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**Play's the thing:
wherein we find how learning can begin**

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Play's the thing: wherein we find how learning can begin

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I

Education develops character, but what are the character traits – the virtues – that make one a learner? What are the abilities that make you the sort of subject who can learn, who can acquire new concepts, new skills? There are perhaps many traits that matter. But I want to suggest that the ability for the creative and imaginative engagement with and sustenance of the playful patterns of our aesthetic experience is core. Play's the thing that makes learning so much as possible.

In this paper I want to outline a very general and basic role for play and the aesthetic imagination in our understanding of the very core elements of pedagogy. I want to suggest that without a central role for the aesthetic sense of play and imagination, we have no hope of making sense of learning. The character of learners has at its core the ability for play. Playfulness is the key virtue. I shall draw on recent empirical work in developmental psychology that points us in the same direction.

Dewey has a central and powerful role for the imagination and play in serious cognitive work:

...the difference between play and what is regarded as serious employment should not be a difference between the presence and absence of imagination, but a difference in the materials with which imagination is occupied. (1944 p.236)

He then continues:

An adequate recognition of the play of imagination as the medium of realisation of every kind of thing which lies beyond the scope of direct physical response is the sole way of escape from mechanical methods in

teaching. The emphasis...in this book...upon activity, will be misleading if it is not recognised that the imagination is as much a normal and integral part of human activity as is muscular movement. (pp.236-7)

The thought here seems to be this: human activity conceived as meaningful responses to the environment (whether of others or of things) rather than merely a physical response, is a form of activity in which imagination is core. That is the thought that I want to explore and develop. Dewey's own account of this thought lacks detail. There are passages that suggest an instrumental conception of the role of imagination as supplier of the 'background of realization or appreciation'; the background of experience to 'familiarize the student at first hand with a certain range of fact and problems' (p.233). That might suggest that the role of the imagination is one of setting the stage for the serious work of enquiry rather than integral to the activities of enquiry as suggested by the previous passage. Dewey is not clear, but he certainly suggests a centrality for imagination in serious cognitive work. I think there is something right about this.

II

Consider Fodor's argument that learning is impossible. The conclusion is so implausible that the argument is often ignored, rather than responded to in any detail.¹ But, like many paradoxes, there is a much to be learned by trying to say what is wrong with the argument. I think we can learn a very great deal about how poorly

¹ For example, in psychology Meadows (1993) p.219-220 only lightly touches on Fodor and then ignores the challenge, although by the second edition (2006) she makes a point of citing Fodor's paradox as reason for endorsing a Vygotskian socio-cultural account of learning, see pp.296-7. Carey (2009) is the exception and one of the few mainstream developmental psychologists to take Fodor's argument seriously and to try to respond to it with care and detail. I draw upon Carey's work below. Fodor is rarely discussed in the philosophy of education and in philosophy at large, his 'paradox of learning' has only really been discussed within a philosophy of science literature trying to make best sense of theories of learning in cognitive and developmental psychology. A Vygotskian account of learning is widespread in the philosophy of education, with support drawn also from readings of Wittgenstein. I don't have space to consider that approach here, but for an argument that shows that this sort of response does not begin to address the issue see my 'Forgetski Vygotsky', paper for PESGB annual conference April 2015.

we understand learning and how our thinking about learning typically misses the key role that our sense of play and imagination occupies in making sense of cognitive development. Fodor's argument raises a bootstrapping problem. It appears simplistic, but I suggest it raises issues that no extant discussion of the problem properly gets in focus.²

First, assume that learning is a personal-level process – learning is something that people do. It is a process that human subjects go through, not a process that their cognitive machinery goes through. This captures something that is intuitively appealing: learning is a process that engages the learner qua subject; they are engaged as a person and not just as a bundle of cognitive processes some of which might be sub-personal and properly processes of modules of their cognitive apparatus rather than processes of them. Trauma might impact upon my cognitive equipment and make some bits work better, others worse. But even if trauma produces improved function, trauma is not learning. It is modification, but it is not something I do. It is something done to me, not by me. Furthermore, the personal level engagement of the learner is an engagement with things that they do not understand. That is what learning seems to be like; it is a process in which we extend our cognitive reach, a process in which we engage with things beyond our ken and come to understand them. This first assumption amounts to a core intuition about learning. I shall call it the intuitive data about learning. At a personal level we can be engaged by things we do not understand and then we come to understand them. That is learning.

² Two broad approaches: (i) the social model influenced by Vygotsky and sometimes Wittgenstein, cf Meadows op cit, Tomasello for the Wittgenstein influence. This approach is broadly descriptive in its aspirations. See Bakhurst (2011) for a recent account in phil of ed that is heavily influenced by Vygotsky and Wittgenstein though the lens of McDowell; see Williams (1994), (2011) for extended philosophical treatment that takes the bootstrapping problem seriously. (ii) an individualistic approach that takes seriously the question: what is it about the individual's cognitive kit that provides the wherewithall to bootstrap themselves into development, prime example Carey (2009) for detailed and thorough attempt at the explanation of what makes the cognitive development of concept acquisition possible.

Second, assume that this process of learning is a cognitive process. This is also intuitively compelling. We need to know more about what we are committed to in calling learning a cognitive process, but it would be surprising to hear that learning was not a cognitive process, that it was not something, for example, that might be characterised by cognitive scientists.

The crunch comes in what I shall treat as Fodor's third assumption: cognitive processes are computational. The best, indeed our only, model of what a cognitive process is like is to treat cognitive processes as computational processes. They are processes of operations upon language-like structures. Combinatorial processes are processes defined over the manipulation of items in some system of representation – a language. If that's not what a cognitive process is, then we're back in the bad of days of behaviourism when it comes to cognition.³ This third assumption makes the argument against the possibility of learning, conceived as concept acquisition, seem inevitable.

The argument is:

- (1) The intuitive data about learning: learning is a process by which pupils engage with things they do not understand and come to understand them.
- (2) learning is a cognitive process
- (3) cognitive processes are computational processes – operations defined over the manipulation of a system of representations.
- (4) What is available to a computational process is a function of what is represented by the system of representation over which it is defined (its expressive power).
- (5) cognitive processes cannot engage with things outwith the range of the representations that define the process (outwith its expressive power)

therefore,

³ Lawrence and Margolis (1999)

(6) there is no cognitive process by which a pupil could engage things they do not understand (no computational process that extends its own expressive power).

From which we must either conclude that learning is not a cognitive process, or deny that learning is possible. Either choice is paradoxical, but in the absence of any clear sense of what it would mean to say that learning is not a cognitive process, we should conclude that there is no such as learning.

If this conclusion stands, it is unclear that anything is left as subject matter for a theory of pedagogy, for if learning is impossible, why bother to try to think hard how best to organise and structure the schooling experiences of learners? It is, however, notoriously difficult to say with any confidence or precision quite what is wrong with Fodor's argument. Fodor's own response to his argument is twofold. His original response (up to 1999) was to endorse nativism about concepts. All lexical concepts are innate. This is metaphysically radical. It is also methodologically radical, for it denies the intuitive data about learning. Whatever is going on in the experiences of pupils when they think they are engaging with things they do not understand, it's not that. Rather, it must be that they are enjoying experiences in which their innate concepts are triggered by their experience of things within the concept's extension. But whatever that sort of experience is, it is not an experience by which they engage with things beyond the reach of their cognitive abilities, for there is no such thing.

Fodor's later view is instructively different although it still denies the intuitive data about learning. His later response is conceptual biologism, rather than nativism. That is to say, rather than posit innate concepts, Fodor allows that our brains are such that experience can trigger/produce the circuitry that produces representations for the things that have this effect through experience. Note, this still denies the intuitive data about learning, for it denies that concept acquisition is something that we engage in at the personal level; rather, it is just something that our brains do. In so far as there is anything at all like learning in this model, it is not something that we

do, it is something that is done to us. It is a causal product of the sorts of causal interactions that our brains get into with the environment. So, still no data for pedagogy to get interested in!

Fodor's challenge holds at an abstract level. We like to think learning is an engagement with things we do not understand and by which we come to understand them. We think this is a cognitive process. Cognitive processes are processes identifiable by their expressive power – the range of things represented by the components of the process, so what a cognitive process can do is exhausted by what falls within its expressive power. But that means there can be no cognitive process for extending the expressive power of cognition. So either all the expressive power you could ever conceive of is there from the start (nativism), or it just happens to 'ping' into existence as the result of the interactions between brain circuitry and the environment (conceptual biologism). Either way learning cannot be a cognitive process by which we extend our cognitive reach in the way that the intuitive data about learning suggests. There is no such thing.

III

Before outlining how we can start to build a solution to Fodor's challenge, I want to explore in a little more detail the role of the third assumption, the assumption that cognitive processes are computational. Fodor's thinks that all extant accounts of learning processes within cognitive science are account of processes of hypothesis formation and testing (HFT).⁴ This is to conceive of learning as a process by which one offers a hypothesis to explain some phenomena. Let the phenomena be the experience of such-and-such type things. Any hypothesis to explain this is going to be of the general form: all such-and-such type things are so-and-so. Plainly, no such hypothesis can be formulated, let alone tested, unless the subject already has the

⁴ Fodor (2008) p.132

cognitive wherewithal to represent 'such-and-such type things' and 'so-and-so type things'. You cannot formulate a hypothesis to test for something you cannot express. So if the putative process for learning is HFT, it cannot be a process of learning.

At this level of argument, one might think that there is an obvious response to Fodor: the HFT model is too intellectualist. That sounds plausible, but it is misplaced. The general form of the argument in the previous section requires only that the process is modelled as a computational process, so even if HFT is too intellectualist, any weaker non-intellectualised notion of process will still have to be some sort of computational process. The challenge to the intuitive data about learning does not go away merely by banning intellectualism. For suppose you thought treating the learner as a proto-scientist formulating hypotheses and then testing them was too intellectualist because it ignored the phenomenology of struggling to make sense of new things that, you might insist, is part of what it is to be a learner trying to extend one's cognitive reach. Okay, so learners struggle, they fumble, they find stuff difficult. All of that sounds reasonable as a set of remarks on the 'what it is like' to be a learner. It certainly sounds an over-intellectualisation to treat all learners as having experiences of mini-scientists, thinking 'Hmmm, I wonder if I might hypothesise thus and so in order to make sense of my current befuddlement?!' Well, of course, not! But that's not the point. Howsoever it might strike a learner while sitting in the algebra class, or the history lesson, or the needlecraft session when it feels to them that they're not getting the hang of whatever it is they are supposed to be learning, the key point is this: Whatever sense of muddle might be appropriate to how it strikes the learner as they struggle with new ideas, concepts and skills, nevertheless their response is a cognitive one and it is their response. They do something that makes the muddle tractable. They bring it all to order.⁵ The upshot is that they do

⁵ Here is where the temptation to go 'socio-cultural' a la Vygotsky can seem irresistible. Surely, you might think, it is the other, the elder, the teacher who brings it all to order for the pupil, they do not do it for themselves. That just misses the point! Whatever order the elder brings to experience, it has to be an order that the pupil can engage with, take notice of,

make sense of it. No matter how rich and befuddled the phenomenology of it all might seem, at the end of the day, they bring it into conceptual order. And now all that Fodor need press is this: what brings it into order if it is not something that can be modelled as hypothesis formation and testing? There is no other game in town for this bit, so pressing the 'emote' button and describing the befuddlement of the anxious confused learner does not get away from the fact that if they learn, they bring cognitive order to their experience. And the only model we have for that is HFT.

What this brings to the fore is a key point about learners. No matter how much they stand on the shoulders of others (their teachers, peers, family and culture), at the end of the day it is the learner who brings cognitive order to their experience. What makes someone a learner is their possession of the ability to bring the muddle to order, to begin to place an order upon the blooming buzzing confusion. That is the key virtue, the thing that makes learners. And it is that idea that can make the very idea of learning seem impossible. How can they bring cognitive order to their experience without already possessing the representations required to express that order? That is Fodor's key challenge. If we could answer that challenge we would have the foundation for a real depth to a theory of pedagogy. I want to outline an answer to this challenge.

IV

Having an order to experience requires concepts. You cannot have things figure in an order to experience without a concept that brings them within that order.

Therefore, there can be no things that figure in experience for which you lack concepts. If that's the central point, then all we need do is deny the claim that you cannot have things figure in an order to experience without concepts. We need what I'll call a 'staging solution': in the first instance, things that we do not understand

internalise. But to do that, the pupil has to be able to 'engage' the order offered by the elder. And that was Fodor's question – how can they do that without already having the cognitive wherewithal to handle what is on offer within cognition?

figure in an order to experience that is not a conceptual order; they get to be in experience without falling under the shelter of a concept.

Well, that's easy to say. The hard bit consists in filling out that idea in a way that does not reduce it to a re-run of the old empiricist idea of the impressions/ideas dichotomy, or sensation vs perception, or sense-data vs representation.⁶ Properly understood, I suggest that the sorts of patterns we find in play provide the basis for a staging solution that sits between the cracks of these familiar dichotomies.

In order to provide a staging solution to the account of the order of experience what is required is not a raw given, but not the rule-governed patterns of concept use either. The orders characteristic of many forms of play provide the basis for a staging solution. Here are three key ingredients of what, for want of a better label, I'll simply call the playful order⁷:

- (i) it's open-ended and has potential for creative extension
- (ii) it is answerable to some notion of fit/appropriateness, a concept of correctness, but not a generalisable semantic correctness
- (iii) it captures the personal-level engagement of experience

Such a notion of order is certainly detectable in what young children do when learning. They engage with adult activities in an ordered way, but not necessarily a conceptual order. They play, they have a joy for rhythm and rhyme. They repeat

⁶ These are all formulations of a familiar ancestry of distinctions that beach us on the shores of a hopeless dichotomy: either we commit to what Sellars called the 'myth of the given' and then we lack any account of how the sensory given can penetrate the patterns of concept use characteristic of ideas, or we simply grant the sensory given the patterns characteristic of ideas and thereby undermine the sense of 'given' or receptiveness that it was supposed to deliver.

⁷ 'play' is a very broad concept and although often thought important in an account of learning, especially learning in early childhood, attempts to characterise the what, why and wherefore of its role have struggled to produce a clear theoretical role for play. For background on play and learning, especially early years learning see Moyles (2010a), (2010b), Whitebread (2012), Bergen (2002). The account of play and playful orders that I am proposing is, in the first instance, answerable to the three conditions stated; it's an attempt to pick out some of the core elements of play. See also Caillois (1961) and Cook (2000) for work that begins to pin down the role of play. Cook is especially good on the way that children play with words creating new meanings. As Cook notes on the human need for fiction, one explanation of that need that he calls the 'creativity explanation' sees fiction '...not as an aid to other functions, but as the origin and condition of distinctly human modes of thought, enabling such activities as science, art, and religion.' p.41. I suspect there is much truth in this.

patterns of sounds, not because the pattern has meaning that expresses conceptual content, but because the words fit in an playful pattern of rhythm, rhyme and the repetition of sounds. These are patterns made up of repetitions of form, sound and physicality. Such patterns provide the 'placeholders' for what will be concepts. That bridge is a difficult one to build, but let's at least acknowledge where it lies and what it is.⁸ It is the bridge between abilities for conceptual manipulation where the arrangement of concepts is answerable to truth and a more basic set of abilities that figure in the manipulation of an order that is answerable to our aesthetic sense, a sense of fit in rhythm, rhyme and repetition. Such an ability is, I suggest, the core virtue that enables learning. Exercising this ability involves a sharing of pattern making and sustaining that is not yet a conceptual pattern. It is a joining in a shared activity, but it is not that it is shared that makes it interesting (or most interesting); it is the nature of the activity itself that matters. For it is only a joining in because the child has the ability already to take part in such pattern making and sustenance.⁹

If we do not acknowledge some such staging solution, then our account of learning reduces to a banal description of the form: adults talk, children join in. That this happens is just a bare fact. Simply to remark that this happens is not to offer an explanation of how it is achieved. On a staging solution, the recipe is, simply put: adults rhyme, children join in. That too is a bare fact about some basic abilities, but the story is not just a description if this level of pattern making provides a basis for patterns with concepts. If there is a developmental trajectory that starts with staged joining-in and then progresses to the concept manipulation joining-in, then we have the outline of an individualist explanation of learning.

⁸ It's not the bridge between the social inter-psychological states and the individual's intra-psychological states. There is no need for the Vygotskian answer and it doesn't work anyway, cf. Luntley (2015b)

⁹ This is not to deny that social interaction is important, but simply to treat it as a datum that needs explaining and not itself part of the explanans. So when Goswami (2008, p.138) says: 'Infants learn language because of social interaction with partners, and not simply because of exposure to sequences of sounds' I am happy to agree. But that just leaves us with questions like: What is 'social interaction'? What is its currency? What abilities provide the infant with the wherewithal to engage in such interactions? And so on.

That's the idea, in the broad. Here's an example that gets us into some of the detail. I take the example from Carey.¹⁰ When young children first use number words, numerals figure in their speech in patterns and sequences akin to the sequences of nonsense words. When this occurs, Carey says the numerals figure as 'placeholders'. They do not stand for numbers and their use by the child is not a use that is appropriately measured for its truth. She says that sequences of numerals are like nonsense sequences such as 'eeeny, meeny, miny mo.' I think this provides a telling insight into the order of experience when learners engage with things they do not yet understand.¹¹

A child who knows the sequence

(A) eeny, meeny, miny, mo

knows that the sequence goes in that order. They will know that the sequence

(B) eeny, meeny, mo, miny

is wrong. But what kind of mistake is that? It is not a semantic mistake. It is not that a semantic content has been disrupted with the change in order. It is simply a mistake in the way the words are fitted together. The word 'mo' *belongs* at the end, after 'miny'. I shall return to Carey shortly, but let me develop the insight that she has put on the table.

Why is it right to say that the sense of mistake with (B) is not a semantic mistake. Clearly, our intuition is the word 'mo' does not have a representational content but the underlying point here is this: although 'mo' *fits* in sequence (A) correctly and does not fit in sequence (B), this notion of 'fit', although signalling a sense of correctness, is not a sense of correctness that is generalisable. The listener who expects 'mo' in

¹⁰ Carey (2009) p.308

¹¹ I am going to concentrate on this simple example, but the point is general. Carey makes a similar point with an example regarding high school learning in physics due to Block (1986), when one first encounters 'F=ma', although one might understand the concept '=', one's grip on force, mass and acceleration can be very limited other than knowing that they fit in this formula; that is to say, one cannot generalise the use of 'mass' into other contexts. See Carey op cit, p.419 and p.519 I think a similar point applies to philosophy undergraduates using sophisticated terminology, many fail to move beyond a point where they can use 'transcendental' accurately unless it's lodged in a familiar sentence frame.

completion of sequence (A) has a sense that 'mo' fits in that position, but that sense of fit need have no generality to it. It is not the case that knowing that 'mo' fits in the fourth position in (A) is connected in a rule-governed way to how it fits in other sequences. Indeed, there might be no sense of how and whether it fits anywhere else. But the hallmark of concepts is that they, and the words used to refer to them, manifest a generality of application. If you know that 'green' stands for greenness, then you know that it applies correctly to anything that is green. If you thought the word applied to an apple, but had no view whether it applied to a cucumber, that would be evidence that you had not properly grasped that the word expressed a concept for a way things look. What this illustrates is evidence for a notion of fit/correctness that is appropriate for the way that words fit in patterns that falls short of the notion of fit due to a notion of semantic correctness. The example with 'mo' in (A) illustrates just such a sense of fit. It is a notion of correctness, but one that answers to our expectations where those expectations lack the generality of application typical of contentful experiences, e.g. hearing the word 'green'.¹²

Furthermore, this notion of fit, although offering a real sense of mistake with (B), nevertheless exhibits an open-endedness. One aspect of the fit exhibited with (A) is the prosodic pattern of the sequence; (B) provides a different rhythm. (A) ends with a flat-footed emphasis on the final syllable of the sequence; (B) does not. This contributes to our sense of why (B) stands out as wrong compared to the familiar (A). But these things can change and be exploited. (B) can be turned into something more acceptable if the nonsense is continued in a way that provides a broader fit for

¹² There is much to be said about the concept of expectations, and it will have to wait to another time. But the way I use the concept here is in contrast to one familiar use in which we speak of expectations where they have propositional content. I use 'expectation' here in a much more restricted sense: it applies to subjects for whom failure to complete a pattern produces surprise – that's what happens with sequence (B) – but where that sense of surprise is subjective and not rule-governed. See Luntley (2010) for more on this notion of expectation. Development psychologists regularly invoke the concept of expectation as what is measured for data for looking times and eye movement. See Butterfill (2012) for some of the detail on this. Such expectations will doubtless include many that are native – hard-wired into the endowment that evolution has provided for us. And although there might be rules governing the generation of such expectations, these are rules of the subject's cognitive systems, they are not rules or patterns that are salient to the subject at the level of experience.

what is, in the single line, a disrupted rhythmic pattern. If (B) were continued in the following way,

(C) eeny, meeny, mo, miny

mine is big and yours is tiny

then we can make 'mo' fit in the altered sequence by providing a larger frame which repeats the rhythm that, on its own, stood out against the familiar expectation and adding a rhyme helps render the altered rhythm acceptable.

It is important that we distinguish between the patterns of expectations generated and manipulated by our cognitive machinery and the personal level sense of expectation that, in the examples with which I am concerned, generates a non-generalisable sense of salience, fit or presence. The subject hearing 'eeny, meeny, miny,....' expects 'mo' to follow. All that means is that they will have a sense of surprise if it does not, but without having any sense of the generality of the patterns that are at play. That's not to say that they will not have preferences regarding different alternatives for 'mo', by which I simply mean that they might be less surprised if 'mo' is replaced by 'doh', than by 'pillow' and that might be less surprising again than 'palace'. Furthermore, one might expect that the surprise ranking would be similar for 'pillow' and 'mat', for one retains the rhyme and the other the rhythm. Many variations are available and the subject's cognitive mechanisms might be manipulating all sorts of representations of sounds in a way that leads the subject to expect 'mo'. But, qua subject of experience, they need have no sense of the patterns of rhyme and rhythm that produce their expectation, their sense that things fit in one way and not another.

My concern is with what can be properly ascribed to the personal level of experience, not the rules that are appropriately hypothesised to capture the workings of sub-personal cognition. The sense of cognitive process that matters for responding to Fodor concerns what subjects do, not what their cognitive machinery does. It matters that we be clear on the distinction between the rules that apply to

the operations performed by elements of a subject's cognitive machinery, and the rules that apply to and figure in their personal level sense of fit. The subjective aesthetic sense of fit provides one with no critical or justificatory leverage when the expectation regarding rhythm or rhyme is thwarted; one simply has a primitive subjective sense that the experience does not fit.¹³

Observing the distinction between the sub-personal and personal levels matters. Our cognitive machinery doubtless develops rules that generate expectations of rhythm and rhyme, but at a personal level such phenomena can be salient – our expectations met or thwarted – without any sense of the generalities of rhythm and rhyme. That, typically, is a much more advanced appreciation of the phenomena. And the sub-personal vs personal level distinction is important for understanding Carey's work.

Like any cognitive scientist, Carey provides a rich theoretical structure to account for the data of concept acquisition and to model the processes by which children acquire numerical concepts. A key initiative in Carey's account is the idea that children first use numerals as 'placeholders'. The idea of a placeholder is simply to mark the space for the idea that early numeral use does not manifest a conceptual grasp of numbers, for the way that numerals are used by young children is as elements of an order to experience that is not yet a conceptual order. So, Carey has a staging solution, but it also a solution that is replete with rules governing the operation of cognitive processes. Such operations do not fall within the compass of Fodor's challenge just so long as they are operations at the sub-personal level. We are interested in what people do, not what their cognitive machinery does.¹⁴

¹³ I take the notion of 'primitive fit' from Ginsborg's idea of primitive normativity, Ginsborg (2011), see also Luntley (2015a).

¹⁴ This doesn't make Carey immune from the challenge from Fodor's followers that says that, at some point, Carey needs HFT to get from placeholders to concepts. That might be right, for that transition is a tricky one to get right. The present point is simply that if operations upon placeholders performed by sub-personal cognitive processes are modelled as instances of HFT, that does not matter, for they do not figure in an account of the personal level of experience. The model I am using has something like HFT operating at the sub-personal level, that issues in expectations at the personal level that provide a sense of fit that is not

There is then at the sub-personal level a manipulation of patterns by our cognitive machinery. This is what is sometimes referred to as our 'natural pedagogy'.¹⁵ In addition, there is the personal level sense of expectation that generates a non-general sense of fit/salience/presence without concepts – things just come into view. And when they do not come into view, their absence is experienced as a salience. They still need to be dressed with concepts, but we are at least beginning to get some order to experience that is not a conceptual order. And the order involved in responding to rhythm and rhyme is essentially open-ended and creative.

Are there rules governing what we do if 'mo' goes in the 'wrong' place? Well, no; there are no rules here. There are regularities in the sub-personal operations that generate our personal level expectations, but those are not rules that govern the personal level experience and activity. The sense of 'not-fit' with (B) has no response that is 'owed' beyond the initial surprise and sense that things are not correct, for it is not incorrect in any sort of generalised way. We can play with the sequence. We can use it to disrupt ourselves and others. We can amend it by retaining the rhythm and changing the rhyme – (C). There is no 'right' answer to what we do next, for we can exploit these patterns in all sorts of open-ended way.

This is, of course, what young children typically do. Their joy and engagement with hearing and exploiting such nonsense variations in creative language use is well documented.¹⁶ It takes considerable repetition to generate the expectations regarding rhyme and rhythm, let alone the ability to play with these things in the creation, sustenance and variation of aesthetic patterns. This play with language has been stressed before. Carter argues for closer links 'between theories of creativity, the classroom and the nature of pedagogy as pattern forming and pattern-

generalisable at the personal level. The tricky move is the move from having the particular personal level sense of fit to having a generalisable conceptual sense of fit (answerability to truth). That's the move that takes more work to understand and model.

¹⁵ See Gergely (2011) p.79ff.

¹⁶ Cook (2000), Winstone (2010), and it's not just young children, see Carter (2004)

transforming linguistic practice'.¹⁷ And he sees the connection here as applicable to language at all levels, '...the term the *art* of talk is not exaggerated. Indeed, it is almost a poetry of talk.'¹⁸ I am sympathetic to this view. The staging solution I am outlining is an attempt to place the poetry of our sense of patterns at the heart of learning.

This poetry stands on the shoulders of much repetition. The role of repetition in generating our sense of rhyme and rhythm is obvious, but the point is often poorly expressed. What stands out in the way that children exploit and play with rhythm and rhyme is the sheer inventiveness of it all. It seems an almost boundless creativity. We tend to worry about open-endedness, for it challenges our sense of rules. And it is tempting to try to bury the open-ended phenomena by rooting it in a process of routinisation. At one level of abstraction it is surely right that creative language use, like creative use of musical sounds, is firmly rooted in repetitive practice. Duranti & Black (2012) say that such an account of how

...creativity is made possible by routinization recognises what child language studies have long argued for; namely, the crucial role of repetition in development and apprenticeship. (p.446)

But to agree with this is simply to agree that there is a correlation and, presumably, some connection between repetition and creativity, but it tells us nothing about what the connection is.¹⁹ There is a reluctance to break with the idea that open-endedness in activities cannot be anything other than the product of another set of rules, but just rules that have been internalised. Duranti and Black again, commenting on Bourdieu's account of *habitus* and improvisation in music:

¹⁷ Carter (2004) p.13

¹⁸ Op cit p.107

¹⁹ Some of the statistics correlating repetition and language skill reveal troubling correlations regarding social deprivation and language training, see Goswami (2008) p.162 for some of the details, but best estimates put young infants of high socioeconomic status (SES) hearing about 487 utterances per hour; infants of low SES hear about 178 per hour. By four years of age, the former will have been exposed to 44 million utterances, the latter children will have been exposed to 12 million.

...interiorized musical codes and constraints (the 'structured structures')...then compose, create, invent and transmit...music (the 'structuring structures').....product of deeply rooted constraints and structures. (Duranti & Black, 2012, p.446)

This is, once again, just to note a correlation between a repetition by which some patterns become routinized and an ability for open-ended productivity in the medium, whether it be language or music.²⁰ And it is an account that has trouble making sense of open-endedness without there being some sort of score from which the production arises. It is not, I think, at all obvious that open-ended production is the *product* of internalised patterns, rather than an activity that makes use of those patterns in doing something quite different.

The 'something quite different' is play, the inquisitive and sometimes random choosing of options from amongst those available to continue a pattern with a rhythm, or with a rhyme, or with both, or with neither but with some other element of continuity.²¹ And what drives this is our evolving sense of 'fit', not the derivation from the internalised rules or scales. There are such things, but typically they are the patterns for performance that have been laid down below the level of conscious personal control in the endless repetition that gives facility with saying words accurately, or producing a minor scale on the keyboard. What those underlying patterns produce are elements of expectation and a personal level sense of fit, not-fit,

²⁰ Many discussions of creativity fail to get much beyond a description of the phenomena, statements of correlations between creativity and repetition, collaboration, cultural context, e.g. Sawyer (2003), Singer (2006). This merely surveys the data that needs explaining, it does not tell us how open-ended activity comes about, or what the key abilities are that explain it.

²¹ Winstone (2010) has a number of things to say about creativity and play that point in the same direction as the one I am suggesting. He stresses the role of uncertainty as an aesthetic virtue (p.5) and of the experience of beauty as a form of judgement distinct to that found in scientific knowledge (p.20). I think this is right and it is connected to the present point about the contrast between the particular sense of 'fit' found in poesis and the generalised sense of fit found in concept use. If the approach I am suggesting is anywhere near right, it has profound consequences for pedagogy. If the open-endedness of learning new skills and concepts is grounded in the intrinsically open-ended play with patterns of poetics, then as Winstone observes: '...teachers must be prepared to live close to what Keats called "negative capability" – "capable of being in uncertainties, mysteries, doubts without any irritable reaching after fact or reason".' p.54

etc. And what fits is also sensitive to what has just happened before, the previous choice and not just the unfolding of the scale or of the memorized sequence of words. The interiorized patterns (in my model, mostly patterns encoded and managed by sup-personal processes, not personal level selection) at any one time throw up any number of possible selections for things that might fit and we, qua persons, build the pattern that fits at that moment. The choices thrown up are not fixed by the internalised routines, for small changes in performance (some random, some chance variation due to external changes) can throw new saliences into view for the experienced talker and player who has practised again and again with their words, or with their music.

The moment by moment selection is a bit like balancing. As you grow, you acquire all sorts of muscle memory about balance and reach. Simple walking, running and jumping rapidly fall within the range of regular modes of activity. You acquire a comfort with the body and its orientation and spatial presence, but that does not mean that you don't continue to experiment and find new limits to your balance, new moves you can make without tumbling to the floor. Familiarity with your bearing can give you the sense that moves not previously tried are nevertheless possible and within reach. Similarly with words and music, deep and multi-textured familiarity with words and sounds achieved through extensive repetition and practice leaves you with a sense of the range of what's possible that is rarely fully accurate (there are always surprises to be gained just round the corner of what you thought you could do).

And like balancing, each small change throws new options, new saliences into view. The poetry of sophisticated performance is not the unfolding of internalised routines; it is the performance of a pattern made in the moment in response to the opportunities that just this unfolding in this moment and in these ever so slightly difference circumstances offers. This is to see us as pattern makers and not just pattern sustainers. We make patterns as we uncover new opportunities for fit in what

we do and in doing that we extend our skills. We learn things we had not known before. We do things that neither we nor anyone else had done just like that before. And those doings group things together and provide the basis for new categories in our activities, new concepts. One of the key drivers here is the phenomenology of looking for 'fit'. It seems to be hard-wired into us to look for fit and it is because of this that we extend our reach and find a new point of balance.²²

But is there any good empirical evidence for this sense of fit, this idea of primitive normativity? It is what is implicated in Carey's examples and seems to capture something recognisable in experience. But if, as I am suggesting, it is key to accounting for the idea of an open-ended order to experience that provides the basis for a staging solution to Fodor's paradox, then we would need to find evidence of this in all learners, including the very young human infant. There is such evidence.

Human infants are odd. As a species we are born too young. Our prolonged immaturity is arguably the most striking biological fact of human ontogeny.²³ What are we doing during that extended period of comparatively helpless and restricted agency? One thing human infants are doing is learning to engage with rhythm and repetition.²⁴

Beginning at age 2-3 months, infants in many cultures enter dancelike, musical game-like interactions with a caregiver, usually the mother. Unique rhythm, phrasing and dynamics of human mother-infant play in Western societies are all characteristics of these behaviours which involve gaze, sound, facial expression, movement and bodily contact.

We're playing! We're engaging with rhythm. As Kagen notes,²⁵

...children seem especially primed to grasp information and relationships embodied in music and movement.

²² Without the idea of looking for 'fit' it is a puzzle how repetitive practice at something can produce learning. See Luntley (2012) for more on this.

²³ See Kagen (2010) p.88ff. for discussion

²⁴ Kagen op cit p.89.

²⁵ op cit p.93

Variation in rhythms, especially exaggerated movements, are key to differentiating human infant cognition from that of primate cognition. Primates follow gaze, but humans spontaneously produce gaze-following given deictic referential cues preceded by ostensive communicative cues. The latter involve things like,²⁶

...schematized partial, slowed down, repeated or selectively exaggerated production of certain aspects of the primary motor routine.

This requires a sensitivity to changes in rhythm and emphasis typical of games and such variations are what mark the action performance as a communicative demonstration. The explanation I am suggesting we give of this is, in a nutshell, that what makes the infant receptive to such communicative demonstration is their sensitivity to and built-in need for the appreciation of and making of the patterns of play. It is the poetics of action that catch our eye first and that makes us realise that we are part of a group of pattern-makers. And this is before we start making the patterns that carry conceptual content.²⁷ For this to be plausible we would need to posit some sense of fit at a very early age. And there is evidence for this.

The distinctively human actions of ostensive behavioural signals deploy marked motor transformations. They are exaggerated performances. This is familiar in early language learning where the role of 'motherese' or 'infant-directed speech' is well documented.²⁸ What do these exaggerated performances do and how do they work? The hypothesis that I am exploring is that they work because the learner is hard-wired to detect rhythm changes as indicative of a sense of 'fit'. They are looking for patterns that fit. This might sound like it reads too much into the infant's early abilities, but there is empirical data that supports this. As early as 10 months old pre-linguistic infants show awareness of others' intentionality in the perseverative search error in the 'A-not-B' search task. This is the situation in which infants persevere with

²⁶ Gergely (2011) p.80

²⁷ There is a growing research field that explores some of this territory with respect to the role of music in understanding our basic sense of companionship. See Malloch & Trevarthen (2009) for some of the details.

²⁸ Goswami (2008) p.154

looking for a hidden object at location A, after previous hidings there, even though they witness the adult hide the object at location B. The perserverance with A is, however, diminished if the hidings at A are not accompanied with the normal exaggerated performances of ostensive demonstrative gestures. This suggests that the exaggerated performance,²⁹

...may have lead infants to infer (and learn) from the A hiding trials that the object “belongs to” and is not just being presently hidden in – container A. This results in continued search for the object in the container A (where it “ought to be”) even during subsequent B trials.

The scare quotes around the notion of where the object “ought to be” is appropriate. It would be extravagant to ascribe the pre-linguistic infant a sene of ought that is rule-governed. But perhaps if the sense of ought were the primitive sense of fit, the sort of thing signalled by and associated with the rhythmic variations of exaggerated performance by the adult, then we are on safer ground and the sense of fit is available as a component in beginning to build a staging solution to how we learn.

The ability to find fit is one of the key virtues of the learner. And it is, perhaps, key to grasping the difference between the repetitions of mere rote learning, and the repetitions that provide a sense of unity and structure: ‘as we have learned from Dewey, the aesthetic shape of the lesson is what will provide it with a sense of unity, coherence and completion’³⁰. So, back to Dewey then:

...aesthetic unity cannot be sharply marked off from intellectual experience since the latter must bear an aesthetic stamp to be itself complete. (Dewey 1934: p.58

and, I would add, to enable to learning to begin to take place.

²⁹ Gergely (2011) p.82

³⁰ Winstone (2010) p.105

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