THRESHOLD CONCEPTS: FROM PERSONAL PRACTICE TO COMMUNITIES OF PRACTICE

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A CLOSER LOOK AT LIMINALITY: INCORRIGIBLES AND THRESHOLD CAPITAL

Ray Land and Julie Rattray, Durham University, Peter Vivian, Open University

Biographical Note

Ray Land, PhD, is Professor of Higher Education and Director of the Centre for Learning, Teaching and Research at Durham University, UK. He is a member of the OECD international expert panel for Higher Education and has also acted as consultant to the European Commission. His research interests include academic development, threshold concepts and troublesome knowledge, research-teaching linkages, and theoretical aspects of digital learning. He has recently edited two new volumes: Threshold Concepts and Transformational Learning (2010) and Digital Difference: Perspectives on Online Learning (2011) both published by Sense Publishers.

INTRODUCTION

I would like to look at four areas this morning. First, the nature of liminality followed by an analysis of spatial metaphors in learning. We then consider liminality as a conceptual space and finally as ontological space, which brings in the notion of threshold capital. It is my pleasure to be delivering the paper, which is a collaborative venture with my colleagues Peter Vivian and Julie Rattray.

The notion of liminality as a space is a metaphor we use. But what do we mean by a 'space'? Is it a space or is it a period of time? Or is it more a set of social relationships? Let's ponder what we mean by a 'liminal' space and unpack that metaphor which we have been using for quite a while in this framework. Then I would like to focus in on two dimensions of liminality, looking at it both conceptually and then ontologically on the assumption that if liminality is the place where students often get stuck, then there is something intellectual, conceptual or cognitive going on. There is something difficult happening. So clearly there is a conceptual dimension to that, but, as we have argued in some of the papers, it is also related to the affective dimension, the experiential element of learning and struggling through these difficult areas of learning; these stuck places. It might be useful to approach this in terms of ontological space and to consider what kind of 'threshold capital', cultural capital or psychological capital students might need in order to negotiate that space well.

THE NATURE OF LIMINALITY

Let's have a look first of all at what we said about liminality and what we need to consider. I think that the area of liminality is the one part of the thresholds model, or framework, that is not terribly well thought through; it remains rather ill-informed and something of a black box. What I want to explore is to what extent we might be able to say useful and purposeful things about liminality, or whether there are aspects of this which we just can't access. I am indebted to my colleague at Durham, Jan Smith, who pointed me towards the notion of 'incorrigibles', which was a word originally used in this sense by the philosopher Ayer (1956) for things which are very difficult to get at because they are part of other peoples' experiences and very hard to extract from those experiences.

We have said in some of the early papers that liminality is a kind of flux. It is a space provoked by some encounter with a threshold concept and it renders things fluid, less certain than they used to be, and starts to transform the learner. As they move through it the space itself seems to change. We have claimed that it is a transformative state and that the thresholds notion is a dimension of transformative learning. The notion of transformation is problematic. Some commentators have critiqued the notion of transformation as a humanist model, an essentialist model which might be problematic. We have said it is a suspended state in which students sometimes can struggle to cope and in which they might revert to mimicry. We have also said it often feels like a space where you are losing things and I think you are losing things in liminality. It is a space where you have to let go of your prevailing way of seeing, your prior understanding, and your prior schema. That has to weaken, or loosen, or be transformed, in order to gain a newer way of seeing, or newer mode of being. Letting go in that way is challenging and I think that is one of the key sources of troublesomeness. We don't like letting go of things that we think we have a very good handle on, or that we have become reasonably good at.

We have emphasised and used images in our books of transformation. We have said that what happens in the liminal state is a changing of function or a changing of state. Such changes often involve the kind of oscillation that anthropologists discuss in liminal states, such as in adolescence, for example, where individuals fluctuate between childlike and adult behaviours. Here's a nice quote from Marina Orsini-Jones' (2006) work.

> *Q. "Did you feel the same as student 1?"*
>
> *Second student: "Yeah. I felt lost".*
>
> *Q. "In lecture times as well?"*
>
> *Second student: "You know, I understood the concept for about let's say 10 seconds, yes, yes, I got that and then suddenly, no, no, I didn't get that, you know, suddenly, like this".*

The changed perspective here slips in out of focus and eludes the learner's grasp. The new understanding comes into view and goes out of view again. The student thinks she's understood it but then is unsure whether she's really got it.

It certainly seems to be a space where language is important and those of you familiar with Vygotsky's (1978) theory will know of his emphasis on the encounter and engagement with language and of how it becomes a space, the writing space, which can be a key factor in transformation. I have spoken to many doctoral students who say it is when they start writing, or when they start analysing data that their conceptual framework starts to emerge and starts to make sense. We recall 'the intolerable wrestle /With words and meanings' to which T.S.Eliot (1943) referred in Four Quartets. Here is a quote from a group of medics (Becker *et al.,* 2005) discussing how, in a very powerful way, this takes place in medicine.

> *"...students acquire a point of view and terminology of a technical kind, which allow them to talk and think about patients and diseases in a way quite different from the layman. They look upon death and disabling disease, not with the horror and sense of tragedy the layman finds appropriate, but as problems in medical responsibility".*

Medical students employ medical discourse to talk about things like pain. Pain signifies something very different to medics than it does to the non-specialist lay persons who are experiencing it. It serves partly to effect an important ontological shift in practitioners who have to deal on a daily basis with extreme and often distressing situations that most ordinary folk do not, but it also serves as an essential tool for diagnostic reasoning. It is part of the way medics think and practise.

The liminal space can also be seen as a creative space. It can be the space where, as we have mentioned, people get stuck, but it is also the space where things become fluid. Once, when I was speaking with some colleagues in an art school in Scotland and we were discussing liminality, I made a reference to students emerging out of the liminal space. They immediately commented, 'No, you are misunderstanding us; we are not talking here about our students coming out of this liminal space. We want them to stay in it. We want them to stay precisely in that fluid state, that complexity, because in that way their ideas won't become crystallised; they won't harden'. What they were seeking was a space in which their students' thinking and practice would stay emergent and fresh, without becoming stylised. In this sense the liminal offered a provisional, exploratory space with plenty of unexplored possibilities, where things were held in tension – an almost perpetual liminal state of creativity.

It can of course often be the place where students encounter conceptual and other kinds of difficulty and they have to try and cope with that. We have seen in some of the earlier writings on thresholds that this can produce what we call 'mimicry', which sounds somewhat negative but is often a coping mechanism for students. We have talked about 'compensatory mimicry' where sometimes students just try to convince themselves that they are in fact learning something. So it's not uncommon to see students revising for exams and perhaps revising completely the wrong stuff but they think they must do something purposeful even though they are not doing what they should be doing. Another form of mimicry is 'conscious mimicry', when the student is aware that what is required is beyond their grasp, other than through the mimicry of pretension. They are consciously trying to make sense of something and cutting and pasting, but recognising that *'this probably isn't it, but we will see what the tutor says'*. Many academics like yourselves will recognise and be familiar with this kind of mimicry.

So liminality is a difficult space, but it is also a space of emergence in which emergent entities (in this case thoughts or states) 'arise' out of more fundamental entities and yet are 'novel' or 'irreducible' with respect to them (Lewes 1875). Transformation, as an emergent, is a higher-level property, which cannot, in Lewes' sense, be deduced from or explained by the properties of lower level entities. As King Lear observed 'nothing will come of nothing'. But some of the re-thinking, re-formation or re-authoring of ideas, or the re-scripting or re-inventing of identities in a liminal space do seem to have this quality of emergent property, where you can't see very clearly how it has arisen from, or can be reduced to, the lower level entities.

If the liminal state is seen as something which is transformative and does help students, then perhaps what it should do is oblige the learner to countenance something new and try to integrate it. At the same time there is a recognition that their existing view is no longer adequate, and that they have to let go of it. This is troublesome in itself, but seems to be a requirement. Hence the progressive function of the liminal state might be characterised as follows:

- a countenancing and integration of something new

- a recognition of shortcoming of existing view

- a letting go of the older prevailing view

- a letting go of an earlier mode of their subjectivity

- an envisaging (and accepting) of an alternative version of self through the threshold space (as a practitioner) – 're-authoring' of self, 'undoing the script' (Ross, 2011)

- acquiring and using new forms of written and spoken discourse and internalising these

My fellow keynote speaker Glynis Cousin has observed that 'you are what you know' and that all learning to whatever degree involves both a conceptual shift and also an ontological shift from an earlier version of yourself. I often cite the movie 'Educating Rita' as a nice example of where you see a sequence of such ontological shifts in dramatic form.

I once attended a seminar led by Etienne Wenger, of 'communities of practice' fame. We discussed the extent to which people on the periphery of a community practice, and seeking to participate within that community, might be said to be in a liminal state. He observed that one condition of effective entry to a community practice was the capacity to envisage (and accept) a re-worked version of yourself as viewed through the threshold into the community. You need to be able to see or imagine a potential version of yourself practising whatever it is that the specific community in question practises. You see yourself 'doing it'. This entails a 're-authoring of self' as Jen Ross (2011) terms it, or as one of her students refers to it, 'undoing the script of yourself'. This student, discussing the transformative potential of reflection, notes that 'It kind of gives you an opportunity to undo the script if you like. If somebody asked me to dissect the magic of it, I can't tell you. I can just tell you it's a blend of things. I can't tell you the proportions. It's like cooking it is like an intuitive response to what's needed I suppose.' Ross (2011, p. 225) notes that, 'Reflection here is described as a magical process of empowerment and emancipation', but the magic is almost the Harry Potterish School of educational thinking. It works at the level of a metaphor, but it is not very helpful beyond that. This brings in the notion of the incorrigible, the phenomena that you can't find a way of 'getting at'. Is transformation an incorrigible notion? Is liminality? There is the risk here of what Theresa Lillis (2001) terms 'practices of mystery'. There are probably many to be found in pedagogical thinking, in all sectors of education. As a still somewhat mysterious process, the notion of liminality probably falls currently into that category and transformation itself does look like a 'practice of mystery'. Ross however helpfully observes that:

> *"In my view transformation has to be understood as a matter of shifting subjectivity, not as deep changes to any essential selfhood. Subjectivity is best understood as always in process, and so shifts are common place. They are part of negotiations that take place as a result of the discursive nature of subjectivity...".* (Ross, 2011, p. 226)

We are continually shifting; everything we read, everything we write. One of the students she cites says, 'by the end of my paragraph, I could have changed completely, just because the process of writing seems to help me inform my opinion' (p. 227). We can shift our thinking and being through the engagement with particular words in small, subtle ways. Ross summarises (p. 226):

> *"By approaching subjectivity as a process, we can demystify transformation and view it as a response to the uncertainty and iterativeness of subjectivity. To initiate, and then channel, these shifts in a particular direction could be seen as the purpose or project of both reflection and education more broadly. This is a purpose that may still be complex and contestable, but which at least has the benefit of being open to analysis".*

This, I think, is where we are with thresholds.   We need to see where we can open up areas such as transformation and liminality to analysis, or at least the areas which seem to have the character of incorrigibles. Usher *et al.* (2002) argue that 'subjectivity is a discursive effect', seeing it as part and parcel of language, and 'it's about writing stories of yourself'. 'Subjectivity is a character in a story as much as the author of the story, representations of self instead of being seen as truth', in a more humanist sense.

> *"Representations of the self, instead of being seen as 'truth', need to be seen more usefully as stories, often very powerful stories, which perform a variety of social functions, including the construction of selves with appropriate characteristics. … Subjectivity is never a once-and-for-all construction, and the experience that meaning can have is never permanently fixed. …Subjectivity is therefore always shifting and uncertain and has to be continually 're-formed"'.* (Usher, Bryant and Johnson, 2002, p. 88)

ANALYSING SPATIAL METAPHORS

We have been talking about liminal space and much educational thinking, many educational tropes, use this spatial metaphor. The most famous one would probably be Vygotsky's notion of a 'zone of proximal development (ZPD), used extensively in primary and secondary education. Here we have the idea of the learner trying to shorten or close the proximal gap, to get closer to the performance or practice of someone who is just a little more expert than him or herself, trying to cross that space. But is it a space or is it just a relationship with someone else? When we talk about the doctorate as a kind of taxing, long four year, five year, seven year liminal space, is it a space or is it better thought of as duration of time? What kind of metaphors can we employ usefully to talk about a learning space?

John Douglas, an architectural educator at the University of New South Wales, considers that the notion of threshold space might be too limiting (Douglas, 2011, pp. 45-46). He points out that if we imagine a line; as soon as that line closes on itself we have a closed interior space. This also creates simultaneously an interior and an exterior space, whereas a curving line which never closes leaves other things open. An open curve 'may create zones of partial closure, administer relations of proximity, or mark changes of state, but it does not establish a dialectic of absolute interiority and exteriority'. This distinction indicates two possible types of space. We can, on the one hand, think in terms of space as a closed curve in which we have a threshold space and material to be learned to enable us to cross beyond a boundary into a new bounded space. Architects, according to Douglas, think of space in other ways, they think of multiplicitous space, of open passage, connection and transformation; spaces that connect you, rather than impose boundaries on you.

We regularly talk about threshold space as being 'bounded', and of crossing boundaries or borders. A threshold, it could be argued, is to some extent about borders, and disciplines are about boundaries, protected tribal spaces and territories (Trowler *et al.,* 2012). Douglas however argues that we need to move away from such modes of seeing. He proposes a distinction between the idea of space as a container and the idea of space as a connection. In a 'threshold space' he suggests, things, effects and events are contained or exteriorised whereas in a 'transformational space' they are transmitted (pp. 45-46). He cites as example the famous London Underground Plan published by Beck in 1931 (Figure 1).
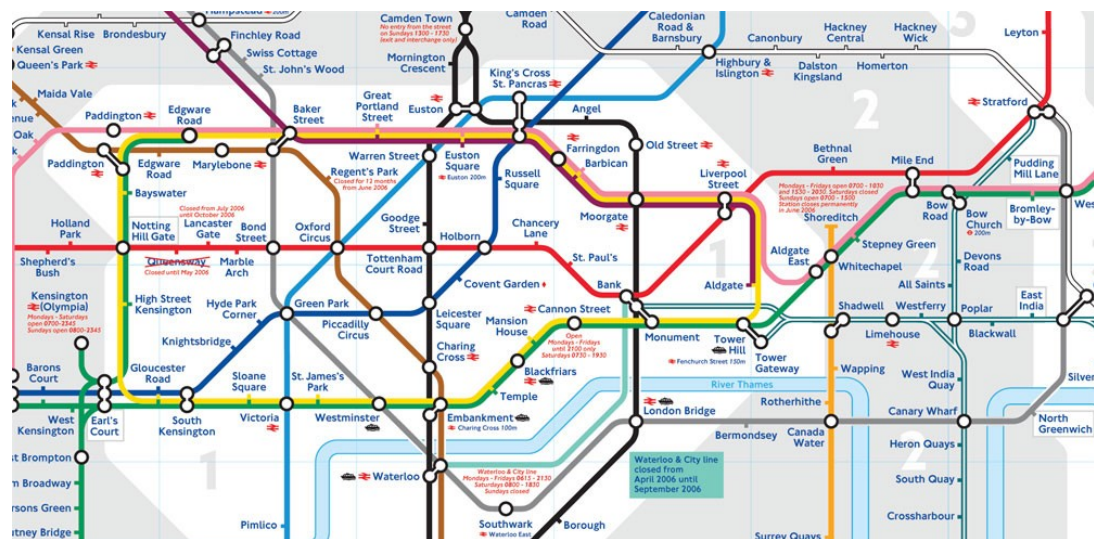
It had occurred to Beck that since the Underground operated mainly underground, then the physical locations of the stations were irrelevant to passengers wanting to know how to get to one station from another. Only the topology of the system mattered. What the map emphasises, Douglas points out, is connectivity. He says 'containment is secondary to connection, to pass outside the threshold space is to cross a line demarcating an interior whether by choice, accident or ejection'. In transformational space there is no strict exterior, only degrees of connection. We use the Underground map to ponder 'how do I get to here, from somewhere else?', or 'what is the best way to get there?' On the map Charing Cross station differs from Edgware 'not because it is a more capacious station, with better amenities and more platforms, but because it has greater connectivity'.

So what might an educational space look like which emphasises notions of connectivity? How might we help students get from here to somewhere else? What is the best way to do it? What are the different possible ways of doing that and negotiating learning spaces that we use?

A compounding factor in this regard may be the nature of 'knowledge structures'. In his later work Bernstein (1999) distinguished between horizontal and vertical discourses, and within vertical discourse between 'hierarchical' and 'horizontal' knowledge structures. The former, most typically represented by empirical sciences, would take the form of

'a coherent, explicit and systematically principled structure, hierarchically organised' and 'attempts to create very general propositions and theories, which integrate knowledge at lower levels, and in this way shows underlying uniformities across an expanding range of apparently different phenomena' (Bernstein, 1999, pp. 161-162). The latter, on the other hand, (most typically exemplified in the disciplines in the humanities and social sciences) is more likely to take the form of 'a series of specialised languages with specialised modes of interrogation and criteria for the construction and circulation of texts' (Bernstein, 1999, p. 162). In hierarchical structures knowledge tends to be accretive, building on the work of earlier scholars and concerned with universal and commonly agreed application and procedure. In horizontal structures competing narratives may well co-exist alongside each other and remain in contestation and mutual incompatibility with each other. In the former epistemological concerns tend to take precedence over social or 'tribal' considerations, whereas in the latter who is promoting particular knowledge stances, and the academic company they keep, may be of as much significance as the stance itself. These structures present different challenges and priorities for new entrants to communities of practice and can add to liminality difficulty in terms of being sufficiently able to read and adapt appropriately to knowledge terrain and interpret the necessary signals and cultures encountered therein.

Another influential metaphor comes through the work of Homi Bhabha. He coined the widely used phrase 'Third Space'. He says 'it is in this space that you will find those words with which we can speak of ourselves and others, and by exploring this third space we may lead to politics, polarity and emerge as the others or ourselves' (Bhabha, 2006, p. 209). It's a space where you can think otherwise and to some extent that is what threshold concepts provoke you into doing, into thinking otherwise and letting go. As Engels-Schwarzpaul and Azadeh Emadi (2011, p. 1) observe:

> "Bhabha's dynamic third space is an interstitial realm, like the threshold, which accommodates ambivalence, conflict, confusion, movement, change and notably, potentiality.   It is held open by the tension between different spaces and temporalities and generates relationships in which both sides are changed through the negotiation of incommensurable strategies, rules and identities in cultural processes and practices". (Bhabha, 1994, p. 218)

This is a space where things can be re-thought, re-authored, where, as we discussed earlier, one can undo the script of self and re-script.

Finally, the psychologist and psychotherapist Winnicot, whom we have cited a number of times in the early literature on thresholds, talked of potentiality and talked about potential space as a kind of intermediate or third area. This is 'neither the individual's inner world, nor actual, nor external reality' (Palombo, Bendicsen and Koch, 2009, p.154). In potential space, creativity develops in the 'discovery, creation, and development of a self' (ibid). The characteristic of potential space is a negative capability. Keats the poet used to talk of negative capability as a 'capacity not to do anything' which in the West we find very difficult, to resist action and remain in a state of potentiality. In potential space, according to Bonz and Struve (2006, p.152):

> "Inside and outside are kept suspended: the inner and outer touch each other in a dance-like movement ... Characteristic of potential space is a negative capability [Keats] to endure in a psychically open process yet remain coherent in changing circumstances"

So the nature of liminal space appears complex. Envisaging it as a space of connectivity rather than blockage, of potentiality or re-formation is something we might want to draw from. For us as educators it still has the feel of 'a practice of mystery'. We attempt to come by it through proxy or metaphor, as if it remains an incorrigible.

Let's now approach liminal space and attempt to talk about it first conceptually and then ontologically.
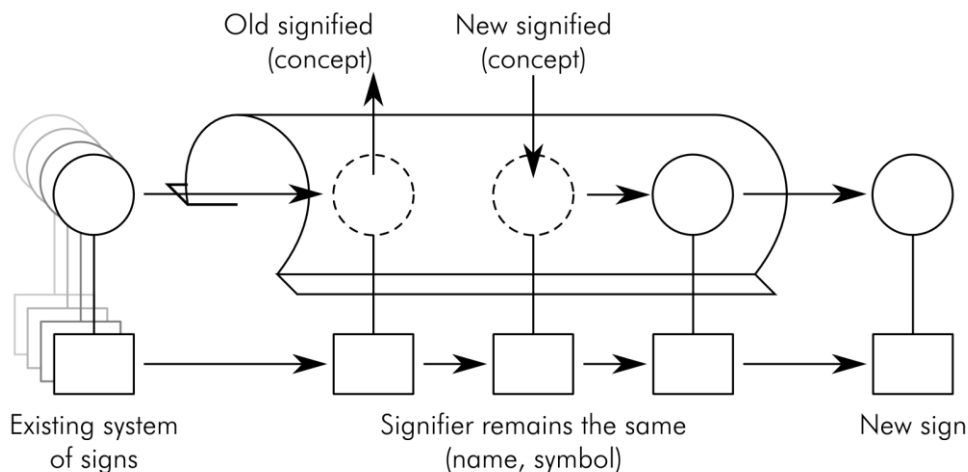
LIMINALITY AS CONCEPTUAL SPACE

Peter Vivien (2012) has undertaken recent work using semiotic analysis and theories of signification (particularly Saussurian notions of the sign) as a means of extending the threshold literature. Saussure was a linguist in the early twentieth century who spoke about signs. We might argue that all learning is about signs, and the understanding of signs and acquisition of new signs, an area normally referred to as semiotic analysis. A sign can be a word, it can be a sound, it can be an image, it can be a book, and it can be a film and so on. All signs, Saussure argued, have a signifier in the physical word. For example I am sending out signifiers now– aural ones in my words, visual ones through the data projection screen. These are signifiers; they are part of the sign. The other part of the sign is what they mean, which is the signified. But what Saussure argued is that that relationship is always arbitrary and is always provisional.

For example, the sign 'mouse' is both a sign and a written word. We agree in anglophone cultures that 'mouse' means (as one meaning) the furry animal with a tail. If it were agreed across the world tomorrow to call mice cats then that would work as well, as long as we all agreed to make the change. In this case we would have the same signifier, aurally and

written (though not visually), and the signified changes. If we apply this to learning a lot of liminal space is about students wrestling with the notion of (a) what is the signifier here, what does it mean, what does it signify, or (b) is what is being signified changing? If you study anthropology, for example, you realise that in anthropology, the signifier 'culture' is very different from what 'culture' signifies in everyday lay discourse.. Of course signs only mean something in relation to all the other signs in the system. So the word cat only means cat because it is not hat or mat or pat and so on.

Fashion is a potent example of this and signs in fashion are characteristically in flux. Being of a certain age, I remember a time when bell bottom trousers were a cultural signifier of certain 'coolness'. At some point, probably around 1973, the signifier started to shift, the signifiers were still around but the signifier was no longer coolness but an increasingly sad quality of being passé. Later of course, probably around 1983, they underwent a re-signification. Now they were retro – cool. However the signifier had shifted, being now a newly fashionable and subtly differentiated boot cut. You get the drift. No doubt bell bottom trousers will endure further re-signification in future.

How does signification relate to liminality? Learners have an existing stock of existing concepts and they all have labels for these signs. As we go through a programme of learning in higher education we can see this as a process of adding signs to our collection. Where does this sign fit in, how do I link this to all the other signs I already have?' Our analysis of what a particular sign means, or signifies, is related to all the other signs we have in our system. Vivien (2012) represents the liminal process graphically as a tunnel rather than a threshold, in that for most of the time the learner cannot discern the exit.

Old signified (concept)   New signified (concept)

Existing system of signs   Signifier remains the same (name, symbol)   New sign

Note that the tunnel is drawn in the conceptual domain, which is internal to the individual learners and tutors. Communication between these individuals, however, is in the physical domain where the oral and graphic signifiers play their part. For example, here we are in the lecture theatre listening (I hope!) to the signs I'm putting out. However, in your personal interior domains you may be asking 'what is being signified'? Whatever is signified will be in the liminal conceptual domain, not in the physical domain of sound or vision.

But how might the teacher become aware of the individual learner's liminal state? Is this one of Ayer's incorrigibles again? Within a module of, say, twelve weeks, can we in feasible, practical terms get at this? Or are these understandings as in Richard Gomm's (2004) opinion, 'unverifiable because they are matters of self-knowledge and not accessible to others'? The student's understanding of these new signs, or 'altered' signs, depends on bringing together in a coherent way a number of conceptual elements – for example the student may have to get a grip on a number of economic concepts and bring them all into a coherent relationship. If any of those representations are poorly understood or misunderstood then the student will have difficulty bringing them together. Any concept has to be described or represented using already familiar signs, and if any of these are poorly understood then the description or representation will be misunderstood. Perhaps the threshold concept is so troublesome not because the concept is so difficult but because it challenges the learner's understanding of its component concepts and this is why it acts as a check point for the learner's progress.

Learners need to engage with and manipulate conceptual materials i.e. the physical means of describing, discussing and exploring concepts. These are the signifiers in the physical domain. What tends to happen in most teaching sessions is that the teacher physically exchanges these signifiers by providing images, diagrams, words, written textual statements – all the different kinds of signs, hoping that what the student will pick up is what the teacher is signifying, what is in the teacher's understanding as a signifier, and that this will bring about the desired transformation. The teacher creates a framework of engagement by setting tasks designed to motivate the learner to engage with conceptual matters (i.e. the

signifieds) by transforming the signifiers from one context to another. The teacher can then infer understanding on the part of the learner by comparing the learner's transformation with their own transformation.

The assessment evidence, the student's new representation, has to indicate this changed signification, their understanding of a new set of signifiers or an altered set of signifiers. Sometimes this is patently obvious by what students produce and at other times it isn't. It can be hard to know whether they have got it or not. What complicates it further is that students during an assessment may not want to reveal their lack of understanding to the teacher-as assessor, that they haven't understood what is being signified.

What does seem to happen is that when a new or an altered sign enters a sign collection we get a new collection of signs. The new sign affects the other signs in some way. It alters the student's discourse as they start using these signs and these new signifiers. The student has to integrate them and use them in a sense which links up with all their other existing signifiers; otherwise they experience a form of dissonance.

As Peter has said, 'generally speaking different dialects can be recognised because there are changes in the signifiers, but sometimes the signifiers stay the same and so the altered understandings are not self-evident. The change in dialect goes unnoticed'. Sometimes students haven't realised how their tutor is now using a particular signifier or particular term or particular image or particular diagram or model in a more sophisticated, elaborate, or advanced way. The students may not be getting that. They may be working with an earlier model and therefore missing that. Similarly the tutor may not realise that their student is actually working from an earlier signifier because they are both in the physical domain, still using the same signifier but it has shifted and have they got it; We don't know it?

From a threshold point of view how can the acquisition of a single concept, e.g. gravity in physics, evolution, osmosis, how can that change the learner's perception of themselves?

> *"Adding a new concept to a learner's collection can affect the understanding of other concepts in that collection, so that over time the whole collection develops and changes. The threshold concept can be a conceptual straw that breaks the camel's back – or a piece in a jigsaw of concepts that causes them to coalesce and produce a step change in perception".* (Vivian, 2012, p. xxx)

Adding a new concept to a learner's sign collection can affect the understanding of all the other concepts in that collection. So over time the whole collection morphs and develops and is transformed. This is likely to involve a troublesome process of integration in which this new fitting of everything together in a new fashion requires a letting go of a previously strong end enduring schema. Relinquishing this is likely to entail an ontological shift.

I recall a female colleague talking about encountering a specific aspect of feminist theory. This one new piece, this one sign, occasioned a 'coalescing' of all the others into 'a new big picture'. Thinking in terms of signification in this way, we would argue, may aid our insights into how students gain new understandings. We have written in the past a paper about thresholds concepts and course design (Land *et al.,* 2005), in which we argued that the student has an important part to play in being prepared to tolerate uncertainty. Very often students acquire these signs sequentially in the world of time, in the physical world, whereas concepts are not necessarily sequential but holistic. The world operates as an integrated whole. A certain amount of holistic understanding is always required. This inevitably means that there will be periods of conceptual uncertainty in which the reason for introducing the concept and perhaps the concept itself are not understood. It is a challenge for the course designer to minimise these periods and threshold concepts are required to integrate these concepts at significant points otherwise the course remains conceptually fragmented. The physical learning of signs is sequential in that the processes of learning are sequential by nature i.e. reading, listening, writing, and thinking etc. This does not preclude repetition (recursiveness) or digression (excursiveness). In practice with minimum pass marks of 40% it is likely that many learners will move from one pedagogic block to another with shortfalls in their understanding. Such blocks are created by the definition of courses, years, modules and even assignments.

So the learner, in a typical learning sequence, receives a set of signs in a linear, time-related sequence – a drip feed – and often it doesn't make sense to them. Very often we have to try and persuade students that it will come together eventually. In the end hopefully these signs will coalesce and the students will gain a transformed understanding. But there will be, whilst that is happening, a period of conceptual uncertainty. This is a mark of the liminal state and it is a challenge for course designers to try and minimise that, to shorten that liminal period in which the student experiences uncertainty. Doctoral learning would be an illustration of this. One hears doctoral students talking of struggling for long periods, months, perhaps years trying to figure out for example what a conceptual framework consists of. They don't get it, principally because they do not yet have all the signs, all the signifiers that they need eventually for that particular conceptual understanding to come together. It may take time and come later in the process.
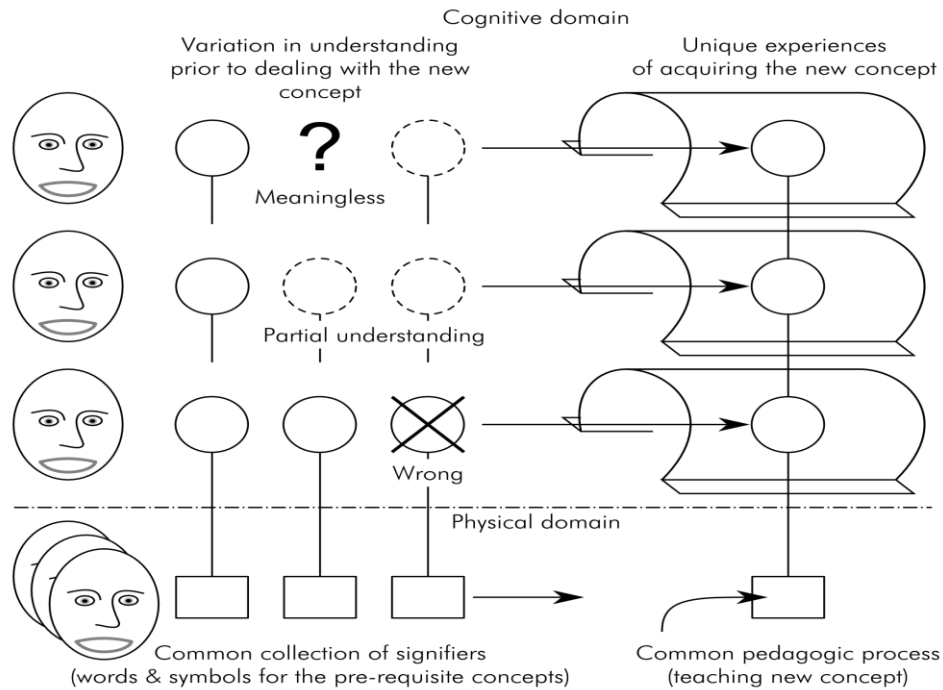
The sequential nature of many of our learning episodes, and the design of our courses through lectures, modules and semesters, results in students encountering new conceptual challenges in bits and pieces. The student progresses to the next module whilst still in the process of trying to piece together the signification of the prior module, and then in the subsequent module encounters a set of new signs. Marek's (1986) article 'They misunderstand, but they'll pass' suggests that we continue to pass students even though we realise that much of the signification that has been taught to them is still not too meaningful to them. But we keep them moving because probably we realise that eventually their understanding will come together, will integrate, in a recursive fashion.

Any concept has to be described or represented using already familiar signs, and if any of these are poorly understood then the description or representation will be misunderstood. Perhaps the threshold concept is so troublesome not because the concept is so difficult but because it challenges the learners understanding of its component concepts and this is why it acts as a check point for the learner's progress.

The transformative and integrative effects of threshold concepts cause the meanings of the existing signs in the learner's collection to change – a new collection of signs, a new 'dialect'. Generally speaking, different dialects can be recognised because there are changes in the signifiers but sometimes the signifiers stay the same and so the altered understandings are not self-evident. The change in dialect goes unnoticed.
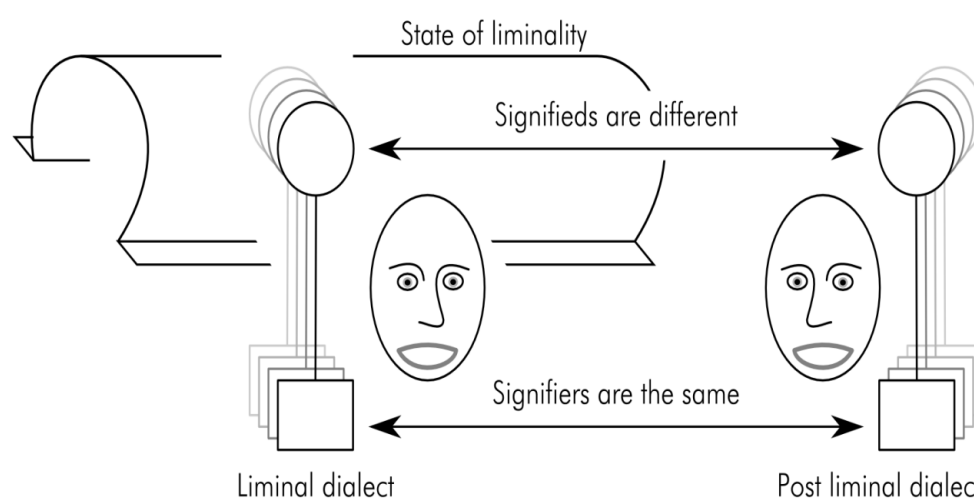
So in terms of liminality as a conceptual space Vivian (2012) suggests that there are, semiotically, four possible outcomes for students. They may encounter signs and just not know what to make of them or how to use them. It is a meaningless response. Alternatively students may gain a *partial* understanding. Kinchin and Hay's (2000) analyses of conceptual mapping indicate that different degrees of partial understanding are a common outcome. One rarely finds students with a total understanding. Thirdly the student may just have got it wrong; they have got the theory wrong, they have got the maths wrong, or they have misunderstood the algebra. We tend to assume that they have a common understanding of the component concepts but that probably isn't the case. We are all using the same signifiers, the same words, the same symbols in the physical domain, but students might be interpreting and manipulating them in very different ways. Or finally, they may have a correct and coherent understanding.

Cognitive domain

Variation in understanding prior to dealing with the new concept

Unique experiences of acquiring the new concept

?
Meaningless

Partial understanding

Wrong

Physical domain

Common collection of signifiers
(words & symbols for the pre-requisite concepts)

Common pedagogic process
(teaching new concept)

Two things emerge from this diagram. One is that the potential complexity of signification is immense. If you think of a theory that contains, for example, three component concepts, this could reveal 48 possible permutations. Some of the theories that we teach might contain twenty concepts, thus the potential for misunderstanding, partial understanding, wrong understanding is enormous. It would not be reasonable for teachers to be expected to map such variation across their student cohorts. And there is always the possibility of course with complex theory that some of the component concepts may not be fully or correctly understood even by the teacher.

What is interesting, and this is reflected in Kinchin and Hay's work also, is that putting students together, letting them discuss the conceptual material to be understood, sometimes works better perhaps because they feel less threatened revealing their misunderstandings and partial understandings to each other than they would to a tutor who is assessing them. Students often use a different discourse; they interpret what is being signified through slightly different signifiers. They use more accessible signifiers which might be more meaningful. The understanding of the language being used is critical. The teacher's use of language, signs and syntax, may fail to communicate meaning because of the learner's inability to handle that usage. This is one possible reason why learners are able to grasp concepts from their peers that were meaningless when supplied by their teachers. Another reason could be the recursive and excursive nature of the peer support process.

Finally knowledge is often troublesome because, from the student's perspective, some critical component may have remained implicit or tacit. We may think we have given the students all the signs and signifiers they require but a critical component may not be accessible to them. For example, critical reasoning might be a concept that students are required to understand to perform certain assessment tasks satisfactorily. Critical reasoning is in my collection of signs, as the teacher, but it may not be in theirs because it was never presented to them, but, rather, left implicit. They have never been exposed to it. Without a signifier there is actually no reminder in the physical realm that the concept exists and hence, since it is left underlying, this may have a deleterious impact on their understanding and required performance.

So one way of gaining further insight into the conceptual difficulties that students may experience in the liminal space may be through semiotic analysis, and thinking in terms of signifying practices.

ONTOLOGICAL SPACE (THRESHOLD CAPITAL)
Finally there remains the notion of liminality as an ontological space.

There may be signifiers which the learner recognizes but are meaningless to them. These empty signifiers are particularly interesting and important as they are then susceptible to unfortunate connotations of anxiety, stress, fear even. 'I don't get this and we've got an exam looming'. We have said on previous occasions that knowledge is often necessarily troublesome in order to provoke a process of transformation and to unsettle students out of a prior way of seeing. It can

of course be discomfiting for students dealing with some of these conceptual shifts and some students seem to deal with them better than others. To use David Perkins' phrase 'dispositional learning', it seems important to ask what dispositions might help students get through the liminal state more effectively.   Is it possible to identify which affective states would be more beneficial? Do they constitute another incorrigible or are they open to analysis and susceptible to measurement?

There is interesting work currently being conducted in the psychological domain in relation to the notion of psychological capital, often abbreviated to 'PsyCap'. The latter is defined (Luthans *et al.*, 2007, p. 3) as 'an individual's positive psychological state of development' that is characterized by:

1. Self-efficacy – having confidence to take on and put in the necessary effort to succeed at challenging tasks;

2. Optimism– making a positive attribution about succeeding now and in the future;

3. Hope – persevering toward goals and, when necessary, redirecting paths to goals in order to succeed; and

4. Resilience – when beset by problems and adversity, sustaining and bouncing back and even beyond to attain success.

The first dimension of PsyCap is 'self-efficacy' (Bandura, 1997) and is associated with a learner's belief in their own capabilities to succeed at a specific task. Self-efficacy is the most popular positive psychology variable used in the educational setting, and has strong research and theory supporting its effect on academic achievement (Bandura, 1997; 2002; Schunk, 2011). Thus a learner who believes they are capable of making sense of troublesome and initially just-out-of-reach knowledge is more likely to expend effort on trying to understand the new idea and more likely to cross the threshold than one with no such belief.

The second dimension of PsyCap relates to an individual's ability to make positive attributions about their potential for success in both the short and long-term. 'Optimism', as this factor is known, correlates with academic performance with a more optimistic explanatory style being associated with higher performance (Carver and Sheier, 2002; Huan, Yeo, Ang and Chong, 2006; Ruthig, Perry, Hall and Hladkyj, 2004; Seligman, 2006; Smith and Hoy, 2007). A positive attributional style or optimistic outlook would seem to be essential if a learner is to sustain motivated behaviour during a difficult phase of their study. If one is to make an ontological shift, one needs to be optimistic that such a shift can indeed happen and that the long-term benefits of such a shift will outweigh any current difficulties and challenges during the transition phase.

The third dimension of PsyCap is 'hope' and this seems to be an important driver in relation to the acquisition of threshold concepts. As we discussed earlier, learners might need to navigate the liminal space using a number of paths as they go down blind alleys and take wrong turns until they finally make it through the tunnel. Hope is about *"Persevering towards goals, and when necessary, redirecting paths to goals in order to succeed"* (Luthans *et al.*, 2007; p3). Researchers have found that hope leads to higher academic performance in children, adolescents, and college students as it facilitates a willingness to explore and engage in trial and error learning – something that is crucial when navigating a new and troublesome concept (Curry, Snyder, Cook *et al.*, 1997; Curry and Snyder, 2000; Gilman, Dooley, and Florell, 2006; McDermott and Hastings, 2000; Peterson, Gerhardt and Rhode, 2006; Snyder, Shorey, Cheavens *et al.*, 2002).

The final dimension of PsyCap is 'resilience', which refers to an individual's ability to continue in the face of difficulty or challenge and even to start over after failure. Resilience has a well-established relationship with academic performance (Borman and Overman, 2004; Gordon, 1995, 1996; Kwok, Hughes, and Luo, 2007; Morrison and Allen, 2007). The extent to which a learner faced with a new and challenging concept will continue to struggle with the concept, even after repeated efforts to understand the concept have failed, will partly determine how willing they are to persist in their efforts to understand. It will also ultimately partly determine their success in crossing the conceptual threshold and emerging with a transformed subjectivity.

These four factors might explain why certain learners are able to negotiate the liminal state and acquire a new conceptual understanding and others, despite having the intellectual capacity, are unable to make the same transformation. A learner who believes they are capable of understanding new ideas (self-efficacy), who is optimistic about their chances of success, who can monitor and re-align goals and the pathways to attaining these goals and who does not give up in spite of the difficulties they encounter with the new knowledge, is likely to be able to expend the necessary levels of sustained effort (motivation) to bring about ontological change. The learner who is unable to do this will suffer from a lack of motivation and quickly give up when they encounter difficulties, leading to a lack of belief in their capabilities, a pessimistic outlook, and lack of hope.

CONCLUSION

The categorisation of PsyCap as a malleable state rather than a fixed trait (Luthans *et al.*, 2007) means that it is subject to influence and manipulation via pedagogical practices, curriculum design and implementation, and learning experiences.

Thus educators wishing to facilitate learners' motivation to navigate the liminal state and engage in the process of ontological shift might consider embedding the principles of positive psychology in their pedagogy and curricula as a means of enhancing students PsyCap and facilitating the engagement they seek.

In order to determine the extent to which PsyCap might influence learner's motivation to make an ontological shift and successfully negotiate the liminal space, the specific nature of the relationship between PsyCap and learner performance and understanding needs to be explored more fully. We need to establish the extent to which students with varying degrees of PsyCap might display varying levels of understanding and other cognitive skills associated with motivated learning such as self-regulation. We propose to undertake a series of studies to investigate these relationships to establish the extent to which PsyCap might mediate passage through the liminal space. It may not be as incorrigible as we imagined.

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