, when it was stored, and who was watching at the time. Observation of other animals, such as rhesus monkeys, rats, pigeons, and dolphins imply a similar capacity but with varying success rates. But how could we move, evolutionarily-speaking, from past-only mental time travel to the more useful (predictive) future mental time travel?

One possibility might be through another kind of imagining: dreaming. Whilst the Cartesian view of dreaming was to see it as a mode of belief, recent accounts of dreaming have suggested that it either is a kind of, or involves, imagining (Walton, 1990, Sosa, 2005, Ichikawa, 2008, 2009; see Chapter 1, §3.3 for a discussion on dreaming and imagination). Walton, for example, characterises dreams as "spontaneous, undeliberate imaginings" (Walton, 1990: 16). If Walton's account is correct and dreams are an involuntary form of imagining, then (percept-based) episodic memory would likely be the basis of this.[21] Research has, in fact, been conducted on determining the content of the dreams of rats (Louie and Wilson, 2001). The results of their neurological investigations suggested that, during REM sleep, their laboratory rats were accessing memory in a pattern previously shown to be associated with their previous experience of navigating a maze. Furthermore, Bendor and Wilson (2012) discovered that dream content could be manipulated by external auditory stimulation, with maze-navigation noises causing them to access memories of that task.

Of course, we may wish to reject the notion that episodic memory is a variety of imagining, and we may be especially inclined to do so in cases where it is involuntary such as dreaming. What possibly leads us to characterise human dreaming as imaginative may be the (still involuntary) creation of novel worlds or scenarios which, even when clearly based upon them are still far removed from the actual experiences that led to us forming the memories being accessed in the dream state. However, it doesn't seem unreasonable to suggest that the accidental adjunction of perceptual information *could* occur in animal dreaming, especially given

[21] Dreaming is seen as on a continuum with fantasy by Levin and Young (2002): "waking [fantasy] and dreaming are not discrete states of consciousness with clearly defined parameters but rather represent continuous attentional states which comprise the 'stream of consciousness' endemic to human cognition" (*ibid.*, 201).

that animal dreams are manipulable through external auditory stimulation. Our own memories are not perfect reproductions of experience, and some flawed reconstruction is probably involved in animal cases too. If recalled information in one domain (number, object-property etc.) is different to the original perceptual experience leading to the creation of the memory being accessed in the dream state, then such cases might even lead to occasional insights if the dreams themselves are remembered, and the maze navigation task repeated. If there is any merit to this idea, then involuntary imagination (or imagination-like) processes such as dreaming might be the genesis of mental time-travel capacity that is future-oriented. All that would be required for this to be the case would be some genetic basis for increasing the regularity of the production of dreams that differ from (mere) remembered events where a proportion are beneficial when later remember. This would make this trait visible to evolution, and selected for because of the behavioural advantages it confers with relation to foraging.[22]

Whether or not this genesis story is correct, there is some evidence that rats *could* be engaging in something *like* future mental time travel. Dragoi and Tonegawa (2011) reported that rats placed in one arm of an L-shaped maze displayed neurological patterns in a way similar to that described above not only when sleeping, but also while they were resting at a barrier to the other arm of the L-shape. They term this activity 'pre-play' (as opposed to 'replay' in memory), and some of the neurological activity recorded matched that recorded when they were subsequently given access to the second arm of the L-shape. Moser and Moser (2011) suggest that this process may be one of generating predictions about environments never visited before.

However, it is wise to be cautious in interpreting this (actually very complex) data with reference to imagination. Predictive mental states aren't sufficient for imaginative ones, and philosophers have been careful to distinguish between imagining and anticipating – imagining S doesn't require that we expect that S, and it is difficult to say in these cases whether the predictive activity displayed here is perhaps just one of expectation-forming in the absence of imagination (which presumably has the adaptive advantage of either encouraging or discouraging exploratory-behaviour to aid foraging or avoid predators in unknown

[22] A similar image-combining process but without any obvious adaptive advantage might be hallucination. However, Boska (2009) points out that empirically investigating the possibility and nature of hallucinations in animals is fraught with some quite obvious difficulties.

environments, respectively).[23] As noted above, Suddendorf and Corballis' review of the literature prior to Dragoi and Tonegawa's experiment didn't persuade them of the existence of this capacity outside of human beings (not even in our closest evolutionary ancestors) and this scepticism appeared to be the prevailing view prior to the results of Dragoi and Tonegawa's experiment. As Gilbert and Wilson (2007) explain:

> Although some animals have evolved strategies to solve problems involving future events such as impending food shortages, it seems unlikely that they achieve these solutions by simulating future events. Indeed, the ability to simulate and pre-experience the future does not appear in human children until the third or fourth year of life, long after other complex intellectual abilities such as language have bloomed (Gilbert and Wilson, 2007: 1352).

§3.2 Animal imagination: inventiveness

A further survey of literature on animal imagination by Whiten and Suddendorf (2007) focused on animal *inventiveness*. This focused on the number of innovations or solutions the animal imagination can produce in response to a given environmental stimulus. It is clear that Whiten and Suddendorf are running the risk of conflating creativity with imagination here, though I've suggested in Chapter 1 that I'm prepared to let the connection between the two run a little closer than others. In particular, it seems like what Whiten and Suddendorf have in mind is something like the kind of objectual imagining we saw in Yablo (1993), with the imaginer holding in mind different states of affairs and attempting to bring them about in the world. This capacity isn't very different from the notion of pre-play described in §2.1 above, though it clearly involves more executive control (pre-play might even be entirely involuntary). At least some inventive behaviour in non-human animals could be explained as a result of combining (probably separately evolved) capacities for generating mental representations of the world using the perceptual features derived from it, and the capacity for storing these representations in working memory. The amount of detail and number of representations any animal is capable of operating with will naturally depend upon the working memory resources it has available to it (though if the creative behaviour it produces is adaptively advantageous then

[23] Whilst it seems fair to say that imagining S doesn't require us to expect S, it is much harder to conceive of a way of expecting S without imagining it where S is a future state of affairs. I presume this might turn on the difference between *conceiving of* S and *imagining that* S. We need not explore this difference here though.

this would, in turn, drive the development of working memory). When confronted with some novel problem, non-human animals can utilise these capacities to generate behavioural responses in accordance with the desire to get the associated reward.

A powerful capacity to generate novel and diverse behavioural responses to a given stimulus in non-human animals could, therefore, be based on relatively simple generative mechanisms - consider, for instance the basic operations of mathematics and the unbounded results they can generate (Kleene, 1971). So, despite lacking fully-syntactic language, non-human animals might still generate a wide range of creative behaviours across domains. As such, human creative behaviour may actually build upon an already rich yet evolutionarily ancient resource. Whiten and Suddendorf's best evidence for diverse and (seemingly) imaginative behaviour comes from analyses of great ape cognition. They found that inventiveness was over-represented in great ape populations in comparison to other animals, including more evolutionarily distant relatives like old-world monkeys (see footnote 20 for chronology of our evolutionary divergence from these species). For example, one study involved chimpanzees trying to 'shell' an 'artificial fruit' (Fig. 2). Those who had learned a particular problem-solving method invented variants on this approach when confronted with a novel problem that the learned method couldn't solve. According to Whiten and Suddendorf, the explanation for the relatively impoverished number of behavioural responses offered by monkeys in comparison to apes 'is [that] baboons *cannot imagine* doing all that the young chimpanzees can' (2007: 41).

Fig. 2 An 'artificial fruit' being manipulated by a young chimpanzee (from Whiten and Suddendorf, 2007: 37)

In these cases, Whiten and Suddendorf claim that the chimpanzees appeared to be 'inventing around a theme' to solve the problem they were confronted with. Interestingly, this capacity is not restricted to the 'functional' domain of foraging for food, but present also in 'playful' situations such as playing with a rope (Parker, 1974a, Parker, 1974b) and possibly also the social domain in cases of deception (Whiten and Suddendorf, 2007). This suggests that while this kind of innovation might have evolved initially for problem-solving, generating diverse responses without a view to functionality might *in itself* be rewarding. That certain kinds of cognitive activity are inherently rewarding is discussed below in §4. And although only tentative evidence, the fact that this inventive behavior appears across domains might be another reason to think that Whiten and Suddendorf have correctly identified the imagination as the cognitive capacity permitting this – it has been noted that the imagination is fundamentally a domain general capacity (Currie and Ravenscroft, 2002).

What might be the cause of these relative imaginative limitations of monkeys compared to great apes? I have already suggested that the mechanism for inventiveness might be a matter of simultaneously holding different mental representations and then attempting to bring them into being. For instance, chimpanzees may hold a representation of the learned (successful) sequence of actions in working memory *alongside* a representation of the steps taken in the current attempt to solve the problem. Failure to reproduce the successful result could be expected to prompt variations on the successful method as a means of 'correcting' the method being applied.[24] Relative imaginative limitations in monkeys might be explained, then, simply by an impoverished working memory. Chimpanzees have quite astonishing working memory, even outperforming human beings in experimental situations (Inoue and Matsuzawa, 2007). Working memory in monkeys is relatively impoverished, with this capacity enhancing and changing over the course of primate brain evolution (Courtney et al., 1998). Similarly, evidence from neurological analysis of corvids points to the emergence of this kind of imaginative capacity in other species. Even though corvids lack the neurological structures associated with working memory in mammals, they appear to have developed alternative

[24] We ought to be cautious when speculating about this imaginative process. Producing behavioural responses to discrepant mental representations in accordance with desire does not (contra-Whiten and Suddendorf) require the animal to hold some notion of a 'theme' that governs the kinds of responses generated, even though that's how we might be inclined to interpret their behaviour. It is, to my mind, an imaginative act utilising the 'visuo-spatial workspace' the animal possesses in virtue of its working memory and percept-based mental representations. But there doesn't seem to be any reason to suggest that the apes are, for instance, representing an available schema of actions as falling under some particular *concept* (PUSH or PULL): the fact alone that their actions are restricted to ones similar to the learned method is not obviously evidence for conceptual thought.

neurological structures for the same purpose (Veit et al., 2014), and perform similarly well in complex, sequential problem-solving tasks, just like chimpanzees (see, for example, Döhl, 1966, Clayton, 2007).

Perception itself might provide some of the cognitive apparatus required for imaginative problem solving of this nature. On Hinzen and Sheehan's (2013) account of perception, it is a process of filtering incredibly rich environmental stimuli and extracting from these stimuli the information relevant to the organism. In this sense:

> Perception is of objects as falling under *meaningful categories*: we see *sunlight* beaming into the room or *persons* walking in the street… We do not perceive photons, acoustic waves, or molecules, which physically corresponds to such objects of perception. Instead, stimuli that can be otherwise quite different are grouped together into more abstract classes equivalent under perception (Hinzen and Sheehan, 2013: 35).

Perception therefore carries with it its own semantics. At least some organisms (depending upon neurological complexity), then, form mental representations, *percepts,* from the filtered information, which represent different environmental variables. Mental computations can then be performed over these representations.[25] Even before language enters the picture, perception can involve classes of considerable abstraction. Pre-linguistic human infants can individuate objects via sortal kinds e.g. BOX, CAR, TOY, CAT (Xu, 2005), even though objects falling under these categories are often enormously varied in terms of perceptual content. Yet more abstract are representations of OBJECT, AGENT, CAUSE, ATTENTION, and PLURALITY, though these still clearly have some (hard to identify) perceptual basis and, perhaps, content. Although perception is largely an involuntary process, occurring *with* the stimulus, its relatively abstract content suggests it has a semantic content that is not stimulus-*determined* i.e. a content that does not simply mirror objects 'out there' in the world.

If perception itself includes abstract classes, and percepts are encoded as mental representations for non-human animal minds to operate upon, then this leaves open a large 'semantic space' even in the absence of language. If non-human animals can recall percepts related to past events (learned problem-solving methods included) as mental representations

[25] See, for example, the case of bee navigation discussed in Gallistel, 1998.

over which they can perform computations, and hold these in working memory alongside current perceptual experiences, the level of abstraction involved *in the percepts themselves* seems to offer a lot of room for behavioural improvisation. Consider corvid tool-selection tasks that depend on size: if corvids represent OBJECT, SIZE and CAUSE in perception, the tools appropriate for the task can be appropriately selected precisely because any currently-perceived tool bears some abstract SIZE/CAUSE-relation to the object it is intended to operate on, even if that object is not currently being perceived. The fact that they can do this sequentially seems to depend further *only* upon their ability to hold multiple representations of correct pairings of tools and objects in working memory while relevant computations are performed. Even with a limited working memory, solving a problem that is perceptually present shouldn't be impossible as completed tasks can be removed from the 'workspace' as new ones need to be considered. It is nonetheless impressive when corvids complete these tasks with little training.

§3.3 Animal imagination: pretence

For Whiten and Suddendorf, a further kind of imaginative act – pretence ("operating mentally in a 'pretend' world", Whiten and Suddendorf, 2007: 31) – seems to depend upon much the same cognitive apparatus. Whiten and Suddendorf argue for a great ape capacity for 'secondary representation' (see Perner, 1991), taken to be heavily implicated in pretence, before suggesting that the very limited but intriguing behavioural evidence of pretence in non-human animals can be taken at face value provided the apes possess this representational capacity. Accordingly, apes can not only represent some object in thought as the object itself, but also *simultaneously* hold a parasitic, secondary representation where that object is represented as something else. For example, in pretending a banana is a telephone, the pretender must hold on to the primary representation of the banana as a banana, and also simultaneously generate a secondary representation of the banana as a telephone. Evidence for the capacity for secondary representation in apes includes:

- *tracking invisible displacements*: determining an object's position based on an initially-perceived trajectory that later becomes occluded;
- *means-end reasoning*: mentally constructing a series of actions required to solve a novel problem, or 'imagining [a] hypothetical world within which newly created means will attain the ends desired';

- *using external representations*: for example, using a scale model of the experimental environment to find a hidden object;[26]
- *mirror self-recognition*: although less than 50% of apes are successful here, their performance is still way beyond that of other animals, including monkeys;
- *recognising simple states of mind*, namely intent (as opposed to accident) and visual attention (Whiten and Suddendorf, 2007: 48-51)[27]

The putative examples of animal pretence come (as Currie, 2004 points out) from apes exposed to human language and encouraged to imitate human behaviour. This small handful of cases includes apes playing with logs, dolls or toy animals 'as if' they were living creatures, for example, hugging them, bathing them, or making them 'bite' themselves or others (Savage-Rumbaugh, 1986, Matevia et al., 2002, Boyd, 2009). The bonobo Kanzi has also been observed engaging in imaginative play acts, apparently hiding invisible objects under blankets or leaves, and later returning and pretending to eat them (Savage-Rumbaugh and McDonald, 1988). Whiten and Suddendorf note also the case of the chimpanzee Viki who was described as pulling along a pretend pull toy (as she had done with real ones) and acting as though the cord had become tangled on a plumbing knob on two separate occasions, a week apart (Hayes, 1951). A similar case is reported where Koko, a sign-language-using gorilla, appeared to make a doll respond to an experimenter's question using sign language i.e. as though the doll itself were signing (Matevia et al., 2002). Given the wider evidence for the capacity for secondary representation, Whiten and Suddendorf's position on these cases is very permissive:

> [T]he corpus of putative pretend actions of great apes, although often weak when scrutinised individually, viewed as a whole does suggest an ability that appears rather different from anything seen in other primates and is sometimes consistent with the kind of pretence that signals secondary representation' (Whiten and Suddendorf, 2007: 48).

However, Tomasello and Call (1997) suggest that this isn't really a case of pretence, and these heavily socialised apes are simply mimicking human behaviour. Whiten and

[26] Penn et al express some scepticism about this claim (Penn et al, 2008: 115).
[27] Recognising simple states of mind like intent and attention could be accounted for by the semantics of perception set out in §3.2: it might simply be part of a perceptual apparatus geared toward seeing the world in terms of agency. It need not, for instance, involve anything like holding beliefs about others' mental states i.e. these states are directly *perceived* rather than *recognised* in conscious thought.

Suddendorf are unimpressed by this kind of response, pointing out that other animals with just as much socialisation, including monkeys, do not perform such acts, suggesting that this behaviour is '*meaningful* to great apes in a way it has not been recorded as doing in home-reared monkeys' (Whiten and Suddendorf, 2007: 47, emphasis added). Instead, Whiten and Suddendorf suggest that these apes may be acting within a (set of) pretend beliefs or desires, as young children do when 'mopping up' an empty cup filled with pretend juice.

It seems to me that a lot of Whiten and Suddendorf's interpretation of the evidence for secondary representation and pretence turns on how they describe the underlying cognitive processes. It seems as though none of the capacities demonstrated above (tracking invisible displacements etc.) *requires* thought with the propositional structure that typifies what we would recognise as a 'belief' in human beings. Conversely, suggesting that apes are acting within a set of pretend beliefs or desires requires just such thought. If the imagination is the generative mechanism for forming pretend beliefs, some story needs to be told about how animals can form beliefs which have the relevant structure and semantic content. This seems to go beyond the kind of objectual imagining we have already discussed and into the truth-evaluable realm of propositional imagining. If, however, such episodes of animal pretence can proceed from much the same processes evident in the corvid tool-selection cases discussed above, then we need not worry about what beliefs or suppositions the animals are operating upon. There would only be a question of *motivation* to answer: why, if they possess the capacity for pretence, do apes not engage in episodes of pretence more often? This may be because neurological 'reward circuits' are simply not attuned to episodes of pretence in non-human animals, though they may be with imaginative problem-solving in (some) non-human animals (see §4.4 for further elaboration on this suggestion).

Alternatively, we might try to offer plausible alternative explanations for the imaginative cases while granting the capacity for secondary representation. For instance, it may be the case that Viki was not inventing an entirely novel scenario: the *real* pull toy may have become tangled, and this may be repetition of some old behaviour that she, nonetheless, internally represents and operates upon. We might also suggest that the ape/monkey difference in pretence is not a result of a capacity for secondary representation, but instead an enhanced capacity for imitative learning which doesn't depend upon secondary representation (the results of the studies focused on inventiveness seem to lend themselves to this interpretation too given the difficulties monkeys found in learning a method for shelling the artificial fruit). This might

explain, for instance, Koko's 'signing doll' as a case of imitating the methods used to teach Koko herself to sign.

Whiten and Suddendorf's account at least attempts to place human imaginative capacities on a continuum with those of great apes, and with some success the evidence they examine suggests imaginative capacities that clearly do not depend upon the possession of full language. These no doubt developed further with pre-cursor hominids whose cognitive and, in all probability, linguistic capacities would also be beyond that of signing apes. In fact, there may be reason to think that imaginative capacities develop in tandem with linguistic ones, and I turn to evidence that tentatively points in this direction in Chapter 6 by examining the connection between language disorders and imaginative disorders. However, our immediate focus is to move to a much later point in our evolutionary history by examining the imaginative and creative capacities of our *Hominid* ancestors.

§3.4 Pre-cursor *Hominid* imagination

Carruthers (2005) suggests that by the time of *Homo ergaster* (c. 400,000 years ago) we can see clear evidence of a 'deepening' of the cognitive capacities described above. According to Carruthers, *Homo ergaster* cognition had developed to the point that it had formed a system of naïve biology (evidenced by an increasingly varied diet as groups rapidly adapted to new ecological environments containing wide variations in flora and fauna) and a form of naïve physics (evidenced by their apparent ability to predict tidal patterns, allowing the introduction of marine creatures into their diet; see also Mithen, 1996). Carruthers also points out that new cognitive capacities appear to have evolved too, such as a social-exchange/cheater-detection capacity (Carruthers, 2005: 77) most likely as a result of selection pressure introduced by an increasingly complex social environment. All of these capacities seem to build upon the capacity to simultaneously hold multiple mental representations, and our Hominid ancestors may even have developed basic analogical relational reasoning by this point (certainly beyond that of our closest living primate cousins) as these new environments would require going beyond mere perceptual similarity when confronted with new potential food sources.[28] Analogical reasoning itself might be thought of as (yet another variety of) imagining.

[28] See Penn et al, 2008: 113 for some critical discussion of limitations in, or absence of, non-human animal analogical relational reasoning.

In terms of the imagination, Wynn (2000) makes a compelling case to suggest that *Homo ergaster* had precisely the kind of *voluntarily* manipulable mental imagery that I suggested above was absent in animal dreaming. This case is grounded in evidence of the fine symmetries that typify the stone tools they made. Wynn suggests that this involved planning strokes in advance and holding in mind an image of the desired shape that the stone would have when seen from the other side. This appears to involve the ability to mentally rotate percepts in order to compare them to present perceptual experience, representing the stone as it is *and* as it is intended to be (modern-day 'stone-knappers' can demonstrate the techniques employed by our ancestors, and presumably the cognitive basis of these skills isn't radically different when the behavior is replicated by our own species).

Despite these new cognitive capacities, the archaeological record of the stone-tool industry actually demonstrates relatively narrow bounds for creative thought and imagination. The tool-making capacities of our ancestors remained static over tens of thousands of years. As such, it seems as though they still lacked a powerful generative mechanism for new ideas.[29,30] It is precisely this glacial pace of innovation in earlier hominid species that gives rise to the puzzle of the Creative Explosion outlined in §1 above. What is it that makes our species, and our species alone, so prolifically creative? It is at this point that we can turn to an attempt to solve the supposed puzzle.

4. Picciuto and Carruthers' Pretend Play Hypothesis

This attempt to address the puzzle comes from Picciuto and Carruthers (2014) (developing upon an earlier work by Carruthers in Carruthers, 2002). You will no doubt recall that the puzzle arises from the gap between speciation and the onset of widespread creative

[29] Carruthers takes these limitations to reflect support for his thesis of modular encapsulation.

[30] Interestingly, Berger et al (2015) have recently published findings relating to a new species of *hominid* whose cranial morphology is similar to that of *Australopithecus*, suggesting they may have lived between 2-3mya, and yet whose behaviour may have included ritual burial, something previously only associated with much later *hominid* species. The remains of 15 individuals from that species were discovered in a cave that is incredibly difficult to access, suggesting the bodies may have been *placed* there (though it is possible that they went to the cave as a group and perhaps became trapped). We might question whether this ought to be regarded as symbolic or ritualistic behaviour in the same sense associated with the later *hominid* species – there are no 'burial goods' associated with the site (bird and rodent bones at the burial site are not presently thought to be associated with the hominid remains). Nonetheless, this is a potentially important discovery if for no other reason than it once again reveals the non-linear nature of human evolution: the skeletal and behavioural features observed to separate later and earlier *hominins* can no longer thought to have arisen as a single adaptive package.

behaviour in multiple domains of human activity. In his 2002 paper, Carruthers suggests that to explain the 60,000-year gap in the archaeological record, it looks like we will:

> *either* have to claim that human creativity resulted from a series of gradual cognitive/cultural accumulations, independent of genetic change and built up independently by different human communities over many millennia; *or* we shall need to claim that some change occurred in the human genotype which could be selected for independently of the nature of the ecological environment (Carruthers, 2002: 227).

As Carruthers rightly points out, neither of these approaches looks initially plausible, because we would have to explain in either case why the relevant developments (cultural and/or genetic) took place at the same time in geographically dispersed groups of human beings. Carruthers goes on to suggest a range of possible explanations of human creativity, assessing each for their ability to plausibly explain the 60,000 year gap in the archaeological record, eventually settling with his Pretend Play Hypothesis. I won't discuss all of these alternatives here, and there are perhaps many more besides the ones discussed by Carruthers, so I will only focus my attention on the alternative explanation most relevant to my own proposal – that involving the emergence of the human language faculty.

§4.1 Carruthers' case for Pretend Play

Pretend play appears to be a universal human trait, and conversely only tentative evidence for it appears outside of our species (see §3.3). Normally-developing humans engage in pretend play from around 18 months old, including participation in imaginary conversations with fictional characters (e.g. talking to dolls or imaginary friends) and pretending to take part in a various adult or imaginary activities (e.g. talking into a banana as if it were a phone, or flying by pretending to be a bird or an aeroplane). For Carruthers, adult creativity and childhood pretend play 'can be seen as sharing essentially the same cognitive basis, insofar as both involve exercises of imagination' (Carruthers, 2002: 228-9). Moreover, according to Carruthers, such creativity in thought and action as an adult *is precisely what childhood pretend play is for*; in other words, because of the benefits in flexible and creative thought it confers later on in life, the disposition toward pretend play in children was selected for by evolution once it appeared. Such creative adult behaviour may have been selected for because of the adaptive

advantages it conferred (natural selection) or because it was a reliable indicator of protean cognition (sexual selection).

Other species, it might be thought, engage in other kinds of play geared towards making them more effective members of their species as adults. For examples, kittens will engage in play-stalking, play-jumping, and play-biting, skills which will latter be used in hunting as an adult cat. But perhaps only human beings engage in *pretend* play – play which involves generating and reasoning with novel suppositions or imaginary scenarios – and it is therefore, according to Carruthers, worth asking what this pretend play is for. Carruthers is quick to note the many uses of suppositional reasoning in adulthood: the 'construction of a new theory, seeking a novel solution to a practical problem', or even 'composing a tune' (Carruthers, 2002). It does, therefore, seem initially plausible that pretend play could be the origin of these capacities.

What, then, is the cognitive basis for this disposition toward pretend play? According to Carruthers, the two most important features of the cognitive basis for human creativity more generally are the capacity to generate new ideas, together with the ability to see the significance of those ideas. It turns out that episodes of pretence rely on much the same basis. Episodes of pretence begin from an imagined initial supposition or scenario, such as a banana being a telephone; the child then follows established behavioural scripts, acting as though that supposition were true, and draws appropriate inferences from the (set of) supposed truths, for example by 'dialling' the telephone, or inferring that someone has answered the call. The significance of enacting these behavioural scripts is in the rewards that they inherently confer in terms of enjoyment (see §4.4).

§4.2 The case against 'just' language

The suggestion that pretend play might be inherently enjoyable is something that I will return to later (this point will actually be co-opted in favour of my alternative hypothesis). However, I will now, following the structure of Carruthers' 2002 paper, turn to his case against the emergence of fully-syntactic language as a sufficient explanation for the emergence of human creativity (the *Language Hypothesis*). Versions of the Language Hypothesis have been put forward by Bickerton (2009) and Noble and Davidson (1996). Supporters of this hypothesis typically believe, firstly, that natural language is the vehicle for human beings' distinctive kind

of thought and reasoning, a belief that both Carruthers and I share to some extent (see Chapter 3 for specifics on the connection between language, thought and creativity), and, secondly, that the creative potential of human thought and imagination is underpinned by the flexibility and recursive power of natural languages.

A version of the Language Hypothesis might note that the appearance of pretend play at 18 months co-occurs with a 'language spurt' – a period of heightened vocabulary acquisition. However, as Carruthers notes, the Language Hypothesis rests not on the lexical but rather the syntactic element of language in explaining human creativity. The deeper problem, however, is the pretty-much universal consensus that the genetic basis for language must have been in place prior to our ancestors dispersing from Africa somewhere 130,000 and 100,0000 years ago. This still leaves a 60,000-year gap between the emergence of language and the Creative Explosion. What seems to be required, then, is something *in addition to* language in order to explain the emergence of human creativity.

Carruthers surveys some possible candidates. These include the discovery of the benefits of inner dialogue with oneself (Dennett, 1993, Bickerton, 1996) or the gradual accumulation of material culture (Mithen, 2000). I won't go through the specifics of any of these in this thesis, and I am largely happy to adopt Carruthers' reasons for ruling them out as alternatives. Instead, I will turn to Carruthers' remaining arguments for the Pretend Play Hypothesis.

§4.3 Experiential and Propositional Imagination

For Carruthers, with the language faculty in place, the cognitive pre-requisites for creative thought were thus present at the emergence of the first anatomically-modern humans 100,000 years ago. One of these cognitive pre-requisites was that of *experiential imagination*: 'the capacity to form and manipulate images relating to a given sense modality' (Carruthers, 2002: 241). This kind of imagination is similar to the objectual imagining that Yablo outlines (see Chapter 1). Carruthers takes this capacity to be a by-product of, and thus come 'for free' with, the 'conceptualizing processes' inherent in our perceptual input-systems:

> There are extensive feedback neural pathways in the visual system, for example, which are used in object-recognition when 'asking questions of' ambiguous or degraded input. And these very pathways are then deployed in visual imagination so as to generate quasi-perceptual inputs to the visual system (Carruthers, 2002: 241).

Carruthers explains this idea in more detail elsewhere, but the basic gist is that pre-cursor *Hominids* seem to have developed the capacity to experientially (i.e. perceptually) complete 'incomplete' data in current perceptual experience (Carruthers, 2005). This is in evidence, for instance, in precursor *Hominid* adaptability when faced with new ecological niches, as discussed in §3.4. More strikingly we see this kind of experiential imagination in evidence in their stone-knapping abilities, which suggest they must have had the capacity to mentally rotate 'their image of what would happen to a stone if it were struck in a particular way, to imagine how it would look from the other side' (Picciuto and Carruthers, 2014: 203).

The second cognitive pre-requisite that Carruthers suggests is *propositional imagination*: 'the capacity to form and consider a propositional representation without commitment to its truth or desirability' (Carruthers, 2002: 242). This too, Carruthers suggests, comes 'for free', this time with language. As Carruthers points out, even with such capacities in place, the ability to creatively generate novel sentences or images won't be sufficient for *creative* thinking (as we outlined in Chapter 1) – there is nothing especially creative in generating just *any* sentence or image; instead what we need is the ability to generate *valuable* (i.e. relevant, fruitful, interesting) ideas. And this is precisely what Carruthers has claimed pretend play is for.

§4.4 Pretence and Motivation

This still doesn't provide a full evolutionary account, as it hasn't accounted for the emergence of children's disposition toward pretend play. Carruthers suggests that children may be 'wired up' in such a way that they receive intrinsic gratification from episodes of imaginative play. Such a connection between gratification and imaginative activity is seemingly already in evidence in primates as mentioned in §3.3. It seems as though imaginative behaviour is demonstrated in non-functional domains in the behaviour of our primate cousins, and research into the neurology of apes performing problem-solving tasks suggests that they enjoy completing experimental tasks regardless of whether or not any externally bestowed reward is

associated with that task (Clark and Smith, 2013) since the brain confers its own chemical reward for success. In other words, certain types of (quasi-) creative or imaginative behaviour might be *their own reward*. The evidence from Whiten and Suddendorf discussed above suggested that where great apes were particularly inventive and (possibly) inclined toward pretence, monkeys performed comparably poorly on similar measures. I suggested in §3.3 that this may be an issue of motivation – if apes are simply more motivated, that would explain their greater success. There is some tentative evidence to bear this out in Harlow (1950). Evidence here, and from Whiten and Suddendorf (2007), suggests that monkeys may simply be much harder to teach specific methods of problem-solving to as their reward circuits are much more closely associated with exploration than with imitative learning.

On Carruthers' view then, the rewards in human beings for pretence come from imaginative engagement with, and the partial satiation of, the agent's desires and interests. Imagination, Carruthers points out, appears as though it is connected to the appetitive and motivational systems in a similar way to belief, such that:

> …imagined sex can make you feel sexy, imagined insults can make you angry, imagined food can make your mouth water, and so on. This is the basis of the enjoyment we take in story-telling, cinema, and works of fiction – imagining doing and experiencing interesting things is itself interesting (Carruthers, 2002: 243).

So, a young child may be fascinated by telephones – their parents use them all the time, yet they aren't allowed to play with them – and they may enjoy talking to their grandma. By engaging in pretend play whereby the child picks up a banana, 'dials' a number and speaks to grandma, the child gains part of the motivational rewards of its real-world counterpart. This connection between the generation of suppositions and the rewards of thinking and acting within those suppositions explains why children are disposed toward pretend play, and once activated this disposition would function as practice for later uses of supposition in theory-building and problem-solving as an adult. If this hypothesis is true, it makes empirical predictions about the connection between a disposition toward pretend play in infancy and creativity in adulthood. In the next section I briefly summarise some recent findings that suggest, however, this prediction does not bear out.

5. Problems with the Pretend Play Hypothesis

Before turning to the empirical data concerning pretend play in infancy and creativity in adulthood, it is worth noting a couple of concerns that might cast some doubt on the Pretend Play Hypothesis in their own right. Firstly, we might wonder how pretend play is supposed to give rise to the particular kind of *artistic* creativity that is ubiquitous across human populations and present at the point of the Creative Explosion. It seems fairly obvious how pretence might give rise to dramatic performances of a sort (for example, re-enacting a battle or hunt, but embellishing for dramatic effect): composition and appreciation in this medium seem to clearly depend upon propositional imagining (as Carruthers describes it), and it is perfectly conceivable that pretend play in infancy, being as it is a process of acting within suppositions and coming to realise the (evolutionary) value of doing so, might give rise to the same process in adulthood. Dramatic performances are effectively pretend play episodes for adults. But what about the cave paintings that emerge around 40,000 years ago? There doesn't seem to be an obvious route to explaining why pretend play in infants might spur on the kind of imaginative thinking that would manifest itself in this particular form of adult creativity (there are no clear battle scenes depicted, and hunting images are rare and often accompanied by some ambiguous images). This point isn't damning, of course, as the claim is simply that pretend play in infancy makes individuals more creative as adults via enhanced suppositional reasoning skills, and this might manifest itself in various ways including naïve scientific theory-formation and composing songs. However, it is not unreasonable to expect that there might be a stronger connection between the form of the explanans and that of the explanandum. I will suggest below, and revisit this suggestion in detail in Chapter 4, that Carruthers has been too quick to dismiss a particular kind of imagining that offers a broader spectrum of possible creative behaviours – one which retains many of the strengths of the Pretend Play Hypothesis, but that can address this concern too – *fantasy*.

Another concern is with Carruthers' inclusion of tune composition amongst the creative activities stemming from the suppositional reasoning abilities enabled by pretend play in infancy. It is not implausible that dance and music in some form may, in fact, predate all of the other creative behaviours that are ubiquitous across human populations. In Steven Mithen's view, there is good evidence to think that they long predate our species, and so pre-date the point in the history of our species where pretend play had become an evolutionarily stable feature of infant behaviour (Mithen, 2005). According to Mithen, song and dance might have

been a feature of the lives of *Homo ergaster*, a common ancestor of *Homo sapiens* and *Homo neanderthalensis*. If this is so, then composing tunes does not depend upon the suppositional reasoning skills engendered by pretend play. Again, this might not be particularly damning – perhaps Carruthers would wish to draw a distinction between the ways in which our evolutionary ancestors composed tunes and the way we do, with the former drawing on similar capacities to songbirds.[31] Nonetheless, it is tempting to want to exclude song and dance from the phenomenon associated with the Creative Explosion unless we insist that the only or best evidence that can count for its presence in early hominid populations is the discovery of musical instruments (such as that noted in Fig.1 above). Whilst it obviously constitutes a creative act to invent such instruments, every normally-developing human being already has access to a (potential) musical instrument in the form of their voice. Mithen's picture seems intuitively more appealing, as the invention of musical instruments around 41,000 years ago would surely be a *refinement to* a highly creative and long-established social practice rather than the *origin of* one.

The most pressing objection to Carruthers' account, however, comes from Carruthers himself. Why, given that the rewards for pretend play are supposedly linked to the imaginative act itself, would 'a disposition to play (involving overt movements) rather than to merely *fantasise* [emerge]?' (Picciuto and Carruthers, 2014: 245, emphasis added). Carruthers' answer comes in two parts. Firstly, he suggests that children probably lack the 'sort of introspective access to their own mental states which would be necessary for enjoyment of mere imagination' (*Ibid.*) This may be so, but as Carruthers notes, this only defers the problem since it doesn't seem 'crucial' that fitness-enhancing activity begin at 18 months. If what is (sexually) selected for is creative behaviour in adults, then it is only *if* it is true that pretend play is the ontogenetic basis for this that this picture holds; if it transpires that pretend play in infancy doesn't enhance creativity in adults, then the central claim of Carruthers' thesis falls away. Carruthers therefore moves to avoid this charge of simply deferring the problem by claiming that young children would *already* have possessed a disposition toward what Lillard et al. (2012) call Physical Play i.e. rough-and-tumble, just as many other mammals do, and that this could be co-opted in service of the development of creativity by becoming a disposition to engage in pretend play. This, in turn, could become shared pretence (a form of social imagining; see Chapter 1), and therefore contribute to the development of the mind-reading faculty (following Leslie, 1987) as

[31] One model that he could adopt to do so is that of Miyagawa et al., 2013.

well as the development of the physical skills utilised in object control and manipulation. However, there are empirical reasons to doubt this, and I turn to these reasons now.

§5.1 Review of empirical data relating to the Pretend Play Hypothesis

Lillard et al. (2012) conducted an extensive survey of empirical research into the link between pretend play in infancy and various measures of cognitive development in adulthood. A table summarizing the data is provided below as Fig. 3. One interesting point that emerges from Lillard's review is that pretend play might not be as ubiquitous across human populations as Carruthers seems to think. In a recent survey, mothers in only 5 of 16 countries surveyed suggested that their children often participate in imaginative play (Singer et al., 2009) and other studies suggest that children in non-Anglo cultures play much less (Gaskins and Goncu, 1992, Lancy, 2007). I won't press that point here, however, as there are bigger concerns about the Pretend Play Hypothesis raised by the review.

Lillard et al. examined the results of a range of studies on play and cognitive development, focusing primarily on pretend play, with a view to investigating three hypotheses proposed by Smith (2010):

1. That pretend play is *crucial* to optimal development (the one most relevant to Carruthers' hypothesis, shown in Fig. 3 under 'Causal')
2. The *equifinality* hypothesis: that pretence helps some developments, but that it is only one possible route.
3. The *epiphenomenal* hypothesis: that pretending is an epiphenomenon of some other selected-for capability, but in itself makes no contribution to development.

If Carruthers' Pretend Play Hypothesis is correct, we should expect to see a correlation between pretend play and cognitive development, particularly in the areas of creativity, Theory of Mind and problem-solving. The most important headline is that this does not turn out to be the case at all: in fact, pretend play was even found on some studies to hinder cognitive development in these areas. The hypothesis that emerged as the most plausible was the epiphenomenal hypothesis – the worst possible result for Carruthers. Ideally, then, my own explanation of what drove the evolution of human creative behaviour should fit with the idea

that play is an epiphenomenon of the drivers I identify. I suggest in Chapter 5 that this is the case.

In the domain of creativity, the evidence overall was inconclusive and did not strongly favour any of the hypotheses. Interestingly, however, one study (Wyver and Spence, 1999) linked fantastical pretend play to the promotion of semantic creativity, which might please supporters of the Language Hypothesis. I pick up on this point again in Chapter 4 when looking at the connection between fantasy and the evolution of language. Most of the studies which supported the hypothesis Carruthers favours turned out to be methodologically problematic, and the support disappeared when these issues were masked.

In the domain of Theory of Mind, the evidence was again inconclusive, most strongly supporting the epiphenomenal hypothesis (as noted above, the worst result for Carruthers). Leslie et al. point out that the evidence which did appear to support the kind of view favoured by Carruthers could have just as easily been explained by linguistic abilities, and that one study even suggested that it is Theory of Mind that enables socio-dramatic play, thus reversing the direction of effects. The most reliable study showed 'no improvement in Theory of Mind from either skills or pretend play training' (Lillard et al., 2012: 16).

In the domain of problem-solving, a kind of physical play (*construction*, e.g. building with blocks) was found to promote creativity, but importantly this was not the case for pretend play. Pretend play was even found to *interfere with* using objects as tools, which perhaps casts doubt on the evolutionary advantage of co-opting physical play into the services of pretend play as Carruthers suggests as his ultimate way out of the objection that he raises: that by his own account, merely engaging in fantasy should be sufficient to explain the development of creativity. I will suggest in Chapter 4 that Carruthers, as I noted in Chapter 1 was the case with many philosophical discussions of the imagination more generally, has been too quick to dismiss the importance of fantasy, and ultimately offer an account of how fantasy might, in fact, be one of the main drivers of the evolution of creativity.

Fig. 3 Summary of Evidence for Each Position

Domain or sub-domain	Support for hypothesis? (Reason)		
	Causal	**Equifinal**	**Epiphenomenal**
Creativity	No (inconsistent correlations)	No (when experimenters are masked or filmed or have other hypotheses, null results)	Best supported, but not clear what of (adult interaction, materials, social mix?)
Intelligence	No (although correlations, direction of effect is uncertain; skills training suggests adult interaction could be underlying third variable.	No (music training is more effective)	Best supported (adult interaction or other features of intervention)
Problem-solving	No (construction but not pretend play)	No (construction but not pretend play)	No (construction but not pretend play; associations might result from propensity to construct)
Reasoning	No (getting children to focus on premises is as effective)	Yes	Possible (f pretend as operationalized is also a cue to pay attention to premises, and this is true reason for results)
Conservation	No (correlational studies find no relationship; training results ride on adult questioning)	No (when experimenters are masked and other aspects of intervention equalised, null results)	Best supported (adult interaction – structured questioning)
Theory of Mind	No (inconsistent. Some correlations to social pretend play with more recent tasks, but direction of effects is unclear)	Possible, yet sounder methods fail to show.	Best supported (considering inconsistent findings and hints of reverse direction of effects; adult interaction)
Social skills	No (correlations inconsistent with both solitary and social pretend play. Direction of effects is an issue)	Possible (other routes unexamined)	Possible (crucial variable could be practice)
Language	Possible (consistent relationships to different aspects of language. Effects could be bidirectional)	Possible (other routes unexamined)	Possible (adult interaction could explain training study results)
Narrative	Possible (correlations inconsistent and to different aspects of narrative development but one solid but small training study needs replication)	Possible	Less likely but one solid but small training study needs replication.
Executive function	Not likely (if so, limited to subsets of children and tests)	Not clear that pretend play leads to.	Not clear that pretend play is reliably associated.
Emotion regulation	Possible (parent rating consistent in single study; other results have other interpretations)	Not clear that pretend play leads to.	Too few studies.
Adapted from Lillard et al., 2012			

Concluding Remarks

In the light of these results, it is therefore worth returning to the issue of what it was that occurred between 100,000 years ago and the Creative Explosion to prompt the rapid expansion of creative activities that followed. It is this issue that I pick up in the remainder of this thesis. Although Carruthers might not have successfully solved the puzzle of the Creative Explosion, his work does give us a clear structure for approaching the puzzle. What needs to be explained is what emerged besides language to spur on the evolution of human creativity. But his work also shows the need to adequately explain the emergence of that thing too. My own answer will be the emergence of a culture of storytelling, and Carruthers has actually given us a head start in explaining the emergence of just such a culture: engaging in fantasy is inherently rewarding. With the issue of motivation already partly resolved, in the remainder of this thesis I need to elucidate and explain the other components required for us to begin telling stories. With that in mind, in the next chapter I aim to set out some specific details on what the emergence of syntax would have brought to human cognition, and the impact that this would have had on our imaginative capacities. Chapter 4 explores the role that fantasy might have played in driving human creative behaviour and the development of rich lexical resources that would begin to ramp up cultural evolution in our species. The result, I argue in Chapter 5, is the development of a culture of storytelling which builds upon a natural inclination to engage in fantastic imaginings. This account overall, I will argue, offers a stronger explanation than Carruthers' Pretend Play Hypothesis, and one which coheres better with the empirical data we currently have.

Chapter 3:

LANGUAGE & HUMAN CREATIVE COGNITION

How did the evolution of language in our species change creative cognition?

Introduction

Chapter 2 began to outline both what language is and how and when it emerged as a capacity unique to our species. I stated that human language essentially consists of two parts – lexicon and syntax. This chapter will begin to unpack the role that syntax, in particular, plays in human cognition, suggesting that features specific to human thought perhaps only emerge when grammar is in place. I will, however, discuss the importance of the lexicon in subsequent chapters. The important new features that language brings would be available for the diverse faculty of imagination to deploy in a number of ways to assist creative behaviour. However, given the puzzle presented in Chapter 2 – the apparent delay between the emergence of language in our species and the emergence of the widespread, diverse creative behaviours seen at the point of the Creative Explosion – we need to begin to sketch some sort of explanation for this delay. I lay the groundwork here for the argument in Chapters 4 and 5 that specific cultural accretions needed to occur before we could expect to see the behaviours that typify human creativity today (e.g. in the artistic, scientific and technological domains). In particular, I will argue in Chapter 5 that storytelling should be seen as a crucial driver of human creativity, but that this practice is ultimately enabled by imaginings that utilise our unique capacity for language.

1. What is language (in the sense relevant here)?

§1.1 Two approaches to studying language

Language can be studied both as a cultural object and as a natural object. The idea that language is a cultural object is perhaps the 'natural-seeming' way of understanding it (Morris, 2007: 1). This view can be seen, for instance, in the work of Locke (1689; 1998) and Aristotle (1996), who suggest that language is *invented* by man for the purpose of communicating ideas (see §2.1 below). The two components of any given language – the lexicon and the grammar –

are, according to this view, simply conventions established and preserved over a number of generations. Language, therefore, can be studied in much the same way as other aspects of human culture, such as commerce or cooking, by examining its historical development. However, it has been argued (by Chomsky, amongst others) that traditional grammarians 'often failed to realise that the standard language is, from a historical point of view, merely that regional or social dialect which has acquired prestige and become the instrument of administration, education and literature' (Lyons, 1970: 20). As such, there are deeper roots to each of these preferred dialects that could in turn become the focus of linguistic inquiry for traditional grammarians as they seek to trace the historical origins of specific dialects.

Generative grammarians, by contrast to the Traditional grammarians of the sort above, study language as a natural object. On this view, human beings are endowed with a biologically-based 'language faculty'. All normally-developing human beings are capable or learning or acquiring language, yet this is a capacity unique to our species and unaffected by cultural differences. No matter how extensive the training given to non-human animals, they are never able to do what every normally-developing four-year-old child can do: construct novel expressions to freely express thought. This inability to acquire language suggests that there is a biological difference between ourselves and non-human animals that accounts for our ability to acquire language and their inability to do likewise.[32] As noted in Chapter 2, this difference may be language-specific (e.g. the neurological changes required for syntax) or not (e.g. adaptations enabling co-operation).

From the 1920s up until the 1950s, the first of these approaches to language was popular amongst linguists seeking to make the study of language 'more scientific' by viewing language through the prism of Behaviourist psychology. The influential linguist Leonard Bloomfield epitomised this kind of approach, seeking to explain language 'mechanistically' in terms of stimulus and response. On the Bloomfieldian view, all aspects of language acquisition and performance can be explained in terms of the cultural transmission of certain established

[32] This is not intended as a knock-down argument: I simply take it that it's a fair assumption that if we possess some capacity uniquely as a species then there must be some biological and evolutionary explanation for this uniqueness. This isn't the same as saying there is a specific biological adaptation for language (see Ch. 2), only that there is some biological difference between ourselves and other species that enables every normally-developing member of our species to acquire language without explicit instruction.

conventions for symbols and their meanings.[33] More recent work in linguistics by Noam Chomsky has argued that such an approach can't account for the 'creativity' of language – that even by the age of five or six years, human beings can produce and understand an indefinitely large number of appropriate utterances that they have not previously encountered. Chomsky doesn't deny that aspects of language are cultural, nor does he believe that there is nothing to be gained from studying individual languages. But in order to explain the universal capacity of human beings to produce and understand novel sentences in the way noted above, in Chomsky's view there must be some biological basis allowing the internal *generation* of such sentences, and it is this basis that is the subject of investigation in his linguistic inquiries. For Chomsky, the underlying cognitive basis for language not only enables linguistic ability, but also provides the limits or constraints for all possible human languages, in much the same way that the visual system enables but simultaneously constrains possible visual experiences. A theory of these constraints is called *Universal Grammar*.

The aims of this thesis are to establish the relationship between the emergence of language and the imagination, and to explain the role that this relationship played in the emergence of widespread and diverse creative behaviours within our species. The claim that there is a biologically-grounded universal grammar i.e. a set of constraints on all possible human languages, provides us with a route to investigate the relationship in the first of these two aims: by examining the basic operations permitted by universal grammar and manifested across all human languages we can establish what new cognitive features are available to the imagination once full language is in place. With this in mind, I offer some further detail on Universal Grammar and the specific mechanisms of language below.

§1.2 Studying Universal Grammar

The grammar of every language consists of three inter-related parts:

(i) s*yntax*, which accounts for the regularities governing the combination of words
(ii) *semantics*, which describes the meanings of words and sentences, and
(iii) *phonology*, which deals with the permissible combinations of sounds in speech.

[33] Perhaps the most well known rejection of this approach to language is Noam Chomsky's damning critical review of Skinner's *Verbal Behaviour* (Chomsky, 1967); his arguments against this kind of approach have remained largely unchanged.

Chomsky believes that elements of each of these are universal. However, 'universal' here does not mean that these elements are present in every language. Instead, this Universal Grammar (UG) provides all of the available options from which different languages select. In this sense, UG is said to be the (genetically transmitted) 'initial state' of the human language faculty, playing the role of a 'language acquisition device'. As Chomsky puts it:

> A plausible assumption today is that the principles of language are fixed and innate, and that variation is restricted in the manner indicated. Each language, then, is (virtually) determined by a choice of values for lexical parameters: with the array of choices, we should be able to deduce Hungarian; with another, Yoruba. … The conditions of language acquisition make it plain that the process must be largely inner-directed, as in other aspects of growth, which means that all languages must be close to identical, largely fixed by the initial state (Chomsky, 2000:121-2).

On this account, an individual child learning a language must determine, from the linguistic information they are exposed to, the set of options in use in their native language (a process driven by UG). No language uses *all* of the options that UG makes available, and it could be (depending upon how broad UG turns out to be) that no one particular option is used by every language (though this seems unlikely e.g. some likely candidates for the options used universally include negation, tense, quantification etc.) As the genetic component of language, UG is 'unconscious' in that it is not available to introspection, and the nature of UG therefore has to be deduced by Generative grammarians from the 'primary linguistic data' (*pld*) generated in the utterances of language-users, and these language-users' judgements about what constitutes an acceptable utterance.

However, the matter is not straight-forward as the *pld* does not directly mirror UG. Linguistic production is affected by a variety of factors such as lapses of memory or attention, or malfunction in the mechanisms underlying speech. As a result, many of the sentences actually produced by native speakers may be ungrammatical. The *pld* therefore cannot be taken at face value, and must be 'idealised', eliminating from it utterances which the native speaker would intuitively recognise as ungrammatical. Chomsky introduces the distinction between *linguistic performance* and *linguistic competence* to capture the nature of this disparity; 'competence' describes the system of linguistic knowledge possessed by native speakers, and

'performance' describes how this system is manifested in actual instances of communication.[34] This distinction is important to Chomsky's linguistics more generally, since the Generative tradition sees competence as the ultimate object of study due to its connection to UG, but it is also important to his comments on the creative aspect of language use, with some criticism of Chomsky's views centring on the perceived ambiguity as to which aspect of language is said to be creative: competence or performance (see Drach, 1981). Crucially for our purposes here, and speaking in idealized terms, examining linguistic competence to establish the structure of UG should allow generative grammarians to establish the basic computational processes involved in generating linguistic utterances in every language. The project of doing so (known as the Minimalist Program; see Ch.2, §2) is not without its critics, but it is not my intention to address those critics here – that is best left to the linguists. Instead, I will work outwards from the findings of specific generative grammarians, taking their credibility for granted, to try to establish what the (supposed) computational basis of language would bring to human creative thought.

§1.3 Generative Grammar

The generative linguistics introduced by Chomsky and his colleagues differed significantly from the then-dominant Bloomfieldian approach. Generative linguistics not only 'made it respectable to talk about the mind again' (Fitch, 2010), but introduced ideas which seemed impossible to explain via the general learning mechanisms which the behaviourists had at their disposal. The central idea was the mathematical notion that an infinite set of meaningful sentences could be generated by a finite set of rules. This capacity for 'discrete infinity' is often said to be the most striking difference between human language and the communication systems of all other known creatures.[35] Chomsky and his colleagues also realised that existing models of syntax, which posited rules for building sentences by manipulating individual words, couldn't adequately explain the power of language. Instead, rules must act upon *phrases*, which

[34] This distinction was drawn in Chomsky 2002 as a distinction between *language* and *corpus*, but adding to the number of meanings for 'language' would be unhelpful here.

[35] Bees are (in principle) able to communicate an infinite number of locations of food by varying the intensity of the signal. However, there is a simple and fixed correlation between the signal and the signal's 'meaning' e.g. the location of food. Human language enables novel combination of discrete units, rather than simply varying continuously one of the parameters of the signalling system (for instance, solely by changing emphasis on a particular word in the same sentence) in accordance with a corresponding variation in meaning, and thus is a far more powerful and expressive system.

in turn can be recursively re-embedded in a sentence.[36] Language therefore has a tree-like, rather than linear, structure, and because of its recursive nature generates an infinite number of possible sentences. I explore this structure in more depth in §2.2 below.

We may summarise the view of language relevant here as follows: at its core language is a biologically-based generative or productive mechanism characterised by its capacity to generate an infinite number of novel, meaningful sentences. Generative grammarians, such as Chomsky, therefore posit that UG must minimally be a 'rich, abstract and restrictive' (Chomsky, 2003: 388) mechanism yielding these features, with UG perhaps reducible to a single operation, *Merge* (see §2.2 below). To make clear the relevance of this approach to language to my thesis, it is first necessary to examine the link between language and thought on this view.

2. (The Structure of) Language and Thought

The aim in this section is to explain a particular view of the relationship between language and thought which I take to illuminate what happened when the final adaptations enabling full language appeared with our species. This, I claim, would put into place a capacity for easily generating thoughts of a kind unique to human beings i.e. thought with a subject-predicate structure, that is truth-bearing, and can flexibly refer to objects, events and propositions, and which could then be externalised in communication, in turn driving the rapid development of culture associated with anatomically modern human beings. The view of language and thought that interests me here is that defended by Wolfram Hinzen (2006, 2007, 2013). Hinzen's view of the relationship between language and thought establishes part of the picture I am aiming to clarify in this thesis; a further, independent argument is required for *why* language would be co-opted by the imagination for the purpose of story-telling, and it is in developing that argument in Chapters 4 and 5 that the relevance of our earlier discussion of fantasy should become clear. The focus of this section, however, is the emergence of the kind

[36] That recursion is a property of all human languages is contested by Everett (2005, 2012), who claims that Pirahã lacks this feature. This is sometimes said to pose a problem for proponents of UG, though Everett's proposals have also been subjected to a number of criticisms which, as a non-linguist, I am not qualified to adjudicate on. However, Chomsky's response to this issue has been to remind us that recursion may be a property of UG, but that like any other property of UG it may not be selected by every language (Chomsky 2006; see §1.2 above). Regardless, it seems that Everett does not wish to deny that recursion is a property of the thought of Pirahã speakers, and in Chomsky's view the primary beneficiary of UG is thought (Chomsky 2007; see Ch.2, §2), so the views may not be irreconcilable anyway.

of thought that provides the content for *what we say*, which Hinzen convincingly argues derives its structure and semantics from what he terms *narrow syntax*.

§2.1 Against Nominalism about language and thought

Hinzen rejects the long tradition in the philosophy of language that assumes that thought is logically and explanatorily prior to language – a view Covington (1984) describes as *Nominalism*. Examples within this tradition include those (as alluded to in §1.1 above) of Aristotle and Locke. Thought is suggested to be *logically* prior to language because Nominalism suggests that the rules of natural language can only be explained in virtue of a more abstract set of rules belonging to an independent 'Language of Thought' (LoT) and encapsulated in the artificial logical languages philosophers have developed, for reasons discussed below. Such a position is taken by Fodor (2001). Hinzen's view, by contrast, claims that the grammar of human language *yields* the distinctive character of human thought, and that no such independent language of thought is required to explain this character. Thought is taken to be explanatorily prior to language because, on the Nominalist tradition, language expresses thought, thus the existence of language is explained in virtue of the prior existence of thought.

Hinzen suggests that 'narrow syntax' is what marks out human thought as distinctive from non-human animal thought. Narrow syntax is 'the mental-computational path leading from a selection of a number of lexical items stored in long-term memory to a syntactic representation of "logical form" at the syntax-semantics interface' (Hinzen, 2013: 2). In other words, it is the process of selecting a lexical item as a starting point for generating a proposition for internal (mental) representation and then processing that lexical item through a series of computational cycles to transform it from (the basis of) a word into a sentence. The specific details of what this computational process contains is precisely what generative grammarians are interested in, and one which proponents of the Minimalist Program attempt to reduce to as few computational processes as possible. The range of possible outcomes is what we described as UG above. On this view, then, UG indicates the full range of thoughts available to human beings.

To clarify, the view being asserted here is not that there is *no* thought without language. There is non-linguistic thought (e.g. purely associative thought) and thought that requires little-to-no grammar (e.g. imperatives) and this is available not only to non-linguistic

creatures but also to human beings *alongside* the kind of thought which is distinctively human – that which is reflected in the essential ontology of semantics, i.e. thought with a subject-predicate structure, that is truth-bearing, and can refer to objects, events and propositions. The referentiality and propositionality of human thought is that which is *generated by* the computational system of human language, and which characterises the cognitive style of (normally-developed) humans. In other words, once language emerges, so does a new cognitive style and new possibilities for thought.

This contrasts starkly with the Nominalist view of thought. Nominalism sees language as an arbitrary system of conventionally-agreed 'labels' for objects, with the meaning of a given sentence depending upon a language-independent 'proposition' which the sentence *expresse*s. One argument that has been posited in favour of this view is the fact that multiple sentences can express the same thought. The suggestion here is that if two different sentences, *y* and *z*, can express the same 'thought' or have the 'same meaning', then they must both express a *distinct and underlying* proposition *P*. For instance, the sentences 'John hits Bob' and 'Bob was hit by John' might be taken to express the same meaning, though they are voiced differently. The Nominalist explanation for this is that there is an underlying proposition that these sentences pick out (which is why both sentences would be expressed by a single sentence in formal logic). This suggestion often appears in the introductory chapter of any introductory logic book (see, for example, Copi et al., 2014) as a justification for the importance of formal logic. However, Hinzen points out that this rests upon a misunderstanding of the nature of sentences: that they can only be individuated at acoustic or morpho-phonological levels of representation i.e. at the level of externalisation, as when spoken or written. Since the Nominalist sees sentences as an 'outer sign' or conventional label *expressing* some inner thought, sentences are treated as mere 'noise' or a 'string of symbols' expressing an underlying, 'meaningful', thought. However, this runs contrary to contemporary linguistic theory, which demonstrates that sentences can be individuated more abstractly. As Hinzen explains:

> Two sentences … when processed by a human brain, [can] be assigned identical underlying syntactic and semantic (and perhaps pragmatic) linguistic representations, even if these are then mapped to different morpho-phonological strings at the interface of syntax and the sensory-motor systems underlying language use (Hinzen, 2013: 5).

In other words, a single sentence may, at the point of production, be represented by two different sets of sounds (or symbols, in the case of writing). However, it doesn't follow that these sentences, while different at the level of externalisation, aren't identical at the level of internal representation (i.e. at the level of thought). To a certain extent, it seems obvious that the ways in which we externalise language are irrelevant – the same sentence can be expressed through speech or through sign language, in English or in Mandarin etc. However, there is more to Hinzen's claim here than that simple observation. Hauser et al. (2002) draw a helpful distinction between the Faculty of Language in the Narrow Sense (FLN) and the Faculty of Language in the Broad Sense (FLB) to distinguish between the aspects of the language faculty that are shared by non-humans and yet not used linguistically, and the aspects of the language faculty that only human beings possess (i.e. the ones that are used for language, and perhaps only for language)[37]. The ability to externalise language in some sensory-motor channel or another (speech, gesture, etc.) is actually shared with non-human animals and precursor hominids. Even in the absence of language, some animals can talk, as Descartes pointed out long ago (Descartes, 1637). Similarly, it has been suggested that Neanderthals could talk (D'Anastasio et al., 2013). Sensory-motor exernalisation is therefore neither language- nor species-specific. So the production of noises and symbols that the Nominalist takes to be expressive of propositional thought are possible even in the absence of linguistic ability. The FLN, by contrast, is *whatever aspects of language are language-specific* – namely, its internal and cognitive ones. It is these aspects of language which interest the generative grammarian, and it is these aspects which belong only to our species and that account for the open-ended generativity and recursiveness of language. The Nominalist works on the assumption that thought precedes language, and thus even prior to the emergence of language, thought of the kind that language expresses must have already existed.

Accepting the Nominalist position leaves the *explanation* of human thought untouched. Assuming we favour a naturalistic explanation of this, human thought needs to be explained in an evolutionary context as a (partly) species-specific, genetically-based, contingent aspect of human cognition. This requires discovering principles that underlie its evolution and development. In the case of sentences *y* and *z*, which both have the same meaning *P*, the task is

[37] I've been deliberately cautious by adding these parentheses here. The computational process Merge (see §2.2 below) may have evolved specifically for language and yet become co-opted for other purposes such as writing music. It has been argued by Katz and Pesetsky (2009) "all formal differences between language and music are a consequence of differences in their fundamental building blocks (arbitrary pairings of sound and meaning in the case of language; pitch-classes and pitch-class combinations in the case of music). In all other respects, language and music are identical."

to explain the existence of *P*, its character, and precisely how both *y* and *z* express *P*. The explanatory problem is this: if we say that the language faculty evolved so that we could communicate the complex propositions which make up thought (as is claimed, for example, by Pinker and Jackendoff, 2005), then we are left with the issue of explaining where the relevant forms of semantic complexity that belong to such thoughts actually come from. The Nominalist answer can't be grammar since this is an arbitrary *post-hoc* invention. Even if thought in non-human animals can take us some of the way there, it seems highly suspicious to claim that all of thought or semantics was already in place and that grammar simply adapted to it (contra-Chomsky, 2007a).

On Hinzen's view, the syntactic constraints of language systematise and organise semantic information, with no need for recourse to independent semantic explanations. This is precisely the kind of view that is rejected by the Fregean-Russellian tradition. It has traditionally been assumed that natural language grammar is imperfectly aligned with semantics, and this is part of what motivated the development of modern logic. However, the supposed disparity between syntax and semantics has increasingly been shown by modern linguistics to be misconstrued. For instance, perceived problems of quantificational scope thought initially to only be explicable within a logical rather than linguistic framework, can be explained by syntactic principles such as the *Proper Binding Constraint* and *Non-Vacuous Quantification* (Huang, 1995). What Hinzen takes this to show is that syntactic theory can shed light upon and provide relevant structures for ontological distinctions, a view which runs contrary to the Nominalist approach. Rather than having 'meaningless' syntax mapped onto an independent, meaningful system governing propositional thought, 'narrow syntax – once supplied with lexical items – actually *yields* (or itself *is*) a language of thought' (Hinzen, 2013, my emphasis). As Chomsky puts it:

> [I]t appears that language evolved, and is designed, primarily as an instrument of thought. Emergence of unbounded Merge in human evolutionary history provides what has been called a "language of thought," an internal generative system that constructs thoughts of arbitrary richness and complexity, exploiting conceptual resources that are already available or may develop with the availability of structured expressions (Chomsky, 2007b: 22).

If we can eliminate the need for an independent LoT, we can not only benefit from a more parsimonious account of thought, but actually begin to explain *why* human thought has the character it does. With an independent LoT out of the picture, we can also see that human thought doesn't derive its character from the nature of the external world. As Hinzen explains:

> A grammatically unbiased look at the world… will leave open how we ontologically categorise it using certain grammatical forms. Suppose we refer to some particular event with a nominal such as *Mary's smile* as opposed to a sentence such as *Mary smiles*: these grammatical forms are radically different, as is their semantic use, yet what goes on in the world may be exactly the same. While referring to some external scene, therefore, that scene will not predict or explain how we refer to it; nor will it explain the range of ways in which [we] *can* do so, having grammar at our disposal (Hinzen, 2013: 11).

So, human thought isn't simply a reflection of the unprocessed perceptual data we take in from the world – we see the world as being in some way. Our descriptions of the world are not *determined* by the perceptual information the world makes available to us: the exact same scene may be described in multiple ways. And yet we needn't look beyond the grammatical distinctions we utilise in order to capture all of the ways in which we can, in fact, think about the world (Hinzen, 2013; see §2.2). If narrow syntax provides the computational system that underpins thought, then it is essentially a device for generating propositional configurations that can then (later) be externalised as communication. It is at this point, I will argue in Chapter 5, that we can begin engaging in social practices like storytelling, which I suggest is the manifestation of a tendency to engage in fantasy, and which in turn leads to the development of a variety of creative practices such as the production of the representational art we see at the point of the Creative Explosion. However, for now, we need to unpack exactly how this computational process is thought to generate the propositional configurations just described.

§2.2 Narrow syntax: the computational cycle behind thought

The computational process begins with a lexical *root* (Halle and Marantz, 1993) – a structureless element which has not yet been categorised for use in a noun phrase, verb phrase or clause. For example, the Latin words 'dol-or', 'dol-enter' and 'dol-eo' ('pain', 'painful',

and 'I feel pain', respectively) all share the root 'dol-'. The root itself doesn't determine how it will combine within a sentence: it must first be categorised. This categorisation takes place as the root enters the computational cycle that generates propositions, which is itself split into three *phases*. At each phase, a single derivation can be performed, for example changing the root by adding an affix in order to generate a lexical head which falls under some category. These derivations are what link the natural language sentence to its underlying logical form. The category under which the lexical item now falls will determine the derivations that can be performed within the rest of the cycle. For instance, if a derivation begins with a nominal head such as 'water', the number of other heads available in that cycle becomes restricted to a classifier, e.g. [glasses of [water]], a classifier and a numeral, e.g. [three [glasses of [water]]], or a classifier, a numeral and a determiner, e.g. [these [three [glasses of [water]]]], and in this order. It will never contain Tense, which would require a new cycle beginning with a lexical root that is categorised as a verb ('watering', 'watered', 'waters'). In such a case, the options at the first (and thus each subsequent) phase will differ, and a different sentence will be generated.

Within this computational cycle, *Merge* operates on the individual syntactic units as they are generated (e.g. it operates on noun phrases, verb phrases etc.) For instance, if the phase cycle is operating upon the nominal head 'water', and generates a structure with a classifier e.g. 'buckets of water', this new structure becomes a single computational symbol capable of being embedded and re-embedded in ever-longer sentences. For instance, 'buckets of water' might be paired with 'these', as in the example above, or with 'weigh six kilograms', or with both – 'These buckets of water weigh six kilograms'. This new structure can again be *merged* into a single unit and embedded again, e.g. 'These buckets of water weigh six kilograms and are far too heavy for me to carry'. In this way, the computational cycle used to generate sentences works from the 'bottom up', beginning with smaller syntactic units and combining them to reach the largest one we eventually see at the point of externalisation, the sentence.[38] This kind of bottom up process is arguably reflected in the phenomenology of language-use: we don't pre-plan our conversations, so our experience of language-production is one of us not really knowing exactly how we're going to 'get there' when we start talking.[39]

[38] Linguists will no doubt be unhappy with this fairly simplistic and undetailed rendering of Merge. However, the details of this operation not included here aren't particularly relevant to the argument being made and, though simplistic, I take it the rendering I give is broadly accurate.

[39] Linguistic comprehension, by contrast, is the other way around – to ascertain meaning we are required to process and deconstruct the *entire sentence*, utilising our ability to de-embed embedded clauses to understand what is being said e.g. in a sentence such as 'John, whose mother I met on Tuesday, told me today that he met Sally, the girl I was best friends with at school, and they fell in love.' This kind of processing requires not only a good

Returning to the details of the phase cycle, Hinzen (2011) suggests that the three possible phases are *nominal* (as in the above example), *verbal* and *clausal*. The only difference between these phases is which lexical items enter the cycle; the *structure* of the cycle is the same across phases, and each phase is closed off by the introduction of a lexical category specific to each kind of head. Something that begins with a nominal head is closed off by a *determiner* (something which expresses reference, e.g. *the*, *these*), a verbal head is closed off by aspect/voice (how the event or state relates to the flow of time, e.g. the *–ing* suffix for verbs in English), and a clausal head is closed off by a *complementiser* (something that turns that clause into a subject or object, e.g. *that*).[40] The phase cycle described by Hinzen has some interesting implications for the discussion of 'complex concepts' in the philosophical and psychological literature on compositionality (e.g. Fodor, 1998). It has long been suggested that we can combine bare concepts like RED and CAR to form the complex concept RED CAR. Hinzen suggests that there is actually a lack of evidence that concepts combine systematically and compositionally in the way just described. Instead, the evidence suggests that it is *formal* concepts rather than bare concepts that combine: 'what the computational system "sees", in other words, when it combines the word 'car', is 'N', not CAR' (Hinzen, 2013: 14). In other words, when generating the proposition, the phase cycle treats the word 'pain' differently only with respect to its grammatical (or formal) classification, not with respect to its 'Fregean sense'. If 'car' is seen as a noun, it is treated just like any other noun, and so on with any word treated as a noun, or as a verb etc.

Hinzen claims that this three-phase computational process is sufficient for generating every available option for human language and thought. And each way of categorising a lexical root allows for only a finite set of possible outcomes: a root categorised as a noun, upon entering the cycle, can ultimately only generate a structure which locates the corresponding predicate in space (allowing us to refer to objects); categorised as a verb, all that can happen is

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working memory but also the ability to pay *attention* to the entire sentence. Our attention, of course, doesn't always hold. Upon hearing a particular word one might be sent on some sort of reverie (about our old school friend, for example). In this way, words can trigger new thoughts, often about only tangentially related issues. Hinzen has nothing to say about how lexical roots come to enter the computational cycle to begin with, but this observation might give us an answer: a lexical root 'pops into' our mind as a response to some sort of linguistic or sensory input, which sets us off on a path which ultimately leads to us forming a thought about that (or a related) topic.

[40] Note that this means that reference in human language is inherently mediated by the cycle, again unlike reference in animal communication, which is 'causally-controlled, stimulus-specific, functional as opposed to intentional, domain-specific, non-propositional, non-compositional, emotional in content, strictly finite, and innately fixed' (Hinzen, 2013: 15-16). See also Seyfarth and Cheney (2014) and Fitch (2010) on the difference between human and non-human animal reference.

to fully specify the argument structure e.g. who does what to whom (allowing us to refer to events). The phase closes, in each of these cases, when a speaker achieves the amount of referential specificity needed for the object or the event. Finally, the third phase can occur. Here, structures for describing events (produced at the second phase of the cycle) can be finitely tensed (i.e. locating the event in time) and thus become (part of) a truth-evaluable proposition. This three-phase process:

> […] yields the essential ontology of semantics: an object, an event, and a proposition put forward with a truth value, respectively… No propositional configurations can be generated without first generating a verbal one, no verbal one without first generating a nominal one… Each phase is thus not only radically finite, but enables reference in discourse to an object, an event, or a proposition, depending on which category we initially choose in the cycle (Hinzen, 2013: 15).

The presentation given of Hinzen here is obviously brief, and it isn't my intention to defend his claims in this thesis as much as it is to explore the consequences of them with reference to the evolution of human imagination and creativity. The rest of this chapter does just that. For Hinzen, the implications that follow for human thought more generally from the introduction of language are radical: thought driven by the grammatical system just described above are thoughts *of a different kind* to those not driven by that same system. Non-human animal thought, therefore, mirrors this difference, lacking the referential functions associated with the three phases Hinzen describes. According to Hinzen, it might even be that propositional minds simply *cannot* evolve in the absence of this computational cycle, which would suggest a radical discontinuity between human and non-human animal thought.[41] It is my contention that it is therefore precisely this ability to generate thoughts referring to objects, events and propositions – a result of the emergence of narrow syntax within human evolution – and coming to externalise these thoughts in a natural language preserving their distinctive semantics that augmented human imagination. This position is implied in the work of Francois Jacob, who sees the infinite representational power of language as centrally involved in the moulding our notion of reality through the "mental creation of possible worlds" (Jacob, 1982:

[41] I'm not sure whether I actually wish to commit myself to this claim. What would be required to persuade me otherwise would be an account of how animal thought could gain propositional structure and yet still lack the flexible referential capacities that seem unique to human beings. It seems that having truth-functional, belief-like states may occur in the absence of language (e.g. Dennett, 1995) but animal communication seems to betray an inflexibility in referential function. This absence may be because animals do not *need* to communicate certain kinds of thoughts, but any suggestion along these lines is purely speculative.

59). I turn to the issue of precisely *how* language augments our imaginative capacities now, leaving until Chapter 4 the issue of *why* the imagination, specifically, would co-opt this new linguistic ability.

3. What does language bring to human creative cognition?

The capacity for language described above would bring about a variety of cognitive changes that could impact upon human imagination and creativity. I sketch out below some of the key changes relevant to this thesis, but this is not intended as an exhaustive list of changes, nor as a full defence of each of these claims.

§3.1 An unbounded creative computational mechanism

Noticeably, the explanation of *how* we choose to categorise a lexical root at the onset of the computational cycle i.e. at the first phase, is left unexplained by Hinzen (see footnote 38 above). It is essentially in attempting to answer this question (before eventually throwing up his hands in surrender) that Chomsky utilises the term 'the creative aspect of language use' – an attempt to describe the essentially unpredictable nature of human language-use. For Chomsky, the creative aspect of language use is the "central fact to which any significant linguistic theory must address itself [thus] a theory of language that neglects this 'creative' aspect is of only marginal interest" (Chomsky, 1964: 7-8). 'The creative aspect of language use' refers in part to the ability, which all normal language-users display evidence of every day, to produce and understand an infinite number of novel sentences. Chomsky (2009) identifies the philosophical roots of his discussion of the creative aspect of language use in the Cartesian view that this ability to form new sentences expressing thoughts in an appropriate but not directly causal manner is what distinguishes human beings from other animals. This observation led Descartes to propose the thesis that this must entail a form of substance dualism, realising that:

> …a fully adequate psychology requires the postulation of a 'creative principle' alongside of the 'mechanical principle' that suffices to account for all other aspects of the inanimate and animate world and for a significant range of human actions and 'passions' as well (Chomsky, 2009: 61).

In Chomsky's view (shared by Descartes), because language-use appears not to be determined by external stimuli or internal physiological states (posing an initial problem for attempts to scientifically explain language), language 'can serve as a general instrument of thought and self-expression rather than merely as a communicative device of report, request or command' (Chomsky, 2009: 64). As we have seen, Hinzen favours a stronger view: language is actually generative of the precise ontological distinctions that characterise human thought and that are ultimately expressed in natural language.

The creative aspect of language use does not refer *only* to the infinitude of possible sentences which a generative grammar enables. Chomsky has been careful to stress this throughout his work, though this fact seems to have been missed by some critics (see below). 'Unboundedness' certainly is one feature that makes it apt to describe language use as 'creative' (cohering, as it does, with the originality criterion for creativity; see Chapter 1), but it is not the only feature of language, nor is it unique to language. Because generative grammars posit a recursive principle (i.e. Merge) they are able to make infinite use of finite means by embedding structural objects within other instances of themselves. For instance, there doesn't appear to be any logical limit to how many place concepts we can embed within other place concepts in a sentence. Consider, for example, '… in the wood by the caravan park behind the hill to the north of the wall…' etc. These recursive structures are present also in the set of natural numbers and in music (see Jackendoff and Lerdahl, 2006, and footnote 6 above). What this suggests is that the principles that govern language might be operating in domains other than language (and thus not really be language-specific), and this seems to be the view currently favoured by the Minimalists.

D'Agostino (1984) terms this kind of infinitude *linguistic productivity*. One notable thing about linguistic productivity is that a computer could be programmed with the appropriate grammatical rules of a given language in order to generate novel sentences; novel both in the sense that that computer has never generated that sentence before, and in the sense that a given sentence has never been uttered by any user of that language previously. It is because of this thought that Boden (1994) claims that Chomsky has misappropriated the term 'creative' – mere novelty is insufficient for creativity. But beyond infinitude, Chomsky has emphasised the *freedom from stimulus-control* of language. This contrasts sharply with other forms of animal communication, even in our closest primate relatives (see Tomasello, 2010), whose communicative output is triggered in a one-to-one way by particular stimuli (seeing an eagle,

for instance, will always and only illicit an 'eagle alarm call' in vervet monkeys, and will continue to do so even after the signal ceases to be useful). Thus, despite Boden's criticism, Chomsky's use of the term 'creative aspect of language use' has always been qualified so as to stress other features of language in describing its creativity. As Chomsky puts it:

> One would not refer to an act as "creative" simply on the basis of its novelty and independence of identifiable drives or stimuli. Hence the term "creative aspect of language use" is not entirely appropriate, without qualification (Chomsky, 1966: note 30).

Human language is 'guided but not determined by internal state and external conditions' (Chomsky, 1999: 17) such that a further feature of the creative aspect of language use is *appropriateness to circumstances*. Human language use is uncaused, unlike animal communication, but is also (typically) recognised as appropriate by other language users.[42] D'Agostino terms this ability to produce novel sentences in a way appropriate to, though undetermined by, circumstance, *Cartesian creativity*. It is precisely the phenomenon of Cartesian creativity which Chomsky believes cannot be explained by any straightforwardly behaviouristic account.[43]

This distinction between linguistic productivity and Cartesian creativity is important, especially given some of the criticisms aimed at Chomsky on the issue of creativity. For instance, Drach (1981) has criticised Chomsky for claiming that while aspects of linguistic competence might be explained, the creative aspect involved in performance will always remain a mystery. However, this claim is unsurprising when we consider that linguistic productivity appears to involve *no more than* making use of the mechanisms which enable the generation of novel sentences (an issue of competence), but that Cartesian creativity *further involves* appropriateness to circumstances (an issue of performance). As Chomsky puts it:

> The rules and principles of grammar "provide the means" for the [creative aspect of language use], thus shedding light on it, but not giving anything like a full account of it, and not resolving the mysteries it poses (Chomsky, 1982: 425).

[42] Of course, propriety when discussing language-use needs to be construed broadly enough to include linguistic ambiguities such as allusions, metaphors, irony, etc.
[43] This thought also forms the basis of Chomsky's defence of free will (Chomsky, 1999).

So, in the first instance, narrow syntax provides us with a computational mechanism for generating an infinitude of novel sentences. But that mechanism appears to operate independently of external stimuli and internal states to the extent that they do not determine its operations. Nonetheless, we usually deploy it in a way which is appropriately responsive to these states. Given the complexity of this dynamic relationship between the computational mechanism and the multiplicity of internal and external states, the output of this computational mechanism is highly unpredicatable. Thus, what language ultimately gives us is a way to generate sentences that are, to some extent, themselves (minimally) creative – even before they are deployed in highly creative ways, as they are in poetry, metaphor or storytelling.

§3.2 Truth

As long ago as 1651, Thomas Hobbes realised that language brings with it some rather important *cognitive* changes. Hobbes observed that:

> When two Names are joined together into a Consequence, or Affirmation; as thus, *A man is a living creature*… If the later name *Living creature* signifie all that the former name *Man* signifieth, then the affirmation, or consequence is *true*; ortherwise *false*. For True and False are attributes of Speech, not of Things. And where Speech is not, there is neither *Truth* nor *Falshood* (Hobbes, 1651 (1985): 104-5).

If correct, Hobbes' observation here describes a major cognitive shift once language appears with our species.[44] Hobbes is claiming here that the concept of TRUTH *emerges* with language – once our thoughts are given a specifically linguistic structure (a subject-predicate form in his example) then those thoughts can be judged to be true or false. Conversely, in the absence of such a structure, thought-content is without a truth-value from the subject's perspective. As we saw in Chapter 1 (§3.1), propositional imagining (e.g. Yablo, 1993) is

[44] Though Hobbes uses the term 'speech' here, he must be, in fact, talking about *language* as Hobbes sees language as expressive of thought. Clearly, in order to form a proposition some kind of language is required to give it the sort of subject-predicate structure he indicates in the passage just quoted. If this isn't natural language, it is still some kind of language that must share structural features with natural language. Speech is simply the mode of externalisation of this linguistically-structured thought; given that thoughts can be true or false just as much as utterances can, TRUTH must emerge at the level of thought, not at the level of externalisation.

defined by its capacity to generate such truth-bearing structures, and thus this imaginative capacity too must emerge with language.

Although approaching language from a different perspective, the view that truth emerges with language is one shared by Wolfram Hinzen (2007, Hinzen and Sheehan, 2013), as noted above. Hinzen, like many contemporary philosophers of truth, rejects the suggestion that words are arbitrary symbols that relate to an external physical object, wherein the relation gives the meaning of the symbol (the Hobbesian view). This kind of approach suggests, for instance, that a predicate like 'wise' picks out a property like 'wisdom', and that a sentence like 'Socrates is wise' somehow mirrors another external object – a 'state of affairs' or 'fact'. Hinzen sees this view of word-external object relations as non-explanatory, if such relations exist at all:

> No doubt mentally represented (non-acoustic) properties of linguistic expressions stand in various causal relations with external physical patterns in the environment… But these causal relations make as such virtually no contribution to the explanation of forms of intentionality we find in humans specifically… As things stand, we are the only creature [that] intentionally refers, which clearly is a function of our internal mental organization – the kind of mind we have (Hinzen, 2007: 2-3).

In other words, the kind of causal relations in which a creature comes to stand are (amongst other things) a *result of* its internal mental organisation. As such, our mind doesn't simply mirror predication 'out there' in the world, predication instead exists because our minds happen to exhibit it.

Hinzen extends this approach to the notion of truth. Hinzen rejects the correspondence theory of truth, which suggests that truth is *correspondence to reality*; Hinzen points out that this again assumes that declarative sentences get their meaning from their relation to a mind-external fact (or 'truth-maker') whose structure somehow mirrors that of the sentence or the proposition expressed by it, inviting further questions about the metaphysical status of such facts. More recently, the correspondence theory has come to be replaced by 'deflationist' theories, which suggest that truth carries no metaphysical significance at all i.e. theories that suggest that there is no property of truth at all, and thus sentences like 'X is true' are equivalent to simply asserting X (see, for example, Ramsey, 1927a). But, both correspondence and deflationist theories follow an *externalist* path to their account of truth; Hinzen's view is, by

contrast, an *internalist* one – looking, as it does, to the inherent structures of the human mind to explain truth. As such, notions of truth (and reference) are turned on their head from those in the more familiar philosophical literature. This may perhaps be a more appealing approach to the issue than the eliminativist approach of Tarski (1944) or the nihilism of Ramsey (1927b) since, for Hinzen, an internalist approach to truth avoids some of the circularity of the externalist explanations of it.[45] For instance, when pressed on the nature of the correspondence relation between a proposition and reality, the relation turns out to be one which makes the proposition *true*. But this depends upon a prior understanding of what truth is, rather than explicating it. Hinzen's internalist approach avoids this circularity by engaging with the concept of truth differently: instead of seeking to define it, it simply pursues a naturalistic inquiry into the *phenomenon* of truth, a concept shared across our species – a 'semantic primitive' (Hinzen, 2007: 13) – and evident in the judgements we make about sentences with a particular structure.

Crucially, thoughts which take the relevant form for such judgements involve a kind of distancing between ourselves and our world. Historically, philosophical discussions of intentional thought have stressed the notion that intentionality invokes a relation between thought and the world. But much human thought involves abstract objects with no perceptual content, such as fairness, joy, social progress, or truth itself. Even when it is directed at the external world, it involves a degree of abstraction from what the external world actually gives us – such as when we think of love, wars, famine, cities, and people. These concepts, in turn, shape how we experience the world around us. Whereas animal (language-like) behaviour (and arguably thought) is *determined* by a stimulus, ensuring they adaptively react to it, human thought and linguistic behaviour is not. A propositional form of thought i.e. one that takes the subject-predicate form yielded by language, is actually capable of 'objectifying' a stimulus, allowing us to structure (and infinitely restructure) our experience as a thought we can make a variety of truth judgements about.

These truth-evaluable sentences are formed in the way described above – proceeding through the phase cycle computation until something emerges which either has the appropriate structure for a judgement of truth, or which lacks that appropriate structure. Noun phrases

[45] For my more practical purposes here i.e. showing that truth is inherently connected to language, it doesn't particularly matter which theory of truth turns out to be the correct one, just so long as the link between language and thought posited above is correct, since all of the usual candidates for 'truth-bearers' – sentences, propositions, utterances, beliefs – are (on this account) essentially linguistically structured.

(e.g. 'Bob's pushing of Alan') and Small Clauses (which have the semantic subject-predicate characteristics of a clause, but lack the tense of a finite clause), for example, lack the necessary structure.[46] Nothing less than a clause can have a truth value (Hinzen and Sheehan, 2013). If our phase cycle involves [PUSH, Bob (Agent), Alan (Patient)], then this could develop into the noun phrase above, 'Bob's pushing of Alan', and close off without yielding a truth-evaluable sentence. However, if this root (PUSH) is categorised as a verb and tensed e.g. 'Bob pushed Alan', and reaches the required level of referential specificity required for the current discourse, it does become truth-evaluable.[47]

Being able to abstract from the world's influence over our behaviour, and instead reflect upon it in terms of truth or falsity is surely the very basis of theory-making. High levels of creativity within the sciences and technology require this capacity in a way that adaptive tool-use and tool-making (such as when chimpanzees use a stick to 'fish' for termites) simply do not. This capacity would enable us to build upon the naïve physics and biology of our evolutionary ancestors (see Ch. 2, §3.4), relying as they must have on perceptual similarity, to develop far more robust theories about cause and effect in nature.

Because of the way the phase cycle operates, the lexical root itself does not determine the semantic content of a sentence. Instead, the beginning of the semantic content of a sentence comes in selecting how the root will be categorised (as nominal, verbal or clausal) and semantics gets into place as syntax does. Given that this is the case, it seems that judgements about truth or falsity can occur only once the relevant cycles have occurred, meaning that we form thoughts of this structure in the absence of commitments to their truth or falsity. It is precisely this kind of computational cycle that seems to be required for the generation of thoughts we can entertain as part of the propositional imagination (and, presumably, if they lack commitments to their truth or falsity, they can also lack any conative aspect, commitments to desirability etc). As Reuland (2010) puts it:

[46] An example of a Small Clause is in the sentence 'Larry pounded **the nail flat**'. Here, the small clause is in bold, and the underlined word functions as a predicate over the nominal immediately to the left.

[47] Referential specificity here might involve pragmatics as well as syntax. Clearly, if the context of the utterance of 'Bob pushed Alan' is one in which the two interlocutors have just witnessed the event, it is clear who (which 'Bob', 'Alan') they are talking about and which pushing event (the 'when'). This is a clear instance in which perceptual information from the outside world can be objectified and become part of rational discourse.

> The crucial evolutionary advantage of language is that it allows combinatory operations to apply blindly, irrespective of preconceived meaning. This has an important consequence: it enables unconstrained creativity; combine and see what the result means later, escaping the limits of the here and now (*ibid*: 101).

Reuland describes this process of using the formal rules of narrow syntax to combine symbols irrespective of meaning *desymbolisation*: where the symbols in the system are effectively separated (temporarily) from what they symbolise, allowing us to combine them in any way we choose and then interpret the result (in other words, the phase cycle operates on instructions to create a symbol, rather than on the symbols themselves). This is what allows us to "ignore common sense, play with expectations, express the inconceivable, escape from the here and now, and create poetry" (*ibid.*) So, what Hinzen describes is the perfect computational system for the generation of thoughts bearing all of the hallmarks of the propositional imagination. As such, the emergence of language would enable the emergence of a powerful imaginative tool to be used in mental-world-creation. I will suggest in Chapters 4 and 5 that this capacity would lead to a dramatic cultural effect that would, in turn, drive human creativity rapidly and in very particular directions.

§3.3 Deception and Theory of Mind

Another area in which humans might become more adept as a result of imaginative capacities enriched by linguistic cognition is in deception. Sodian and Frith (1992) distinguish between deception and sabotage, with sabotage a matter of disrupting a conspecific's ability to attain some goal without requiring any kind of theory of mind, and deception a matter of deliberately aiming to cause false beliefs.[48] It happens to be the case that mindreading capacities (a form of imaginative projection) mature in line with linguistic ones (Fitch, 2010), possibly as a consequence of the enhanced representational powers that language confers (see below). As such, with the co-introduction of an understanding of false beliefs and an ability to freely produce a potentially infinite number of utterances that could deceive, humans could become more creative in the social domain in terms of how they manipulate one another (which poses something of a puzzle about the selection of language by evolution). So, for instance, we might

[48] Currie, 2004, suggests that we can regard some animal behaviour as deceptive even in the absence of any mindreading skills. The general point here is that, however we draw the distinction, the kind of deceptive behaviour that draws on such skills is of a distinct kind to that which doesn't.

easily come to understand that our own judgements of truth and falsity can turn out to be incorrect, and we could observe from the behaviour of others that their beliefs are likewise incorrect. Once natural language is in place, we could generate propositions we know (or believe) to be false and express these linguistically to our conspecifics in the hope of causing some behaviour we take to be desirable (developing significantly upon any capacity for deception that our evolutionary ancestors might have had; see Ch.2, §3.2).

There may even be a stronger link between the emergence of narrow syntax and theory of mind than the one just intimated above. de Villiers (2005) argues that children are brought to the point of mastery of the human 'mind-reading' capacity through the grasp of specific syntactic forms of language i.e. finite sentential complements embedded under verbs like 'say', 'think' or 'believe'. On her view, conceptual maturation co-occurs with syntactic maturation. Gleitman et al. (2005) suggest that syntax may even play a causal role in the acquisition of such verbs. If this is the case, accounts of the evolution of language that suggest that syntax might simply be an arbitrary cultural device resulting from a more general set of cognitive capacities like Theory of Mind might find this challenging to explain.[49] More to the point, this would give language (in the sense relevant here) a more fundamental role in the development of human social interaction than is often assumed.

§3.4 A shift in cognitive style

Narrow syntax offers a computationally minimal way of generating these propositions, with possibly just a single operation, *Merge* (Chomsky et al., 2000), ultimately underpinning the cycle described above. Such a simple computational operation capable of accessing information in any domain of human activity, and capable of working with a range of abstract ideas, if not *enabling* new kinds of thought, would surely make them far easier to process than their pre-linguistic equivalents. The generative process described above also seems to lend itself to greater executive control over our imagination. Dor (2015) describes language as an 'imagination-instructing system', in that it allows us to compose a sentence whose structure (and even its individual symbols, see footnote 38) can direct us toward picturing some particular thing. Propositional imagining can thus lead to other kinds of imagining, like

[49] Though certainly not impossible – if syntax is biologically grounded, it must first have been visible to evolution to be selected for. If it was initially an arbitrary cultural device, it might have subsequently become biologically grounded and then come to play a role in the acquisition for our theory of mind capacity as our cognitive style shifted to favour a linguistic one.

objectual imagining. This would seem to give us a capacity to direct our imagination that would be presumably absent in non-linguistic creatures. If animals can, despite lacking language, imagine states of affairs, they might have much more limited ability to do so because the generative system might be computationally 'heavier' since it is not operating over symbols that have been decoupled from semantic and conative content. Although it is impossible to know, if animal imagination computes with semantically and/or conatively loaded symbols then their ability to freely direct this will be much more limited as those semantic and conative aspects cloud their thinking. Animal imagination might, perhaps, be more like some kinds of memory – involuntarily triggered by things in the immediate environment. For humans, however, an internal language is part of our environment (in that we constantly talk to ourselves), and would give us far greater control over what we imagine. This would, in turn, confer great advantages in terms of planning, giving evolution reasons to select for language.

The computational process underpinning language may therefore have been selected for in evolution primarily because of the advantages this confers in terms of planning (Chomsky, 2007b), but could have been co-opted for computational processing in a range of domains. For instance, there have been some attempts to suggest that musical cognition utilises the same computational principle(s) as language (e.g. Lerdahl and Jackendoff, 1983) – reflecting the shared neurological basis between music and language suggested by the musical impairments to aphasic patients, which I will discuss in Chapter 6 – though there is some dispute about the order of priority between music and language (Mithen, 2005, and Tallerman, 2013 both argue that musical cognition formed the basis of some kind of musical protolanguage in pre-cursor hominids).

The suggestion that language aids cognitive processing does not only apply at the syntactic level. There is evidence to suggest that even at the level of 'labelling' this can impact upon success rates for task completion, even in animals. Various studies show that chimpanzees can better differentiate between food quantities once they have learned to associate numerical labels with particular quantities (e.g. Boysen and Berntson, 1989). Pre-cursor *hominids* are widely thought to have possessed some form of protolanguage (Fitch, 2010), suggesting that they were quite adept at creating abstract categories and labelling them in the way that seems to make these chimpanzees better able to differentiate quantities. It might be, then, that the development of the linguistic capacities shared with non-human animals and our ancestors gradually ramped up cognitive capacities that could be co-opted for the imagination. *Homo*

ergaster, for example, appears to have evolved visual imaginative capacities beyond that of *Homo erectus* that are evident in the differences between the stone-knapping techniques of the two. This may be attributable to enhanced abilities to conceptualise their environment, seen also in how quickly these later *hominids* were able to adapt to new ecological niches despite the perceptual differences between the flora which made up part of their diet (Stringer, 2002). At the point that these concepts are introduced to syntax, they take on a whole new character, forming referential propositions capable of being assessed as true or false.

Being able to see the world as structured syntactically may have increased our ability to rapidly extract information from a given scene and recognise similarity elsewhere. de Villiers (2014), for example, found that when participants of a study were asked to examine an image of an event (for instance, a man pushing a woman in a wheelchair) their ability to recognise a similar event in a set of pictures subsequently shown to them decreased significantly when their language faculty was tied up in another task.[50] I propose in Chapter 6 that we could conduct a similar experiment to test our ability to fantasise in the absence of language in order to show the strong connection between the two. One possible conclusion we could draw from de Villiers' experiment is that, when processing perceptual information extracted from a scene, we can do so more quickly and accurately with language at our disposal. If this is the case, it would make sense that we would come to lean more heavily on the new cognitive style that language offers us, rather than the evolutionarily more ancient ones that run alongside it. As we come to do so, we'd come to utilise the propositional imagination more and more, very possibly at the expense of the visual imagination, shifting with it the nature of our creative output to ones which involve language more heavily.

Concluding Remarks

This chapter has set out both the understanding of 'language' that is relevant to this thesis and the computational mechanism upon which all human language appears to be based. With that computational mechanism in place, we were able to sketch out some of the key cognitive shifts such a mechanism would yield, and how these could be co-opted by the imagination. Having suggested that language offers so much to the imagination, we once again arrive back at the puzzle of why it seems to have taken so long for us to begin exhibiting the full

[50] There are numerous methodological difficulties with this particular study noted by de Villiers, however.

range of creative behaviours that would seem possible once this cognitive infrastructure was in place. My answer to this question will now be developed in Chapter 4.

LANGUAGE, FANTASY & STORYTELLING

How Humans Became Creative

Volume 2 of 2

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VOLUME 2

Chapter 4

FANTASY & LANGUAGE

How and why did fantasy drive the evolution of language?

Introduction

In the previous chapter, I set out a number of cognitive differences the emergence of fully-syntactic human language would have made to our species. It was argued that the advent of language brought with it a new concept, TRUTH, bringing with it the capacity for propositional imagining. It was also suggested that, because of its computational simplicity and unbounded generativity, we would come to favour linguistic thought over its non-linguistic precursors. Yet these changes are all *internal*, while the creative shifts in our species that we're looking to explain here (see Ch. 2, Fig. 1) are all very much *outwardly* manifest. How did these cognitive changes lead to rapid technological advancements and the emergence of representational art? The next two chapters offer an answer to that question – that answer being that the new cognitive possibilities for the imagination brought about by the evolution of language were co-opted in the form of fantastic imaginings that would ultimately lead to a culture of story-telling. This culture reinforced and expedited our shift toward a linguistic mode of cognition, but also changed the nature of creative invention itself. Developing this answer requires that we now revisit the notion of *fantasy*.

1. Refining Fantasy

In Chapter 1 we saw that Freud viewed fantasy as a kind of wish-fulfilment: it is imagining the manifestation of our ambitions i.e. for sex, for work etc. In Freud's view, works of popular fiction are expressions of this process – they reveal the author's desires. Gaut, by contrast, sought to separate fantasy from imagination: imagination lacks the intrinsic ends of fantasy in that we aren't committed to desiring or believing the thing imagined. Fantasy, by contrast, necessarily involves the conative aspect. Fantasy, for Gaut, is necessarily *goal-oriented*: the goal being to enhance our enjoyment. Entertaining our desires through fantasy brings with it some of the rewards of actually accomplishing what we desire.[51] We saw that Scruton, by

[51] According to Gaut, it is because imagination is absent in such commitments that it is 'peculiarly suited' as the vehicle of *active creativity* - searching out various solutions and consciously trying out different approaches to solve a problem. Yet it is worth pointing out that this kind of imaginative act in turn requires a *generative mechanism* i.e. some mode of thought capable of providing the varied solutions and approaches the imagination entertains. What

contrast, views the particular goal of fantasy as *escape* rather than enjoyment, with imagination taking up the task of attaining a better understanding of reality. I want to address some of these points here and suggest that much more work needs to be done to refine our understanding of the relationship between fantasy and imagination (particularly because I suggested, with Currie and Ravenscroft, that fantasy is a *way of imagining*). Doing so, I argue, can carve out a more significant role for fantasy than has been previously acknowledged.

§1.1 Fantasy and Desire

As I suggested in Chapter 1, because of its association with desire, there's a tendency in the philosophical and psychological literature to denigrate fantasy's *usefulness*. Perhaps this is because we think the *mere* satiation of desires is base, whereas imaginative engagement with a practical problem yields tangible benefits and imaginative engagement with works of art leads to intellectual enlightenment. Yet it seems to me that no imagining can get off the ground *without* desire, at least inasmuch as it is desire that motivates us to act, even if that action is one of imagining. We desire a solution to the practical problem, and we desire a greater understanding of the world, and so we imaginatively engage in appropriate ways to achieve these things. Simply examining what *motivates* fantasising and what *motivates* imagining isn't likely to tell us much about the differences in the acts themselves, any more than looking at what motivates somebody to play snooker rather than tennis will tell us anything about those sports. Instead, we must look at the *content* of fantasies and imaginings to try and note any instructive differences.

The suggestion common to Freud and Gaut is that the content of fantasy is focused on its conative aspect: *we imagine getting what we want*. A sexual fantasy, for instance, is imagining having sex with the particular person (or persons) we desire. A gastronomic fantasy might be imagining eating a delicious piece of hot chocolate fudge cake. The success of a given fantasy is, therefore, determined by how closely it simulates its counterpart in reality (even if the goal is itself unrealistic or unattainable – for instance, fantasizing about eating a long-extinct animal). Gaut explains this as follows:

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is notable about human creativity is the seemingly endless ways in which we can solve and re-solve the same problems, from the utensils we use to eat to how to systematise a one-person, one-vote democracy. The generative mechanism described in the previous chapter stands out as the strongest possible candidate, allowing, as it does, an infinitude of possible combinations of ideas that are computed first and evaluated afterwards (thus lacking any commitments to truth or credulity or desirability until that evaluation has taken place).

> I can aim, for instance, to imagine whatever is required to make me feel good about myself and to give me pleasure. That is the central aim of personal fantasy. However, even in this case my imagination does not operate in a normatively unconstrained fashion: for what I should imagine is determined by my goal of maximizing personal pleasure. If I find myself imagining scenes of personal misery and humiliation, I have failed in my project of fantasizing. The constraints on what and how one should imagine are fixed then by one's goal in imagining (Gaut, 2007: 152).

Gaut here identifies the goal of *personal* fantasy: imagining satisfying one's own desires. No doubt such a kind of fantasy exists, and its entire and only purpose may be (partial) satiation of our personal desires. But this leaves open the possibility that we can develop the notion of *impersonal* fantasy, which may contrast with personal fantasy in numerous ways.

The term 'impersonal fantasy' is not entirely new: it crops up in discussions of sexual fantasy in the psychological literature, and is used to describe fantasies involving looking at obscene images and watching other people have sex (in, for example, Wilson and Lang, 1981). What is being described as 'impersonal' in the latter case here is presumably the idea of viewing a scene in our imagination from the 'outside' i.e. we aren't part of the scene that provides the gratification, so it is impersonal inasmuch as we are not part of the scene we imagine. Other examples of 'impersonal' fantasy given involve using an object for stimulation and sex with strangers. This sense of 'impersonal' seems to be that of lacking particular affection for the person or object that provides the gratification i.e. a lack of emotional connection. So there seems to be two senses in which fantasies could be impersonal according to Wilson and Lang: if the fantasy involves a third-person perspective and/or there is no personal connection to the object of gratification.

While this notion of fantasy might still ultimately be about satiation of (sexual) desires, it is noticeably distinct from another kind of sexual fantasy Wilson and Lang identify, *intimate* fantasies. i.e. those that involve intimacy, such as fantasising about a person we love. Such fantasies would certainly count as personal fantasies on Gaut's definition. But Wilson and Lang also identify a group of fantasies they describe as *exploratory* – those that involve group sex, promiscuity and homosexuality. What makes these exploratory (though their account is scant on explanatory detail) appears to be the fact that they take us beyond the norm: we explore

unfamiliar situations via the fantasy (so, we imagine what it would be like, or what would be enjoyable about having sex with multiple partners or someone of the same gender). And whilst they add sadomasochistic fantasies as a final grouping of sexual fantasies, this final grouping are arguably also exploratory and/or impersonal. Sadomasochistic fantasies include being forced to have sex; if rape is necessarily non-consensual, then fantasies of rape seem to somehow fall short of this if they are somehow meant to reflect the actual desires of the person having the fantasy. It would seem that either the fantasy is imagined from an impersonal perspective, or that it is an exploration of a situation beyond the norm. The notion of impersonal fantasy here is, I want to suggest, instructive. Most noticeably, it has features that are characteristic of *narratives*. When we develop a narrative it is often done from a third-person perspective, and quite often is about people or things to which we have no personal connection. These narratives might provide gratification to us, and thus ultimately be a reflection of personal desire, but nonetheless differ to personal fantasies bound up with intimacy. Impersonal fantasies might also objectify the self, allowing us to become part of an imagined scene to which we have no personal connection, yet which still gratifies us by allowing us to explore an unfamiliar situation – again, a characteristic feature of many narratives. I will return to the significance of narratives in the next chapter. At this point, we need only note that our fantasies might not involve either ourselves or things or people we regard with any affection. I think this suggests something beyond that which Freud and Gaut regard as fantasy.

Given that personal fantasy is necessarily bound up with our personal desires, it is worth exploring the possibility that impersonal fantasy might not be strictly subject to this same bind. One way in which this could be the case is if personal fantasy was mere escapism (see §1.2). Another way, however, would be to suggest that impersonal fantasy could be an imaginative exercise in which we engage in fantasy from another person's perspective; that is to say, we *simulate the satiation of someone else's desires*. As such, fantasy is still bound to desire, only in this case to someone else's (imagined) desire.

We engage in this kind of activity often, though not always in an indulgent manner. Acts of kindness, for example, are often motivated by understanding the desires of others. Such an understanding can be gained through adopting the beliefs and desires of another person, and then imagining how their desires would be satisfied by choosing certain courses of action (see Stotland, 1969 on how empathy can be enhanced by asking the experimental subject to imagine the feelings of an observed person in a given situation instead of focusing on the situational

facts). Buying Christmas gifts for my family requires this process of me on an annual basis – I can imagine what it would be like to enjoy golf, Christian rock music, or zombie movies, and then consider whether I would enjoy receiving this or that gift. We *could* do this via suppositional reasoning about the bare facts (if x likes Z, and Y is similar to Z, then x should like Y), but (when done right) a more effective way to choose gifts would involve considering someone else's desires (rather than their behavioural tendencies). Simulating the fantasies of another would be an extension of this kind of imaginative process. What would be the benefit of such a process? If personal fantasies are connected to intimate desires, then such desires are likely to be revealing about that person's character, and thus give us a greater understanding of them.[52] Simulating another person's fantasies is therefore a useful way of exploring the psychology of our conspecifics – whether those desires relate to sex, food, social status, or any other thing which might be greatly desired. This is useful both in building social bonds with our closest friends and family, but equally useful in getting a greater understanding of our rivals.

§1.2 Fantasy and Escape

Another way in which we could conceive of impersonal fantasy is where fantasy is about escaping reality, rather than imagining satiation of our desires. It is true that there could be some overlap here: indulging ourselves in an alternate reality in which our desires are satisfied is one way to escape our reality. But it seems to me that there are plenty of examples in which we indulge in escapism to worlds that are simply unlike our own, rather than more desirable. The popularity of the fantasy genre of books, television and movies is a testament to this. Currently the most popular show on TV is *Game of Thrones*, but the world depicted in that show is certainly no more desirable than our own. We might be forgiven for thinking that people who enjoy such texts do so because they identify with the heroes of these stories, and thus imagine themselves walking in that particular character's shoes. However, this particular show is notorious for the proximity within which tragedy and heroism live in the fantasy world it creates, so it is unlikely that anyone actually desires vicarious escape through those characters. It is more likely that it is simply entertaining and enjoyable to engage with a world

[52] We appear to engage with works of fiction in a similar way. Currie (1997) argues that we empathise with fictional characters by simulating their beliefs and desires, and Miall (2011) suggests that our body follows suit, physically responding to the fictions we engage with in such a way as to suggest we put ourselves in the shoes of another person. I suggest we use this capacity in many daily examples like the gift-giving one above: in persuading someone to do something they're reluctant to do, in trying to reassure someone who is confronting something they're afraid of, in watching tragic events unfold on the news and deciding to donate to a related charity, and so on.

that is radically unlike our own (containing, as it does, magic and dragons).[53] Fantasy for the purpose of escapism, then, might not be bound to our desires in the way that personal fantasy is. It may even be the case that some fantasy worlds are simply too unrealistic to be desirable – they require too much suspension of belief from us.

There is something else worth noting about the view of fantasy as escapism. We saw in Chapter 1 that Currie and Ravenscroft disagreed with Scruton's distinction between fantasy and imagination. In their view, fantasising to escape and imagining to attain a better understanding of reality are just the imagination put to different uses. I'm inclined to agree that both are kinds of imaginings, and clearly both do aim at different things. But I think this also skips over an important question: can fantasizing actually help us achieve a better understanding of reality? If this turned out to be the case, then fantasising would carry clear evolutionary benefits because of its impact on our ability to function effectively in the real world.

Gopnik (2005) notes that children as young as 3 spend a not insignificant portion of their time inhabiting *paracosms* – fictional universes with their own political and social systems. These may be those gifted publicly to children through movies and literature like *Harry Potter* or *Star Wars*, but more often than not, they are paracosms of their own making. Much public discussion of this phenomenon is centered on the *moral* implications of creating such worlds for children i.e. whether those worlds are suitable for children to inhabit, but given a child's tendency to invent their own paracosms we must question why it is that children are drawn to fantasy worlds and, if the escapist view of fantasy is correct, away from reality.

It turns out that the claim that fantasy is some kind of act of escapism (e.g. Scruton, Currie and Ravenscroft) isn't really a solid explanation for fantastic imaginings in childhood. Gopnik (2005) argues that it, in fact, tends to be happier, healthier children who spend more time immersed in their imaginary worlds, and the work of Freud and Piaget suggesting children may not be able to discriminate between reality and fantasy is still unsupported after some 30 years of empirical research (*ibid*). Rather than being an attempt to *escape* reality, Gopnik suggests that fantasy is a child's attempt to *comprehend* reality.

[53] Consider, also, our enjoyment of works depicting dystopian fantasies such as Margaret Atwood's *A Handmaid's Tale*, George Orwell's *1984*, Anthony Burgess' *A Clockwork Orange*, and so on.

Creating fantastic imaginary worlds utilises many of the same cognitive processes as theory-building. A scientific theory describes how the world is, but it also does much more than that – it *makes predictions* about how the world was in the past and will be in the future. Climate science, for example, describes the rate at which sea levels are currently rising; but it also predicts a very bleak near future for human populations living in areas that are currently just a few metres above sea level. Theory-building is therefore intimately tied up with the process of generating a map of possible worlds, and provides a guide as to how we get from this world to each of those possible worlds. Fantasy utilises these same processes to construct alternate realities, but it is very probably driven by the same instinct that pushes children to constantly ask 'why?' about our own world. As Gopnik puts it:

> A human being who learns about the real world is also simultaneously learning about all the possible worlds that stem from that world. And for human children those possibilities are unconstrained by the practical exigencies of adult survival. The link between the scientific and the fantastic also explains why children's fantasy demands the strictest logic, consistency, and attention to detail. A fantasy without logic is just a mess (Gopnik, 2005).

Gopnik is suggesting that children engage in impersonal fantasy more than adults because they are less concerned with the practical issues that consume much adult thought. We protect our children from as many concerns as possible to allow them this protracted period of immaturity in which they can learn by conceiving of the world in ways limited only by their own imagination. This can often backfire – children sometimes build fantastic theories which unsettle or frighten them. The squeaky floorboard in the corridor outside must mean that a giant has come to steal them from their beds; the shadow in the corner of the room is a crocodile waiting to pounce. But even these theories, whilst perhaps not qualifying as fantasies under the common definition because they lack the desire component, can be useful mental explorations of emotions for a child, allowing them to learn to respond under emotional distress without having to be in any real danger.

It seems, then, that the relationship between fantasy and desire, and fantasy and escape, is more complex than has previously been suggested. We may construe fantasy in both personal and impersonal ways, and in doing so change the relationship that fantasy has to desire. This may (I hope) elevate the status of fantasy above that where other philosophers and psychologists

have previously placed it. I have suggested that it is useful in developing our social understanding when we simulate the fantasies of others. Furthermore, it appears that, rather than it being a means of escaping our reality, it is (actually) a way of better comprehending reality, giving fantasy a clear and positive role to play in cognition.

2. Fantasy and Language

It is not enough for this thesis to simply show the *general* cognitive benefits of fantasy – the claim here is that it is a co-evolution of fantasy and language that drives human creativity. It is clear that fantasy as an aid to theory-building would be, in and of itself, evolutionarily beneficial – making more accurate predictions about how the world around us behaves is the basis of our very survival. However, there are other consequences to this fantasy behaviour, and some are specifically *linguistic* ones. To understand the link between language and fantasy, we have to return to the discussion in Chapter 2 of the evolution of language. It was briefly mentioned in Chapter 2 (§2), that linguist Michael Tomasello (2010) saw the central biological adaptations 'for' language as non-linguistic; in his view, language falls out of non-linguistic adaptations for shared intentions and co-operative behaviour. Tomasello's 'cooperation model' of human communication takes as a basis for language *shared intentionality*.

Tomasello argues that the 'code' of natural languages must be derived from shared conceptual resources (consider the difficulties Quine's radical translator faces in the absence of such resources; Quine, 1960), and that these resources would have been developed out of communicative acts like deictic pointing and pantomiming. Kendon (2004) suggests that this kind of human gestural communication functions in essentially two ways: (1) to direct the attention of a conspecific to something in the immediate perceptual environment, or (2) to direct the imagination of a conspecific to something that (typically) is absent by (iconically) simulating an action, relation or object. In the first case, this can be done with a simple point, and in the second it may involve a more complex series of steps (miming the action of drinking, answering a phone etc.) Tomasello points out that even the simplest of these actions is rich in communicative information. For example, if a man catches the attention of a bartender and points to his empty glass, it can communicate that the man would like his drink refilled, thus directing attention and communicating a request.

The cooperation model of language, however, makes a more important observation about what is unique about human communication, even in its gestural form. Because, Tomasello argues, the basis of human communication is shared intentionality, it has a unique form:

> [S]hared intentionality refers to behavioural phenomena that are both intentional and irreducibly social, in the sense that the agent of the intentions and actions is the plural subject "we"… [B]ecause humans are able to engage with one another in acts of shared intentionality – everything from a joint walk together to joint participation in transforming people into institutional officials – their social interactions take on new qualities (Tomasello, 2010: 72-73).

Human beings, uniquely amongst species, have a capacity to create a rich 'common ground' by considering not only what is in the immediate environment when we communicate, but also what is absent, yet still relevant to our conspecifics. This depends upon the process of 'recursive mindreading' – where person A knows that person B knows X, and A also knows that B knows that A knows that B knows X, and so on. Tomasello argues that this distinguishes human gestural communication, even amongst prelinguistic infants, from great ape gestural communication in a key way. Common ground allows our conspecifics to determine not only our referential intention, but our *social* intention too. Consider again the bartender and customer; if there is a shared common ground in which the bartender and customer are both aware that they attend the same Alcoholics Anonymous meeting, the customer may be pointing at his empty glass to indicate that he has managed, after sitting at the bar for quite some time, to resist having a drink. Thus common ground takes us beyond our own egocentric perspective on the world.

This discussion, and the examples therein, reveal something that is incredibly important to note about human language use and communication: we do not only communicate to *request* (help, information), but also to *inform* and *share* (information, emotions, attitudes etc.) Again, the ability to do this in a stimulus-independent manner (see Ch. 2) is a trait unique to human beings and present in pre-linguistic infants. Non-human animals rarely use pointing to communicate, but even when they have been trained to do so (a process with a low success rate) they typically do so only to request – for instance, pointing to food they want, or at its most complex, pointing to a tool they want to help retrieve some food that they want. Human

infants, however, point to things from a very early age simply to inform or share. Consider, for instance, a young child pointing at an aeroplane in the sky. They do not do this to request that we *get the aeroplane for them*, they do it so that they can direct our attention to something they find interesting (and think that we might also find interesting). It is therefore deeply entrenched in human communication that we share things of interest. And it is this fact that connects to the real usefulness of fantasy for creativity.

Human beings love to share things of interest. As we have seen in §1, fantasy is perhaps unique amongst kinds of imagination for its intimate connection with desire – either our own or (what we imagine are) someone else's – so fantasies are presumably of the utmost interest to us. This is why, I want to suggest, that we would start externalising both personal and impersonal fantasies as soon as it was communicatively possible: we are hardwired to do so, both in terms of our communicative needs and in terms of the connection between imaginative communication and our reward circuits as observed by Picciuto and Carruthers (2014; see Ch. 2). Walton (1990) too, as we have seen, also suggests that fantasy is peculiarly enjoyable (though he seems to conflate it with daydreaming) because of its 'spontaneous' and surprising nature. Because of their looser connection with reality, fantasies, like a good joke, can lead us in unexpected directions and, like a good joke, they are enjoyable to hear.

The obvious constraint on our capacity and tendency to fantasise early in human evolution would be a lack of linguistic resources with which to both have and to communicate fantasies. Lacking a 'fantasy lexicon' would limit both what we could fantasise about, and how rich our fantasies could become.[54] For instance, before the term 'mermaid' (and its equivalents in other languages) entered common parlance, it would be more difficult to communicate about a fantasy world involving such creatures. But once the term enters the common lexicon, it would be far easier to create imaginary worlds in which some of the inhabitants were mermaids, giving us a computationally easy token with which to construct a fantasy and freeing up cognitive resources with which to create new ideas to incorporate (like a *siren*). So the process of externalising fantasies would actually make the process of fantasising easier, as well as making richer and more varied fantasies possible.

[54] The earliest entries into the 'fantasy lexicon' might even have been accidentally created. Consider the suggestion in Chapter 1 that dreaming is an evolutionarily ancient kind of imagining, though it is involuntary and spontaneous. Perhaps what gave us some of the earliest fantastic entities was the accidental combination of ideas in dreams, which we then attempted to describe to our conspecifics using the 'real-world' lexicon available to us.

With rich lexical resources available, the fantasy worlds we could create are potentially infinite. Young children engaging in pretend play demonstrate this on an almost daily basis, with seemingly little to no effort. Pretend play routinely creates new symbols – a ball becomes a cat, a blanket becomes a lake etc. But it also tends towards the fantastic, creating symbols for impossible creatures, as I recently discovered while playing with a friend's 9-year-old son. In this particular game (which essentially involved walking on a wall of an enclosure surrounding some decorative garden stones and the odd gardening implement), a plastic cup containing some sprouting daffodil bulbs can become a pack of 'lava prawns' (prawns capable of shooting lave from their mouths). This new fantastic creature would also persist into another play session, operating in a totally different context. Possessing a linguistic system which decouples labels from their real-world counterpart to allow them to be utilized in the absence of any visual stimulus offers us the capacity to imagine the physically impossible, communicate it to a conspecific, and then build a shared imaginary world around the new lexical items we have just created – a kind of social imagining which helps build relationships with conspecifics. And it is really this notion of 'fantasy' that is neglected in the philosophical literature: the one where fantasising is about creating paracosms unconnected to any real-world desires beyond our own desire to play.[55]

Fantasy may be closely intertwined with *language as a cultural artefact*, but what about its connection to language as a biological endowment? That is to say, what role does the computational cycle described in Chapter 3 play with respect to fantasy? One obvious way follows from Hinzen's claim that the concept of TRUTH emerges with syntax. Presumably our understanding of fantasies depends upon our ability to distinguish them from reality i.e. to say which parts are real and which are not. However, this is not a particularly interesting observation. More interesting is the suggestion that the computational cycle is 'blind' to content: it begins with a lexical root and generates a sentence which is only evaluated once the computational cycle is completed. This makes language a particularly powerful tool for imagining *impossible*, or highly improbable, worlds: it doesn't matter whether 'lava prawns' could or couldn't exist, we simply put those words together and now we are suddenly able to (jointly) imagine them, however impossible that world might seem. Access to a generative system like this is precisely what would allow us to imagine in unconstrained ways, and upon

[55] There is a question raised by the claims here about whether imagination is impaired alongside language. I discuss some challenging empirical information in Chapter 6, and propose areas for further research that would test the claims I make at various points in this thesis.

finding something useful we could then codify our findings in natural language, disseminate them to others, and begin to develop a lexicon specific to our group. This is a central feature of developing a culture – having shared ideas specific to your particular group.[56] Culture could develop in the absence of language, but it couldn't disseminate as easily or spread as far and wide as it can once language is in place.

3. Fantasy and Evolution

The suggestion above, then, is that fantasy actually drives the evolution of language. Remember that language is both a biological endowment and a cultural artefact. The cultural aspect of language i.e. natural languages, could be enhanced by the process of externalising fantasies, introducing as it would new items into the lexicon. That fantasy aids lexical development isn't an idle suggestion, there are other reasons to believe this too. Skolnick Weisberg et al. (2015) found that children acquired vocabulary more easily from fantastical stories or play sessions (using toys) than they did from their realistic counterparts. As Skolnick Weisberg et al point out, this is actually surprising given what a large body of psychological literature suggests about learning and transfer, namely that the more similar the learning context is to the context where the information is eventually going to be applied, the better. Realistic books and toys should, predicting from those studies, provide better vocabulary learning for the words with a real-world use (e.g. cooking vocabulary). Yet this was the precise opposite of what they found.

Skolnick Weisberg suggests two possible explanations for this. The first is that children may be more engaged and attentive in the face of fantastic stories and play because the events therein challenge their understanding of how reality works. The added attention required to spot the difference between the imagined and the real worlds may account for their increased learning. Alternatively, they suggest, there could be something about fantastical contexts in particular that aids learning. Perhaps engaging immersively in such fantasies engages cognitive processing at a deeper level, requiring them to check the fantastic world against both the real

[56] Arguably, there is no more significant a shared idea than natural language with regards to indicating group membership. This is true not only of the divide between natural languages (e.g. English speakers vs German speakers) but also within natural languages, where dialect differences can indicate geographical and class differences (a 'Newcastle accent' vs a 'Sunderland accent', or pronouncing 'with' with a 'th' sound at the end vs an 'if' sound). See Ghafournia, 2015, for an overview of the ways that language can indicate group membership.

world physics and logic they have thus far developed and the internal physics and logic established in the imaginary world.

Elsewhere, a broad survey of the literature on the connection between play and creative problem-solving by Wyver and Spence (1999) found that there was a reciprocal relationship between the two: the development of divergent problem-solving skills (being able to generate creative ideas by exploring many possible solutions) facilitates the development of play skills, and vice versa. Notably there was a strong correlation between fantastical pretend play and the promotion of semantic creativity (problem-solving involving words), particularly when this was social in nature. So it appears that engaging in fantasy aids the use of language for creative purposes, and using language for creative purposes helps us to engage in fantasy, particularly where this is shared with others (in play), pointing to a complex co-evolutionary story. Note that this co-evolutionary story also explains the development of pretend play in our species, something which we saw in Chapter 2 would be required of the best solution for the puzzle of the Creative Explosion.

If the findings of these studies are correct then, we can start to piece together an understanding of the delay between the emergence of our species and the emergence of widespread diverse creative behaviour, and its explosive nature when it does appear. If we're hard-wired to enjoy engaging in fantasy, and engaging in fantasy helps with both the development of language and language acquisition itself, then once natural language reached a sufficient degree of richness to enable us to externalise our fantasies then we should expect that to significantly drive the development of new lexical resources and speed up the process of language acquisition throughout the human population. Tattersall hints at a similar thought when he suggests that:

> [O]ur imagination and creativity are also at least partly implicit in the symbolic process, for only once we have created mental symbols can we combine them in new ways and ask key questions such as "what if?" (Tattersall, 2014: 201)

Reaching this point would take some time – the tendency to engage in fantasy would not stabilise as an evolutionary trait until it yielded some benefits that were actually visible to natural and/or sexual selection. Whilst the process may be intrinsically rewarding i.e. always pleasurable to engage in, this would not make that trait something that evolution would select

for unless that experience of pleasure was somehow adaptive to our ecological niche or attractive to members of the opposite sex. It's unclear how *simply* fantasising could match that description. It would need to be the outward manifestations of fantasising that were adaptive or attractive. As we have seen, one such outward manifestation is childhood pretend play – but it turns out that this tendency doesn't, so far as we know, correlate with any adaptive advantages (see Chapter 2). It must, therefore, be some other outward manifestation that explains our universal ability and tendency to engage in fantasy. If language is itself adaptively advantageous – and it would seem indisputable that it is – then fantasy may in turn be adaptively advantageous because of the benefits it confers in terms of language acquisition and in developing the lexicon itself. This would mean that fantasy and language would co-evolve.[57]

There are, of course, other candidate explanations for the evolutionary selection of a tendency to fantasise, and we may think them more persuasive. We have already noted that sexual fantasy brings with it some of the rewards of actual sex i.e. thinking about sex can lead to arousal. It is conceivable that this could be at the root of evolutionary selection of fantasising as it would encourage sexual activity, and thus procreation, passing on the genes of those who engaged in fantasy. Boncinelli et al. (2013) have demonstrated that sexual fantasy can be used as a treatment for hypoactive sexual desire – perhaps in a species where we tend to stay with our mates for a long period of time this would be beneficial in promoting sex more frequently within couplings. But it is also seemingly true that our tendency to fantasise has moved well beyond the sexual domain, so it perhaps has other adaptive benefits besides encouraging a willingness to engage in more sexual activity.

Another suggestion is that positive fantasies about idealised futures can help us turn those fantasies into realities. This kind of 'positive visualisation' is the terrain well-trodden by self-help books: jobseekers should imagine themselves as future CEOs to help them find work. However, this suggestion has come under fire over the past twenty or so years, with numerous studies suggesting that positive thinking in other domains doesn't seem to yield the benefits promised by self-help gurus. Oettingen and Wadden (1991) found, for example, that there was no correlation between positive fantasies and weight loss (subjects who negatively fantasised

[57] I wonder if linguistic *error* is another way in which the lexicon could expand, as well as being a source of creativity e.g. puns. For example, in writing an earlier chapter I made a typing mistake and wrote 'articstic', which I read to myself as 'arctic-stic', which immediately created a rush of simultaneous images and ideas in my mind of polar animals and human inhabitants engaging in art-making. Could such errors lead to things like this becoming part of the lexicon when shared amongst social groups? Or would they bring to light the very possibility of word-play? This would possibly be seen as a creative act and an indicator of protean cognition.

actually fared better), and Oettingen and Mayer (2002)'s subsequent study confirmed the suggestion in the former that expectation has far more impact on attainment then fantasising. One reason for this is suggested by Kappes and Oettingen (2011) – fantasies fail to generate the 'energy' to actually pursue our desires.[58]

Whatever the reasons to evolutionarily favour fantasy in the first place, it is still seemingly the case that it has a connection to linguistic development, and that would be a further reason to encourage it –*evolutionarily* or *socially*. If fantasies are shared, then we can develop our understanding of those closest to us (see §1.1); but we can also cause enjoyment in others by directing their attention toward the paracosms we have created. Children at play often *co-author* paracosms, each contributing to the system of physics or logic that it contains (often a cause of dispute when one boy attempts to 'kill' another boy in the paracosm – "No, I can't be killed by lava because I have lava armour!") This kind of activity is a basic form of social imagining that I suggested in Chapter 1 (§3.3) has been neglected in trying to explain what may have driven the cultural accretions required to explain away the gap between the emergence of the biological basis for language and the Creative Explosion. Specifically, sharing fantasies would drive the expansion of the lexicon in the way described above, leading to more systematic ways of externalising our fantasies. Of course, Picciuto and Carruthers' candidate explanation is pretend play, which is one way in which we can externalise and share fantasies. However, I will argue in the chapter which follows that the *earliest* systematic way we would have found to externalise our fantasies is through storytelling, and that storytelling in particular can explain the appearance of new kinds of creative behaviour in our species.[59]

Concluding Remarks

I have argued that there is a need to further develop our understanding of fantasy and its relationship to the imagination, to desire, and to escape. I suggested both here and in Chapter 1 that one of the reasons that our understanding of fantasy may be impoverished is because we focus on examples that are less informative than the more common occurrences of fantasising, such as that which we see as manifest in childhood play, but also in jokes, in improvised bedtime stories, and so on. Traditionally focus has been on personal fantasy (e.g. Freud, Gaut), rather than impersonal fantasy, but where there is discussion of impersonal

[58] For a critique of these studies and their findings, see LaBier 2011.
[59] Arguably, shared episodes of pretend play *depend upon* an ability to construct and tell stories.

fantasy (though not in those terms – e.g. Currie and Ravenscroft, 2002) those discussions have tended toward works of literature and visual art. Artworks *are* important to giving us an insight into the nature of creativity and its evolution, and I think a tendency to fantasise is a crucial part of the evolutionary story behind their existence also, but because of their cultural status relative to less 'serious' artworks I think they haven't helped move our understanding of fantasy on in the way I suggest is required.

In any case, we are starting to develop a solution to the problem of the Creative Explosion i.e. the gap between the emergence of language in our species and the emergence of widespread, diverse creative behaviour (a gap which, according to Hublin et al., 2017 may be bigger than was initially thought). That answer would, I argued in Chapter 3, come partly through the emergence of the ability to form thoughts with the semantic properties characteristic of human language, something which would clearly augment the imaginative capacities *homo sapiens* inherited from our evolutionary ancestors. But it would also come partly, I have argued above, from the gradual development of the lexicon as a result of our tendency to engage in fantasy (an idea I develop further in the next chapter). To some extent, this parallels the ontogenetic development of language: for individuals within our species to fully develop their linguistic capacities they need to be exposed to a certain amount of language-use before a particular age. If this is overly impoverished, the language capacity fails to get off the ground. Similarly, for language to impact significantly upon creativity, natural language would need to be sufficiently rich. Once it reaches a certain degree of richness, all kinds of imaginative possibilities open up. For example, two human children with access to a shared lexicon to describe their imagined environment would suddenly (if so inclined) be able to construct rich narratives for pretend play by engaging in acts of imagination and fantasy and communicating their most interesting findings to one another. This could include any number of situations: some perhaps based very closely upon reality, such as pretending to hunt together or pretending to do battle, to fantastic ones, such as pretending to live underwater as a half-human half-fish. Such fantastic cases would, as I have said, help increase the lexicon as terms were coined as shorthand expressions for these newly-generated ideas, creating new symbols that would make future episodes of pretence easier to get going. It would also, according to Gopnik, help these children form a better understanding of the natural and social worlds they inhabit; according to Skolnik Weisberg, it would have the added benefit of helping them acquire lexical items of an ordinary nature. From this position of being armed with a rich lexicon and a fertile imagination that enjoys building imaginary worlds, coupled with a more

evolutionarily ancient propensity for sharing information, attitudes and emotions, it would seem as though we became a species well designed for, and poised to, begin developing stories and telling them to one another.

Chapter 5:

STORY-TELLING & CREATIVITY

How did story-telling drive human creativity?

Introduction

Consider again the puzzle we set out in Chapter 2: what explains the apparent 60,000 year gap between the emergence of our species and the sudden and dramatic appearance of new technologies and representational art? Technology is not unique to human beings. Animals have been observed to fashion tools to help with survival (e.g. a stick to fish for termites, a rock to open a nut etc.), but clearly human beings show a greater degree of creativity in this domain. But it isn't just the volume of tools we produce that marks us out as different, it is also the purpose for which we develop them. Human tool invention is driven as much by social concerns as it is practical ones. Consider the relatively recent invention of social networking, or the much older invention of musical instruments. And humans alone make art. Why is it that our creative endeavours led to us creating representational drawings of animals on cave walls tens of thousands of years ago? Is there any story that can be told that can explain this specific innovation? I address these questions here by examining stories themselves. In §1, we learn that the practice of storytelling is much older than we might have initially thought, and that some of the stories we are familiar with today are as old as the cave art that features in our puzzle. §2 seeks to address the questions of how and why we began to tell stories in the first place. Finally, §3 suggests that storytelling provides us with an explanation of the nature of human creativity that we see at the point of the creative explosion.

1. The (Hi)story of Stories

The Catalogue of Women, attributed to Hesiod, tells the story of a beautiful young woman named Callisto, a devotee of Artemis, the goddess of hunting and chastity. Despite having sworn to the goddess a vow of chastity, Callisto was seduced by Zeus and fell pregnant with their son, Arcas. Enraged by her husband Zeus' infidelity, the goddess Hera transformed Callisto into a bear and banished her to live alone in the mountains. Arcas would go on to be the king of Arcadia. One day, the king took to the mountains to hunt and came across Callisto. Recognising her son, Callisto approached him with outstretched arms. Arcas, however, took the bear to be attacking him, and took aim with his bow to kill Callisto. Just as he was about to

fire the deadly arrow, Zeus swooped up mother and son to avert the tragedy and placed them in the sky as the constellations Ursa Major (the great bear) and Ursa Minor (the little bear).

Hesiod's story dates back to around 750BC, making it nearly 3,000 years old (West, 1966). However, this story is not unique to the Ancient Greeks, nor does it originate with them. Some version of this story is, in fact, shared with the Iroquois of the north-eastern U.S. and the Chukchi and Finno-Ugric people of Siberia. These disparate groups each have a tale involving a man or an animal pursuing and/or killing one or more animals, with the characters in the story being changed into constellations. As Julien d'Huy explains:

> These sagas all belong to a family of myths known as the Cosmic Hunt that spread far and wide in Africa, Europe, Asia and the Americas among people who lived more than 15,000 years ago… The most credible working hypothesis is that Eurasian ancestors of the first Americans brought the family of myths with them (d'Huy, 2016: 58-59).

Another story with ancient origins is that of Polyphemus, familiar to most Western scholars from Homer's *Odyssey*. I briefly discussed in Chapter 1 (§1.1) the suggestion that Homer was not a single author, but in fact a *tradition* (for a detailed discussion of this view, see Graziosi, 2002). On this view, the Homeric epics of the *Iliad* and the *Odyssey* were sculpted and changed as they passed from one oral poet to another over a succession of generations. It has generally become accepted that the poems are around 4,000 years old (Croally and Hyde, 2016: 26), but as with the story of Callisto, versions of the Homeric stories appear in geographically and chronologically disparate places and times. The story of Polyphemus in the Homeric tradition is that of a one-eyed giant with a proclivity for eating human flesh. The hero Odysseus and his crew find themselves in Polyphemus' lair after they land on the island of Cyclops in search of food. After Polyphemus has devoured a number of Odysseus' men, Odysseus gets Polyphemus drunk, which renders the giant unconscious. Odysseus seizes his opportunity to blind the one-eyed monster and secure passage out of the cave by hiding himself beneath a sheep as Polyphemus sends his herd outside to feed.

As with the story of Callisto, a version of this story exists in North America, this time amongst an Algonquian tribe, the Blackfoot Indians, whose survival primarily depended upon hunting buffalo. In their version of the story, the heroes escape a human-bird hybrid by hiding beneath the skin of a buffalo while the herd charges out of the cave. In many Amerindian

versions of the tale, the hero hides inside the animal by entering via its anus. The oldest version of the Polyphemus story that d'Huy traces (in d'Huy, 2015) is in the Valais area of Switzerland, with suggestions that it could even be as much as 18,000 years old (Tehrani and d'Huy, 2016). The core of the Polyphemus story is thus: a hero, typically a hunter, faces one or more monsters in possession of a herd of animals. The hero ends up in the location of the monster's herd and becomes trapped by some obstacle. The monster attempts to kill the hero, but the hero escapes by utilising the animals of the herd as camouflage.

d'Huy's research utilises the models of phylogenetic analysis biologists use to attempt understand the evolution of species and applies them to myths and folklore to trace the evolution of stories such as that of Callisto and Polyphemus. His approach identifies core story elements ('mythemes') and traces their emergence and appearance across the myths and folktales of numerous cultures, and then compares them against anthropological, genetic and climatic data which helps us trace the movement of human populations since the emergence of our species. We might assume that similar stories being shared by disparate cultures is simply the product of a universal human nature – humans the world over have similar desires, needs etc. and are, broadly speaking, exposed to similar environment, so would produce similar stories as a result. Carl Jung advocates for a similar position when he suggests that myths are the expression of the 'collective unconscious', the fundamental nature shared by all human beings (Segal, 1998). However, if this were the case, we'd expect Cosmic Hunt stories, like that of Callisto, to appear everywhere, yet they are virtually entirely absent in Indonesia, New Guinea and Australia (d'Huy, 2016).[60] d'Huy therefore believes that his work lends credibility to the Out of Africa Hypothesis discussed in Chapter 2, with the story following the path of northbound groups (ultimately heading both West to the Americas and East to Siberia), rather than those who moved southward. This comparative analysis suggests that many of the stories we are now so familiar with may have much older origins than previously thought.

[60] The nature of d'Huy's analysis makes it impossible to say that these stories are *entirely* absent in these areas: to achieve a workable model for phylogenetic analysis of stories d'Huy's 'mythemes' need to be sufficiently broad to connect story elements, but this broadness means that some mythemes do appear across cultures. What is being claimed as absent here is the specific arrangement of mythemes i.e. a tale involving a man or an animal pursuing and/or killing one or more animals, with the characters in the story being changed into constellations. Notably, Ursa Major is only wholly visible throughout the year in the northern hemisphere, so where the Cosmic Hunt story does appear it seems to be a case of a story-teller taking inspiration from commonly observable features in his or her environment. If this tale migrated from a common origin, as d'Huy suggests, then this fact is of limited relevance. However, the alternative explanation might be that Ursa Major was simply a commonly received inspiration for story-tellers in various cultures all across the northern hemisphere. This is why d'Huy's research calls upon genetic and climate data as further evidence.

It is worth noting at this point that there are numerous kinds of stories. Simply reporting an event in detail to someone is one way in which we might tell a story. However, there is an important distinction between event-reports and the kind of stories that are important here, which is the connection to truth. When we recount an event to a conspecific, we generally do so in a way which is intended to present events as they happened i.e. we tell them the truth. Of course, there are scenarios under which we also intentionally deceive someone by reporting an event in such a way that what we report doesn't cohere with the truth (we might say that A did Y, when it was in fact B who did Y, or we might say that A did Y when Y never, in fact, happened at all). Fantastic stories, by contrast, are connected with the truth in a somewhat more obscure way. Telling a fictional narrative typically involves a prior understanding between the storyteller and the audience that the events being described are not the literal truth (or a description of actual history). However, they may contain or be grounded in truth in that the 'moral' of a story might be intended to convey some truth about the world, or events in the story might help someone acquire knowledge by helping them to realise the truth of some (set of) proposition(s) about a particular topic, even though this knowledge was set in a fictional context (for instance, the best technique for hunting a wild animal, or which berries to avoid eating). Using stories as *metaphors* was very possibly one of the earliest creative acts we engaged in;[61] metaphor-making itself can expand the lexicon (consider metaphorical language used to describe music; the language of music may even be essentially metaphorical – see Zangwill, 2011, for a discussion of this idea) giving us another way in which storytelling could have driven the evolution of language (see Chapter 4). In any case, it is stories with this more obscure relation to truth that are of importance here, since they are *fantastic stories* – involving fantasies rather than reality.

I have suggested in previous chapters that storytelling might have been one of the earliest drivers of human creativity, which would make it older than even d'Huy has suggested above. That isn't to say that as soon as language got in place we suddenly were telling highly structured narratives like the Cosmic Hunt and the Polyphemus stories. Clearly these stories will have developed over time, developing in different directions as the cultures of the groups retelling these stories evolved. But even before that, it would have taken time to get certain ideas into place, establishing themselves in common parlance. So how did we begin such a

[61] Gaut (2003) describes metaphors as a paradigmatic example of the creative imagination, though he means this as a heuristic notion – teaching us about the phenomenon – rather than as a chronological first.

process of developing a precursor to tales like the Cosmic Hunt? It is this question which I address in the next section.

2. How and why did we start telling stories?

First of all, it is worth noting that stories today need not be, and sometimes are not, told linguistically. A fairly basic way of telling a story would be through mime and gesture (in its most complex form, think for example of the silent films of Charlie Chaplin). We're rather adept at communicating quite specific information using only movement, and could even construct a basic narrative (who did what to whom) through pointing, miming and gestures, possibly involving props where useful. Yet this repertoire would have been available to our evolutionary ancestors for millions of years – even the great apes have a surprisingly rich gestural communication system, though they seem to lack the combinatorial capacities that would permit communication of sophisticated narratives (Tomasello, 2010). This means that a rudimentary form of narrative may well have existed prior to our species.

Consider, as another example, contemporary dance performances, which often attempt to establish a narrative using only movement. It is hard to find evidence for the emergence of dance within our species, but detailed arguments have been presented nonetheless for the existence of both dance and music prior to the emergence of language. Mithen (2005), for example, suggests that language itself might emerge from a kind of musical proto-language involving proto-symbolic singing and dancing intended to influence the emotional states of others (and thus their behaviour). Like language, both singing and dancing are ubiquitous throughout our species but, as Tomasello (2010) has argued, gestures might have taken on a sort of symbolic meaning before the existence of words, opening up the possibility that a ritualised form of dance could do the same. As such, the tendency to create (at least simple) narratives might have long been in place before the evolution of fully-syntactic language, and long before the existence of the natural languages we use to tell stories today. The first narratives, perhaps, would have recreated or predicted the hunt, or a dramatic event in the shared memory of a group (Asma, 2017). These narratives wouldn't require anything like the complex hierarchical structuring capacities we see in grammar, but they would certainly have required learning a repertoire of moves, gestures etc. that were sequential in order to usefully convey information about sequences of events. Learning such sequences

would have to coincide with (and/or drive) increases in short-term memory and sequence processing power in precursor hominids.

With this in mind, let us now briefly consider why narratives, at their core, are useful. Asma (2017) identifies two functions of what he terms 'imaginative communication': *social bonding* and *information transmission*. By constructing narratives, we can strengthen (or weaken) social bonds through the emotional manipulation of our audience. Mithen suggests that this would be one of the central functions of his musical protolanguage – to make conspecifics feel a certain way so that their behaviour would be responsive to those feelings. For instance, creating a feeling of fear through some ominous or tense music or a particularly aggressive dance routine (consider the purpose of the Maori 'haka') might help to intimidate a rival group; upbeat music and lively dance might put conspecifics in a celebratory mood. A second function of narratives is to transmit information, for instance facts about who did what to whom, or to demonstrate skills with which to exploit resources from the immediate environment. Again, these functions can be met through non-linguistic means.

If a tendency toward narratives predates the existence of language, then we would predict that language would be co-opted for this purpose once it emerged in evolution. But there is still a lot to be explained as to how this might have occurred. An instructive account of the evolution of language that can help us here comes from Robin Dunbar (1996). Dunbar actually works in the opposite direction to that which I have just suggested. For Dunbar, a tendency toward narrative emerges from the invention of language for the purpose of 'vocal grooming'. In Dunbar's view, language emerged as an efficient replacement for the kind of social grooming we see in various animals, and particularly in other primates. Social grooming has many benefits. In macacques, for example, it reduces stress and thus decreases the likelihood of conflict (Aureli and Waal, 2000); for rats, it seemingly helps prevent mammary tumours and extends lifespan (Yee et al., 2008); for baboons, grooming reduces the risk of disease spread by ticks (Akinyi et al., 2013). But aside from these health benefits, there are social benefits to grooming, and these are often thought to be the primary role of grooming. In many species of primate, grooming helps maintain 'friendships' (Seyfarth and Cheney, 2011) by reinforcing the complex social hierarchies within their groups. For example, in black crested gibbons, social grooming promotes social cohesion and stability (Guan et al., 2013), with more complex grooming patterns correlating with group stability.

As hominids became more adept at surviving in their environmental niches, social groups became larger. However, Dunbar argues that in these larger groups, physically grooming all of our 'friends' would become increasingly costly in terms of time and energy (Dunbar, 1996), and it is for this reason Dunbar suggests we moved to a less costly form of grooming – vocal grooming. Making vocal sounds would allow us to service many relationships simultaneously, while our hands could be gainfully employed with some other task. Vocal grooming, according to Dunbar, would then evolve gradually into vocal language, specifically in the form of 'gossip' (exchanging information on social matters). For Dunbar, it is because language evolved from gossip that it takes the grammatical structure it does, one which he suggests is peculiarly suited for narration.

There are a number of problems with Dunbar's account. For one, I have already given (in Chapter 3) an alternative account of the emergence of grammar which suggests that it is not purely a social construct. Moreover, it isn't clear why exchanging social information would have any precedence over pure description in accounting for the structure of grammar. Simple reporting and describing of *any* event requires the same grammatical classes (those relating to agents, patients, actions, events, etc.), it is not unique to gossip. 'The bison can be found on the left side of the small hill' requires the same grammatical complexity as 'John met Mary in the empty coffee shop', and both involve reference and truth, the core aspects of propositional thought. Furthermore, vocal grooming's 'cheapness' is at odds with Dunbar's claim that it would explain the evolution of language, given that its cheapness would undermine the honest signalling that the time and energy commitment that physical grooming clearly conveys (Power, 1998). The vocal signals involved in gossip are easy to 'fake', since for social information to be valuable it must be about something outside of the current discourse context (anything immediately perceivable by conspecifics isn't valuable since they would most likely have acquired that information themselves in the absence of the gossip). However, this presents the problem of verifying the information given: the hearer either has to take what they hear on trust, making the reliability of the signal easy to fake, or they must seek further evidence of the veracity of the gossip, driving the costs for the hearer up significantly, thus making gossip a costly signal after all.

Despite the criticisms of Dunbar's account, it is still nonetheless potentially instructive. One criticism we might level at Dunbar is that his account doesn't really explain the transition from the production of pleasing but meaningless sounds used in vocal grooming to fully-

syntactic speech. If, instead, we assume that Dunbar's vocal grooming predates our species, and then the neurological adaptations for grammar came into place quite suddenly much more recently, we'd have a species with a highly complex social structure, which was already very vocal, but could now begin to arrange vocalisations into meaningful sequences that take us beyond the simple sequential structures that might be present in dance, gesture and mime, and (eventually) into the complex hierarchical structures present in fully-syntactic language. Grammar, therefore, wouldn't *fall out of* vocal grooming, it would instead *shape the very nature of* vocal grooming. And if, as Dunbar suggests, vocal grooming was primarily concerned with conveying social and emotional content, then grammatical and lexical features would eventually emerge to suit those communicative needs.

More recently, Asma (2017) has suggested that storytelling might partly have its roots in the ritual dimension of communication. He points out that social dancing, like self-ornamentation with beads, paint etc., functions in part as a kind of signal for group membership. Asma suggests that the dance or song precursors of storytelling might strengthen social bonds inasmuch as knowing and being able to produce the sequence for the dance or song would signal that you were, in fact, a member of this group, and not a rival, quoting Sterelny (2012: 49) to explain: "Human groups are 'symbolically marked'; they share distinctive norms, customs, rituals, and the like. Symbols are badges or insignia of group membership and identity." The notion of group identity is significant when considering the role that storytelling plays in shaping our culture (as I argue below), and it may have taken on greater significance when our evolutionary ancestors began to tell basic stories in the form of song or dance.

Asma goes on to cite the example of the ritualistic chants of Brahmins (Hindu priests and teachers, and protectors of sacred learning across generations) to emphasise the importance and prevalence of ritualistic performance. Asma explains:

> Select Brahmin fathers… transmit elaborate Sanskrit mantras to their sons through exhausting repetition of verbal chants, broken into memorisable chunks and paired with subroutine body movements… But *in addition to* these identifiable Sanskrit mantras, the singers chant an ancient unidentifiable hymn that no linguist can decipher. It is a crucial song that accompanies the seasonal twelve-day fire sacrifice (for Agni), performed for thousands of years of Verdic history (Asma, 2017: 141; emphasis added).

These chants have a structure, but no linguistic meaning. Yet they still have great social significance. The Brahmin believe that these chants are responsible for keeping the cosmos ordered and coherent, but on a purely social level they indicate that the 'speaker' belongs to a certain *varna* (class or caste), and the hearer who understands them knows they belong to the same cultural group. It is possible, then, that beyond the meaningless but reassuring vocal grooming sounds, we'd already begun to order vocal noises into meaningful sequences in a similar manner to the chants of the Brahmin. On a number of accounts of the evolution of language, fully-syntactic language emerges from an existing lexicon made up of meaning-signal pairs (a particular noise which signals something with the intention of triggering a particular behaviour, similar to the complex alarm call system we see in vervet monkeys). Such 'holistic protolanguages' might include music- or dance-based protolanguages, or 'word-like' noises (Bickerton, 1996).[62] These signals, on some views, expressed whole propositions, but did not involve compositionality since the signals were not 'broken down' into words (Arbib, 2008, Wray, 2002). What the emergence of fully-syntactic language would bring would be an increased capacity to parse prosodic units into ever-smaller pieces, and assign specific meaning to each, in order to meet our expanding communicative needs. Ritualistic chants are rhythmic but, as Dissanayake (1992) says, so is everyday language. This could, perhaps, be a hangover from its ritualistic origins, with rhythmic units gradually being broken down into smaller phonemes. It's also possible that the reverse relation holds: that certain rhythms within everyday speech are naturally pleasing to us, and thus took on greater significance in order to *produce* ritualistic chanting (I pick up on this point again in Chapter 6). But the big shift in the lexicon at this point wouldn't be in establishing labels for objects in the external world – it is quite likely that this was being done as part of any protolanguage possessed by precursor hominids. Instead, it would be in beginning to develop ways of expressing the inner, emotional world upon which social bonding is based. This would include ways of sharing our attitudes toward various things with our conspecifics (the kind of 'gossip' that Dunbar has in mind), particularly about persons who weren't in our immediate perceptual environment. And as we saw in Chapter 3, the computational device that language is based upon is ideal for just such a purpose.

One of the features of language discussed in Chapter 3 was the fact that narrow syntax, the computational basis of sentence generation, operates blindly over formal categories rather

[62] For a general critique of the idea of holistic protolanguages, see Tallerman, 2007.

than over symbols with semantic content. The computational system which generates linguistic utterances doesn't operate on words, like 'pain', but instead on grammatical categories, like NOUN. It is only once a lexical root has been categorised in this way that we can begin building a grammatically meaningful sentence. So in this way, fully-syntactic human language constitutes a break from any of its precursors in that it is a fully (formal) symbolic system. I have previously outlined the ways in which this could aid human creativity in terms of creative thought, but here we need to say more about how this can be employed in practice.

As mentioned in Chapter 3, language is, according to Daniel Dor, an 'imagination-instructing system' (Dor, 2015). As we also discussed it in Chapter 3, we could see its role as directing our minds as we attempt to solve problems. But it also allows us to direct the minds of other people to very specific imaginings. If someone says to you, 'The president of the USA is on the TV again', it is natural to decode that utterance and picture Donald Trump in some scenario. The more specific the description, the more prescriptive it is for the listener's imagination. Language acts as a scaffolding for the construction of imaginary worlds. When we engage with what somebody is saying, it isn't just our imagination that receives instruction, our bodies also naturally and instinctively react to what is being said, betraying the underlying imaginative simulation that is going on. For example, if we hear the word 'cup', our motor and tactile systems engage, possibly based on some memory, simulating the actual holding or picking up of a cup (Bergen, 2012). Yet the generative system works differently to those governing language comprehension. Narrow syntax, as we have said, works 'blindly', operating only on the grammatical class, which means that the symbols within the computational system (i.e. the words) are decoupled from their semantic content (see Chapter 3, §3.2). This also has the effect of decoupling them from any emotional associations.[63]

[63] Asma (2017) suggests that the development of words themselves might have involved a gradual shift away from their referents in order to *aid* the decoupling discussed above. The thought here is that, for example, an early word for 'cow', might have involved some kind of sound that mimics the noise cows make. This would later be substituted for the far more arbitrary 'cow'. He cites the kind of 'toddler talk' parents use as an example (wherein a cow might be a 'moo-moo'), though notes the difficulty of substantiating the wider historical claim he is making here. I'm not entirely persuaded by this example, as I suspect the etymology of the word might reveal a closer connection to the 'moo' sound than Asma might expect, but his general point seems reasonable: there are plenty of words which *must* be arbitrary given that they lack real-world referents (e.g. 'on', 'there', 'justice' etc.) For opposition to this view, see Foster (1978), who claims that today's linguistic sound-meaning pairs are not at all arbitrary.

Recognising the same phenomenon, Asma (2017) suggests that 'this is an exciting issue for the rise of imagination', noting that once language decouples words from their semantic and emotional content in order to generate novel sentences:

> …we now have mental headroom to play with concepts, memories, and ideas without triggering life-and-death emotional systems that evolved to save our lives. Certain kinds of daydreaming… and more structured imaginings could thrive and develop unchained from the emotional storms that usually accompany involuntary memories and dreams (Asma, 2017: 146).

With language available as a generative mechanism with which to safely play with concepts, memories and ideas, and a tendency to engage in fantasy because of the rewards it brings (see Ch. 1, Ch. 4) as well as a social need to gossip, it seems that there is every reason to think that we would begin telling stories just as soon as we had the lexical resources to do so. Telling stories would allow us to manipulate our social environment, tightening bonds with those important to us, but also severing the bonds with any rivals we have by triggering counterfactual images and events in the minds of those we talk to as we manipulate conspecifics through lying (thus developing the kind of social-exchange/cheater-deception capacity Carruthers, 2005 discusses; see Chapter 2). It would also allow us to transmit information of various kinds – about the natural world (which plants were safe to eat, where to find water etc.), about our culture (religious and moral stories, instructional stories on the purpose and use of tools etc.), and much more besides.

The adaptive benefits of storytelling has received a great deal of interest in recent years in the field of 'Literary Darwinism'. More well-known accounts include those from Joseph Carroll (2004), Denis Dutton (2009) and Jonathan Gottschall (2012). There are many apparent benefits to *fantastic* storytelling in particular, however. Consider again Asma's suggestion that its roots might, in part, be in the ritualised aspects of language. The earliest stories could provide an easily memorable account of, or guide to, good parenting, tribal history and hierarchy, crucial survival information about our immediate environment and so on. In turn, memorising stories that have cultural significance is likely to drive the further development of working memory. So, a tradition of oral storytelling early in our species would reinforce selective pressures on working memory provided those stories were useful in the way described above. Those able to remember stories (or, in precursor hominids, dance- or music- based

narratives) and pass on the useful social or practical information would be more likely to reproduce, thus improving working memory capacity in the species. This would not only enhance our problem-solving skills more generally, but would also further our capacity to produce and process more complex linguistic structures, thus develop richer narratives.

We saw in Chapter 4 that language acquisition itself improves when it involves the fantastic, and at their very core fantastic stories are simply more entertaining. This is why there is a plethora of literature about vampires, shape-shifters, giants, zombies etc. in the best-seller lists on an annual basis; it is also why the most popular show on television right now (when taking into account illegal streams and downloads) is *Game of Thrones*. These works of popular fiction don't tend to push any creative boundaries, they are for the most part quite formulaic, but they convey central ideas about politics, society and morality in a way that engages the imagination – such stories hold our attention (perhaps because of the additional imaginative effort required). We are seemingly naturally drawn to fiction as entertainment, but also capable of extracting something useful from it at the same time. Thus fantastic stories are excellent ways of codifying important social and practical information in order to convey it to our conspecifics. As we saw in Chapter 1, Kant and Schopenhauer see works of exemplary creativity as instructive because they establish some new standard or rule for production of future works. But the real genius of the practice of storytelling is that, by establishing and repeating a formula, we can create memorable works capable of codifying a potentially infinite amount of useful social and practical information to disseminate. The most *useful* stories are probably not the most highly creative or structurally complex, yet this observation about the practice of storytelling gives a clearer guide to the intuition of those defending the Language Hypothesis (e.g. Pinker, 1994; see Ch. 2, §1.1, Mellars, 2002) that language helps us quickly 'ramp up' cultural accretions.

Being a good fantastic storyteller could function as an indicator of protean cognition (as well as 'emotional intelligence'). As a storyteller, you minimally demonstrate the ability to recite from memory, but as a *good* storyteller you need to still be able to *surprise*, since (as Walton observed; see Ch. 1) this is what brings with it enjoyment. Being able to conjure up surprising and entertaining stories, even by simply improvising around an established theme, would no doubt make us more attractive to potential mates, whilst simultaneously signalling the enhanced creative and linguistic capacities that lie beneath the fiction. And if stories are particularly good information transmitters, then this is likely to aid in parenting too, making

your offspring more likely to survive as they are better prepared to deal with the world.[64] This kind of storytelling to children might even be accompanied by, or it might otherwise inspire, episodes of pretend play, reinforcing any practical skills being discussed in the narrative. If this is the case, then storytelling might explain why pretend play appears to be an epiphenomenon of some other selected-for capability that contributes to creativity, as described by the 'epiphenomenal hypothesis' in Lillard et al. (2012; see Chapter 2). As such, the *Storytelling Hypothesis* proposed here seems to better account for the empirical findings surveyed in Lillard et al than Picciuto and Carruthers' Pretend Play Hypothesis. Storytelling is itself visible to evolution and thus something which can, and would, be selected for.[65]

3. How did storytelling drive human creativity?

The considerations above explain how and why storytelling would develop at the level of the individual, but does not fully discuss how those individual creative acts would take on significance at the level of the group. It is this issue I deal with now.

If stories share information, then they can also promote culture within a group, leading to an enhanced sense of group identity. For instance, a story with a *moral* message (a person is punished for acting in some specific way) spreads a moral principle; if the story manipulates the group emotionally in the right ways, the moral principle will take root, and so one aspect of that culture spreads. If a story conveys *practical* information (a person successfully hunted the bear thus), this shares *other people's* knowledge and experience, which in turn could lead to more innovation based upon these disseminated ideas; this, in turn, drives creativity in the technological domain. The entire collection of social and behavioural norms, and the technologies they employ, are precisely what a given culture is. And as I noted above (see footnote 55), natural languages are themselves an incredibly significant kind of cultural norm that signifies group membership – both in terms of belonging to a specific group and to a subset within a group. The emergence of fantastic storytelling in linguistic form, then, would mark a radical point in the development of cultures, making them far richer than ever before. The

[64] We could invoke the controversial evolutionary notion of group selection here: a group with more effective stories would be more likely to survive conflict, rapid changes to ecological niches etc.
[65] Stephen Davies offers a pretty comprehensive overview and critique of the many ways in which storytelling (following Joseph Carroll, he uses the term 'literature' to include the oral tradition of storytelling) is thought to be adaptively advantageous: in terms of mate attraction, enhancing social standing, education and acculturation, and as an instructive thought experiment (Davies, 2012: 165-172).

connection between storytelling and the dissemination of cultural and practical information, and the promotion of social bonding, is probably why storytelling is ubiquitous across human populations and the primary way in which storytelling drives creativity. But it isn't just the ubiquity of stories and storytelling that indicate the importance of this practice, it is also the link between storytelling and other creative cultural practices. As we saw in §1, d'Huy (2016) identifies a number of story types that can not only have their origins traced back tens of thousands of years but, he claims, can also be (tentatively) linked to another creative practice – cave painting.

It was perhaps cave painting that stands out most amongst the numerous cultural and technological innovations that appeared around 40kya and set up the puzzle of the Creative Explosion. Their appearance in the archaeological record is somewhat jarring – they seemingly appear *apropos* of nothing, with no clear precursors, and little to no gradual development.[66] Of course, the practice must pre-date what is found in the caves – there was, most likely, a practice of creating 'mobile art' on rocks that would become exposed to the elements, or perhaps figures were drawn in the mud or sand and consequently not preserved. But this simply makes the practice of representational drawing *older still*, and places the possibility of supporting the claim out of reach. The interesting question that follows from this, I therefore suggest, is not *when did we begin producing representational art?* It is, instead, *what prompted us to begin drawing in the first place?* In the case of cave art, the question is deeper still: what prompted us to make difficult and dangerous journeys into uninhabited caves to draw images on walls?

My suggestion is the practice of storytelling. I outlined above and in earlier chapters the ways in which, as linguistic creatures with a predisposition to share information, emotions and attitudes, we are predisposed toward telling stories. I have also argued that our fantasies (personal and impersonal) would make for naturally enjoyable things to share, and that doing so seems to confer various evolutionary advantages. But stories themselves, when shared amongst enough people, can take on a cultural life of their own. The fact that certain types of story have persisted across thousands of years, and thousands of miles of human migration (d'Huy, 2016;

[66] It might be tempting to see hand stencils as a precursor from which the more spectacular drawings of bison, hybrid figures etc. developed, but I think this would be too simplistic an assumption. It is true that the earliest (on some accounts, at least) cave paintings were hand stencils e.g. those found at the Maros-Pangkep caves in South Sulawesi, Indonesia (Aubert et al., 2014), but that practice continued within our species up until some 9kya in the Cueva de las Manos in Santa Cruz, Argentina (UNESCO, 1999). Moreover, in the same Indonesian caves we find a drawing of a pig that is a 'minimum' of 35,400 years old, placing it within 5,000 years of the hand stencils found there (Aubert et al., 2014).

see above), demonstrates their cultural significance. A story can become venerated: the most obvious kind of example would be religious stories, e.g. those of Jesus' miracles, but consider also the founding myths upon which many cultures and nations are built. The Ancient Greeks seemingly had founding myths for every major city – the story of Cadmus of Thebes, the conflict between Athena and Poseidon for Athens etc. Plato, in *The Republic*, recognises the importance of origin stories when he suggests that his republic be built upon a *noble lie*; even hypothetical cities begin with stories for the Ancient Greeks! Of course, for Plato, the noble lie plays a social function – it exists to justify the current state of affairs and keep the three tiers of his ideal city working in harmony. Justifying (or, at least, explaining) the status quo is perhaps the function of all origin myths (Eliade, 1981). Regardless, the stories we tell play a central role in delineating one cultural group from another, even today. And it is perhaps unsurprising, then, that many of these stories move beyond oral telling and retelling into other modes of presentation. The most obvious shift in presentation is from oral to written: writing is a relatively recent invention, perhaps as young as 5,000 years old. But this is still a linguistic mode of presentation. Another obvious way to present stories is through visual art. We even represent the stories of *other cultures* visually; for example, Fig. 4 shows the story of Callisto represented by French painter François Boucher, perhaps some 17,000 years after the story had its first telling.

Fig 4. *Jupiter and Callisto*, François Boucher, 1769

The practice of capturing elements of stories visually, like storytelling itself, may be much older than we originally thought. However, we should be cautious in comparing the storytelling of our earliest ancestors to that even of the Ancient Greeks. By the time of Hesiod, human beings had become literate. As such, we'd developed a system which is capable of telling stories of a fundamentally different nature. Oral storytelling differs from its literary counterpart in that oral storytelling is done face-to-face, making it far easier to know what common ground is shared with the audience. Written stories can travel much further, and so must be embellished with additional detail, leaving less room for ambiguity. As such, stories will certainly have changed in their details as they moved from the oral tradition to the written one. However, following d'Huy's phylogenetic analysis of the evolution of stories, their more ancient origins still give us cause to re-examine the palaeoanthropological record. Specifically, d'Huy suggests (and I agree, with the forewarning just mentioned), we should reinterpret the cave paintings we find in light of the stories that were already being told at that time: is there any evidence that suggests a connection between these ancient myths and the cave art we have found?

d'Huy makes a number of suggestions. The Polyphemus myth, for instance, is thought to be connected to a belief shared by many ancient cultures that there is some 'master of animals' who keeps them in a cave, requiring an intermediary to free them so they can be hunted. This notion has led some to interpret the production of cave art as part of a hunting magic ritual (see, for example, Lewis-Williams, 2002: 47-8 for a discussion of this view). Some accounts of this belief system also involve the suggestion that animals emerge from an underworld (a belief that plays heavily into Lewis-Williams' interpretation of rock art from many cultures across the world as a kind of religious art associated with Shamanic cultures and practices). Under these interpretations of the Polyphemus myth, d'Huy suggests that we can reinterpret a well-known figure from a panel at Trois-Frères (shown in Fig. 5 below):

> At the Cave of the Trois-Frères (or "three brothers") in the French Pyrenees, frequented during the upper Paleolithic, a panel shows a small creature with the head of a bison and the body of a human, which seems to be holding a short bow. Lost in the middle of a herd of bison, another animal, similar to a bison, turns its head toward the human hybrid, and the two creatures exchange gazes. On examination, the left rear thigh of the "bison" is not the thigh of a ruminant; its proportions are much smaller, like a human thigh – so much so that archaeologist André Leroi-Gourhan took it for a

human silhouette. Moreover, the artist has meticulously drawn the anus and the vulvar orifice. These two elements can be compared with some Amerindian versions of the Polyphemus story, where the man hides himself in the animal by entering its anus (d'Huy, 2016: 63).

Fig. 5 Engraving from the right hand wall of the Sanctuary in Les Trois Frères (from Sieveking, 1979)

Certainly many aspects of the Polyphemus myth are present here – most obviously the large, stampeding herd of wild animals, a hybrid figure who might represent a monster, and an animal with carefully drawn orifices who appears to be fleeing that monster. This cave art dates back approximately 15,000 years, fitting with the other evidence presented by Tehrani and d'Huy (2016) suggesting that the Polyphemus story is at least as old (clearly, if this is a depiction of that story then the myth predates the artwork; Tehrani and d'Huy suggest the myth may be some 3,000 years older than this cave art; see §1 above).

Consider also the example of the Cosmic Hunt, involving a hunter and at least one animal, with one or more of these parties eventually being placed in the sky as a constellation (Ursa Major). d'Huy connects this story to the 'shaft scene' found at Lascaux, France (Fig. 6 below). On d'Huy's interpretation:

> The intriguing lone black spot near the bison's withers would thus be a star. The fixedness of the animal, which does not give the impression of actually charging, would make sense if it represented a constellation rather than an action. Moreover, according to some experts, the man might be upright and the bison ascending, which echoes the rise into the sky of the protomythic animal. Finally, the black stains on the ground under the bison suggest the bloodstained autumnal leaves of the hunted animal (*ibid.*)

Fig 6 The 'shaft scene' at Lascaux, France

Taking a little more seriously d'Huy's suggestion that the 'lone black spot' could be a star, if this image connects to the story of the Cosmic Hunt, which in turn connects with the constellation Ursa Major, then we might wonder if there are any elements of this drawing that connect a little more directly with the constellation. Although it obviously can't be mapped directly onto the image from the cave, there are some basic perceptual similarities between the constellation and the image. If the constellation is thought to resemble a bear, then clearly it could just as easily be thought to resemble another quadruped with a tail, like a bison. Perhaps more interestingly is the set of 3 pairs of dots to the left of the bird-man figure: Ursa Major characteristically has three pairs of stars, located at the feet of the great bear. Perhaps these dots are a nod to that feature of the constellation.

Like language itself, (oral) stories don't fossilize, and thus it is impossible to say for certain that some particular piece of cave art is directly connected to a story prevalent within the culture that produced that art. However, the existence of those artworks must have *some*

explanation, and an entrenched culture of storytelling would provide a viable candidate. We have continued to represent stories visually, just as Boucher did with the story of Callisto, such is the inspirational power of these tales, so why shouldn't the earliest versions of these stories have inspired the artists of the Upper Palaeolithic? To connect these artworks to extant myths we don't require an exact match between any familiar version of the tale and the cave art – these stories will have evolved just as much as our cultures on the whole have done since these artworks were created. The fact that some key 'mythemes' can be connected with a degree of convincingness to art that dates back tens of thousands of years should itself be a remarkable enough a coincidence to make us consider this thesis more seriously, particularly given that the details of these stories will have changed over time, as they moved to new regions of the globe, and as they became literary tales rather than oral ones. The further facts that human migration patterns (evidenced through mitochondrial DNA analysis and climate data) point to the conclusion that these stories moved around the world with their tellers should make us yet more sympathetic to the idea that stories provided the inspiration for at least some cave art.

If this is the case, stories might be considered a key driver of the most remarkable kind of human creativity present at the point of the Creative Explosion. Stories might have provided the impetus for the invention of representational drawing.[67] As suggested previously, an advantage of this view is that if there really is a gap between the emergence of creative human behaviours and the emergence of the cognitive basis for language then this can be explained by the time it would take to get into place the *cultural* basis required for storytelling: a wide and varied lexicon to allow for some common points of reference – characters, plots, and so on – and for lexical items denoting (shared) 'fantastical' imagery. As the lexicon for each culture expanded, eventually the capacity for narratives would be more readily available, perhaps beginning with very simple notions, expanded upon over time, handed down from parents to children. They would likely initially involve the people, things or scenes (including constellations as with the Callisto story) most readily available, and as populations expanded, the significance of these stories might change and become elaborated into origin stories for local cultures. But the development of this lexicon would, in turn, have other preconditions such as a particular level of population growth resulting in a shift to verbal grooming and the gradual development of material culture. But note here that the *main cultural driver of creativity is still the development of externalized language*.

[67] Though, no doubt, representational *markings* pre-date the practice of drawing animals and animal-human hybrids e.g. the notched ochre at the Blombos caves (see Fig. 7 below) might have represented a quantity of goods.

The second key advantage of this view, however, is that it can sensibly explain the most difficult item on the list of innovations at the time of the Creative Explosion – art. Technological innovations in hunting and food storage might have responded to changing circumstances (different prey, climate change etc.), but why do we suddenly see the appearance of representational art *apropos* of nothing? The answer *must* be that it doesn't appear suddenly, without any reason, but instead that it appears as part of a much broader culture of representation – perhaps beginning with dance and music, later taking a linguistic form, and eventually inspiring the creation of representational drawings (not initially in caves). As this wider practice of storytelling, and the fledgling accompanying practice of illustration, took on greater socio-cultural significance, there was an increased desire (or need) to produce more spectacular, preserved artworks depicting the core ideas of Upper Palaeolithic culture. This, I suggest, gives us a better explanation than that offered by the Pretend Play Hypothesis, and possibly even explains the empirical evidence suggesting that pretend play is actually an epiphenomenon of some other practice: it is an epiphenomenon of a tendency to represent fantasies.

Concluding Remarks

We have seen that stories familiar to us today have much more ancient roots than we could ever have thought. I've independently argued that there are reasons to think that storytelling is something we're naturally inclined to do and that language, once in place, would be utilised by the imagination for this purpose. The benefits of doing so are tremendous: stories promote social bonding by revealing and sharing our attitudes and feelings, and they transmit crucial cultural and practical information to our conspecifics. Casting early human beings as storytellers also provides us with a solution to the puzzle of the Creative Explosion: it fills in the 'gap' with a story about our cultural development, specifically the development of the cultural element of human language (i.e. natural language). Once in place, language can be co-opted by our tendency to fantasise, allowing us to externalise our fantastic ideas. And this particular cultural development helps explain the most intriguing part of the puzzle – the sudden emergence of representational art.

Chapter 6:

TESTING THE THESIS

What empirical support is there for this thesis' central claims?

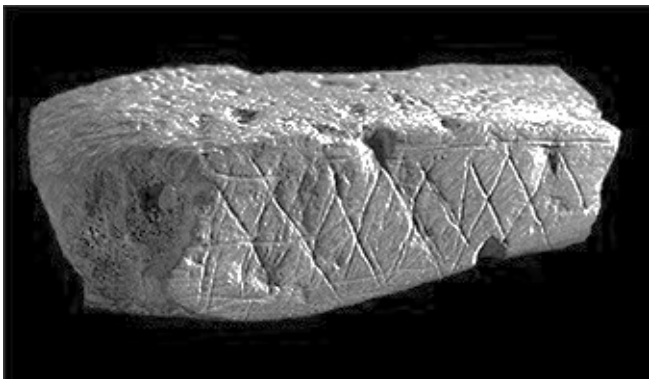
Introduction

This thesis has argued that the puzzle of the Creative Explosion can be solved by telling a story about the co-evolution of fantasy, language and storytelling. Along the way, however, we have raised some issues that were left unresolved, such as how long the gap is between the emergence of our species and the emergence of creative behaviour. I address that issue here. In addition, I outline further evidence that I believe supports the thesis I'm proposing, and I also propose an empirical route to further test one of my central claims.

§1 The Problem of the Narrowing Gap

Probably the first outstanding issue to address is the suggestion that the gap between the emergence of our species and the emergence of distinctively human creative behaviours appears to be narrowing. Specifically, we might wonder whether discoveries like those at the Blombos caves in South Africa (Henshilwood et al., 2009) pose any kind of problem for this thesis. At the Blombos caves we (arguably) see representational markings, with some suggesting they possibly denoting quantity (see Fig. 7). The comparison seems to be with making tally marks as we do today, without any suggestion that this is a full numerical system. Would the use of such markings suggest that the timeline for getting fantasy, language and storytelling into place is somehow problematic? I'm not certain that it is.

Fig. 7 Blombos ochre



The first reason is that there is little evidence to suggest the practice was widespread at this time, and evolution functions in such a way that the same traits can appear at different points in a species' lineage yet not be selected for upon their first appearance (see the Introduction to this thesis). It might be that some population groups began to demonstrate creative behaviours such as making symbolic markings earlier than others, without the biological or cultural basis explaining that innovation being preserved. If fantasy has the important role that I have suggested that it does, then differences in creative practice between cultures may have been effected by *what different population groups fantasised about*. Förster et al. (2009) conducted a study of how fantasising about love and about sex might impact upon our problem-solving skills, and their findings suggest that fantasising about love encourages a holistic thinking style (because it focuses on long term) whereas fantasizing about sex encourages a more analytic thinking style (focused on details), with the former being more conducive to creative thinking. Perhaps our ancestors who show the earliest signs of creative behaviour were subject to social pressures tending them toward monogamous relationships, encouraging them to fantasise about loving, long-term partnerships rather than sex.

Secondly, even if the practice of tally-marking was more widespread than we currently have evidence for, it could just as easily be a feature of a quasi-literate point in our development, where the lexicon is still developing (perhaps having built some labels for quantities at this point), and where our ancestors are starting to flex their relatively new linguistic capacities to begin to describe and refer to the world in new ways. Interestingly, we see a similar practice of making tally marks in the Czech Republic around 30-40kya on the famous 'wolf bone' (Flegg, 2002). If the practice persisted during this period, then this could suggest that it migrated out of Africa just as I have suggested the practice of storytelling did. If anything, the more evidence we have for the migration of relatively sophisticated cultural practices the more plausible the claims of this thesis become.

Offering further evidence for the last of these claims, it is perhaps worth noting that it is not only the practice of keeping tally that is shared between the human beings responsible for the discoveries at the Blombos caves and the behaviour of their European ancestors. The tally markings found in South Africa were made in blocks of red ochre, which is a material commonly found at various locations across the globe. This same material was used in ritual burial in Wales around 33kya (Richards and Trinkaus, 2009) and creating pigment for the cave paintings found in Europe at the point of the Creative Explosion (Curtis, 2007). Whilst it is

unsurprising to see a commonly available material utilised for multiple purposes – for instance, wood can be used to build homes, create weapons, and so on – the selection of red (and other-coloured) ochre is interesting because it is seemingly chosen for its aesthetic, or at least decorative, qualities. This, in itself, is evidence of a burgeoning material culture, and it is yet another one that arguably seems to have possibly followed human migration patterns. If our aesthetic tendencies are hardwired, as Dutton (2009) and others have suggested, then this might be taken as evidence that they had already begun getting into place by this point.

A related problem might be the fact that the evidence suggests that culture developed at different rates, in different ways, in different places. For example, cave art appears only in certain areas, and appears to be absent in others. Similarly, there are regional variations in the style of tool making. Does this pose a problem for the claim that storytelling was an influential and universal practice early in our evolutionary lineage? Again, I think not. Storytelling doesn't *necessarily* manifest itself in visual representation, as I noted in Chapter 5. Cave painting is one way of expressing a narrative. But live performance (including music and dance) is another, and this latter kind of representation wouldn't fossilize (*other than as a continued tradition*, which it clearly has given its persistence to this day; of course, we can't pinpoint where or when this tradition began for the reasons just given). Of course, despite the suggestion that we may have engaged in music and dance (even prior to language), we don't see any clear evidence of musical instrument use until around 32kya (Klein and Edgar, 2002). But this doesn't mean that musical instruments weren't in use at an earlier point – some instruments made of materials that would not be preserved could possibly have been in use (such as animal hides stretched over wood to form a kind of drum), and the body offers every normally-developing member of the species an instrument for song and dance regardless of any technological innovations we might come up with to supplement this.[68]

A final point to note is that the most recent evidence suggests that there may, in fact, be a much bigger gap between the emergence of our species and behavioural modernity. Hublin et al. (2017) have recently written of the discovery of sapient remains in Morocco which date to around 315,000 years ago. If these remains really do belong to biologically modern human beings, there is an even larger gap than we have assumed. One of the (probably insoluble)

[68] It would make sense for dance and song to be co-opted by storytelling, once that practice emerges, by becoming part of dramatic performances. The many accounts of Shamanism involve multi-media performances that include stories, dance, song and body decoration.

problems in addressing questions about our evolutionary history is the fact that it is pretty much impossible to know when we reached biological modernity. We can look to anatomical features like skull shape and size, and even see whether or not our brain size was the same based upon imprints on the inside of skulls. However, proponents of the Chomskyan view of the evolution of language suggest that the final adaptations for grammar were not the result of increased brain size, but of a mutation affecting the internal i.e. neurological, organisation of the brain. As such, even if the Moroccan hominid shared all other biological features with us, we can't be sure they had a relevantly similar neurological make-up. To address that question, our best evidence is still the direct evidence of behavioural modernity – that of cultural innovation. My thesis attempts to make sense of the evidence we have available, and to solve the puzzle of the Creative Explosion by drawing inferences from a range of evidence as to what else would need to get into place to best explain our creative behaviours. Anything like a definitive answer is almost certainly impossible, so we can only offer hypotheses that best cohere with the evidence. It is my contention that the evidence points to human beings as biologically inclined toward storytelling, with such stories providing and inspiring the material culture which explains the emergence of other creative practices. I turn again to this issue now.

§2 Humans as Storytellers

I have argued in previous chapters that fantasy provides both the motivation and content for storytelling, and that evidence from our use of language suggests that we are naturally inclined to want to share certain fantasies we think might be of interest to our conspecifics. The grammatical system that emerged at some point in our evolution, it turns out, offers a computationally simple way of generating an infinite number of ways of communicating those fantasies. However, it isn't just that we like to *describe* (real and imagined) worlds in narratives, it seems that we also *perceive* the world in narratives.

Our perception system is sometimes referred to as a *hypersensitive agency detection device* (Gray and Wegner, 2010) because it has evolved to seek out agency, even when perceptual information is incomplete. Failing to spot a potential predator is so costly, in evolutionary terms, that mistaking a non-agent for an agent is a small price to pay by comparison – ancestral members of our species who failed to attribute the rustling in the bushes to a leopard would be less likely to reproduce than those who did; and if a little paranoia about those bushes meant that predator-avoidance behaviour was triggered incorrectly at times, then so be it. As a result

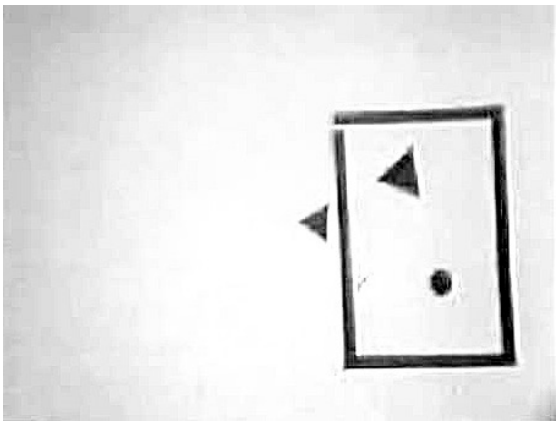
of this hypersensitivity, we are subject to phenomena like pareidolia, where we see faces in things like clouds, buildings, cars etc. (see Fig. 7) when clearly there are none, and we hear threats in normal background noises (such as when we're alone in the house at night). The human brain has evolved to become a sophisticated pattern-recognition computer, seeking to identify causes and effects at every available opportunity, and seeing things in terms of agency is part of just such a system.

Fig. 8 The 'sneaky house'

Consider, for example, the phenomenon observed by Heider and Simmel (1944) in which participants in their experiment described the motion of geometric shapes in a video (see Fig. 8 below) in terms of one shape *chasing* another one, or one *running away from* the other: in other words, as a video which involves agents. What this suggests is that we are hard-wired to seek *explanations of* natural phenomena in ways that (often falsely) incorporate stories about agency. So, not only are we predisposed to telling stories, we are predisposed toward telling stories of a peculiar nature: ones where seemingly *anything whatsoever* can be cast as an agent in order to explain the world around us.[69]

[69] Bruner (1986) puts this in terms of *imposing meaning upon the world*.

Fig. 9 Still from Heider & Simmel animation



This has led some to the view that cave painting is part of a wider shamanic culture involving an attempt to explain (in religious terms) the natural world (e.g. Whitley, 2009). It may well be, therefore, that the stories which inspired the cave art we see were (quasi-) religious in nature. Even the story of Callisto we discussed in Chapter 5 can be seen as an attempt to explain how the night sky took its particular shape, casting powerful supernatural agents as the explanation. This ancient story even involves transforming a human agent into a non-agent (a star) which is still seen as identical with that agent i.e. it is a transformation through which personal identity is retained. This ability to track personal identity through such impossible transformations is something which even very young children have a surprising capacity for, as noted by Chomsky (see McGilvray, 1999: 73, for an account of Chomsky on this issue). Chomsky notes that his young grandchild had no problem tracking the identity of a donkey who is transformed into a rock, and later back into a donkey, as part of a story he read (see also Kahneman et al., 1992).[70] A capacity to see non-agents as agents (or persons) yields a fertile ground for fantastic stories, and could even explain our tendency to personify, and even hybridise, animals – something expressed in both early stories and early art. I return to the connection between these now to discuss a further challenge to this thesis.

§3 Art without Language?

Following d'Huy (2016), I have suggested that the cave paintings we see at the point of the Creative Explosion are visual expressions of already-established myths. And it isn't just d'Huy who has noticed similarities between the depictions in the caves and well-known myths

[70] Chomsky takes this to be evidence for the innateness of the concept PERSON.

and legends. Gregory Curtis (2007) too sees the connection when he is struck by the 'Venus and Sorcerer' image - what appears to be a depiction of a woman (or the female genitalia) with the head of a bison (Fig. 9 below). What strikes Curtis is the immediate connection he makes with the myth of Zeus raping Europa whilst in the form of the bull, conceiving Minos in the process. Although he is cautioned against making that connection by the first archaeologist to fully document the painting, Yanik Le Guillou, Curtis can't help himself:

> [W]hen I let my mind go, it goes straight to the minotaur, although I know that Yanik's warning is prudent. I'm sure I should heed it more than I will in the following sentences. European culture began somewhere. Why not right here, where someone painted a woman and a bison-man on a stone pendant 32,000 years ago? That coupling of human and beast is embedded so deeply in our psyche that it has endured in myth and spectacle ever since (Curtis, 2007: 215).

Fig. 10 The Venus and Sorcerer or Man-Bison, Chauvet (Clottes, 2011)

But note here that Curtis reverses the priority I have suggested of cave paintings and myths – for Curtis, the myths *begin* with the cave paintings, whereas I have argued that the paintings represent (elements of) the myths. So, is it possible that a culture of cave painting

could have developed in the absence of a corresponding culture of storytelling? One person who thinks this is certainly possible is Nicholas Humphrey (1998). Humphrey's position is, in fact, much stronger than this – he suggests that cave paintings could occur *in the absence of language*.

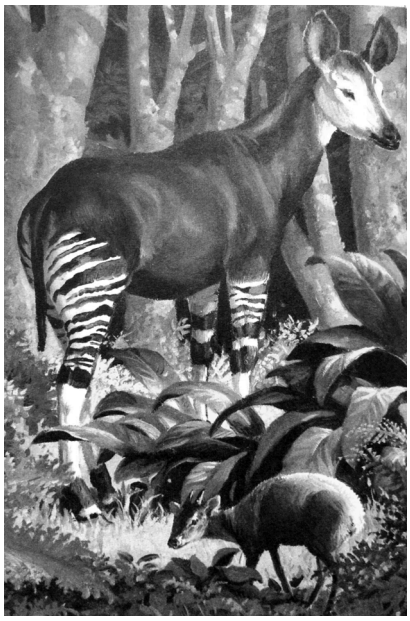
As mentioned in Chapter 2, there may be reason to think that imaginative capacities develop in tandem with linguistic ones. This evidence comes from examining the connection between language disorders and imaginative disorders. Note that this is a different issue to that addressed in Chapter 2 when discussing the pre-linguistic imagination of non-human animals and precursor *hominids* – I have since argued in Chapter 3 that the emergence of language within our species brings with it a shift in cognitive style, so examining language impairments should reveal something about the way that the human imagination, distinctive for its ability to employ (and, I suggest, its reliance upon) language in its service, is impacted when things go wrong with the language faculty. Evidence from pathologies in language and the imagination demonstrate striking correlations. Such cases include autism, aphasia and (contrary to common belief) Williams' syndrome. I address the specific challenge from Humphrey immediately below, and go on to address other pathologies in the sections which follow.

Humphrey's challenge to this thesis comes from his discussion of the case of Nadia, an autistic savant who from an early age was able to produce strikingly realistic drawings whilst at the same time showing severe language deficits (Humphrey, 1998, Selfe, 2011). Autism is defined by a trio of deficits known as Wing's triad (Wing and Gould, 1979) with impairments to *imagination* (by showing a tendency toward repetitive or obsessional activities and a lack of spontaneous pretend play), *social competence* (an inability to share and direct attention, to collaborate on shared intentions, to imitate, to recognise affect, and to understand and interpret the mental states of others) and *communication* (delayed or absent development of speech). Currie and Ravenscroft (2002) even suggest that, on the whole, autism is a disorder of the *recreative imagination*. This is the capacity that underpins perspective-shifting – 'seeing, thinking about, and responding to the world as the other sees, thinks about, and responds to it' (Currie and Ravenscroft, 2002: 8-9).

Humphrey presents the case of Nadia to challenge the orthodox view that, by the time we see cave art emerge, language must have been in place, since Nadia is seemingly capable of producing similar drawings in the absence of language. Whilst most of her drawings clearly

replicate images Nadia had seen, some are sometimes cited as original pieces of work. For instance, that shown in Fig. 10 has been suggested to be one that Nadia had composed by combining different animals to create a hybrid figure (Humphrey, 1998). If Humphrey is correct that Nadia is able to produce original drawings (and not merely copy images or draw from memory) then, rather than cave art being the product of a relatively rich linguistic tradition of storytelling as I suggest, cave art might have been produced in the absence of language (or, at least, in the near absence of it).[71] However, there is reason to doubt Humphrey's analysis based on the evidence from Nadia's case: Lorna Selfe believes that the image in question is in fact a depiction of an okapi (Selfe, 2011). Selfe notes that Nadia was fascinated by the Ladybird series of books, and in one such book (Leigh-Pemberton, 1969) an okapi does feature (Fig. 11). As such, it looks like Nadia's 'hybrid figure' does not present any case more puzzling than the other images Nadia produced.

Fig. 11. ***Nadia's okapi/hybrid*** **(Selfe, 2011)** **Fig. 12** ***Ladybird's okapi*** **(Leigh-Pemberton, 1969)**



Happé and Vital (2010) suggest that savant skills in a variety of domains (e.g. mathematical calculation, perfect-perspective drawing, absolute pitch, instant reproduction of newly heard music etc.) may all be explained by an important difference in *cognitive style*. They

[71] This approach, of course, ignores all of the other evidence from the time of the Creative Explosion that points to the existence of language at that time (see Fig. 1). There is also the separate issue of explaining (without recourse to anything linguistic in nature) why someone would take the dangerous trip into the cave to begin with, taking with them the materials required to create the cave paintings and selected 'offerings', and why people returned for generations alongside their children i.e. in the absence of some kind of cultural explanation such as a rich tradition of storytelling.

see Wing's Triad as 'fractionable' i.e. as *potentially dissociable* aspects of autism, each bearing a different relation to the appearance of special skills in autistic people. Typically-developing individuals process incoming information in such a way as to preserve the 'gist' at the expense of the detail, whereas the reverse is true for autistic individuals (sometimes termed 'weak coherence' or 'enhanced perceptual functioning'). On their view, 'attention to detail and tendency towards exemplar-based memory… is the starting engine for talent in the savant domains' (Happé and Vital, 2010: 33).

Savant skills therefore don't demonstrate any kind of exception to the rule that autistic individuals demonstrate deficits in imagination. They are, instead, a reflection of a cognitive style that focuses inappropriately on minute details at the expense of the wider 'meaning'. These deficits affect both inventiveness and the capacity for pretence. Autistic children struggle with tasks measuring response diversity, for example, coming up with multiple uses for a series of standard objects (Ward, 1968) as well as for pretence.

Currie and Ravenscroft's view on the latter deficit seems to fit with those of Happé and Vital. Currie and Ravenscroft point out that autistic children *can* engage in 'instructed' pretence, and answer simple questions about pretence quite well. They also cite the results of one study (Leevers and Harris, 1998) which suggest that their visual imaginative capacities are in line with typically-developing children in tasks such as completing incomplete drawings.[72] They note that in the Leevers and Harris study that this task is cognitively less demanding for autistic children than pretend play because they are perhaps better equipped to set aside aspects of their visual environment and substitute them with imagined alternatives than they are with alternative propositional states – a matter of difficulty *integrating* these states into the current cognitive set.

Currie and Ravenscroft cite further research from Harris and Leevers (Harris and Leevers, 2000) in favour of the notion that autistic individuals may favour visual or imagistic thought. If this is correct, it seems to me that language deficits might be heavily implicated here: the role of language in thought is precisely to give us a mechanism for forming truth-functional propositional thoughts that can draw on conceptual content across domains (see Chapter 3). As the issue isn't a problem of forming such propositional thoughts 'full stop'

[72] As noted in Chapter 2, pre-cursor *hominids* also demonstrate clear strengths in visual imagination in the absence of language.

(which is why this suggestion doesn't predict an *absence* of language), it is *integrating* them with other thoughts of that nature, this too seems like something language can help with: despite their richness in content, I have suggested that linguistically encoded representations might present a lighter cognitive processing load than visually encoded ones, and by all accounts autistic people have impaired linguistic capacities (in production, comprehension and in acquisition). Perhaps this difference in cognitive style explains the difficulties they face with integration. Moreover, impairments in the linguistic domain may simply push autistic individuals toward a more visual cognitive style, strengthening neural connections in this domain while weakening them in the linguistic one. This evidence therefore seems to support some of the central claims of this thesis: that the emergence of language brings with it a shift in cognitive style, and that language can be (and is) co-opted by the imagination in such a way as to support pretend play (via fantasy).

There is also an explanatory story of co-development to be told here to support this suggestion: the co-development of language and working memory in human beings. Courtney et al. (1998) suggest that analysis of the difference in functional neuro-anatomy between monkeys and humans points to a *distinct and important* shift in cognitive style. Neural substrates concerned with visual memory are 'displaced' in human beings, moving away from the relevant cortexes which employ them (thus making information processing in that domain cognitively more demanding). The reason, they suggest, is the emergence of language, whose associated cortical areas appear to take precedence. So, it would seem, human working memory was 'reformatted' by the emergence of language, supporting the claim in this thesis that (certainly later in human evolution) language offers a cognitively lighter mode of processing, making it preferable as a cognitive style and prompting a shift away from a visuo-spatial mode of thought.

§4 Imagination and Other Pathologies

Having (hopefully successfully) responded to the challenge that Nadia's case presents, it is worth turning to evidence from other pathological cases to examine how language impairments might affect our imaginative capacities. If there is a strong correlation, then this suggests that my claim that imagination co-opted language in its service, and later came to depend heavily upon it, is credible.

§4.1 Aphasia

Let us first examine acquired aphasia. Evidence suggests that aphasics have demonstrated impairments in a range of musical endeavours in which they were formerly competent, and in which the imagination might be taken to be heavily implicated. Musical examples include the perception of melodies e.g. detecting errors in familiar pieces of music, and in determining whether pairs of melodies were the same or different where pitch and/or contour were altered. Both of these capacities seem to involve simultaneously holding representations of the music as it is currently perceived to be structured and as we otherwise believe it to be structured, which we have suggested in Chapter 1 is one function of the imagination. The results of studies of the latter kind of example, according to Peretz (1990), suggest that musical processing is *hierarchical*, much like linguistic processing – the individual units can only be processed once the overall framework is established.

In one case of Wernicke's aphasia, that of composer Maurice Ravel, the impairment was that he could not translate musical representation into other representational forms. As Winner and von Karolyi (1998) explain:

> [H]e could not translate musical notation into motor form by playing, and he could not translate his auditory imagery of a piece of music into a visual form (by notating it) or into a motor form (by playing by heart). Yet he could use each of these modalities separately (Winner and von Karolyi, 1998: 380).

Because the cause of the deficit in musical processing seemingly *is* the language impairment, processing for music and for language must either share some neural substrates or share contiguous neural substrates. This musical impairment appears to be a similar problem of integration as that described by Currie and Ravenscroft above relating to autism, since the aphasic patients could not integrate thoughts about their current perceptual states with those about the structural features of the music. *Graphic* representation (drawing), by contrast, has a much weaker association with aphasia, with the ability to draw remaining uncompromised even in cases of significant aphasia, which is to be expected if the visuo-spatial imagination long predates the linguistic imagination (as argued in Chapter 2). If the shared neural substrates underpinning language and music processing explain the difficulties aphasics face, the fact that autistic individuals struggle with propositional rather than 'perceptual' integration, yet can

display savant skills for reproducing newly heard music, seems again to only be explicable in terms of a cognitive style which inappropriately focuses on detail.

These observations about aphasic cases, then, again support the idea that language (in this case, language's computational mechanism narrow syntax) might have been co-opted by the imagination for use in producing and comprehending music, replacing the percept-based modality employed by our more evolutionarily ancient imaginative capacities. That also suggests that the nature of music itself might have been rather different after the advent of language, assuming (as we have in Chapter 5) that music predates language. Once our species came to lean more heavily on a linguistic comprehension of the world, music might have developed to take on a different (hierarchical) structure - or, perhaps, it *became* structured. As we noted in Chapter 5 with regard to the chants of the Brahmin, rhythmic elements that are particularly pleasing to us might come to take on significance. It is possible, therefore, that once we began structuring these musical elements that specific structures also became significant, taking what would be a more recognisable shape when compared with the music of today.

§4.2 Williams Syndrome

Another case worth considering is that of Williams Syndrome, which looks like the pathology most likely to *challenge* the notion that there is a connection between language and imagination. These cases are often taken to be evidence for the modularity of language because of its apparent encapsulation from the effects of other deficits associated with the syndrome. Children with Williams Syndrome are usually said to show deficits in executive and imaginative skills, and yet show 'precocious' social and communication skills (Carruthers, 1996). This would suggest that the imagination *can* remain in tact when our linguistic capacities are impaired, presenting something of a challenge for this thesis. However, this picture isn't entirely accurate.

Firstly, Currie and Ravenscroft point out that in some social aspects, such as performance on false-belief tasks, children with Williams syndrome don't perform significantly better than some autistic children, and that as adults they do, in fact, have considerable difficulty in social understanding. If Theory of Mind develops in tandem with our linguistic capacities, as has been suggested in earlier chapters, then the poor performance on false-belief tasks of both autistic children and those with Williams syndrome might have a common cause: a

corresponding language deficit. Of course, the commonly accepted position on Williams syndrome is that there is no such deficit. However, an extensive review of language abilities in Williams syndrome by Brock (2007) suggests that, while language abilities might be somewhat better than in other pathological cases such as Down syndrome, there are some subtle differences between typically-developing children in terms of the rate of language acquisition, the mechanisms deployed in speech perception, and grammatical capabilities. In the case of grammatical capabilities, it is suggested that 'good grammatical abilities in Williams syndrome may be a consequence of good auditory memory and rote learning as opposed to intact grammatical skills' (Brock, 2007: 111). The perceived precociousness of Williams syndrome patients in terms of language is likely down to their strengths on receptive vocabulary tests, in which they perform better than typically developing children. Yet, despite this strength they perform worse on sentence repetition tasks, making distinctive syntactic errors (Brock, 2007: 113). We might infer from this, then, that something has gone awry with the computational mechanism underpinning grammatical thought; and surely it isn't a stretch to assume that (recursive) mindreading skills would be enhanced by a fully functioning computational system whose main purpose appears to be the generation of truth-evaluable propositions. If beliefs are the archetype of a propositional attitude, then any impairment to the system which generates such propositions could certainly impact upon performances on false belief tasks.

§4.3 Psychosis

Another pathological case draws a more indirect connection between language and the imagination, and this can be seen by looking again at literature on the evolution of language. Crow (2000) suggests that the emergence of language in our species may have brought with it an unexpected problem: psychosis. In Crow's view, psychosis is the 'price that humans have paid for language'. The persistence of mental illnesses like psychosis present something of a puzzle for evolutionary biologists, so Crow suggests that psychosis must accompany some selected-for trait like language.

As I have previously noted, in Chomsky's view the main benefits of language are for planning in thought (Chomsky, 2007b). But for something to be visible to evolution for selection it must become outwardly manifest. It seems obvious that better planning could make us more suitably adapted to an ecological niche and less vulnerable to predation, and given that

the biological basis for language got in place around 100kya we might expect to see evidence of increased population density (evidenced by the number of occupied sites) as a result of this new planning capacity. However, we don't really see evidence of this until the point of the Creative Explosion (see Fig. 1 above). As such, we might wonder if the real benefit of language comes when it is co-opted by some pre-existing capacity like the imagination, and channeled into creative behaviour. If psychosis 'comes for free' with language, and language is selected for as it begins to enhance our imaginative capacities, then this would perhaps give a better alternative argument for the view that psychosis persists in the population because it bestows some kind of evolutionary advantage upon those who suffer simultaneously from its disadvantages (Cela-Conde et al., 2006, also tie psychosis more directly to creativity than to language).

Crow (2008: 34) describes the symptoms of psychosis as including a sense of 'persecution', as well as one of 'grandiosity' (enhanced in male subjects) and the invocation of 'paranormal beliefs'. Crow's proposal is that the nuclear symptoms of schizophrenia are *abnormalities of language*, specifically the transition between thought and speech i.e. when we think something we want to say, and speech (perception) and meaning. Thoughts, emotions and intentions are generated internally but misattributed to an external agent since they are identified as speech and alien control (see Fig. 12). Crow explains the connection to language as a functional breakdown in areas of the brain concerned with speech-production and comprehension. This is possible because:

> The sensory and more phonological engrams, located presumably in Wernicke's and Broca's areas respectively, are not the same. They must be related – because the words that we hear are the basis of the words that we speak, a relationship established in the acquisition of language – but the two are anatomically segregated, and in the normal use of language must be functionally independent' (Crow 2008: 39).

In other words, our underlying capacity to 'hear' voices in ordinary speech-perception is distinct from our ability to produce an inner monologue. In cases of psychosis, just such a breakdown is apparently common, and this could account for the sense of external agency in certain acts of creation. In particular, a central problem is the function of the indexical 'I'. In speech acts this indexical refers to a unique individual, the speaker (except in cases of reported speech), but in cases of psychosis a host of neurological problems appear to cause a breakdown in understanding that internally generated thoughts (e.g. 'I need to eat something') to take on

the appearance of perceived speech – where the 'I' refers to an external speaker who is not otherwise perceptually present. This leads the psychotic individual to misattribute the thought to an external agent.[73]

Fig. 13: Nuclear symptoms of schizophrenia (Crow, 2008)

Descriptions of key elements according to the glossary to the present State Examination
Thought echo or commentary [item 57]: the subject experiences his own thought as repeated or echoed with very little interval between the original and the echo.
Voices commenting [item 62]: a voice of voices heard by the subject speaking about him and therefore referring to him in the third person.
Passivity [delusions of control – item 71]: the essence of the symptom is that the subject experiences his will as replaced by that of some other force or agency.
Thought insertion [item 55]: the essence of the symptom is that the subject experiences thoughts which are not his own intruding into his mind. The symptom is not that he has been caused to have unusual thoughts [for example, if he thinks the Devil is making him think evil thoughts] but that the thoughts themselves are not his. In the most typical case the alien thoughts are said to have been inserted into the mind from outside, by means of radar or telepathy or some other means.
Thought withdrawal [item 58]: the subject says that his thoughts have been removed from his head so that he has no thoughts.
Thought broadcast [item 56]: the subject experiences his thoughts actually being shared with others.
Primary delusions [item 82]: based upon sensory experiences [delusional perceptions] in which a patient suddenly becomes convinced that a particular set of events has a special meaning.
(Reproduced from Crow 2008: 33)

It is precisely this notion of alien control which Whitley (2009) describes as typifying Shamanic art-production, and which might also explain the Platonic version of Inspirationalism which ties creativity to divine inspiration. The suggestion that artists in these states are (from their own phenomenological perspective) acting out the will of another individual is what unites these cases. Crow's view of the link between language and psychosis provides a way of naturalising creative acts of this kind, without violating the non-accidental condition of the analysis of creativity, seeing as they are nonetheless the authors of their own creative thoughts, but are simply unable to recognise them as such.

§4.3.1 Hearing Voices and Creativity

But there are, perhaps, bigger implications to consider in the connection between hearing voices and being creative. Daniel (Dennett, 1997) has argued for the importance of learning to talk to ourselves i.e. developing an inner monologue. For Dennett, this takes the form of a 'semi-understood self-commentary', with Dennett understandably reluctant to

[73] I am glossing over a great amount of detail here – for a full account of the specific neurological areas affected by psychosis, see Crow, 2008.

suggest that all thoughts in which we talk to ourselves are fully expressed linguistic propositions. But his tentative suggestion for how we come to acquire this capacity does (seemingly) depend upon full language. He suggests that we come to associate the warnings of our parents (e.g. 'Don't touch the stove, it's very hot!') with a certain situation and pattern of behaviour (in this case, *hot stove avoidance*). As we enact this behaviour, we recite to ourselves the parental mantra, creating a kind of inner monologue which develops further as we come to represent our own mental states and activities to ourselves, and not just our parents' chiding.

Consider again, then, my suggestion that our tendency to fantasise drove us to eventually externalise those fantasies, later developing some of them into stories. Fantasy must, at least in part, *depend upon* our ability to create an inner monologue. Fantasies seem to involve an active kind of imagining, not the more passive process of picturing; we seem to control and manipulate events in a fantasy, but by contrast other kinds of imagining seem to be quite passive experiences. Full language is the perfect tool for *instructing the imagination* in terms of sequences of events, allowing as it does for referential specificity (who did what to whom and when). As such, fantasies can be developed into complex narratives with the use of language, all of which can be generated in our own minds via a kind of inner monologue. That isn't to say that there are no visual aspects of fantasies, there certainly are; but these visual aspects are perhaps also driven in response to linguistic prompts.

The capacity we have to create an internal monologue today would presumably have developed alongside our acquisition of natural language, and prior to the emergence of natural language it would be severely restricted by the lexicon of meaning-signal pairs inherited from our evolutionary ancestors. The earliest and most basic fantasies would certainly have related to our basic needs, since they are almost certainly (based upon observation of animal signaling systems) the things we would also create lexical items for first. We might have fantasies, for instance, about sex or food. As the relevant lexical items relating to these topics were drawn into the computational process of narrow syntax, they could be related to one another in new and revealing ways, eventually being arranged into truth-evaluable propositions that take us beyond what is given to us in perception.[74] But this process, I have suggested, depends upon the language faculty. Is there any way to be sure of this?

[74] Intrerestingly, Asma (2017: 148) points out that there is psychological evidence to suggest that we have a tendency to unconsciously exaggerate perceptions (a process influenced by our subjective emotional and cognitive

One way we could test this would be to conduct an experiment similar to that conducted by de Villiers (2014), which was discussed briefly in Chapter 3 (§3.4). de Villiers observed that experimental subjects struggled to recognise event similarity in images when their language faculty was tied up in another task. The suggestion I made in Chapter 3 was that the emergence of the language faculty altered the way we perceived the world, making it easier to parse information like who did what to whom. This claim is reinforced, I suggest, by observations made in §2 of this chapter. But language is also involved in generating imagined perceptions, I have suggested, in cases where we fantasise. A way to test this claim would be to ask participants to (attempt to) fantasise whilst the language faculty was tied up in another task. Difficulty doing so could be attributable to the role that the language faculty plays in being able to fantasise.

§5 Positive Evidence?

Besides hypothetical evidence in favour of this thesis, there are other extant studies that, I suggest, offer additional direct support for my central claims. In the first instance, a study by Trionfi and Reese (2009) suggests that there is a strong correlation between imagination and narrative (the ability to tell and comprehend stories). In their study, 5-year-olds who had previously engaged with imaginary companions scored higher on narrative quality (i.e. they tell richer narratives) when retelling stories and personal narratives. Engaging with imaginary friends is an example of the kind of paracosm, or fantasy world, that children routinely create. This looks to me like further support for the claim that fantasising both drives linguistic development and that it drives creative behaviour.

It has been suggested, as discussed in Chapter 5, that storytelling is a good way to disseminate information. However, the medium through which one tells a story makes a significant difference to the truth of this claim. A study by Singer and Singer (2005) which compared oral storytelling with other mediums, such as films and television, as a method of disseminating information, found that it performed comparatively poorly. This is perhaps unsurprising – television and films tell a story, but with the aid of images, and as I have noted, our imaginative engagement with images has more evolutionarily ancient roots. However, an implication of this study is interesting. Singer and Singer suggest that the fact that the

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states). For instance, people regularly report the size of an intruder as much larger than the actual perpetrator. This unconscious process might be part of what drove us away from the truth when we first began to fantasise.

information passed on through oral storytelling is less well remembered might implicate a more active role for the imagination in reconstructing stories when we come to recall them. The more incomplete the information is, the more we have to invent things to fill in the gaps in our memory. As such, storytelling could be expected to drive our imaginative capacities quite rapidly as we sought to remember and re-tell stories. This could explain the 'explosive' nature of the emergence of human creativity.

We noted in Chapter 4 the Wyver and Spence study showing that there was a correlation between divergent problem-solving skills and pretend play. More recently, Kaugars and Russ (2009) reinvestigated this link and found that children who show better storytelling skills in episodes of pretend play were those who showed the better divergent problem-solving skills. This seems like direct evidence that storytelling can be connected to creativity, but it also fulfills the explanatory challenge from Lillard et al to posit an explanation of creativity that has pretend play as an epiphenomenon by suggesting that the common cause of both a tendency to engage in pretend play and enhanced divergent problem-solving skills is an enhanced capacity for storytelling. Moreover, Moore and Russ (2008) found that overall creativity could be enhanced by adults assisting children with play episodes by giving them stories to enact (or even just the beginning of a story). As such, it appears that any benefits from pretend play might, in fact, be benefits of engaging with a story through play. This, coupled with the considerations above, should give us reason to support the view that storytelling, via fantasy, drove the evolution of human creativity rather than pretend play. The common theme which emerges from the totality of this evidence is that the more we engage with fantastic narratives, the more likely it is that we will be creative adults.

Concluding Remarks

This chapter has reviewed a range of further empirical evidence that I take to either challenge or support the conclusions I've advocated for throughout this thesis. I have attempted to deal with challenges to the connection between language and the imagination raised by cases like Nadia, the autistic savant, and from Williams syndrome cases. Beyond this, I have presented evidence that ties language, fantasy and storytelling to the development of creativity. If this evidence is taken seriously then I believe that it gives us good reason to prefer my Storytelling Hypothesis over Picciuto and Carruthers' Pretend Play Hypothesis, which attempts to solve the same puzzle – that posed by the Creative Explosion.

CLOSING REMARKS

The nature of the puzzle of the Creative Explosion makes it near enough impossible to provide a definitive solution to it. Because certain kinds of practice don't fossilise, we will never be able to fully demonstrate the truth of any claims about what appeared in the gap between the emergence of our species and the emergence of our species' creative behaviours. As such, we're left in the position of advocating a view which can, at best, have only indirect evidence. This has led some scientists and philosophers (e.g. Buller, 2005) to dismiss any attempt to address such puzzles as mere 'just-so stories', in reference to Rudyard Kipling's fanciful explanations for children as to how animals acquired certain characteristics. No doubt my thesis is yet another such tale. But I think it is worth asking why these kinds of stories are so popular, even amongst academics who should perhaps know better. And I think I've answered that question in this thesis – we are naturally inclined toward telling stories with a peculiar nature, namely, ones which attempt to explain the way the world is, even if this requires us to posit unusual entities as agents, and even if these explanations actually move us further from reality and into the realm of fantasy. The result of constructing such stories is perhaps that they encourage us look for all sorts of (usually indirect) evidence that we might otherwise neglect or dismiss. The fact that such stories are common across all human populations, and across every domain of human life, is revealing about our nature I think. And it is in attempting to explain that nature that I have arrived at the position I have defended here.

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