

# A Cognitive Approach to Spatial Patterning in Literary Narrative

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## Abstract

This thesis argues that spatial representation in literary narrative is governed by the order of the visual perceptual system. This study reviews three categories of space – landscapes, indoors and the body – within a data set of novels and argues that each reveals a systematic pattern of description. Using Chen’s (2005) global invariant model of the visual primitive, it is argued that the patterns found here are ‘holes in backgrounds’ from the gestalt concept of ‘suroundedness’. In consideration of the representative nature of these spatial categories this thesis also seeks to understand how these patterns, as a direct perceptual record, survive translation through the neural processes that support narrative production. Reviewing these neurological processes, specifically, episodic future thinking and language production – it is further argued here that the patterns are not interfered with by memory and language – they are maintained by them. Using the insights gained from these neural relationships this study applies these findings and performs a reading of a selection of modernist and postmodernist writers as a means of re-interrogating the relationship between visual perception and the text.

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# Chapter 1: Introduction

## 1. General Introduction

This thesis argues for the existence of spatial patterning in literary fiction. Drawing on a data set which consists of fifty novels written and translated in English, I argue that there are specific spatial frames within these texts that have, to date, not been discussed in contemporary literary studies nor have their features been examined. These frames, which I term ‘topological frames’, assume a very specific meaning related to a particular model of visual processing (global-to-local) where wholes are processed as opposed to parts of an image, the details of which are discussed in full in Chapter 3. However, for the moment, we can broadly say that topological frames within their broader context of spatial connotations are familiar to us as readers; they are the passages in a text where the spatial detail is typically delivered for the sake of orientation and information. They deliver a specific reference to the location and view of the narrator/focaliser. Upon examination these topological frames appear to be constructed systematically. I review three types of spatial representation here: outdoor, indoor, and human bodies, and argue that a unique systematic pattern of representation emerges in the topological frame for each of these types. Furthermore, the patterning does not deviate between writers, cultural influence and historical trends.

If external structural devices, such as culture, are not responsible for the existence of these patterns then it becomes necessary to look beyond the traditional boundaries of literary studies. In doing this I have favoured an approach that looks at the system which produces representation: cognition. By examining the cognitive mechanisms at work, primarily, visual perception, memory networks and language processing, I argue that there is evidence to suggest that topological frames expose a link between the ordered way we perceive the real world and that this order survives translation through a number of cognitive systems.

Fundamentally, this thesis attempts to answer the following questions:

1. Why do these spatial patterns exist?
2. Do they have a literary function?
3. What can they tell us about narrative production?

Therefore, the following hypothesis guides this research:

Topological frames are systematically ordered and this happens during narrative production. This is due to the ordered way that we visually perceive the real world and this is not altered by the other cognitive systems that govern and support textual representation.

### 1.1 Systematic patterning: what is it?

To illustrate my argument, consider the following literary description of a landscape:

‘I went to my window, opened it, and looked out. There were the two wings of the building; there was the hilly horizon; there was the garden; there were the skirts of Lowood.’



What spatial information is being communicated within this passage? For instance, we could say the following:

1. We know where the narrator is in relation to the space; we know this because she implies that she is located indoors (window) and that in order to view the space she must look outwards.
2. We know that she has a visual relationship with the space; she 'looked out' from the window.
3. The space described is outdoors because she lists types of spaces that are typically located outdoors; horizon, woods, garden etc.

Now consider the following description:

I went to my window, opened it, and looked out. There were the two wings of the building; there was the garden; there were the skirts of Lowood; there was the hilly horizon.'

Is there any new or different meaning to be gained from this second passage? The discernible difference is that the spatial description in the second passage is formatted in a particular way: the narrator describes the space in a proximal to distal fashion throughout her landscape, i.e. she describes the space closest to her first and progresses to the space further away. However, does knowing this enhance, or even diminish, the spatial meanings from the passage outlined above? Does systematicity add further meaning to the space of this narrative? I will argue throughout this thesis that it does not and this is because the systematic pattering found in these

texts is not derived from any narrative structure rather, it is a direct perceptual record of the visual system.

The text used in the examples is a passage from Jane Eyre (Brontë 1847) with the first example a rearranged construction on my part and the second the actual passage, so we have Jane looking out the window of her school and commenting:

‘I went to my window, opened it, and looked out. There were the two wings of the BUILDING<sup>1</sup>; there was the GARDEN; there were the SKIRTS OF LOWOOD; there was the hilly HORIZON.’ (Brontë 2001 [1847], p.72)

Brontë’s landscapes are produced in the same way throughout the entire novel, for example<sup>2</sup>:

Leaning over the battlements and looking far down, I surveyed the grounds laid out like a map: the bright and velvet LAWN closely girdling the grey base of the mansion; the FIELD, wide as a park, dotted with its ancient timber; the WOOD, dun and sere, divided by a path, visibly overgrown, greener with moss than the trees were with foliage, the CHURCH at the gates, the ROAD, the tranquil HILLS, all reposing in the autumn day’s SUN.’ (Bronte 2001 [1847], p.90)

Thus, within landscape descriptions the space is consistently formatted as a systematic proximal to distal representation resulting in a ‘progressive pattern’. This pattern emerges when we identify the first noun (lawn) and track its spatial relationship to all subsequent nouns (field, wood, church, road, hills and sun). For example:

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<sup>1</sup> Capitalisation, where necessary, will distinguish patterning throughout .

<sup>2</sup> See Appendix for full list of data sample detail.

## Sense and Sensibility (1811)

The situation of the house was good. High HILLS rose immediately behind, and at no great distance on each side; some of which were open downs, the others cultivated and woody. The VILLAGE of Barton was chiefly on these hill, and it formed a pleasant view from the cottage windows.<sup>3</sup>The prospect in front was more extensive; it commanded the whole of the VALLEY, and reached into the COUNTRY beyond. The hills which surrounded the cottage terminated the valley in that direction: under another name, and in another course, it branched out between two of the steepest of them. (Austen 2002 [1811], p.23)

## Finnegans Wake<sup>4</sup> (1939)

Who blocksmitt her saft anvil or yelled lep to her pail? Was her banns never loosened in Adam and Eve's or were him and her captain-spliced?...I heard he dug good tin with his doll, delvan first and duvlin after, when he raped her home, Sabrine Astore, in a parakeet's cage...[There are 8 other rivers mentioned in the intervening text here] Who sold you that jackalantern's tale? Pemmican's pasty pie! Not a grasshoop to ring her, not an ants grain of ore. In a gabbard he barqued it, the boat of life, from the harbourless IVERNIKAN OKEAN till he spied the loom of his landfall and he loosed two croakers from under his tilt, by the smell of her KELP they made the PIGEON HOUSE. (Joyce [1939], p.197)

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<sup>3</sup> Note here the beginning of a new pattern within the same topological frame and this is due to change in narrative view.

<sup>4</sup> ) This sample requires some decoding in order to see the pattern: this passage is discussing the moment HCE, the male protagonist, first meets ALP, his female counterpart. As with the entirety of this text, each word is generally a pun on another, although not necessarily from the English language lexicon. The first point of space here 'pail' could refer to both a pail of water or The Pale, an Anglo-Norman term for Dublin and its hinterlands. As with Bann – a river in Northern Ireland and also a marriage band (captain-spliced). However, what is evident is that all the points of space can be said to refer to a body of water – pail –river- ocean. And, like the other examples, there is this movement away from proximal to distal. The pail is swollen to a river and the river washes to the ocean What is also of note here, is that the pattern is reversed when HCE spots ALP ('till he spied the loom of his landfall') and the water volume dissipates: Ivernikan Okean- Kelp (only grows in shallow oceans and seas) - Pigeon House (South Wall entrance to the River Liffey in Dublin).

However, this patterning is not confined to landscapes, it also appears when characters and indoor spaces are described. Notably, for each of these spaces, the systematicity does not alter but what does change is the type of pattern produced by what I term the *spatial set* (ss). This term denotes the spatial groupings of objects and locations within a particular length of description, the topological frame, and their relationship to each other. How quickly the description delivers the space from origin to boundary and in which direction it moves characterises the type of pattern produced in the spatial set. For example, with landscapes the (ss) produces a ‘progressive’ pattern which begins with a description of an object or location close to the narrative view. The description consistently denotes an object or location further from the previous until it provides the reader with a textual representation of perspective: proximal to distal vanishing point, or the building to the horizon as in the case of Jane Eyre. However, with indoor space, a description of a room often contains multiple spatial sub-sets because the pattern ‘bounces’ between the centre and the edge of a room, illustrated below:

It was a large, stately apartment, with (PURPLE CHAIRS) AND (CURTAINS), a (TURKEY CARPET), (WALNUT-PANELLED WALLS, one VAST WINDOW RICH IN STAINED GLASS), AND A (LOFT CEILING) nobly moulded. Mrs. Fairfax was dusting some vases of fine purple spar, which stood on (SIDEBOARD). (Bronte 2001 [1847], p.88)

Thus, in this example the number of spatial sub-sets, highlighted in parenthesis, is six, resulting in a short ‘bouncing’ pattern that still retains its

systematicity in that it consistently moves from the centre to the edge.<sup>5</sup> Thus we could say that the spatial subset is categorized as bouncing and that it contains multiple spatial sub-sets (6) of the centre-edge binary.

Character descriptions produce a different pattern; they begin with an outline of the shape, for example, ‘a large, heavy-set man’, and then move to the facial and head area. However, they do not form the closed binary sub-set that we see with the centre-edge combination in rooms, because what follows once the outline/head is delivered is a third component with two possibilities: the description can either stay with the facial/head area or move to a body part. Thus, it is not random because it never returns to outlining the shape rather the descriptions form an open-ended sub-set of two. Evidenced in the two differing sample sub-sets below:

Set 1: Outline-Face/Head-Body

Jane Eyre

I looked at my pupil, who did not at first appear to notice me: she was quite a child, perhaps seven or eight years old, SLIGHTLY BUILT, with a small featured FACE, and a redundancy of hair falling in curls to her WAIST. (Bronte 2001 [1847], p.85)

Twenty Thousand Leagues Under The Sea<sup>6</sup>

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<sup>5</sup> Although this centre-edge pattern can, and does, alternate to edge-centre. However, either one produces systematicity.

<sup>6</sup> This description continues for a further five lines but remains with the bodies of the islanders. Notably, it switches from the male to female islanders but does not begin a new TS with the women instead it moves from the bodies of the men to those of the women: ‘Beneath their pierced, distended earlobes there dangled strings of beads made from bone. Generally these savages were naked. I noted some women among them, dressed from hip to knee in grass skirts held up by belts made of vegetation. Some of the chieftains adorned their necks with crescents and with necklaces made from beads of red and white glass. Armed with bows, arrows, and shields, nearly all of them carried from their shoulders a sort of net, which held those polished stones their slings hurl with such dexterity.’ (Verne, e-book [1870], no page ref)

They obviously were true Papuans, men of fine stock, athletic in BUILD, FOREHEAD high and broad, NOSE large but not flat, TEETH white. Their woolly, red-tinted HAIR was in sharp contrast to their BODIES, which were black and glistening like those of Nubians. (Verne [1870])

Set 2: Outline-Face/Head only

Crime and Punishment:

Sonya was of small STATURE, about eighteen years old, a THIN but GGOD-LOOKING blonde, with wonderful EYES. (Dostoevsky 2003 [1866]. p.221)

And, in Pride and Prejudice:

Lydia was a STOUT, well grown-girl of fifteen, with a fine COMPLEXION and good humoured COUNTENANCE. (Austen 2003 [1813], p.40)

Therefore, we can now describe the three types of patterning as:

1. Landscape TS: ( $P \rightarrow M \rightarrow D$ )= Progressive

Where  $P$ = the proximal space,  $M$ = median point,  $D$ = distal space.

$M$  is key to revealing the progressive pattern because it aids with the distinction between proximal to distal. Therefore, the ‘wood’ in the extract below from Jane Eyre would establish a median point in this description;

Leaning over the battlements and looking far down, I surveyed the grounds laid out like a map: the bright and velvet LAWN closely girdling the grey base of the mansion; the FIELD, wide as a park, dotted with its ancient timber; the WOOD, dun and sere, divided by a path, visibly overgrown, greener with moss than the trees were with foliage, the CHURCH at the gates, the ROAD, the tranquil HILLS, all reposing in the autumn day’s SUN.’ (Bronte 2001 [1847], p.90)

However, an immediate issue arises here as to what constitutes an object or location because if we look at the data samples, for example:

Leaning over the battlements and looking far down, I surveyed the GROUNDS laid out like a map: the bright and velvet LAWN closely girdling the grey base of the mansion; the FIELD, wide as a park, dotted with its ancient timber; the WOOD, dun and sere, divided by a path, visibly overgrown, greener with moss than the trees were with foliage, the CHURCH at the gates, the ROAD, the tranquil HILLS, all reposing in the autumn day's SUN. (Bronte 2001 [1847], p.90)

It could be argued that this passage has one distal point (*D*), the 'autumn day's sun', however, it could also be said that 'hills' represent a distal point from the narrator's position within the 'battlements' of Thornfield Manor. This is a typological issue; does a pattern present itself here because it is indicative of a location that remains ontologically distal or does the systematicity lie with measurable spatial relations? Thus, is the 'sun' always distal because it represents an unreachable location within the pattern – rendering it always distal – or is it distal because it is the furthest point from the narrator's location?

Kosslyn's research (1987; 1992) on visuo-spatial processing focuses on how these types of space are conceptually distinct from one another. Arguing that the processing of both types is governed hemispherically, the left cerebral hemisphere controls the processing of categorical spatial relations whereas the right controls the coordinate, Kosslyn defines this difference as:

*Coordinate* [sic] representations specify precise spatial locations in a way that is useful for guiding action...*categorical* [sic] representations assign a range of positions to an equivalence class (such as connected/unconnected, above/below, left/right). For many objects, parts retain the same categorical spatial relations no matter how the object contorts. (Kosslyn et al. 1992, pp.562-563)

Important here is the notion of guided action. Kosslyn et al. note that for visual perception, the units of coordinate space are not equivalence classes because the governing function of this type of processing determines a guide for action and thus, each object or obstacle, has to be measured as a separate entity in order to prevent the body from harm. However, a certain measure of spatial specificity is needed in order to guide one's action through this space.

Categorical space is a less specific perception of our space, particularly for scene processing – all that is needed is some general spatial positional detail. As Kosslyn et al. comment, ‘...the brain does not need to represent metric information precisely; differences in the precise positions of two objects or parts are often not relevant...’ (Ibid, p.562). Yet, categorical space does operate on the principle of equivalence classes. Therefore, in conceptual terms, the cat's paws, for example, are connected to the whole and each part will retain a categorical relationship (above, below etc.) to the whole despite the part being contorted when running or sleeping etc. and despite its change of specific location within any given space. Thus, it becomes unnecessary for the brain to know that the cat's paws are 20 cm from his eyes, it being simply enough to know that they are positioned in the lower area of the leg region regardless of whether the cat changes its position.

With regards to the patterns, this distinction can help us resolve the issue of whether the progressive pattern of landscape is derived from either a



categorical or coordinate spatial relationship. So far, it has been argued that each topological frame contains a spatial set (and also the potential for a number of spatial sub-sets) and in the case of the landscape pattern this would be (ss1) – the pattern emerges when we process the scene as a single whole entity. Looking at the overall formation of the pattern, we can say that it is not categorical space because a ‘field’ in isolation is not enough to define the entire scene of the landscape and categorical space relies on equivalence classes. It could be said that the Jane Eyre example is coordinate space because we need to understand the distal relations, in order to process the guide for action – if we wished to walk this route we could. However, the inclusion of the ‘sun’ still poses a problem as we can distinctly categorise that as something we will always be positioned below and far from and not an accessible part of this action route.

Sergent’s ‘Processing of spatial relations within and between the disconnected cerebral hemispheres’ (1991) suggests that the distinction between categorical and coordinate space is not so clearly delineated and this is due to function. Sergent argues that at times, both hemispheres work together depending on the quality of visual information being presented to the viewer and that we should not think of categorical and coordinate space as conceptually distinct because her data suggests that coordinate space contains units of categorical. She further argues that this is an early processing stage in ascertaining specific spatial distance relations.

Interestingly, the same cannot be said of the reverse, coordinate space does not form discrete early units of the categorical space – it appears that we do not need further specific measurement to understand where it is (cat’s paws argument). However, in terms of the patterning for landscapes, could it now be said that the ‘sun’ signals the end of the view in a very definite way i.e. that there is no possibility of going any further and that this initial information means that we can now process the coordinate space of proximal and median points in a more specific way? This would allow the ‘sun’ to form part of the coordinate chain but retain its categorical nature to define the measurement between the proximal and median space in the descriptions.

However, the corpus data would suggest here that the distal point is not always inaccessible and thus not categorically distinct from the rest of the pattern, for example, in Temple of the Golden Pavilion the distal point is represented as the mountains. The sky and clouds are located as a median point within this pattern as they form the intersecting space above the sea but below the mountains producing a stacking effect, however, it is still a progression through the landscape:

It was the wild sea. The waves surged forward in an almost continuous mass, hardly letting one see the smooth, gray gulfs that lay between one wave and the next. Piled up over the open sea, the great cumuli of clouds...and in its center [sic] it enveloped a faint blue sky of whose actual existence one could not be sure. Behind the zinc-colored [sic] waters rose the purple-black mountains of the cape. (Mishima 1987, p.160)

It is from this example, and others, that direction of action cannot be ruled out as a guiding contributor to pattern formation. And yet, the viewer never traverses the scene. This is an interesting secondary finding about the landscape pattern: at no point during the view does the character move towards through scene. This is supported by my claim that these scene representations are static in nature for an entirely different reason; if we are viewing the objects as a chain within a bounded area of space then to traverse this scene would require the insertion of movement and presumably a representation of moving through/past the object which would in effect, change the entire space from a macro to a micro representation. Therefore, holding two separate but coherent images of the same space but with a different focus may not be able to be maintained simultaneously.

There is also data in the corpus which, for landscapes, denote an incremental rise between the objects in the scene (field, hill, mountain) and this can, but does not always, end with a steep rise in gradient towards the sun/sky/moon, as with Jane Eyre. It can also remain on the same plane, relative to the viewer's position, as is typical with Hemingway; thus we have river, forest, distant hills when his narrator is travelling through mountainous areas by car. Added to this is the stacking effect produced by Mishima, as above. Despite gradient or axis the descriptions are systematically progressing because they are coordinated space as defined by Sergent – the overriding principle that allows for patterning in these

landscape descriptions is that we can distinguish one space from another in a specific way and that this is sometimes aided (as Sergent claims, only when necessary) by the insertion of an overtly categorical space at the end of the chain.

Sergent's argument for the interaction between hemispheric relations may be due to the fact that the space in the landscape patterns is outdoors and thus a more expansive surface area in need of assistance from the left hemisphere categorical process. This argument is supported by the fact that the patterns of room and the body are not so clearly reliant on coordination. Beginning with the indoor space of rooms, we can now say the patterns are presented as thus:

2. Indoor SS: (C $\rightleftharpoons$ E) or Multiple indoor SsS: (C $\rightleftharpoons$ E) (C $\rightleftharpoons$ E) (C $\rightleftharpoons$ E) = Bouncing

For example:

20,000 Leagues Under the Sea (1870)

It was a library. Tall, black-rosewood bookcases, inlaid with copperwork, held on their wide shelves a large number of uniformly bound books. These furnishings followed the contours of the room, their lower parts leading to huge couches upholstered in maroon leather and curved for maximum comfort. Light, movable reading stands, which could be pushed away or pulled near as desired, allowed books to be positioned on them for easy study. In the center stood a huge table covered with pamphlets, among which some newspapers, long out of date, were visible. Electric light flooded this whole harmonious totality, falling from four frosted half globes set in the scrollwork of the ceiling. I stared in genuine wonderment at this room so ingeniously laid out, and I couldn't believe my eyes.' (Verne 1870)

Where  $(C \rightleftharpoons E)$  is the closed binary of Centre and Edge which the alternation of either is represented by  $\rightleftharpoons$ . The spatial relations for indoor space can now be said to be coordinate space also as we can measure the distance between, for example, the wall and the table. There is also an argument here for *weak modularity* (Kosslyn et al. 1992) in the sense that overlapping may occur between typologies in the brain due to its network structure and that knowing the distal relationship between objects can sometimes help with both coordinate and categorical space. For rooms, I would argue that the reverse is also occurring here but also weakly: we could say that each unit of the indoor scene ( $n$ ) could equally represent the whole ( $X$ ); for example, a bed could represent the set of 'bedroom'. However, for the pattern to emerge is it more important to know that the bed is located centrally and the wall is at the edge of the scene. Defining this space categorically is not necessarily helpful and thus, indoor space also appears to be represented as coordinate.

However, it becomes obvious from discussions such as these that the introduction of multiple spatial typologies cannot provide a clear and consistent model on pattern illustration. For example, landscapes are both coordinate and categorical when Kosslyn and Sergent's explanations are employed. What is needed is a model which is both simple and universal in its application and which does not require incremental levels of complexity for it to work. This can be found in the work of Chen (2005) who

demonstrates that distinctions between categorical and coordinate geometries, such as Kosslyn et al.'s, are better understood through the principles of topology. Chen's work replaces these absolute definitions, for example, categories of space, with topological relativity whereby figure and ground are interchangeable. In this analysis no single feature is either categorical or coordinate rather that paw can be ground to claw just as the floor is ground to cat. Therefore, using Chen's topological model, and particularly his argument on 'holes' in backgrounds, the patterns will be explained in Chapter 3 as features of the fundamental geometry of topological invariance. In Chen's research, visual perception is based on the mind's ability to function visually across what he terms 'transformations' i.e. its ability to extract visual primitives, like holes in a background, which are examples of the most fundamental of all geometries, topology. Thus, any object is capable of functioning as ground and vice versa i.e. any background is capable of becoming an object.

### 3. Character TS:

- a)  $(O+F/H)$ = Short Loop
- b)  $(O+F/H+B)$ = Long Loop.

For example:

The Strange Case of Dr. Jekyll and Mr. Hyde (1886)

'Mr Utterson the lawyer was a man of rugged countenance, that was never lighted by a smile... (Stevenson, R.L., 1994 [1886], p.1)

‘[Dr Lanyon] was a hearty, healthy, dapper, red faced gentleman, with a shock of prematurely white hair...’(Stevenson, R.L., 1994 [1886], p.18)

Anna Karenina (1878)

‘In him, in his handsome, radiant figure, his sparkling eyes, black hair and eyebrows, and the white and red of his face, there was something which produced a physical effect of kindliness and good humor on the people who met him’. (Tolstoy 1998 [1878] p.55)

The term ‘Loop’ denotes here the description of outline of shape (O) followed by a description of only the face/head (F/H) and a second set, the long loop, encompasses the third component of the body (B). The outline of a body will always remain in position to the other parts despite movement or contortion of the body in space.

This opens up a further argument as to why the body is perceived as spatially different from landscapes and rooms. The obvious answer is that we have both subjective and objective knowledge of the body in space i.e. we can objectively view another’s body as a spatial entity whilst understanding what it is like to be on the inside of this view. Despite this, the patterns rest on the division of the body into parts, like landscapes and rooms. Although dividing up the body into parts is not a simple task – where do we cut? In terms of a view, how is the face different from the head? The surface area of the body is much smaller than a landscape and thus looking at the hills then the sun may involve an actual eye/head movement whereas how does one look at a person’s hair but not their head? This is discussed in much further detail in the next chapter on visual

perception but for the purposes of the current discussion suffice it to say that the body is a fundamentally different spatial entity than the other categories yet it seems to receive the same visual treatment.

Hoffman and Richards ask the question: 'Given that one wants to recognise an object from its shape, why partition the shape at all?' (Hoffman and Richards 1984, p.66). There is a wealth of literary discourse which could answer this question but this is mostly symbolic in nature and not very helpful for the larger discussion at work here. So, in keeping with Hoffman and Richards for the moment, we must also ask, why it is necessary to 'recognise' a literary character. We generally have no previous textual relationship with them and typically no real world relationship, yet, the data here would suggest that characters are viewed as if we are trying to identify them regardless by breaking their whole into parts.

Firstly, it appears that we divide the body up in a non-arbitrary way via a process, developed by differential topologists, called transversality. Hoffman and Richards comment, '...just as syntactic analysis decomposes a sentence into its constituent structure, so the visual system decomposes a shape into a hierarchy of parts. Parts are not chosen arbitrarily; the mental category 'part' of shapes is based upon a regularity of nature...transversality' (Hoffman and Richards 1984, p.66). Transversality is defined as 'When two arbitrarily shaped surfaces are made to interpenetrate they always meet in a contour of concave discontinuity of their tangent planes' (Hoffman and Richards 1984,



p.69). This may seem somewhat removed from a discussion on representation of a literary character yet it can illuminate the earlier argument illustrating the two 'loops' of (1) Outline+Face/Head and (2) Outline+Face/Head+ Body, as they comment, 'parts must cut an object at its articulations; a thumb-wrist part on the hand, for instance, would be powerless to capture the various spatial relations that can exist between the thumb and the wrist' (Hoffman and Richards 1984, p.71). In simpler terms, transversality occurs when a line intersects at least two other lines. The pattern would seem to support this type of partitioning: for example, if we consider that the outer neck lines are both intersected by the line of the clavicle, then the figure becomes divided into head and body, and, as Hoffman and Richards state: 'a rule of [which] exploits the uniformity of nature' (Hoffman and Richards 1984, p.66).

The outline is harder to distinguish as segregated by transversality as this is not an intersecting of lines, more of a continual loop around the surface area of the body. Yet, Tversky can help here with her work on visuo-spatial processing:

[T]here is a preferred level of reference, a most common way of talking in everyday speech, the level of shoe or chair, over a broad range of contexts. This level has been termed the *basic* level (Rosch, 1978). The basic level has a special status in many aspects of human cognition. Central to recognition and to categorization of objects at the basic level is contour or shape. (Tversky 2005, p.3-4)

In the corpus data there are very few references of, for example, spinal areas, thighs, calves, pelvic regions etc. Tversky findings support this, as she comments:

The brain has twin representations of the body, on either sides of sensory-motor cortex, one for the sensory part, one for the motor part. In both cases, certain parts, like lips and hands, have larger than expected amounts of cortex devoted to them, and other parts, like backs, have smaller than expected amounts of cortex devoted to them. (Tversky 2005, p.4)

And, this is supported by Hoffman and Richards who also comment:

[A]n articulation of shapes into parts is useful because one never sees an entire shape in one glance. Clearly the back side is never visible (barring transparent objects), but even the front side is often partially occluded by objects interposed between the shape and the observer. (Hoffman and Richards 1984, p.67)

Thus, there appears to be a two-pronged approach to dividing up the body: the shape of the body is gauged initially by contouring the outline, whether it be fat, tall, thin or small because it is the most basic level on which to ask ‘what is it?’ and it is only after we recognise what we are dealing with can we then proceed to divide the parts hierarchically.

This leads back to the notion of why we need to ‘recognise’ a literary character? I argue that we do not need to do this; readers obviously cope with, for example, the parade of symbolically dismembered body parts in Koestler’s Darkness at Noon (1940), yet within topological frames the body is sectioned as if the writer is also trying to view it for the first time, to recognise it. This leaves the question why the loop pattern of the body is used every time the same character is described within a topological frame.

In answer to this, I argue throughout this thesis that the production of a body in topological frames is governed by something deeper, not merely visual perception but perceptual organisation, despite literary intent towards specific characterization.

## 1.2 Systematic patterning: where is it?

These sets of patterns do not occur for every representation of landscapes, rooms and people. They are manifest in, as mentioned, topological frames of the text. Akin to Labov and Waletzky's (1967) notion of 'free clauses' in that they 'ha[ve] no fixed relation to the temporal sequence...and can range freely through the narrative sequence'(Labov and Waletzky 1967, p.12), these are places in the text which generally produce a spatial representation for the purpose of representation<sup>7</sup>. They are not found at a pivotal point within the narrative nor are they of central importance to the narrative arc. Highly visual, they foreground the space within the description; there are often no narrative distractions such as character movement, dramatic climaxes or even dialogue in which to interrupt the representation. For example, in Dickens' Great Expectations (1861):

At such a time I found out for certain, that this bleak place overgrown with nettles was the CHURCHYARD [...] and that the dark flat wilderness beyond the churchyard, intersected with dykes and mounds and gates, with scattered cattle feeding on it, was the MARSHES; and that the low leaden line beyond was the RIVER. And that the distant savage lair from which the wind was rushing, was the SEA...'(Dickens 1973 [1861], pp.1-2)

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<sup>7</sup> Although an occasional example of movement has been found, for example, Hemingway's The Sun Also Rises contains a reference to a boat sailing by Jake the narrator.

And, Achebe's Anthills of the Savannah (1987):

The low hibiscus HEDGE outside the window and its many brilliant red bells stood still and unruffled. Beyond the hedge the COURTYARD with its concrete slabs and neatly manicured bahama grass at the interstices showed no flying leaves or dust. Beyond the courtyard another stretch of the green and red HEDGE stood against the one-storey east wing of the Presidential Palace. Over and beyond the ROOF the tops of PALM-TREES at the waterfront swayed with the same lazy ease they display to gentle ocean winds.' (Achebe 2001, p.8)

At times, these spatial descriptions can lend themselves to the metaphorical or the allegorical and so it could be argued, for example, that Jane Eyre gazes out windows at landscapes after dramatic events have occurred and that she uses these moments in which to contemplate her fate. This will be addressed later, however this does point us in the direction of asking what purpose these spaces serve in the narrative? If they are not of central concern, then what are they doing? And, this line of questioning leads us into much deeper problems concerning spatial representation in narrative space; what does narrative space do?

In exploring this I argue that, critically, space has been somewhat overlooked as a functional operative within narrative. By this, I mean that space has not been awarded the level of functional scrutiny that has traditionally been the preserve of, for example, time. And, this has perhaps led to a lack of critical awareness of space as an ontological source for the processes of narrative production and comprehension. As Zoran argues,

narrative space 'is pushed into the corner, so to speak. It is not altogether discarded, but neither does it have a recognised and clear-cut status within the text' (Zoran 1984, p.310). This may be due to the ambiguity that surrounds narrative space; we are aware of its purpose, setting, background etc., but it can become rather unclear as to its specific functional role within narrative. The problem with space is its overall indefinability, we understand what it is when we speak of the narrative 'setting', but we can never fully capture and articulate its quintessential properties. It would seem that its only regular feature is its indistinctness. In some ways, this thesis argues that the lack of functional explicitness of narrative space – hence the dominant critical practice within literary studies on space's descriptive and symbolic qualities – denotes a type of structural dislocation from other aspects of the narrative, such as temporality and character interaction.

### 1.3 Systematic patterning: Methodology

In light of the above, it must be stated from the outset that this is a literature thesis, with a literary problem: why are these patterns appearing in these particular texts and what purpose do they serve?

The discovery and demonstration of this systematicity falls outside a traditional literary interpretation of texts because cultural context alone cannot account for the manifestation of these patterns in a data set that spans Victorian Britain, Anglo-American Modernism, Postmodernism and non-western contemporary texts. Thus, there is no grand meta-narrative in

which to place the research, no overarching philosophy in which to guide the results. This is not to say that previous works on spatial representation will not be engaged with and narrative paradigms will not be drawn upon, merely that there is no teleological expectation. Therefore, in many ways this research is more akin to a scientific endeavour than a literary one. A hypothesis is formed; data collected and results are interpreted to produce a general theory. This can be problematic, especially at the stage of data collection and result interpretation:

1. How does one objectively search for patterns without having to read every literary text ever written?
2. Would every passage of said texts need scanned and checked in order to fully ensure that there are no passages which negate the hypothesis?
3. If proved, why then do these patterns occur – is it really possible to separate cultural explanations from cognitive?

A transparent account of data selection would best describe it as purposive sampling. It must be noted, however, that the identification of patterning was not the original research premise. The initial research question was whether literary space possessed unique or unusual properties that could not operate outside narrative or alternatively, to address the limits that may be imposed by literature. Before the patterns were identified, Jane Eyre was purposively sampled due to prior knowledge of the text's frequent

references to landscapes in the hope of understanding the more componential aspects of spatial representation. However, landscapes were soon found to produce a systematic pattern, now known as the *progressive*, and further categories were introduced to test for other patterns – characters and indoor spaces. At this stage, the premise was formed that the patterns may be influenced by Victorian artistic practices (ekprasis) or the influence of visual literature in the guise of periodicals and magazines, such as Blackwood's, so further canonical Victorian texts were analysed to check for patterning in all three categories. These proved to support the findings in Jane Eyre thus, new literary periods were needed to test against cultural practices, hence the introduction of modernist texts; all of which were sampled for their canonical standing and focus on one or more spatial categories. For example, the assumption for Manhattan Transfer was that it would deliver a heavy focus on cities and rooms. Canonical postmodernist texts were added for the same purposeful reasons however, with the awareness that they may disprove the previous periods due to their frequent dispensing of narrative coherency, for example, Finnegans Wake. Therefore, the nature of this thesis' methodology is more characteristic of narrative itself, in that it begins with a discovery in a single novel from a particular period and this pushed the analyses to broaden its scope to test for cultural influence, or lack thereof. The initial exploration of Jane Eyre can be treated as a pilot study and this informed the subsequent data

collection and the process was repeated. That being said, some parameters need be applied to test the hypothesis, therefore, fifty texts from four historical and cultural periods are manually scanned to isolate any topological frames and then each of these spaces are categorised into one of the three categories (Landscapes, Indoor and Character) which are then further investigated for evidence of patterning. A corpus is drawn upon, a consistent process is used for analysing data and results collected. Thus, although there is no rigorous methodology adopted here, and in the strictest sense there cannot be, this thesis sets out to chart topological frames within a collection of texts in order to test the hypothesis against cultural trends. This is perhaps a first step for a potentially much larger study and my hypothesis could be tested by different methods in the future.

In literature we deal in generalisations, for example, a feminist reading of *Jane Eyre* in no way negates an argument concerning the gothic, the two are both valid and manifest within the text; evidence for one does not reduce the evidence for the other. However, this study cannot rely on such generalisations but it does not necessarily have to fulfil the criteria questioned in 1 and 2 (a full manual scan of every literary narrative) in order to prove that space is systematic. To address questions 1 and 2 with objective rigour is restricted by the boundaries of any thesis project and thus, is beyond the scope of this one too. However, there are current



corpora programmes, such as *DocuScope*<sup>8</sup>, which are available and could aid in tackling the question of textual volume. Yet, as with every task reducing aid, it will not provide the final overview, which in this case is the illustration of patterning. Therefore, if a manual scan is impossible and an automated one provides a part solution, a new means of testing is necessary. Indeed, scholars such as Moretti (2005) do just that. In *Graphs Maps Trees*, Moretti explains his concept of ‘distant reading’ in which he urges the literary scholar to put aside the ‘concrete individual works’ and embrace a process of ‘deliberate reduction and abstraction’ (Moretti 2005, p.1). By removing the data out of the localised context of the text, Moretti demonstrates that traditional criticism can only move forward on an individual level incapable of uncovering universal theories about the production of a literary text.

#### 1.4 Systematic patterning: models of explanation

From Achebe to Joyce the patterns conform and persist, hence the search for an operating principle in the mind, its processes and architecture. But the mind and studies of it is a vast and daunting area in scale and difficulty. The first step is a focus on those areas within such a large field that seem relevant to this study in order to answer the question: what is driving the appearance of these patterns? If we break the patterns down into parts, it can be said that they are comprised of three key components – vision,

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<sup>8</sup> See Hope J, and Witmore, M. ‘The Very Large Textual Object: A Prosthetic Reading of Shakespeare’. *Early Modern Literary Studies* 9.3 / Special Issue 12 (January, 2004): 6.1-36<URL: <http://purl.oclc.org/emls/09-3/hopewhit.htm>> for further detail.

imagination and language – and these headings form the remaining chapters of this thesis. Thus, it is structured as follows:

**Chapter 2 – Spatial Patterning and the Literary Aesthetics of Space:** This chapter expands on the illustration of patterning and reviews literary attempts to structure space. Focusing on narratology, this section will primarily ask one question: Why has spatial representation been largely ignored as a functional structure of texts? I will argue that space poses problems for those seeking to create typologies within literature and this is mainly due to the difficulty in fully articulating the function of narrative space – assuming it has one.

**Chapter 3 – Visual Perception and Patterns of the Primitive:** Vision is arguably the dominant mode of human perception and, for the purposes of this study, the mode that consistently delivers the literary descriptions of space. It becomes necessary to understand if visual perception is somehow ordered and if this order permeates the visual spaces within narrative. This chapter reviews the traditional models of visual perception, such as Feature Integration Theory (FIT), in the search for a potential explanation of the source of the patterns. However, FIT proves unable to explain fundamental aspects of the patterns, such as the absence of motion, and thus a more recent model, proposed by Chen (2005) is employed. Chen's work focuses on the visual primitive – what do we see first – and explains the patterns through relative topology thus, illustrating the patterning as a sequence of

relative 'holes in backgrounds' by his neo-gestaltian re-reading of surroundedness.

**Chapter 4 – Episodic Memory and Imagined Space:** Even if, as we shall see, our visual perception of the real world is ordered, can the same be said of an imagined version of this perception? Thus, it is essential to investigate the cognitive areas of the brain that enable the production of narrative, namely Episodic Memory and in particular, our ability to project our own and another's events via Episodic Future Thinking. This chapter will demonstrate that the perceptual system is directly linked to our episodic memory system and that the order of our visual primitive is preserved when it is translated to the episodic system.

**Chapter 5 – Textual Processing:** this chapter reviews the neural and cognitive operations that support narrative. Research data on narrative production is scarce and thus, any production theorist needs to look to comprehension models for support. Using neurological and cognitive psychology, particularly the ‘Immersed Experiencer Framework’ this chapter argues that the neural substrates that govern comprehension also seem to govern production. Further to this, I argue that these models support my hypothesis that the act of writing does not interfere with the translation process between perception, memory and language.

**Chapter 6 – Literary Applications:** this final chapter reviews the findings of this thesis in terms of literary application. In particular, I re-examine modernist/postmodernist writers such as Beckett and Joyce and the former’s attempt to dispense with visual saliency as a means to diminish the ‘terrible materiality’ of the written word. I also examine the post modernist writer John Banville and his philosophical concerns on reality and demonstrate how the patterns continue to operate despite, both periods concern with language and writing.

## Chapter 2: Spatial Patterning and Literary Aesthetics

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**Abstract:** this chapter addresses literary criticism on spatial representation. It reviews narratological enquiry with its inherent focus on structure and spatial typology as a means of potential pattern explanation. This involves an analysis of the key theories, such as Text World Theory, and their efforts to understand the nature of literary space. This chapter also recognizes the lack of specificity of both the term narrative space and the theories that have tried to address it. Arguing that the issue lies with the ambiguous function of space in literature, this chapter attempts to introduce further specificity to spatial terminology. Finally, it performs a comparative analysis on a selection of Victorian and Modernist texts to test for pattern presence and in the process deals with the issue of stylistic choice. By illustrating the patterns and their apparent lack of cultural origins this chapter also introduces the potential of cognitive influence on the patterns.

### 2. Introduction

Conceptions of space are central to our understanding of the material world and, it seems, endemic within discourse. As Sack points out, ‘Space is an essential framework of all modes of thought. From physics to aesthetics, from myth to magic to common everyday life, space, in conjunction with time, provides a fundamental ordering system interlacing every facet of thought’ (Sack 1980, p.4). Although Sack succinctly grasps the range and functional diversity of our spatial interaction, his comment somewhat diminishes the primary difference between the types of space he denotes:

a) material space - ‘everyday life’ and b) abstract space - ‘aesthetics’ etc.

favouring instead to blend these terms into a single ontology of space.

Although it can often seem difficult to do otherwise, the two are not to be conflated. For example, at the most rudimentary level, a geographical map

is merely an abstract representation of a particular area of material space as are any of the functional tools employed to structurally represent the material world: geometrical co-ordinates, the periodic table, biological diagrams etc. Yet it seems that space permeates our thoughts and actions to such a degree that it can become difficult to distinguish between the real and the represented. In a post-Baudrillardian world, it would not seem too much of stretch to argue that, occasionally, symbols of material space have displaced their original physical properties - the prevailing 2D image of the map of the world for example, condenses the vast array of global spatial types and their properties through a consensual metonymic system.

These notions of space become even more complex when enquiries move away from the objective enquiries of the physical world into the more subjective domains of art and literature - this is not to say that the material can only ever be evaluated through objective study, our own daily subjective experience with the material world negates any equation of physicality and objectivity - the point is, that our familiarity with space, in all its variant manifestations, can reduce our consideration and awareness of the difference between the tangibility of the material world and the abstractions of its representations. This poses complications for any literary study of space.

Literary space is, of course, abstract. The text, as a tangible object, may exist in the material world but the narrative is abstract. However, explaining how

an abstract space can be understood through our experience of a material space is a question altogether more difficult to explain. Recent work within the cognitive sciences relating to mental imagery (Tverksy 2005, Freedberg and Gallese 2007, Zwaan et al. 2010) has attempted to unite narrative to higher order processing within the brain. Freedberg and Gallese's presentation of mirror neuron resonance has initiated a multitude of successive studies into how the 'real' space of the body (embodied cognition) can impact the representation of space. Although these studies have gone some way into explaining why a reader can feel 'immersed' within the text they have yet to produce a definitive explanation and evaluation of the cognitive processes during narrative production. However, there is a fundamental commonality within a large proportion of these studies: visuo-spatial processing. The hegemonic position of vision within recent understanding of reading and its purported immersion has certainly impacted the blurring of the lines between material and abstract space. Despite the labours of some researchers to combat visual prevalence (Susanne Millar's (2008) work on haptic perception) it seems that the abstract representations of narrative are continually driven towards of our visual relationship with the material world.

One of the major issues with the word 'space' is the variety of non-specific terminology that surrounds it, such as place, setting etc. and their synonymous uses. This is coupled with the fact that descriptive terms often

come loaded with cultural and theoretical assumptions. For example, the word landscape (a nineteenth century invention<sup>9</sup>) alludes to all sorts of cultural agency - cultivation, environment or the picturesque, to name a few. Or the term place, which can denote either inside or outside, private or public and each of these also come with their own set of cultural and historical values. For example, the change in historical attitudes towards domesticity and its relationship to place not only impacts societal and cultural discourse but can also inform new architectural modes of thinking.<sup>10</sup> Therefore, before any definitions are offered as to what is meant in this study by narrative space, it would seem rather naïve not to have at least an awareness of the changing relationship that we have to both material and abstract space. Conceptions of space, it would appear, are neither a cultural/historical constant nor are they categorically specific in terms of the material and the abstract. Despite this, the epistemological difficulty, and perhaps paradox, posed by this study is that the patterns provide evidence for a constant – a series of unchanging patterns that derive from cognitive consistency represented through what should be the unpredictability of literary aesthetics.

Thus, it is within these contested boundaries that this study seeks a new structure.

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<sup>9</sup> See Hirsch and O' Hanlon's, 1995. 'Introduction' in *The Anthropology of Landscape*. Oxford: Clarendon Press.

<sup>10</sup> See Charles Rice, 2007. *Emergence of the Interior*. London: Routledge.



## 2.1 What is narrative space?

To begin, let me be clear about what I mean when I say ‘narrative space’: the general literary terms of setting, place etc. are not sufficiently specific for this study. However, the fields of enquiry that are more specifically determined, such as narratology, have yet to consider the particular type of space in which these patterns are occurring. For example, Ryan’s recent paper ‘Space’ (2012) makes a number of useful distinctions about the specificities of narrative space. With the understanding that there is not a clear spatial typology, she highlights the key research that has been undertaken in order to pull apart the notion of spatial ambiguity that has seemingly plagued narrative study<sup>11</sup>. From these works, she outlines five types of spatial representation within textual narrative as:

- 1) Spatial Frames: these are the spaces which provide the spatial detail, the location for the action. Ryan states that they are determined by the idea of containment, for example, a bedroom will be understood in terms of it being inside a house etc.
- 2) Setting: This is a broad label which describes the ‘general socio-historico-geographical environment’ (Ryan 2012) of the narrative events.
- 3) Story space: This includes all textual representation of the places and locations described even those which are not physically interacted with via plot and characterization. Ryan uses Joyce’s Eveline and her dreams of South America as an example.

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<sup>11</sup> In particular she refers to the works of Baxtin (1938), Werth (1999), Herman (2005), Gennette (1972), Fauconnier (1985; 198), Friedman (1993) and Turner (1996).

- 4) Narrative (story) world: This notion brings forth the reader's interaction with the space through their own experience of spatial relations and it is here that the reader can make assumptions about the non textually-explicit connections between spaces, for example, a road or river may not be represented within the text but this is not necessary for the reader to understand that one may be implied.
  
- 5) Narrative Universe: this is the story world of the narrative coupled with all other possible worlds presented by the text. These are often internal or mental worlds of the characters but need to have an explicit root within the text.

Structurally, the categories outlined here appear to evaluate the inter-spatial relationships necessary to understand the functional purpose of narrative space: elucidating the textual, mental, explicit and implicit representations. Focusing on her first category, spatial frames, this would appear to be the space of the patterning. It offers the type of spatial detail in which a pattern occurs – room descriptions, landscapes, etc. However, on closer inspection, there are two criticisms that need to be addressed here in order to understand where the patterns appear, and perhaps why. Firstly, Ryan includes action and movement within these frames and despite the validity of the evidence for the existence of these spaces, she does not split this category further to address the type of spatial frames which are principally static, and not coincidentally, the frames in which the patterns appear.

For example, consider these landscape examples from a passage in Northanger Abbey [1818]:

Spatial frames as per Ryan's definition:

It came—it was fine—and Catherine trod on air. By ten o'clock, the chaise and four conveyed the two from the abbey; and, after an agreeable drive of almost twenty miles, they entered Woodston, a large and populous village, in a situation not unpleasant. Catherine was ashamed to say how pretty she thought it, as the general seemed to think an apology necessary for the flatness of the country, and the size of the village; but in her heart she preferred it to any place she had ever been at, and looked with great admiration at every neat house above the rank of a cottage, and at all the little chandler's shops which they passed. At the further end of the village, and tolerably disengaged from the rest of it, stood the parsonage, a new-built substantial stone house, with its semicircular sweep and green gates; and, as they drove up to the door, Henry, with the friends of his solitude, a large Newfoundland puppy and two or three terriers, was ready to receive and make much of them. (Austen 1994 [1818], pp.196-197)

Spatial frames of patterns, 'topological frames':

She was struck, however, beyond her expectation, by the grandeur of the ABBEY, as she saw it for the first time from the lawn. The whole building enclosed a large court; and two sides of the quadrangle, rich in Gothic ornaments, stood forward for admiration. The remainder was shut off by knolls of old TREES, or luxuriant PLANTATIONS, and the steep woody HILLS rising behind, to give it shelter, were beautiful even in the leafless month of March. (Austen 1994 [1818], p.162)

In the first example, the movement of the protagonist is foregrounded within the spatial frame whilst the corresponding detail of this space is subordinated to this action. It is a classic example of what Ryan terms 'the immediate surroundings of actual events, the various locations shown by the narrative discourse or by the image' (Ryan 2012). Thus, Ryan includes any corresponding action, such as character movement, within her definition. However, the second passage, the topological frame, foregrounds the space itself, seeming to pause any explicit narrative action. This is not to say that

the frame is absent of motion, rather it is reserved for the space itself; there is implied motion through clauses such as ‘rising behind’. However, overall this type of frame seems at odds with aspects of Ryan’s definition that claims ‘This textualization [of space] becomes a *narrativization* when space is not described for its own sake, as it would be in a tourist guide, but becomes the setting of an action that develops in time’ (ibid). Ryan’s argument would seem to suggest here that the second example is not narrative; they appear to render detail for the sake of detail, thus, can we say that certain spatial frames are non-narrative?

If so, then perhaps they are more akin to the ‘free clauses’ set out by Labov and Waletzky in their early seminal work ‘Narrative Analysis’ (1967). They propose six components that are necessary for a ‘fully developed’ narrative and this includes the category of ‘Orientation’ which they claim provide details of the ‘person, place, time, and behavioral situation’ within the narrative structure (Labov and Waletzky 1967). Operating freely, in the sense that they are not tied to the dominant narrative event (although they do note that in oral narrative this type of clause is usually pre-event) this definition allows for the notion of spatial detail that is not tied to an event and thus this argument would refute Ryan’s definition of what makes a space ‘narrative’ as outlined above.

They also include the body (‘person’) as a spatially orienting operative which Ryan’s definition, drawing on work since, does not and here we have a

second criticism of Ryan's definition. Within the 'aesthetic' spatial frames the body of a character can be represented in the same mode as inanimate space. Consider Jane Eyre's description of St. John Rivers' features (short loop TS):

Mr. St. John—sitting as still as one of the dusty pictures on the walls, keeping his eyes fixed on the page he perused, and his lips mutely sealed—was easy enough to examine. Had he been a statue instead of a man, he could not have been easier. He was young—perhaps from twenty-eight to thirty—TALL, SLENDER; his FACE riveted the eye; it was like a Greek face, very pure in outline: quite a straight, classic NOSE; quite an Athenian MOUTH and CHIN. It is seldom, indeed, an English face comes so near the antique models as did his. He might well be a little shocked at the irregularity of my lineaments, his own being so harmonious. His EYES were large and blue, with brown LASHES; his high FOREHEAD, colourless as ivory, was partially streaked over by careless locks of fair HAIR. (Bronte 1994 [1847], p.341)

Here, St. John is cast as a spatial entity in the same way Jane describes her landscapes and rooms as does, for example, the narrator of Crime and Punishment [1866]:

He was a man already on the other side of fifty, of average HEIGHT and STOCKY CONSTITUTION, with HAIR that was turning grey and a large bald patch. His FACE had the swollen look that comes of constant drinking, almost greenish in colour, with puffy EYE-LIDS through which tiny, slitlike EYES shone, reddish and animated. (Dostoyevsky 2003 [1866] pp.15-16)

This jars with not only Ryan's 'spatial frames' but *all* five categories she outlines, which imply that characters belong to the events and action of the narrative instead of its 'setting' and it also reveals a difference that is not distinguished in the work of Labov and Waletzky. Orientation clauses include temporality as a part of the orienting structure and this can hold true

for the topological frames under study here to some extent in that they can convey temporal detail through a spatial entity, for example ‘the sun was going down’. However, an orientation clause for Labov and Waletzky can contain just a temporal reference, for example, ‘it was 6 o’clock’, whereas with the topological frames, temporality is not necessary and often not included within the frame. Typically a topological frame will pause any action, movement and time to deliver the spatial detail as in Twenty Thousand Leagues Under The Sea [1870]:

It was a library. Tall, black–rosewood bookcases, inlaid with copperwork, held on their wide shelves a large number of uniformly bound books. These furnishings followed the contours of the room, their lower parts leading to huge couches upholstered in maroon leather and curved for maximum comfort. Light, movable reading stands, which could be pushed away or pulled near as desired, allowed books to be positioned on them for easy study. In the center [*sic*] stood a huge table covered with pamphlets, among which some newspapers, long out of date, were visible. Electric light flooded this whole harmonious totality, falling from four frosted half globes set in the scrollwork of the ceiling. (Verne 2003 [1870])

In some respects it seems that early narratological discourse comes much closer to identifying the characteristics of ‘topological frames’ than subsequent research. Zoran (1984), in particular, outlines three levels of spatial structure within narrative texts: Textual, Chronotopic and Topographical, the latter being of particular importance here. Zoran tantalizingly describes the topographical level as ‘space as a static entity...perceived as self-existent and independent of the temporal structure of the world and sequential arrangement of the text’ (Zoran 1984, pp.315-

316)<sup>12</sup>. However, Zoran fails to furnish the idea of topographical levels with concrete examples of what form this may take in a narrative text, ‘a scene on the topographical level is a place...places may be houses, cities, streets, fields, mountains, forests etc. A place is a certain point, plane or volume, spatially continuous and with fairly distinct boundaries, or else surrounded by a spatial partition separating it from other spatial units (ibid). Thus, Zoran does not appear to include the body as a space nor does he clarify the contradictory aspects of his arguments in particular: his idea of a ‘field of vision’ is similar to Ryan’s spatial frame yet at the topographical level he appears to argue that each spatial entity forms a separate unit and does not illustrate how they link, if they indeed do so, to become a field of vision. And, further in his argument he argues that topographical places can overlap with ‘zones of action’ and this would appear to contradict this space as a ‘static entity’ (Zoran 1984 p.315). Thus, despite his correct assumption that these spatially static moments exist in the text, it cannot be argued that Zoran pursues them as a separately spatial frame with its own defining characteristics.

Therefore, the spaces outlined by the research above can be validated within a number of literary texts however, the topological frames where the patterns reside appear to have been overlooked in terms of their specific and

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<sup>12</sup> The ‘sequential arrangement of the text’ is not at the syntactic level in this level, Zoran is referring instead to the sequence of narrative events, similar to the idea of free clauses.

unique characteristics<sup>13</sup>. Thus, I offer the following definition for what I term topological frames:

These frames are generally static descriptions of a setting, place or person. Typically atemporal and absent of action, they pause the narrative event in order to render the detail of what is being viewed. They are systematically constructed and produce a unique pattern of spatial representation which is determined by their category (setting, place and person).

## 2.2 Theoretical review of narrative space

Unfortunately, this lack of scrutiny is symptomatic of the overall study of the structure of narrative space.

The initial enquiry on space, leading to Zoran's attempt at a theoretical model, concentrated on the representation of space within text. Focusing on deixis, specifically *place deixis*, early critics used lexical references, such as 'here' or 'there' as a way of demonstrating how readers understand the space of the narrative. Readers could anaphorically (a way of orienting the entity's contextual information) track the noun in which the deictic marker refers to as they orient themselves within the text. These markers could also provide both distal and proximal information. Although the deictic direction within discourse is problematized, due to the differing definitions of psychology

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<sup>13</sup> However, it must be noted that recent work on narrative segmentation by Speers et al. (2009) reveals a new interest in how readers are able to capture frames within texts and films through 'event boundaries'. Although, currently it is a comprehension model and not one of production.



and computational theories of artificial intelligence, this in no way hinders the later, more sophisticated models of representation.

The focus on text-based theories took a turn towards the cognitive when Duchan, Bruder and Hewitt published their work 'Deixis in Narrative: A Cognitive Science Perspective' (1995) which proposed a deictic model of reader processing called 'Deictic Shift Theory' (DST). Basing their research on the earlier work of Bühler (1955) and his concept of the co-ordinate system of 'origo', a term which refers to 'the subjective orientation to which all parties in verbal exchange are and remain attached' (Jarvella and Klein 1982, pp.13-14), they applied cognitive science to the conjunction of the linguistic and the psychological. Using Bühler's three key textual components of the temporal, 'NOW', the spatial, 'HERE' and the person 'I', Duchan et al. expanded the philosophical notion of subjectivity so that the origo, (I, HERE, NOW), becomes the deictic centre within a text. Emmott, arguing for the similarities to this and Werth's theory of 'Text-Worlds' (1995), comments that Deictic Shift Theory can explain the 'means of relocating the reader's deictic centre, so that a reader enters the spatio-temporal world of the narrative and moves around it' (Emmott 1999, p.58) or as Duchan et al. argue themselves, '... the fictional Origo is not the 'speaker' of the text but the experiencing character within the story world' (Duchan et al. 1995, p.25). As necessary and insightful as DST is, its significance for spatial enquiry became eclipsed by narratology's

preoccupation with its empathic impact upon mental representation during reading—evident in the volume of criticism surrounding Rizzolatti et al.’s (1996) discovery that not only does neural activity in the pre-motor cortex become stimulated when a person performs a motor action but the same area is neurally activated when they merely observe the same action in another. Thus, the narratological investigation of space was overtaken by the race to theorise reading. And, for the purposes here, this also seems to have eclipsed any potential for research on spatial representation during narrative production.

Therefore, embarking upon a general investigation of narrative space cannot simply serve to pick up where Zoran left off, despite the minimal and tangential attention space has received in the interim, because criticism itself has evolved. The ability of literary analysis to look outside its own field of enquiry (Whyte’s Metahistory: The Historical Imagination in 19<sup>th</sup> century Europe, 1973; Lacan’s The Language of the Self: The Function of Language in Psychoanalysis, 1968 etc.) ensures that any theoretical stances are dynamic ones. Within spatial representation this has meant its recent re-annexation by cognitive psychologists, such as Tversky, Zwaan and Radavansky, and their very recent work on the mental representation of space, with Zwaan specifically focusing on narrative.

Critically, a growing number of literary sub-disciplines have approached cognitive science with a consilient attitude and these new hermeneutic

relationships yield the potential for changing literary scholarship. For example, the influence of Evolutionary Criticism on literature has been furnishing academia with new and innovative ways in which to view and understand the role of narrative in our species development. The introduction of these ideas stems from foundational texts such as Evolution and Literary Theory (Carroll 1995), or Gottschall and Sloan Wilson's The Literary Animal: Evolution and the Nature of Narrative (2005).

Evolutionary Literary criticism is by no means the only scientific avenue available to those who wish to combine, borrow or create anew from varying disciplines in order to explain literary phenomena. For example, Lisa Zunshine's recent work entitled Why We Read Fiction: Theory of Mind and the Novel (2006) is indicative of the growth in Cognitive Cultural studies, an emerging field influenced by earlier works, such as, Turner's The Literary Mind (1996).

Although more indepth analysis is provided elsewhere in this thesis on the relationship between language and cognition, a particular school of thought's discourse is pertinent to the arguments for this chapter: cognitive poetics, more specifically, the strand called 'text-world theory' (TWT). The reason that this theory warrants elevation above other linguistic enquiries is that it is also trying to address similar representational problems to the ones posited here. As Gavins comments, '...the idea that literature or literary language and rhetorical figures are based in the processes of an ordinary

cognition.’ (Gavins 2007, p.1) Although, it must be noted that they are generally concerned with the relationship between semantic interpretation and knowledge selection, they do, nonetheless, provide a model for mental representation which can be utilised for narrative analysis.

Formulated by Werth in 1995, and championed by Gavins, text world theory is described by Gavins as:

We construct mental representations, or text-worlds, which enable us to conceptualise and understand every piece of language we encounter. How these text-worlds are formed, their conceptual configuration, and how we as human beings make use of them are the focus of text world theory. (Gavins 2007, p.2)

Adopting the semantic tools of interrogation, such as deixis (Gavins sees this process as world-building elements), proposition and entailment, text world theory seeks to use our experience of language and the world as reference points for discourse. Based on the fact that there will always be two interlocutors, TWT breaks down the process of interlocation into sub-worlds based on notions of self-reference, temporality and spatial boundaries. It is not necessary at this present moment to describe in detail the sub-world terms (which include notions of deontic, modal and epistemic language), merely it is suffice to say that TWT’s consider language to be the driving force of our mental representation of both real and fictional worlds. The strengths of TWT for this study lie with their emphasis on the relationship between the mind and the body, an embodied theory of

language which supports our ability to use real word cognition to support mental representation:

[A]ll approaches to cognitive discourse study are founded on the basic assumption that the mind and the body are inextricably linked. This we are often mapping our physical experience onto unfamiliar situations. (Gavins 2007, p.36)

Key TWT ideas such as this, in general, support my hypothesis that there is cognitive governance at work within topological frames. However, in the more specific criteria of spatial categorisation, TWT's loose terminology makes it difficult to see how space, despite TWT's nomenclature, is pinned down. For example, among the levels of worlds (discourse, text and various sub-worlds) there is the notion of 'world building elements', particularly, 'the enactors' which are the people and objects at the text world level. These elements are essentially the characters and objects within a scene, thus, TWT, unlike Ryan, include the body as a spatial entity. The remaining sub-worlds presumably include the body too.

However, TWT cannot provide further illumination to the type of frames under discussion here for two reasons:

1. It is heavily concerned with how worlds interact and how a speaker/reader negotiates the movement between these worlds and thus do not provide a coherent and stable structure for each of these worlds – i.e. we cannot say if there are universal properties to each.
2. Enactors, identified as people and objects within the text world level, are not worlds in themselves; instead they are world building

elements. This suggests that enactors are in a constant state of updating, augmenting etc. as new information becomes available. This is not to suggest that the same activity does not occur when a literary text is read but that enactors do not possess the static qualities of topological frames. And, this lends itself to a further criticism of TWT: there are no clear boundaries as to where and when the space world changes or ends – is this textually cued? I think so, however, this would seem to contradict the management of a constant flow of enacting data and how this is maintained amongst the level of worlds.

Although TWT successfully provides a model for how language is mentally represented, their claims for narrative mental representation, outlined here by Gavins:

A significant component of cognitive linguistics continues to be dedicated to understanding our ability to construct and maintain mental representations not just of simplified image-schematic but of complex linguistics structures. When we talk, read or write we are only able to understand one another through the creation of not just one mental representation of the language we are using but often dozens at once. (Gavins 2007, p.6)

is somewhat tenuous and their lack of neurophysiological input in which to decipher the activities they refer to, such as cognitive mapping, destabilises their claims as cognitive critics.

This may seem a harsh review, however, to thoroughly understand *all* the processes at work during mental representation, it may be that a theory

needs to include discourse from a variety of disciplines to ascertain any conclusive answer. If one remains fixed within a discourse then it is a teleological certainty that all data will stem from a theory as opposed to an enquiry which is data driven.

Although the research outcome of such works has proved fruitful when the nexus between art and science is explored, this is predicated, however, on the new directions that each can provide from their singular perspective. Whereas, new research findings are taking place within, for example, neurophysiology, and they may help to explain the purpose of these narrative patterns. Until recently, the full operating processes and capacities of deep brains areas, such as the retrosplenium, were not completely understood. However, this is changing, as Vann et al. have proven:

The past decade has seen a transformation in research on the retrosplenial cortex (RSC). This cortical area has emerged as a key member of a core network of brain regions that underpins a range of cognitive functions, including episodic memory, navigation, imagination and planning for the future. (Vann et al. 2009, p.792).

What is pertinent here to narrative is that RSC studies have shown how spatial navigation and its relationship to memory may influence how we construct and comprehend narrative space. For example, scene construction can be manipulated by the RSC through its ability to ‘translate’:

It has been proposed that the RSC transforms allocentric representations into egocentric representations and vice versa. In other words, the RSC helps to switch between egocentric, viewpoint-dependent (mediated by the posteriorparietal cortex) and allocentric, viewpoint-independent (mediated by the medial temporal

lobe) frames of reference [...] For instance, a scene or event is constructed in a person's hippocampus and medial temporal lobe. This is in an allocentric framework (for example, it is built in relation to a landmark 10 metres north, where north is relative to the environmental cues driving the head-direction system). This representation has to be translated into egocentric directions to enable a person to act, such as left or right from the current (or imagined) direction of view (for example, a landmark 10 metres ahead if the viewpoint is north or 10 metres to the left if the viewpoint is east). In this model the RSC is involved in the translation process, possibly by acting as a short-term buffer for the representations as they are being translated. (Vann et al. 2009, p.797)

### 2.3 Cognition before Culture?

If the form of narrative space is systematically constructed and if this systematicity is a product of the modular processes that control our ability to perceive, manipulate and, in this case, represent space, then it would appear that the production of narrative space leaves little room for cultural influences. However, it seems unlikely, but not yet impossible, that a purely cognitive approach can provide a theory which explains the appearance of systematically represented space. If these patterns are a purely cognitive production then a persistent reoccurrence of the same trends within each category, spanning literary periods and individual writers, would be the forecasted result. However, a cultural construction would yield only difference, and perhaps, randomness. And, what of stylistic choice? Writing is a conscious act and therefore, consideration must be given to the choices a literary writer makes when constructing characters, scenes etc.



Therefore, in order to fully understand these patterns, this section conducts an experiment using the data collected from four novels within the corpus. Reviewing landscapes within the Victorian period and rooms in the early Modernist texts, this section conducts a comparative analysis in order to check for the presence of spatial trends, and in particular, any similarity in these trends. The space of the body receives the same but separate treatment in the next chapter because, as mentioned, the body holds special status amongst these spatial types and thus, warrants a deeper review.

Coupled with the check for trending runs a conventional literary critique of the dominant features of each category. There are three reasons for conducting the experiment in such a manner:

1) **Stylistic choice and cultural determination:** if we can assume that the neurobiological equipment is universal for all writers of literature then it brings into focus the issue of choice. Literary studies have long tracked particular features of writers, periods and subjects that have been grouped in some fashion in order for it to be named as a literary movement, for example, Modernism. Joyce's literary style, however, cannot be likened to Beckett's and yet both are modernist. Style is more specific than a broad movement and can be analysed at both the lexical and syntactical level – it can be witnessed in the truncation Hemingway's prose but not that of Woolf's; it is the maximalism of Joyce but the minimalism of Beckett and so forth – that the patterns are also discerned at this level may prove

problematic for cognitive interference. If no obvious spatial trends are present for descriptions of landscapes within the same literary period but the symbolic features prevalent within that period are manifest, then it can be deduced that culture, and conscious creativity, inform the construction of narrative space.

2) **Cognitive** – If however, despite the presence of cultural symbols, patterns cross literary periods, then this would support the argument that our cognition of space, and its represented form, stems from our perceptual (visual) and higher order cognitive systems.

3) **Hybrid** – if similar patterning is found within literary periods, but does not cross over into the other groups, then it may be that a dual process is at work; one which maps out the narrative space of the body through a system of spatial points but also allows for conscious and symbolic embellishment of that space.

### Jane and Pip: The outdoor world

Through the developments within cognitive sciences, we know that certain brain areas, such as the RSC, influence our spatial abilities - motor functions, perception, visual ability etc. - therefore, it seems reasonable to argue that cognitive processes must also play a role within our representation of space. However, cultural influence, and its focus on the particular spatio-temporal context in which a narrative is produced, has also

been heavily documented as a dominant influence on the creative process, for example, postcolonialist theory. Yet, understanding which of these processes govern the construction of narrative space is much more difficult to discern. Therefore, leaving cognition aside for the moment, this experiment begins with a question - what, if anything, does culture tell us about narrative space? In beginning to answer this question, it seems appropriate to start again with Jane Eyre and the Victorian period of literature. Without generating a further socio-cultural history of Victorian England here, it is nevertheless necessary to review the general features of this literary period in order to understand their influences on the narrative space of Jane Eyre and Great Expectations.

There is a general consensus amongst literary critics of this period that a creative tension arose between idealism and realism, the desire to happily reconcile but in a manner that would not betray a sense of the truth. And thus, new, but fledgling, uncertainties concerning the meta-narratives of class, gender, religion, philosophy etc., began to pervade the creative process. These doubts about self-hood rose in direct correlation to the drastic changes brought about by the economic infrastructure of industrialisation. As Robin Gilmour asserts:

The Victorians wanted the 'real' in the form of ordinary life, but they wanted it heightened, softened and sweetened...they were often contradictory in their demands...the novelists responded to these contradictory demands with the mixed form, as it has been called, of their novels. This was a form neither closed and neatly tied...it was

a way of holding together a growing sense of life's shapelessness and a longing for shape and order. (Gilmour 1986, p.11)

In both novels the questioning of order is prevalent: the protagonists (and narrators), Jane and Pip, share a sense of frustration about their place in the world. Pip's embarrassment at Joe Gargery's regionalisms and lack of sophistication is counteracted by his guilt at leaving his childhood home and its uncomplicated structure. Meanwhile, Jane's social liminality is only reconciled at the end of the novel through her marriage to Rochester; the novel begins with her role as the orphaned outsider and continues this theme through her role as governess<sup>14</sup> and perhaps even to a certain extent when she discovers her independence at Moor house, as she will not and cannot submit to St. John River's spiritual intimidation. Eventually however, just as Gilmour describes, both Jane and Pip overcome their sense of liminality, at least in terms of social class, and despite their difficulties in reaching these points, the Victorian reader is rewarded with the 'softened and sweetened' ending that they demanded.

Therefore, in terms of narrative plot and stylistic devices both Jane Eyre and Great Expectations stem from the increasing problematised social order that beset the Victorian period. However, neither text is concerned only with social class; there are other social issues which both novels confront: childhood abuse is escaped through the genre of bildungsroman, gender is

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<sup>14</sup> The role of the governess was a highly debated topic in the mid-Victorian era and Bronte was not the only author to tackle this issue. Others, include, Lady Blessington's The Governess (1839), Elizabeth Sewell's Amy Herbert (1844) and Harriet Martineau's Deer brook (1839).

enacted through fear illustrated by the gothic elements of Bertha and Miss Havisham, as is colonialism and its desire to imprison if Bertha and Magwitch are compared. The symbolic features listed here lend themselves to, as said, genre, style and plot, however, they seem to reveal little about the 'where' of the narrative. Despite Hillis Miller's proclamation that 'time [in the Victorian novel] is a more important dimension of fiction than space' (Hillis Miller 1979, p.6), both Jane Eyre and Great Expectations do not merely consist of the 'what, who and when', the 'where' is also endemic to the novel - Pip's encounter with the city of London or Jane's Wordsworthian relationship with her surroundings, are both pertinent to the narrative. To rebuke Hillis Miller's comment is not to rate the manifestation of time lowly on the narrative scale - as time is a complex matter in both texts- nor does it serve to question why space is relegated to cultural notions of English regionalism. Instead, this research wishes to perform the same cause and effect treatment that culture reserves for genre, style and plot. In other words, if it can be argued that certain cultural influences, for instance, class, are caused by changes in the Victorian social order, then the effect, as we have seen, is that they are manifest in symbolic ways within the text. We understand why the plot is designed in such a way so that we can relate the two. However, what of space? Can we say that Pip's encounter with London is symbolic of industrial migrancy or the rise of the middle class gentleman? Probably, but what does this tell us about the mechanics of its

construction? If we can list the mechanics of, for example, Gothic construction (fear, supernaturalism, sorrow etc.) then it is reasonable to assume that if Victorian narrative space is a cultural product then we should be able to dissect its narrative space through its features and, more importantly, show how they are designed.

In order to test this theory, we turn now to a comparative analysis of the outlined spatial categories for both Jane Eyre and Great Expectations. If the space of landscapes are culturally driven, then we should expect to see a similarity between both texts, and there is. Consider descriptions of landscapes within both texts:

a) Jane Eyre:

I went to my window, opened it, and looked out. There were the two wings of the building; there was the garden; there were the skirts of Lowood; there was the hilly horizon. (Bronte 2001 [1847], p.72)

b) Great Expectations:

At such a time I found out for certain, that this bleak place overgrown with nettles was the churchyard...and that the dark flat wilderness beyond the churchyard, intersected with dykes and mounds and gates, with scattered cattle feeding on it, was the marshes; and that the low leaden line beyond was the river. And that the distant savage lair from which the wind was rushing, was the sea...(Dickens 1973 [1861], pp.1-2)

If we chart the points of space within each example, it seems that not only are both narrators moving in a progressive trend, through the landscape in

direction away from the proximal space, but also that both descriptions are systematically constructed in relation to each other:

a) Building - Garden - Skirts of Lowood - Horizon

b) Churchyard - Marshes - River - Sea

The same progressive trend can generally be located throughout both texts' description of landscapes:

c) Jane Eyre:

Leaning over the battlements and looking far down, I surveyed the grounds laid out like a map: the bright and velvet lawn closely girdling the grey base of the mansion; the field, wide as a park, dotted with its ancient timber; the wood, dun and sere, divided by a path, visibly overgrown, greener with moss than the trees were with foliage, the church at the gates, the road, the tranquil hills, all reposing in the autumn day's sun. (Bronte 2001 [1847], p.90)

d) Great Expectations:

We came to Richmond all too soon, and our destination there was house by the Green: a staid old house, where hoops and powder and patches, embroidered coats, rolled stockings, ruffles and swords, had had their court days many a time. Some ancient trees before the house were still cut into fashions as formal and unnatural as the hoops and wigs and stiff skirts; but their own allotted places in the great procession of the dead were not far off, and they would soon drop into them and the silent way of the rest. (Dickens 1973 [1861], p.255)

c) Grounds - Lawn - Field - Wood - Church at the gates - Road - Hill - Sun

d) House - Trees (before the house) - Not far off

The use of metaphor in this example renders the pattern unclear initially, however, if we understand that Pip is facing the house from a frontal perspective ('...and I stood still looking at the house', p.255), then he, like

Jane, is using the house as the point of origin and constructing his view in relation to this point, as he moves further away from the house to the trees that screen the front of it, then onwards to the wood ('procession of the dead', p.255) that is nearby.

e) Jane Eyre:

I cannot tell what sentiment haunted the quite solitary churchyard, with its inscribed headstone; its gate, its two trees, its low horizon, girdled by a broken wall, and its newly-risen crescent, attesting the hour of even-tide. (Bronte 2001 [1847], p.6)

f) Great Expectations:

By that time the river had lifted us a little, so that we could see above the bank. There was the red sun, on the low level of the shore, in a purple haze, fast deepening into black; there was the solitary flat marsh; and far away there were the rising grounds, between which and us there seemed to be no life, save here and therein the fore ground a solitary gull. (Dickens 1973 [1861], p.416)

e) Headstone - Gate - Trees - Horizon/Broken wall - Newly-risen crescent

f) Shore (sun is reflecting off this point of space) - Marsh - Rising grounds

The landscape descriptions up to this point within both texts have been chosen for their similar visual subject - the natural environment - and perhaps, it is not all that surprising that both follow a similar trend, especially if we consider the Victorian revival of ekphrasis and its relationship to art. Consider example f) where Dickens uses the terminology



for artistic construction, ‘foreground’, this is paralleled in Jane Eyre wherein Jane is looking at a landscape from her window seat:

At intervals, while turning over the leaves in my book, I studied the aspect of that winter afternoon. **Afar**<sup>15</sup>, it offered a pale blank of mist and cloud; **near**, a **scene** of wet lawn and storm-beat shrub, with ceaseless rain weeping away wildly before a long lamentable blast. (Bronte 2001 [1847], p.6)

Just as Dickens provides his readers with a pictorial view, consciously revealing his methodology through the use of ‘foreground’, so too does Jane, as she constructs her view from the window in pictorial terms. If both Bronte and Dickens use a combination of ‘the sister arts’ (pen and pencil) to portray landscapes that read as pictures, then this would suggest that the cultural trend at this time for ekphrastic works is certainly influencing the landscapes of both texts.

Although the use of methodology, such as ekphrasis, may be responsible for the image-like landscapes available in both texts, it reveals little about why they are both systematically constructed. At this point in the analysis, it can be confidently asserted that the natural landscapes of Jane Eyre and Great Expectations share a construction method which locates points of relative space in a systematic, progressive order, and thus, the resulting patterns share a remarkable similarity in their output. Therefore, this cannot be governed entirely by cultural trends because a random listing of spatial locations and objects would still produce ekphrastic effects. A more

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<sup>15</sup> My emphasis.

definitive test would involve locating a point in either narrative which departs from its comparative counterpart, and Pip's relocation to London should provide the very means in which to test this argument.

The entire narrative of Jane Eyre is rurally located, save for a few villages and hamlets whereas Great Expectations moves the narrative to the opposing space of a city. There is no comparative material in Jane Eyre which can juxtaposed against Pip's sojourn in the city but its very absence in the former provides the test for either cultural or cognitive spatial construction: if a cityscape is constructed in the same format as the other landscapes listed here, then would the results bolster the cognitive aspects of this argument concerning outdoor space in general? For example, would Pip's Victorian London behave like the enclosed space of Jake's Paris in Fiesta?

On closer inspection though it seems that London is never awarded any panoramic or expansive views by Pip, instead the reader encounters this space through his arrival at inns, chambers and offices of business. London, for both Pip and the reader, is constructed as a series of navigations from one indoor space to another, for example, consider Pip's description of his arrival:

Example g)

It was a little past midday when the four-horse stage-coach by which I was a passenger, got into the ravel if traffic frayed out about the Cross-Keys, Wood-street, Cheapside, London...while I was scared by the immensity of London, I think I might have had some faint

doubts whether it was not rather ugly, crooked, narrow, and dirty. Mr. Jaggers had duly sent me his address... (description continues of his short journey to Jaggers' office and its interior contents). (Dickens 1973 [1861], p. 151)

Or Example h) which sees Pip arrive at his lodgings, Barnard's Inn, for the first time:

We entered this haven through a wicket-gate, and were disgorged by an introductory passage...(p.161)

And Example i)

I dropped in to the office to ask if Mr. Jaggers had come in yet, and I found that he had not, and I strolled out again. This time, I made the tour of little Britain, and turned into Bartholomew's Close; and I now became aware that other people were waiting about for Mr. Jaggers, as well as I. (p.154)

From these examples, it seems obvious that Dickens' does not provide his reader any scenic views of London; if we look at example i) Pip makes a tour of the area called Little Britain and there is not a single remark on what this space presented to him, which seems rather odd. It may simply be that this may be Dickens' own recollection of a city experience, and his attempt to represent it may influence his descriptions, but this seems over-simplistic. There is but one exception to his absence of extensive views and this occurs when Pip is reporting a bout of inclement weather:

Example j)

Day after day a vast heavy veil had been driving all over London from the East...so furious had been the gusts, that high buildings in town had had the lead stripped their roofs; and in the country, trees had

been torn up, and sails of windmills had blown away; and gloomy accounts had come in from the coast of shipwreck and death. (Dickens 1973 [1861], p.296)

This example sees Pip systematically work his way out of the city, noting that he begins above it in the first place, toward the country and out to the sea. Just like his depictions of previous landscapes, this example follows the trend which appears to be reserved for more legitimate types of outdoor space. This points towards one thing: cities are not wholly processed as outdoor areas, in fact Pip's London shares similar trends to the later, modernist texts of Hemingway and Dos Passos, and it is to such that we now turn our focus.

### The enclosure of the city

The rapid urban growth that accompanied Victorian industrialisation encouraged a pace of housing construction that resulted in slum conditions and all of the social and physical ills that accompany such living conditions. Thus, London, for Pip, is a dirty and dangerous place. As he describes: 'I thought the windows of the sets of chambers into which those houses were divided, were in every stage of dilapidated blind and curtain, crippled flower-pot, cracked glass, dusty decay, and miserable makeshift...' (Dickens 1973 [1861], p.161). By the early modernist era, the city has been firmly established but, in some respects, literary attitudes towards this behemoth of construction had not. One needs only to think of Eliot's 'The Wasteland' to understand what Lehan terms as the process of 'cut[ting] a man off from his

spiritual roots, the profit and loss had emptied modern man of meaning, created the walking dead who are called to their commercial tasks...'(Lehan 1987, p.68). In the four novels analysed here – Great Expectations, Fiesta, Manhattan Transfer and The Great Gatsby – the city literally oppresses its inhabitants and this physical state of suffocation is often accompanied by a mental counterpart. As early as 1922, H.G. Wells in a lecture entitled 'The Scope of the Novel' was annexing social responsibility for modern literature, commenting that it is 'the only medium through which we can discuss the great majority of the problems which are being raised in bristling multitude by our contemporary social developments.'(Gamache and MacNiven eds. 1987, p.16).

Again, without wishing to reiterate a full history of the Modernist period, it is suffice to say for the purposes of this section that 'The Wasteland' is only one of a number of literary texts that sets the city against the land of the dead; the recurrence in of this theme can be found on a spectrum as wide as that which takes us from Balzac's *Pere Goriot* [*sic*]...to Dreiser's *Sister Carrie* and Fitzgerald's *The Great Gatsby*...' (Lehan 1987, p.72). Therefore, any number of examples from the four texts will attest to the city as a negative space, witnessed in the following examples:

#### Example k) Great Expectations

So I came into Smithfield; and the shameful place, being all asmeared with filth and fat and blood and foam, seemed to stick to me. (Dickens 1973 [1861], p.154)

Example l) Fiesta

I did not sleep much that night on the Sud Express...I saw the Escorial<sup>16</sup> out of the window, gray and long and cold in the sun, and did not give a damn about it. I saw Madrid come up over the plain, a compact white skyline on the top of a little cliff away off across the sun hardened country. (Hemingway 2004 [1927], p.210)

Example m) Manhattan Transfer

Like sap at the first frost at five o' clock men and women begin to drain gradually out of the tall buildings downtown, grayfaced throngs flood subways and tubes, vanish underground. (Dos Passos 2000 [1925], p.276)

Example n) The Great Gatsby

This is a valley of ashes - a fantastic farm where ashes grow like wheat into ridges and hills and grotesque gardens; where ashes take the form of houses and chimneys and rising smoke...'(Fitzgerald 1994 [1926], p.29)

It would be oversimplifying matters to say that Jake's ennui with life in the city is represented in the same aggressive format as Dos Passos' New York but within each text there is desire to escape the cityscape - Pip wishes for a return to Joe, Jake needs to simple pleasures of rural Spain, Jimmy Herf is literally lost at the door of a familiar skyscraper and Nick Carraway cannot fully bring himself to live within the city confines, preferring a commuter town on New York's periphery. Each protagonist is never fully comfortable within the heart of the city. Symbolically, this fear of the city and in some respects, self-enforced exile from it, is clearly a 'real world' social manifestation, as the critics above argue. However, as with the Victorian

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<sup>16</sup> The Escorial is the historical residence of the king of Spain, situated near Madrid.

period, does this tell us anything about the construction of city space within the texts? It seems that despite the social, visual, technological and architectural developments that have occurred from Dickens' 1860's to the 1920's of the Modernist writers, our cognition of these changes fundamentally remain the same. The city, despite architectural embellishment or functional purpose, is pared down to its skeletal frame - it becomes an indoor space. With Fiesta, buildings, monuments, narrow streets etc. occlude, and even obstruct, the natural line of sight, forcing the narrator consistently look upwards for an organic escape. The enclosure of the city renders the narrators' perception of this space as proxemically limiting and hence, patterns which we would expect to follow the outdoor progressive trends are forced into the bouncing trends of place due to the demands on the peri-personal space of each protagonist. The other notable variation here is that when an outdoor space follows the indoor (room pattern) it can violate the claim for an absence of motion within topological frames. This is supported by the following illustrations:

Example o) Great Expectations:

Following the wall of the jail, I found the roadway covered with straw to deaden the noise of the passing vehicles...(Dickens 1973 [1861], p.154)

And:

All things were quiet in the temple as ever I had seen them. The windows of the room of that side, lately occupied by Provis, were dark and still, and there was no lounge in Garden-court. I walked past the fountain twice or thrice before I descended the steps that

were between me and my rooms, but I was quite alone. (Dickens 1973 [1861], p.359)

In these examples we find Pip narration of the city space to follow the general trend of **Edge-Centre**: in the first passage he describes the wall and then the road and in the second he moves from the windows to the fountain, which are usually positioned centrally, in this case in Garden-court, until he leaves this space.

Example p) Fiesta:

The taxi went up the hill (CENTRE), passed the lighted square (EDGE), then on into the dark, still climbing (CENTRE), and leveling out onto a dark street behind St Etienne du Mont (EDGE), went smoothly down the asphalt (CENTRE), passed the trees and the standing bus at the Place de la Contrescarpe (EDGE), then turned on to the cobbles (CENTRE) of the Rue Mouffetard. There were lighted bars and late open shops on each side of the street (EDGE). (Hemingway 2004 [1927], p.22)

In this example, Jake like Pip is moving, but the trend, although reversed, still holds - a systematic bouncing trend between the edge of his enclosure to its central space.

Example q) Manhattan Transfer

A steamroller was clattering back and forth over the freshly tarred metaling of the road (CENTRE) at the cemetery gate. A smell of scorched grease and



steam and hot paint came from it. Jimmy Herf picked his way along the edge of the road (EDGE)...He brushed past swarthy-necked workmen and walked on over the new road (CENTRE) with a whiff of garlic and sweat from them in his nostrils. After a hundred yards he stopped over the gray suburban road, laced tight on both sides with telegraph poles and wires (EDGE)...(Dos Passos 2000 [1925], p.108)

Here, the example is following an identical trend to that of Fiesta: Centre-Edge, despite the fact that Jimmy is on foot whilst Jake is in a taxi-cab.

Example r) The Great Gatsby:

He [Gatsby] wouldn't say another word. His correctness grew on him as we neared the city. We passed Port Roosevelt, where there was a glimpse of red-belted ocean going ships (EDGE?), and sped along a cobbled slum(CENTRE)lined with the dark undeserted saloons(EDGE) of the faded-gilt nineteen hundreds. (Fitzgerald 1994 [1926], p.74)

The patterning in this example, although a systematic combination of the binaries of Centre and Edge, begins, somewhat ambiguously with Edge, presuming that Nick looks to either his left or right. If not, then the pattern reverts to that of the other modernist writers, Centre-Edge, and this seems more likely. If Nick can only catch a glimpse of the ships, then his view is blocked by the buildings of Port Roosevelt and therefore we cannot be certain of its location.

To conclude, the findings at this point concerning both landscape, and by extension, the cityscape, have resulted in the following:

1. Landscape representations during the mid-Victorian period are constructed in a systematic progressive trend. This could be culturally driven but the consistent systematicity cannot be governed by cultural production. If popular artistic practices of the day, such as ekphrasis, were governing the construction of landscapes, then the effect would be manifest regardless of systematicity.

2. Cityscapes adopt the bouncing trend normally reserved for indoor space. Despite the dominant symbolic effects of these cities, the pattern crosses over literary boundaries, and we see the same binarity of description, Centre and Edge (or its reversal), consistently utilised as the mechanism for representation throughout the four texts analysed. Indoor spaces are also atypical in terms of motion – of all three categories, indoor spaces contain a higher frequency of motion within the frames, for example, character movement. A possible explanation for this is that they are living spaces and are thus populated by the potential for action. They are also bounded spaces – walls, doors, etc. and are foreshortened by the surface area. The body, as a category of study here, is also a bounded space (outline) but cannot move outwith these boundaries whereas indoor spaces allow for both the potential of motion beyond a particular room.

## Stylistic Choice

This section focuses on the space of landscapes and explores in more detail the textual and cultural aspects of this type of narrative space in an attempt to counteract a fully cognitive model of construction. Using the data analysed from the Victorian novels this section argues two key points:

1) The argument is introduced that textual linearity creates the potential for systematic patterning but not the content. By examining the stylistic choices in a number of patterning examples, it is further claimed that literary style does not appear to interrupt patterning: syntactical components such as prepositions, adjectival clauses etc. differ in the cases studied below however, each example continues to maintain the patterns.

2) Using the visual arts as a comparative tool, it is argued here that the patterning is a textual representation of visual perspective.

The linearity of syntax would suggest that narrative comprehension is an incremental process; the mental representation of characters, locations etc. are added, amended and discarded as the text dictates. As Garrod and Sanford describe, ‘...(Garrod, and Sanford 1999, p.3). Therefore, a landscape description would not be perceived as a landscape until all the points of space became a unified whole, each point of space adding to the previous one and anticipating the next. This, however, is problematic on a number of levels; there is strong evidence to suggest that readers need only a minimal amount of detail in which to construct a sufficient spatial

representation for narrative purposes (Zoran 1986), and despite the intuitive thought that narrative space is incrementally formed, it would appear that instead it is the linearity of this form which fragments the same space. Unlike a visual representation of art, linear syntax cannot deliver the whole at once, it can only deliver a series of sequential packages. To this end, more recent models of discourse have discounted text as the primary means of reader comprehension, favouring a framework which can account for the simultaneous but escalatory relationship between the ‘surface code’ of the text, the relationship between elements of the text and the situational model (Van Dijk and Kintsch 1983) which attempts to explain the psychology behind reader immersion within the text (Oosterndorp and Goldman 1998, Zwaan and Radavansky 1998). There can be no doubt that reader comprehension theories have benefited from the recent influences of the cognitive sciences. Therefore, as with reader theories, the patterning exemplified below will attempt to ascertain whether the form of text is an enabling or constraining factor on the systematic structure of landscape representation.<sup>17</sup>

Recalling data from previous analysis, the landscapes of *Jane Eyre* and *Great Expectations* were similarly and systematically constructed. The spatial description begins near the imagined viewer and moves further away, for example:

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<sup>17</sup> This discussion is taken up again in more detail within a cognitive context in Chapter 5 section 5.3

a) Jane Eyre:

I went to my window, opened it, and looked out. There were the two wings of the building; there was the garden; there were the skirts of Lowood; there was the hilly horizon. (Bronte 2001 [1847], p.72)

And

b) Great Expectations:

At such a time I found out for certain, that this bleak place overgrown with nettles was the churchyard...and that the dark flat wilderness beyond the churchyard, intersected with dykes and mounds and gates, with scattered cattle feeding on it, was the marshes; and that the low leaden line beyond was the river. And that the distant savage lair from which the wind was rushing, was the sea...(Dickens 1973 [1861], pp.1-2)

On closer inspection, aside from the patterning, there are few other stylistic similarities between both examples; the use of the definite article and the narrative mode of first person. The stylistic *difference*, however, is more pronounced. Consider the coordinating conjunctive clauses in example b) compared to a), or the presence of noun modification in b) compared to a), resulting in the sense that the reader has an assumed level of familiarity with the space in Jane Eyre, whereas example b) is a passage from the opening

page of Great Expectations and presumably this is why it furnishes the reader with an increased level of orienting detail. And, it is with spatial orientation that further disparity is discernible: the prepositional phrases that guide the reader through the points of space serve to convey distance in Great Expectations, yet in Jane Eyre none are present<sup>18</sup>. Pip explicitly records, through his use of the preposition ‘beyond’, a measure of proximity from each point of space to the next as the passage progresses; this *churchyard...beyond* the churchyard was the *marshes...line beyond* that was the *river...the distant savage lair from which the wind* was rushing, was the *sea*. Whereas Jane does not denote any proximal/distal relationship between the points of space that she describes. Yet inferentially we understand that the house is the point of origin and the garden boundaries this space, as do the skirts, hills and horizon respectively. Bronte is assuming that her readers understand that she is representing an imagined view of a natural landscape and presents it as such.

If the specific syntactical elements of the passages relating to space, such as prepositional phrases and phrase co-ordination, are responsible for driving the patterns, then it is arguable that the higher the frequency of syntactic markers relating to a particular space, the more the presence of patterning would emerge and its clarity enhanced. However, this is not the case, in both texts it is clear that the targeted noun shares a particularly distal

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<sup>18</sup> It is also worth noting that Jane’s view represents an increasing gradient of perspective as she tracks the space within her field of vision on more of a vertical axis, whereas Pip’s description remains relatively horizontal.

relationship from the previous one regardless of any prepositional guidance. Indeed, a high frequency of specificity would negate the existence of any patterning - the very establishment of (cross cultural) patterns found within this research would suggest that only minimal amount of information is necessary and is provided. That patterning could become obscured by detail may seem rather teleological in its claim but from the texts analysed thus far, evidence suggests that unless the space is functioning on a symbolic level, the descriptive terms tend to track the space through noun phrases not modification.

If, as is argued here, the syntactical content of landscape description is not responsible for patterning, could it be the form of text that causes patterning? In other words, does the linearity of text force our understanding of the narrative sequentially, thus resulting in systematic descriptions? Yes and no, from a purely textual perspective linearity is incapable of expressing the scene as a whole unit of thought and thus, we have a fragmentation of information. However, linearity is not responsible for patterning. Pip and Jane could still convey the same information about their landscape through a different ordering of its space. Pip could mention the distant sea, then the churchyard etc. as could Jane with her view of Thornfield's environment. It is not the text that orders the patterning, it is the topographical relationship of the points of space to each other that determines it. Textual linearity produces the potential for sequential

description, allowing for spatial tracking, but it cannot determine the content of the sequencing nor its geographical relationships.

### Cultural Influence and style

If we can ascertain that a different type of representation (one which is co-temporal with the analysed novels) is able to signify the whole, then it should inform the previous argument regarding textual governance of patterning and also lend itself to one on cultural influence. This leads us to the visual arts, or more specifically, landscape paintings. More specifically, if the spatial properties of the two Victorian novels discussed are expressed in similar terms to landscape painting of that time then it may be a case of cultural manifestation; were systematic depictions a visual Victorian cultural practice and thus chosen specifically by the authors for this influence?

The landscape descriptions within both texts have been chosen for their similar visual subject - the natural environment - and perhaps, it is not all that surprising that both follow a similar trend, especially if we consider the Victorian revival of ekphrasis and its relationship to art. Consider example c):

By that time the river had lifted us a little, so that we could see above the bank. There was the red sun, on the low level of the shore, in a purple haze, fast deepening into black; there was the solitary flat marsh; and far away there were the rising grounds, between which and us there seemed to be no life, save here and therein the fore



ground a solitary gull. (Dickens 1973 [1861], p.416)

Here Dickens uses the terminology for artistic construction, 'foreground', this is paralleled in Jane Eyre wherein Jane is looking at a landscape from her window seat:

At intervals, while turning over the leaves in my book, I studied the aspect of that winter afternoon. Afar, it offered a pale blank of mist and cloud; near, a scene of wet lawn and storm-beat shrub, with ceaseless rain weeping away wildly before a long lamentable blast.  
(Bronte 2001 [1847], p.6)

Just as Dickens provides his readers with a pictorial view, consciously revealing his methodology through the use of 'foreground', so too does Jane, as she constructs her view from the window in pictorial terms. If both Bronte and Dickens use a combination of 'the sister arts' (pen and pencil) to portray landscapes that read as pictures, then this would suggest that the cultural trend at this time for ekphrastic works is certainly influencing the landscapes of both texts. The fact that both writers are borrowing properties from the visual arts in order to express an image through text, points towards the notion that they were aware of the textual limitation regarding landscape portrayal.

However, how was the visual counterpart of the sister arts representing landscape at this time? Was it constrained by form, in the way that textual

expression appears to be? According to Steiner, art, like literature has also suffered in its struggle to represent. She argues that art is constrained by temporality and this has a negative impact on any attempt to portray narrative. As she comments:

The pictorial medium is temporally static, and thus painting has long stood as a symbol of the transcendent object - beautiful, outside of time's depredations, complete in itself...the logic of Renaissance perspective largely put a stop to narrativity in high art, for the image was to be a perceiver's vision of the world at a single moment in time. (Steiner 1988, p.2)

This argument has some weight when considered in direct comparison to a literary text - both of the novels discussed are in effect capturing a single momentary view of an imagined viewer but this space can be augmented as the narrative progresses; the lack of proximal detail in example a) from *Jane Eyre* acknowledges that the reader has a previous textual familiarity with this landscape.

What Steiner also alludes to here is the not just the restriction of form but also the meta-physical acceptance of this constraint and the conscious choice to cease in an attempt to overcome it, to the point where this choice becomes a cultural trend - and quite a lengthy one at that. The world of Post-Renaissance art revered the objectification of the landscape. They were idealised and often used as backdrops to a broader mythical or biblical analogy. This is not to say that some developments were afoot; in the fourteenth century, Italian painters, such as Giotto di Bondone, began to appreciate the natural elements of their environment and despite the

established practice, Italy became a centre for new and innovative compositional techniques, such as graphical perspective (Steiner 1988). It was not until the seventeenth century that landscape truly escaped its relegation as backdrop. The influence of Dutch painters, known as the Dutch Golden Age, further developed expressive techniques. However, it is was the landscape paintings of nineteenth century that would make Sir Kenneth Russell proclaim their position as ‘the chief artistic creation’ of that period. By such times visual perspective was fully embedded into technique, aided by the French practice of painting *en plein-air*. The early Italian geometric models were now fully fledged immersive perspectival models of viewing.

Is it perspective then that governs the space in landscape depictions? Arguably yes, practices such as repoussoir (the depiction of an object into either side of the foreground to draw the viewer’s gaze) may seem at odds with this but if we consider the two paintings below by the French artist Camille Corot:



Fig. A. View of Genazo. 1843



Fig.B. The Ferryman. 1865.

We can see that Fig. A. does not adopt the use of repoussoir technique as Fig. B. does, yet this does not determine the overall structure of the space. The eye of the viewer may be drawn to the presence of the tree in Fig.B. but it does not alter the overall spatial arrangement - near space moving towards a distal point. Like the imagined reader of narrative, landscape art's imagined viewer does not have direct control of composition. Despite what we, as readers, imagine Jane and Pip see, the space is structured before we activate any mental representations of it – as it is with painting – thus, drawing a gaze does not alter the perspectival pattern of near then far.

Once this is realised a further claim can be made here as to what the systematic patterning of textual landscapes may be doing: arguably, they are trying to portray the same perspectival space as a visual image. Reviewing a number of natural landscape paintings from post-Renaissance art will reveal a commonality that crosses over into the textual: generally, the space is constructed in a proximal to distal fashion. It cannot be structured in any other way if an attempt at realistic perspective is included. The insertion of the perspectival narrator or painter will always determine a pattern as such - it seems impossible to do otherwise. Therefore, it would appear that systematic patterning could stem from attempts to translate the visual into the textual.

Therefore, having reviewed cultural influence and stylistic choice as potential controlling influences in the patterns through a periodic examination of techniques such as, ekphrasis, and symbolic representations of specific social preoccupations, the argument points to an initial conclusion that the patterns do not originate with these factors. Thus, the remainder of this study will concentrate on potential cognitive governance of the patterns with a specific focus on visual perception.

However, a cautionary note should be sounded here as it should not be inferred that allowing the cognitive processes of visual perception as the mechanisms that govern the patterns denies the interaction of cognition and culture. Recent work (Gibbs 2005 and Marik et al. 2010) suggests that ‘The adult cortex adapts to alternations in sensory experience...and that specific functions...can be altered by sensory deprivation and learning...and nervous system damage e.g. retinal lesions, stroke, neurodegenerative disease or amputation’ (Marik et al. 2010). The reference to learning, for example, sheds new light on the development of the adult cortex and its networks which previously were considered to have been impervious to change or indeed could be fixed at an early stage of life. This in turn shifts changes in such networks from an exclusively cognitive base to one which admits a role for cognitive and cultural interaction. This further suggests that the patterns belong to a wider set of cognitive operations that can, in the longer term, modify neural networks.

## Chapter 3: Visual Perception

**Abstract:** This chapter explores the dominant models on perceptual organization of the visual system as a means of assessing the origins of the patterns. It reviews the local-to-global models – particularly Feature Integration Theory – which organizes the processing of visual stimuli through a series of partially extracted features via a top-down and bottom-up combination of reassembly. Alternatively, global-to-local models are predicated on gestalt principles and seek to explain visual processing as holistic organization. Local-to-global models are considered here as a potential explanation of the patterns as a function of cognitive efficiency: a cognitive recall aid based on Nakayama’s theory of visual icons. However, it is the latter global-to-local (topological) model that provides the best-fit explanation of the form and content of the patterns by proposing the theory that the patterns show strong similarity to the registration of the global invariant of topological geometry.

### Introduction

Ultimately, this chapter argues that the patterning is caused by the visual perceptual system. Using a topological model of visual perception to explain the patterns existence, I suggest that the patterns are a record of the structure of the visual primitive – what we perceive first – and its intact translation to the memory system, specifically episodic memory, which governs the ability to create narrative. Whilst conducting an extensive review here of local-to-global models and their potential application to the patterns it must be recognized that topological model developed by Chen (2005), provides evidence that form perception precedes motion – visual motion detection only occurs after form has coalesced. Therefore, it may be the absence of motion within topological frames that exposes them as them as a record of the visual primitive.

Specifically, Chen provides an alternative to traditional models of visual perception, such as Feature Integration Theory (FIT), which conclude that visual perception is a dual process: bottom up and top down processing with the former delivering the salient aspects of the image/target object such as shape, colour and texture. However, Chen maintains that topological geometry is responsible for the visual primitive which results in a global to local model. This differs from FIT which argues that the local detail of colour, shape etc. are determined first and then mapped onto the object at the attentive (top down) stage. For Chen, local details are added later and what is determined first is the global registration of topology which is decided by invariance – what cannot be altered despite geometric transformation. Using gestalt notions of connectivity and surroundedness, Chen applies the rigour of Kleinian mathematics to demonstrate that the global invariant of the visual primitive is a hole in a background. Through a close reading of Chen’s work, this chapter will suggest that the patterns are a series of holes in backgrounds whose sequencing can be explained as the relative relationship of a hole becoming a background as the pattern progresses. The wider implication of this argument, and this chapter, is that the patterns are a direct record of the visual primitive.

Furthermore, if the hypothesis is correct here, that all topological frames are patterned, then it needs counter-examples to support the proof. The majority of counter-examples are found within the samples of children’s



literature in the corpus. On examination of these texts, there are two possible explanations of why patterning does not occur: motion and genre. Therefore, this chapter will also discuss counter-examples and how, despite their evidence of non-patterning, show that the counterexamples too are more consistent with Chen's account than with the alternatives.

### 3.1 The visual delivery of topological frames

In the novel *Jane Eyre*, the dialogue develops the narrative's plot and action but Jane's prose consistently lends itself to the pictorial. As her gaze fixes upon her subject of study, she presents her reader with landscapes that read like paintings and characters cast as sculptures. Consider for example the following description of her view from the window seat in a breakfast-room:

Folds of scarlet drapery shut in my view to the right hand; to the left were the clear panes of glass, protecting, but not separating me from the drear November day. At intervals, while turning over the leaves in my book, I studied the aspect of that winter afternoon. Afar, it offered a pale blank of mist and cloud; near, a scene of wet lawn and storm-beat shrub, with ceaseless rain sweeping away wildly before a long lamentable blast. (Bronte 2001 [1847], p.6)

Here, Jane is deploying the window as a framing device whilst the closed drapes ensure minimal peripheral disturbance, leaving her free to present the scene before her; the contours of the land, the back/foreground setting of the clouds/lawn and the quality of light, as an ekphrastic space of representation.

That Jane narrates in such a visual manner is fundamental to the identification of patterning within this study. The empathic role that visual hegemony encourages within the narrative catalysed further study within this thesis, resulting in a detailed focus on the visual constructions of the novels spatial representation and the emergence of patterning as a governing design. The narrative passages that clearly signal spatial consideration, are demonstrated through Jane's use of clauses such as 'I watched' or 'I looked'. The category of rooms, for example, yields the following Edge-Centre binary:

I stood and warmed my numbed fingers over the blaze then I looked round; there was no candle but the uncertain light from the hearth showed, by intervals, papered walls (EDGE), carpet (CENTRE), curtains (EDGE), shining mahogany furniture (CENTRE): it was a parlour, not so spacious or splendid as the drawing-room at Gateshead, but comfortable enough. (Bronte 2001 [1847], p.35)

In this passage Jane is surveying her space ('I looked') in a particular way; she shifts her gaze from the edge of the room (walls) to a more central area within the room (carpet) and then back to the edge again (curtains) until she finally returns to a more central view (furniture).

However, the dominant role of vision is not always as explicitly stated in the corpora. Generally, visual perspective is implied in the delivery of the frame.

For example:

1)Body category

Anna Karenina 1878– Third person narration – Short Loop

‘In him, in his handsome, radiant figure, his sparkling eyes, black hair and eyebrows, and the white and red of his face, there was something which produced a physical effect of kindliness and good humor on the people who met him’. (Tolstoy 1878, p.55)

In the Name of the Rose 1983 – First person narration – Short Loop

**Example b)** ‘The cellarer was a stout man, vulgar in appearance but jolly white-haired but still strong, small but quick.’ (Eco 1998, p.27)

2) Landscape category

The Third Policeman 1967 – First person narration – Progressive pattern

Example c) ‘To the left was brown bogland scarred with dark cuttings and strewn with rugged clumps of brushes, white streaks of boulder and here and there a distant house half-hiding in an assembly of trees. Far beyond was another region sheltering in the haze, purple and mysterious...’

(O’Brien 1993 [1967], p.54)<sup>19</sup>

The Rainbow 1915 – Third person narration – Progressive pattern

Example d) ‘ Still the Marsh remained remote and original, on the old, quiet side of the canal embankment, in the sunny valley where slow water wound along in company of stiff alders, and the road went under ash-trees past the Brangwens’ garden gate. But, looking from the garden gate down the road

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<sup>19</sup> The narrator repeats this patterns in the next sentence only from the right side of his view. In essence creating 2 separate topological frames.

to the right, there, through the dark archway of the canal's square aqueduct, was a colliery spinning away in the near distance, and further, red, crude houses plastered on the valley in masses, and beyond all the dim smoking hill of the town' (Lawrence 1995 [1915], p.7)

### 3) Room category

20,000 Leagues Under The Sea 1870 – First person narration – Edge-Centre

Example e) 'It was a library. Tall, black-rosewood bookcases, inlaid with copperwork, held on their wide shelves a large number of uniformly bound books. These furnishings followed the contours of the room, their lower parts leading to huge couches upholstered in maroon leather and curved for maximum comfort. Light, movable reading stands, which could be pushed away or pulled near as desired, allowed books to be positioned on them for easy study. In the center stood a huge table covered with pamphlets, among which some newspapers, long out of date, were visible. Electric light flooded this whole harmonious totality, falling from four frosted half globes set in the scrollwork of the ceiling. I stared in genuine wonderment at this room so ingeniously laid out, and I couldn't believe my eyes' (Verne 1870).

These examples illustrate the role, explicit or implied, that vision plays in both narrative perspective and, more specifically, pattern production. However, it is not enough to argue generally around the idea of the

involvement of visual perception in the patterning. These patterns form particular structures and it is necessary to reduce visual perception down to its initial form to understand the argument that these patterns follow the same primitive structure.

### 3.2 Models of visual perception: Feature Integration Search (FIT)

It is broadly acknowledged that perceptual organization is structured around the dynamic relationship between bottom up (preattentive) and top down (attentive) processing of features. Neurobiological relations can also specialize depending on what is being viewed, for example, the primary visual cortex will rely more heavily on the dorsal stream for motion perception whereas object recognition is supported by the ventral stream. We know that visual perception is temporally ordered, and for global-to-local models this temporality suggests a further hierarchy of organization. The temporal organization of visual perception is important here: what do we see first i.e. what is the visual primitive? This question is pertinent to an explanation of the 'form' that the patterns assume. For example, are they indicative of local features such as colour, size and texture? Or, are they organized by an altogether different set of principles, for example, the gestaltian groups of wholes and parts?

According to Chen, there are two leading theories on the way in which visual perception is ordered and they are divided into models of visual saliency and models of holistic registration: 'local to global' and global to

local' models. He calls this 'A Great Divide' in perceptual organisation (Chen 2005, p.553)<sup>20</sup>. Each of these models provides an account for the visual primitive in an attempt to understand how the order of perception begins. Models of visual saliency rely on the integrative mapping of salient features such as shape, colour, texture etc. Whereas holistic registration models employ fundamental geometries of topology as platforms on which saliency occurs. However, each model will be given consideration here in terms of helping to explain the origin of the patterns: Feature Integration Theory (local-to-global) is explored as a potential candidate model for the specific features of the patterns types: shape, size, contour etc. Nakayama's local-to-global theory on visual icons is also explored as a potential representational aid for cognitive efficiency if we consider the possibility of the patterns as a templative spatial aid. Finally, with the awareness that local-to-global models are increasingly being challenged by more cognitive approaches (Wang et al. 2007, Henderson et al. 2007), this chapter reviews the global-to-local model proposed by Chen (2005). Chen's 'The topological approach to perceptual organization' (2005), a holistic model, is of particular interest here and this is because he sees form perception as the point of origin for visual perception – a platform for which saliency, and motion, can be built upon. The consistent absence of explicit motion in the topological

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<sup>20</sup> The 'local to global' and 'global to local' divide is disputed by others, for example, Wolfe in 'On topology's place in the psychophysical structure of human vision' (2005) argues for a spectrum of theories as opposed to an either or choice. Wolfe also argues that Chen's work is not an extreme 'global to local' rather somewhere in the middle citing Oliva's and Torralba (2001) on 'spatial envelopes' as a more 'global to local' model than Chen's.

frames is a key feature and thus, a model such as Chen's may help to explain why the patterns form in the manner they do. However, favouring a topological approach does not rule out the validity of research stemming from visual saliency based models: the strong neurobiological consensus on object recognition and motion perception within the dorsal and ventral streams, the most recent advances made through models on predictive coding and the general agreement on the dynamic cognitive relationship between global and local perceptual features.

During perception, evidence suggests that adaptations for processing the input from distal stimuli enhance the information that is finally obtained and that it is these adaptations that make perceptive processing complex and indirect. As distal stimuli reach the sensory organs of the body using light, pressure waves and so forth, the mind converts these to neural energies in the process of transduction. These neural energies - proximal stimuli - are then used to create 'percepts' or enhanced versions of the object. Gestalt psychology has provided us with many useful solutions to the understanding of vision particularly when it describes a suite of adaptations like 'grouping' where, for example, we enhance raw data from the visual cortex to see stimuli that are close together as part of the same object - the 'proximity rule'- or the 'common fate' rule which groups together stimuli based on the agreement of variables like movement, direction and speed. Gleitman (2004) usefully summarises this whole area of gestalt by saying that perceptual

grouping principles can be brought together under a single rule: the principle of maximum likelihood.

However early models of gestalt grouping are of limited use as they are in essence a set of observations, and useful as these are, they are intuitive in nature and do not constitute a theory as such. Whilst gestalt theorists saw grouping as central to vision and perception they had not defined their terms rigorously enough and are not a proper solution to identifying what were to become known as the visual primitives.

One of the dominant models in visual saliency is Feature Integration Theory (FIT). It can be examined and evaluated as a possible candidate model for the patterns by considering it and its variants as a tentative solution which explains sequencing in the patterns.

There are different versions of this basic concept and collectively - due to their reliance on detailed local features - they are referred to as 'visual saliency' models, pioneered initially by Treisman and Gelade and Marr. FIT suggests that a version of visual search – feature search – allows us to identify features like colour, size and movement more or less instantaneously with no application of 'attention', or 'preattentive' processing (Treisman & Gelade 1980). FIT breaks the search into two distinct phases – a bottom-up phase which is essentially disintegrative and preattentive which renders targets into their constituent features – colour, orientation, movement, location, texture and shape - thereby creating



‘feature maps’. These are then subjected to a top-down processing which is ‘attentive’, requiring concentration and attention and creates or draws on ‘saliency maps’ to reintegrate the features offered in phase one to identify or recognise the observed target/s and it is this second stage or phase which gives the theory its name. The most interesting idea here relating to the patterns is that at this bottom-up preattentive stage the objects are disintegrated into their constituent features which are then dealt with separately. This may provide a connection to the patterns which ‘disintegrate’ the representations of people and places, such as the landscape pattern, to reveal a literary equivalent of feature mapping.

Using FIT as an explanation for the particular sequences that we are finding in the patterns, we could say, for example, that the Long loop of the body pattern can be thought of as a two phase operation. The first - preattentive bottom-up processing- could be regarded as the sub-conscious data feed, for example, the outline stage of the body loop which then feeds potential visual matches from a top down store in a process generally referred to as mapping, which delivers the organisational element of the patterns – Outline – Head – Body. Thus, the patterning, in the context of this theory, is driven by the relationship between subconscious searches matched with conscious data stores. However, FIT requires disintegration in first-phase search but it does not indicate the order in which the features thus isolated are scanned. Yet, we may deduce from the act of disintegration itself that

some form of sequencing occurs and that bottom-up search should target large over small in terms of human and animal targets and near over far for topology as they offer a greater likelihood of information.

The key idea in visual saliency theories is that the features identified as visual primitives are vital to their success: location, size, shape, colour, luminescence, movement, texture and so on. Of all features, Treisman and Kanwisher give shape the greatest importance – which accounts for why we see the outline in the body pattern first. In ‘Perceiving visually presented objects: recognition, awareness, and modularity’ (1998) they comment:

The goal of perception is to account for systematic patterning of the retinal image, attributing features to their real world sources in objects and in the current viewing conditions. In order to achieve these representations, multiple sources of information are used, such as color, luminance, texture, relative size, dynamic cues from motion and transformations, and stereo depth; however, the most important is typically shape. (Treisman and Kanwisher, 1998)

This is supported by FIT’s distinction between the two types of visual searches: ‘feature’ with its low reaction time (RT) and ‘conjunctive’ with a much higher RT. Reaction time or ‘latency’ tells us that the speed of different types of sensory processing. The success of our human ancestors was partly based on their ability to respond quickly to stimuli. More importantly – as is the case with feature search – the mind can work so quickly that it can produce responses that seem almost instantaneous:

Evolutionary pressures have given high priority to speed of visual recognition, and there is both psychological and neuroscientific evidence that objects are discriminated within one or two hundred

milliseconds. Behavioral studies have demonstrated that we can recognise up to eight or more objects per second, provided they are presented sequentially at fixation... (Treisman & Kanwisher, 1998)

and:

During real-world scene perception, we move our eyes about three times each second via very rapid eye movements (*saccades*) to reorient the high-resolving power of the fovea' (Henderson et al., 2007).

The low latencies of bottom-up processing give it a prominence in FIT over the top-down processing which requires the use of attention. These theories are often augmented with probability decision models of saccadic decision which were used to understand gaze fixation like the LATER models (Linear Approach to Threshold with Ergotic Rate) (Carpenter & Williams, 1995; Reddi and Carpenter, 2000) These were so-called 'race to threshold' probability models which mathematically describe the way in which accumulating data i.e. units of saccadic information, compete to trigger a saccadic decision and direct gaze. Their use emphasises the hegemony of saliency and inbound visuality.

However, it is the work of Oliva and Schyns on hybrid imagery that can help explain the preference of large over small in visual sequencing: hybrid imagery combines images at both low and high spatial frequencies to create optical illusions whereby subjects see two different percepts depending on their distance from the target. This phenomenon explains why hybrid images, which offer the brain alternative images depending on viewing

conditions like distance, explains why ‘outline’ is processed ahead of ‘head’, or near before far, in the patterns. In this view, the act of writing is an achievement of the embodied mind embedding a perceptual pattern from the mind into patterns in text.:

SFs [*spatial frequencies*] can be described as groups of frequencies termed ‘bands,’ and different SF bands convey specific information about the appearance of a stimulus. For example, bands of higher SFs (HSFs) typically convey edge information and fine detail of a stimulus whereas bands of lower SFs (LSFs) carry information regarding the global structure of a stimulus. (Freeman & Loschky, 2011)

More interesting however was the observation that: ‘...Oliva's work shows that the brain extracts large-scale features slightly earlier than fine-grained features. Large scale features are processed within 50 milliseconds, giving an overall impression of the visual scene. The processing of fine-grained details begins slightly later, at around 100 milliseconds.’ (Costandi, 2011).

Using FIT’s organizational principles, we can account for the sequencing in the progressive patterns of landscape (large favoured over small/near to far) and it can explain why the outline/shape is processed ahead of the salient aspects of head and body parts. However, it does not help in understanding why head is perceived before body in the Long loop body pattern. These areas are organised in the second phase of the visual primitive – top down processing – through feature maps and suggests that larger target features

are processed before smaller ones – thus, body should be processed before head and not vice versa. Yet, if we recall from earlier illustration when a character is described the contour of the body precedes references to both heads and body parts with body parts belonging to the Long loop pattern only. Therefore, if we can call the contour of the body a larger target area than its summative parts (leg, head etc.) then the patterns align themselves with FIT's organizational principles.

### 3.3 Cognitive models of visual saliency: the patterns as a representational aid?

An early idea in this thesis centred around the notion that the patterns were appearing as some form of cognitive template that aided recall for both writer and reader in terms of the deictic shifts created/presented to them in the narrative. As a representational aid, the patterns could serve to assist areas of the brain such as the retrosplenial cortex (RSC) as the 'translation model' suggests that the 'RSC uses information about current heading direction to translate allocentric (hippocampal) representations into egocentric (parietal cortical) representations — this would be required to reconstruct a scene or memory or to imagine a new perspective' (Vann et al., 2009, pp.799).

This idea is supported by later visual saliency models that combine cognition with bottom-up processing. Ken Nakayama see the bottom-up phase of visual search in terms of neurophysiology with '...neurons sensitive to a

variety of features, including disparity, motion, color, line orientation, line termination etc.’ and ‘...organised as a multi-resolution, multi-feature pyramid...’ (Nakayama, 1990, p.412). On the top-down side there is ‘visual memory’ which contains ‘...tiny pattern recognition templates or icons...’ which are activated in two ways ‘...First by the process of pattern matching with incoming visual signals from the feature pyramid. Second, by the activation of other icons through associative learning...’ (pp.412-413.)

The two-phase processing of FIT in Nakayama’s model is still apparent here but the existence of pattern recognition templates or icons in the top-down phase takes FIT further. This suggestion of a templative formatting of stored records in ‘visual memory’ could be linked with the idea of the patterns acting as a representational aid. However, the second top-down phase is integrative so seems to be about wholes as opposed to parts. But we could say perhaps with more accuracy that the second-phase process is better described as *reintegrative* so that like phase one processing it is still about the assembly of features or components so that both parts of FIT and its variations could point to patterning as feature mapping whether disintegrative or reintegrative or both.

Whilst top-down processes are clearly cognitive in nature and acknowledged as such, they have been relegated to a secondary, support role so that FIT and later variations which favoured bottom-up, preattentive models struggle to develop cognitively driven models. A further problem is that the icons

used in the top-down side of processing are myriad and individualistic and are therefore questionable in terms of efficiency and economy and thus possibly rule out this functional proposal of the patterns as a cognitive aid.

With cognitively biased models of saliency we see one of the main problems facing theorists of ‘visual saliency’ – what drives gaze or gaze fixation? By concentrating on constructing a predominantly reactive model focused on inbound features, they largely ignore the question of what directs the gaze internally. Is the saliency driving visiocognition or is it the other way about – is cognition driving gaze? Nakayama, Wang and others challenge FIT and its variants – there are a number of these including Attentional Engagement Theory (Treisman and Sato, 1990) and Wolfe’s Guided Search Theory – in a search for alternatives. In an article entitled ‘Efficient Visual Search without top-down or bottom-up guidance’, Wang, Nakayama and Kristjansson announced a new approach which reveals results in visual search – as the title suggests - that are independent of bottom-up and top-down processes:

To expose the potential involvement of other mechanisms, we introduce a new search paradigm whereby a target is defined only in a context-dependent manner by multiple conjunctions of feature dimensions. Because targets in a multi-conjunction task cannot be distinguished from distractors either by bottom-up guidance or top-down guidance, current theories of visual search predict inefficient search. While inefficient search does occur for the multiple conjunctions of orientation with color or luminance, we find efficient search for multiple conjunctions of luminance/size, luminance/shape, and luminance/topology. (Wang et al., 2005)

The move to a context-dependent manner of defining the target is typical of newer experimental approaches many of which employ task-oriented methodologies to overcome some of the problems referred to earlier. For example, ‘To explore visual scenes in the everyday world, we constantly move our eyes, yet most neural studies of scene processing are conducted with the eyes held fixated.’ (Golomb et al., 2011). Notice too for the purposes here that the categories of successful search that remain independent of saliency are a close match to the three categories of this study namely size, shape and topology (landscape, bodies and rooms). The article by Wang et al. goes further to conclude:

Using a new search paradigm, we have demonstrated that search can be efficient without explicit top-down or bottom-up guidance and that processes independent of spatial filtering and selection can determine whether search is efficient or laborious. An account consistent with the results...described here is that visual attention serially examines perceptual groups rather than individual items...It is possible that, under laboratory conditions, groups are the individual items themselves. But in many cases, a group consists of a set of items. Our results suggest that an adequate theory of visual attention needs to go beyond local filtering and top-down selection by incorporating perceptual grouping processes. (Wang, et al., 2005)

The conclusion here seems to see perceptual ‘grouping’ as a possible way forward. This is reminiscent of where we started, examining gestalt perception, but it leads us to a new approach to vision, search, attention and identification.

In ‘Visual Saliency does not account for eye movements during visual search in real-world scenes’, Henderson et al. state: ‘We conclude that visual



saliency does not account for eye movements during active search. The existing evidence is consistent with the hypothesis that cognitive factors play the dominant role in active gaze control.’ (Henderson et al. 2007) and here we have the new approach to saliency revealed: cognitive factors that drive gaze control. The latter has a surprisingly important role in new developments here and we can begin to appreciate why this should be so when we examine a definition they use in the article which describes it as ‘...the process of directing the eyes through a scene in real time in the service of ongoing perceptual, cognitive, and behavioral activity’. (Henderson et al., 2007). To strengthen their case they cite three main reasons why gaze control is vital to an understanding of scene perception. The first is that ‘...human vision is active, in the sense that fixation is directed toward task-relevant information as it is needed for ongoing visual and cognitive computations’ and ‘...vision naturally unfolds over time and multiple fixations. Any complete theory of visual cognition, therefore, requires understanding how ongoing visual and cognitive processes control the direction of the eyes in real time, and how vision and cognition are affected by where the eyes are pointed at any given moment in time.’ (Ibid.) Secondly ‘...eye movements provide a window into the operation of selective attention...As a case in point, eye movement records reveal a much richer role for memory in the selection of information for viewing.’ (Ibid.) Here we can see how the new cognitive approach provides a much more

credible explanation of the system as whole functioning in the real world wherein gaze is directed by memory, for example, but working with vision in an interactive manner. Finally it is suggested that ‘...eye movements provide an unobtrusive, sensitive, real-time behavioral index of ongoing visual and cognitive processing.’ (Ibid.) The visual cortex has always had what appeared to be a huge claim on the brain’s resources but this shows why. Vision is much more than seeing. It is also a massive act of selection, guidance, evaluation, construction and much more and it takes multiple forms. This new approach affords a solution to the dilemma we mentioned earlier as to what drove gaze - saliency or cognition - with the ground here shifting firmly to cognition although, as mentioned earlier, vision is active but now works *with* cognition through a dynamic partnership: ‘On the cognitive control hypothesis, the visual stimulus is, of course, still relevant: The eyes are typically directed to objects and features rather than to uniform scene areas (Henderson, Weeks and Hollingworth, 1999); however, the relevance of a particular object or feature in the stimulus is determined by cognitive information-gathering needs rather than inherent visual saliency (Ibid.).

Henderson et al. examining the cognitive hypothesis of perception, incorporated insight into perceptual grouping that was mentioned earlier and explain how this is part of the cognitive machinery of gaze control and deployment. They recall how Henderson and Ferreira in ‘The interface of

language, vision, and action: eye movements and the visual world' sort the knowledge available to the human gaze control system into several general categories: short and long term episodic memory, scene scheme knowledge and task-related knowledge. The first – short-term episodic memory '...underlies a viewer's tendency to refixate areas of the current scene that are semantically interesting or informative ...' while the second – long-term episodic memory '...involves information about a particular scene acquired and retained over time.' (Ibid.) Where both drive gaze control we can see that this places cognition firmly as the dominant partner, not saliency: 'Another interesting example of the influence of episodic scene knowledge on gaze control is the finding that viewers will often fixate an empty scene region when that region previously contained a task-relevant object'. (Ibid.) Further, in relation to the third category '...Schema knowledge includes information about the objects likely to be found in a specific type of scene (e.g., bedrooms contain beds) and spatial regularities associated with a scene category (e.g., pillows are typically found on beds), as well as generic world knowledge about scenes (e.g., beds do not float in the air)'. (Ibid.).

This is where visual organization or perceptual grouping comes in. Much of the early work on context facilitation of scene processing comes from Moshe Bar and Shimon Ullman. In their 'Spatial Context in Recognition' they conclude: 'A possible suggestion is that objects are organised in recognition memory in structures that depict typical scenes. Such a

structure, which may be called a 'context frame' contains a number of objects such as a face, a hat, glasses, in a typical configuration...' and 'When an object is recognised, it invokes context frames in which it appears. The frames then set expectations not only about other possible objects in the scene, but also about their expected location, scale, and orientation.....Information derived from the context frame regarding the expected identity of other objects, as well as their position, orientation, scale, etc., could therefore facilitate significantly the recognition of related objects' (Bar and Ullman, 1993). The final category was task-related knowledge: 'Task-related knowledge can involve a general *gaze control policy* or strategy relevant to a given task, such as periodically fixating the reflection in the rear-view mirror while driving, and moment-to-moment control decisions based on ongoing perceptual and cognitive needs.' (Henderson et al. 2007) In their own study they examine captured data on gaze in a series of experiments and use a variety of methods to analyse them – including visual saliency: 'Our conclusion is that the evidence supporting the visual saliency hypothesis is weak, and that the existing evidence is consistent with the hypothesis that cognitive factors play the dominant role in gaze control'... and their general conclusion was '...Despite the recent popularity of the visual saliency hypothesis as an explanation of gaze control, the evidence supporting it is relatively weak. Cognitive factors are a critical and likely dominant determinant of fixation locations in the active viewing of

scenes.’ (Ibid.) Even this brief review of the cognitive hypothesis and perceptual grouping shows clearly how the previous criticism of FIT has been answered. Saliency is involved in scene viewing but as part of a loop driven by cognitive factors like episodic memory. The questionable existence of saliency maps and multiple icons are seen to be more likely to be associated with grouping arrangements as we see with Bar and Ullman’s ‘context frames’ or Henderson et al.’s schema’.

Recalling Wang et al.’s conclusion that ‘... an adequate theory of visual attention needs to go beyond local filtering and top-down selection by incorporating perceptual grouping processes.’ (Wang, et al., 2005) we can now also examine one major attempt to modernise gestalt grouping, Leeuwenberg’s Structural Information Theory (SIT):

It explicates formal rules for determining which of all possible interpretations (in this case, groupings) are the ‘best’ in the sense of having minimal information content according to well-defined criteria...’ and ‘...In its classical form, Leeuwenberg’s structural information theory (SIT) is what Marr (1982) called a ‘computational-level’ theory: It does not attempt to specify the actual processes that produce grouping in perception, but only the input-output mapping between images and organizations. (Palmer et al., 2003)

The gestalt principles were from their inception seen to be organised according to the law of ‘Prägnanz’ or ‘pithiness’ and Leeuwenberg turns

this into the simplicity principle which itself suggests that systems tend to states of equilibrium wherein minimum energy is expended – like the sphere-shape adopted by the soap bubble. SIT employed the simplicity principle to a coding of visual stimuli to facilitate perceptual organization. The patterns in this study, too, are simple. It is completely possible that they represent a level of perception that is at the most basic of levels, so basic, in fact, as to be unseen, unrecognised and in such fashion at one with the visual primitives - a form of default framing that has evolved for minimum energy expenditure and maximum energy conservation.

### 3.4 Holistic registration: Neo-gestalt and topological approaches

Fundamentally, Chen's topological approach disagrees with local-to-global models even the more recent cognitively driven accounts and also therefore, by association, my proposal that the patterns serve as a templative aid to cognition. A topological approach would suggest that the patterns are simply the residue of the visual primitive. They do not, or cannot, add extra cognitive load to the relationship between the perceptual and memory systems – that is an inefficient approach. In some ways such a theory is akin to Leeuwenberg's SIT theory with its implications of simplicity, however, a topological approach is more rigorously defined and addresses the specifics of gestalt that ultimately leads to a 'best fit' explanation of the patterns.

Topological models begin with Gibson who radically opposes all contemporary theories of perception in his approach first mentions the idea

of invariance. In 'The Ecological Approach to Visual Perception' (1986) he announced his rejection of orthodox theory thus: 'the process of perception must be described. This is not the processing of sensory inputs, however, but the extracting of invariants from the stimulus flux. The old idea that sensory inputs are converted into perceptions by operation of the mind is rejected. A radically new way of thinking about perception is proposed' (Gibson, 1986). He went on to use ecology as the framework for perception that was action-centred and perceived the world directly, without the intervention of percepts and enhancement from the brain. One key idea related to 'invariants' which were features that remained unchanged when all else was subject to transformations. Gibson's theories stop short of explaining direct perception because of problems with mapping what he calls the visual array. Both Gestalt and Gibson are revisited by Chen in his attempt to challenge FIT with his model of topological invariance (global-to-local). In 'The topological approach to perceptual organisation' (2005) he presents an alternative model to FIT with updated versions of earlier ideas like Gestalt and grouping and also with the work of Gibson and direct or holistic vision. This model has grown from the broader trend in scholarship, driven by the questions being asked by Wang and Henderson etc. Chen, while accepting that '...early feature analysis has wide acceptance and dominates much of the current study of visual cognition' (Chen, 554), moves against feature theory accounts of perceptual organization and in

what amounts to a fundamental revision of both Gestalt and Gibsonian theories creates a powerful challenge to the dominant local-to-global approach. In order to determine whether the patterns in narrative space can be linked to this neo-Gestalt/Gibsonian model it will be necessary to examine this new area in detail. But we should recall the drift away from saliency by many experts that was mentioned earlier was already underway in the recognition that perceptual grouping was the way forward: ‘Wang et al.’s conclusion in 2005 that ‘... an adequate theory of visual attention needs to go beyond local filtering and top-down selection by incorporating perceptual grouping processes’ (Wang et al., 2005.) Wang has gathered evidence for a topological approach to perceptual grouping from neurological sources e.g. in a study entitled ‘Global topological dominance in the left hemisphere’, Wang et al. (2007) concludes, as the article’s title clearly suggests, that ‘...for right-handers, the LH [left hemisphere] is reliably and consistently superior to the RH for the global topological perception.’ Using a range of laboratory experiments involving the comparison of the perception of geometrically topological ‘invariants’ i.e. geometrical entities that do not alter under transformation ‘including the number of holes, inside/outside relation, and the global invariant of presence vs. absence. ...’ with other features and manifestations from other geometries ‘...including orientation, distance, size, mirror-symmetry, parallelism, collinearity, etc.’ (Wang et al., 2007), Wang and his colleagues



have provided a firm neurological base for behavioral observations that the LH is attuned to topological invariants. They were able to track the experiments using fMRI scanning of test subjects and this in turn revealed that ‘...only a region in the left temporal gyrus was consistently more activated across subjects in the task of topological discrimination, consistent with the behavioral results. (Ibid. p.1) The conclusion was reached that the global topological dominance in the LH was a reality and this in turn leads to another reason why this paper is important as it ‘...suggests a unified solution to the current major controversies on visual lateralization.’ (Ibid. p.1)

In 2008 in a paper entitled ‘Holes, objects, and the left hemisphere’, He set up a series of experiments that show that “Topological precedence [in the LH] is clearly evident in the results shown in the current study, because responses to topological differences were both faster and more accurate than control conditions...” but more than this ‘...Topological perception has an advantage in both hemispheres, but more so in the left hemisphere’ (He 2008, p.2). And in another important paper: ‘Neural Correlation of ‘Global-first’ Topological Perception: Anterior Temporal Lobe’, Zhou et al. demonstrate how the topological model of perception can be a universal solution. They take as their subject ‘apparent motion’ or AM, a set of visual illusions, wherein motionless points or objects can give the illusion of movement, a well-known one being the cartoon flicker book containing a

set of discrete drawings which when flicked, however, create apparent motion. Zhou et al. comment: 'Despite its long history and obvious theoretical and practical interest, a general-purpose theory of long-range AM that can account for its ecological functions is lacking...' (Zhou et al., 2008, p.1). As we will see as this chapter progresses, the topological approach to perception defines the visual primitives of perception as topological invariants like holes and the inside-outside relationship and states that these 'global' properties (global in the sense that they are invariant or stable across transformations) register first and that 'local' features come later hence the term 'global-to-local'. The paper describes how Zhou, Zhang and Chen conducting both behavioural experiments as well as brain imaging using fMRI conclude that despite the apparent movement we experience, AM actually '...works by abstracting global form invariants, and hence is actually associating with form perception rather than motion perception.(Ibid. p.1)

However, this raises the question of motion and the topological frames of the patterns: what role does motion play in determining perceptual organization? As previously argued, the frames are atemporal, they are devoid of character movement. Chen's theory argues that not only does topological perception come first but that it, as a global property, determines any motion thereafter: 'With respect to the question of whether motion perception precedes form perception...topological discrimination should occur earlier and determine motion perception' (Ibid, p.556). This is

an essential point towards the argument that topological frames are motionless. The global invariant must be extracted first – this is the visual primitive according to Chen and thus, all other aspects of perception, including motion are preceded by this. If applied to the patterns it may help explain the lack of explicit motion within their topological frames. Using this model it could be argued that although each pattern type is bounded by the dimensions of the particular ‘hole’ within the scene, hence the different patterns – progressive, looped and bouncing (subsets) – however, it is form perception that coalesces first and the patterns reflect this absence of motion

FTT models currently explain how we map from one transformation or AM frame to the next and Zhou et al.’s paper discusses the so-called ‘correspondence problem’: ‘... in the process of perceiving AM, one has to establish, at some level, a correspondence in which the visual system somehow identifies a shape in one display with its match in a later display, even though the shape may not be identical in the two displays. The starting question in the study of AM therefore is: what are the constituents of a stimulus that are matched by the correspondence process?’ (Ibid. p.7) For Ullman and other FTT adherents, ‘edge and line segments’ (Ibid p.7) are critical to the first stages of processing, while for Zhou, Chen and other more recent researchers, edges and lines cannot be topological invariants, and, they argue, only topological invariants can form the visual primitive.

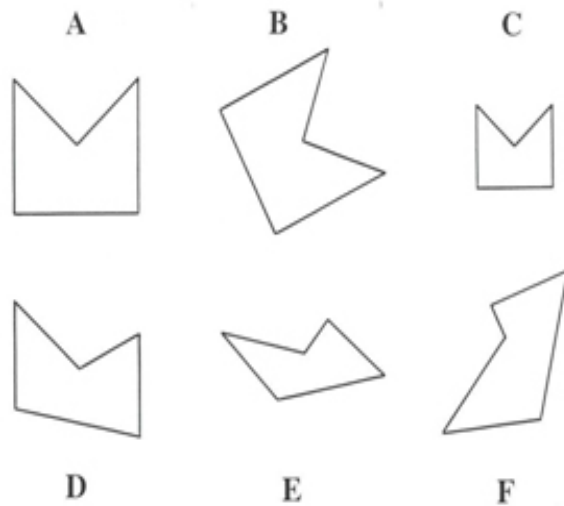
Zhou et al. conclude that in situations like this where FIT has to introduce more and more theoretical items like the correspondence process to make feature theory and 'local-to-global' work, topology '...therefore highlights its broad applicability to various issues at different levels of cognition, much more beyond AM.' (Ibid. p.7)

Chen claims that the insights of Gestalt grouping are intuitive and in need of proper definition:

[T]he notion of perceptual organization has its own problems... like other Gestalt concepts it has suffered from a lack of proper theoretical treatment. Gestalt evidence has often been criticized for being mainly phenomenological and relying mainly on conscious experience. Consequently, explanations from theories of perceptual organization usually rely on intuitive or mentalistic concepts that are somewhat vague and elusive. What is needed is a proper formal analysis of perceptual organization that goes beyond intuitive processes, and provides a theoretical basis for describing or defining precisely the core concepts related to perceptual organization. (Chen 2005, p.560)

He goes on to recognise the work of others like Rock and Palmer and uses the former's definition of perceptual organization in Rock's 1986 article, 'The description and analysis of object and event perception': 'The meaning of organization here is the grouping of parts or regions of the field with one another, the 'what goes with what' problem, and the differentiation of figure from ground...' (Chen, 2005, p.560). And, it was Rock and Palmer who added the 'connectedness' and 'common region' categories (Rock and Palmer, 1990) to the existing set of gestalt groupings. Important as these groups are Chen says that a '...mere list of Gestalt laws without unifying

formal analysis is unsatisfactory. Is there,' he asks,' a common principle underlying various phenomena of figure and ground perception?' (Chen 2005, p.564) One of the abiding problems of all theories of perception is that of the visual primitive i.e. *what happens first?* FIT employs a variety of candidate features like orientation, location and size and a range of geometries. However, Chen saw that one way to put rigour into the theory was to apply the mathematics of Klein and his Erlangen Program of hierarchical geometries, discovered in the nineteenth century. He shows that a central principal of Klein's was the observation that '...the more general a transformation group, the more fundamental and stable the geometric invariants over this transformation.'(Ibid. p.603) i.e. the more fundamental in form a geometry is, the more that geometry is able to resist transformations or change. 'Using this principle, Klein built a hierarchy of geometries, stratified in ascending order of stability: Euclidean geometry, affine geometry, projective geometry and finally topology with the highest stability' (Ibid. 603). In simpler terms, the topological geometry as the most simple, was the one that remained most stable - or visible - across or during transformation. A diagram can help us understand what these different geometries involve:



In this figure, one gets from A to B by a rotation (an isometry), to C by a size scaling (a similarity transformation), to D by a skewing (an affine transformation), to E by a slant in depth (a perspective transformation), and to F by a more general projective transformation (e.g., a combination of two perspective changes) (Wagemans, p2).

The author of this explanation also adds: ‘...In Euclidean geometry, one can do rotations but not size changes (i.e., distance between a pair of points is an invariant property). In similarity geometry, one can do uniform size changes but not size changes that are different in different directions (i.e., all pairwise distances should be scaled by the same factor). In affine geometry, one can do skewing and stretching but not perspective deformations (i.e., midpoints and parallelism are preserved). In projective geometry, slants and tilts are allowed (i.e., cross-ratios defined by four collinear points are invariants) but not bends and folding (i.e. topological transformations).’ (Ibid. p.2). It will be noticed here too that each geometry has its own

invariant. However the most stable is topological geometry. This leads to the main explanation of the role of topological geometry in perceptual grouping and revised Gestalt: ‘...the core idea is that perceptual organization should be understood in the perspective of transformation and perception of invariance over transformation’ and ‘...topological perception (based on physical connectivity) is prior to the perception of other geometrical properties.’ (Chen 2005, p.555) Chen thereby suggests topological items as the visual primitives and also suggests a solution for the sequence of processing here. Klein’s Erlangen Program shows that perception occurs in line with the most stable level of the geometric hierarchy i.e. topology, so the more global or stable a property the earlier it is processed hence – as we saw above – topological perception occurs first. In this way Chen places his theory directly against FIT et al. by claiming that the processing sequence is ‘global to local’ where ‘local’ refers to saliency and local geometry and its features. According to him it is the topological invariant that is the basic unit of perception and perceptual organization.

In such a system a topological transformation ‘...can be imagined as an arbitrary ‘rubber sheet’ distortion, in which neither breaks nor fusions can happen, however changed in shape the ‘rubber sheet’ may be. Under this type of ‘rubber sheet’ distortion, for example, connectivity, and the number of holes, and the inside/outside relationship remain invariant. Hence they are topological properties. In contrast, local geometric properties such as

symmetry, orientation, size, parallelism and co-linearity are not topological properties, because they may be altered by arbitrary ‘rubber sheet’ distortions.’ (Ibid. p.568)

However the solutions offered by topology faced another major difficulty. A paradox exists wherein ‘...an apparently disconnected array can be perceived as a subjectively connected object. This phenomenon of subject connectedness despite discrete stimulus input seems [to] contradict the mathematics of topology...’ (Chen 2005, p.590). A discrete set in topology is one made up of a number of points which are isolated from each other like the dots in a dot array. We can see this problem in Gestalt where the groupings are ‘...often based on apparently disconnected stimuli...’ and raise the question: ‘How are disconnected arrays organised into perceptually connected wholes?’ (Ibid, p.590) So, despite the promise of topology, it appeared that we are ‘...not able to directly apply general (continuous) topology or point-set topology to describe perceptual organization’. (Ibid) General topology – or continuous or point-set topology – is the branch of topology that studies topological space and the basic concepts that relate to it. The solution was to import the concept of ‘tolerance’ which ‘...when applied to perceptual organization, could imply ignoring detailed changes...for attaching importance to global properties’ and could be seen as ‘... a basic strategy for the visual system to perceive global properties.’(Ibid, p.592) The thinking behind the mathematics of tolerances



is that they permit the mind to overlook or ignore discrete points as visual local entities in themselves in order to see what they constitute as a global set. When we see an array of dots, for example, although we can see them as disconnected we ignore this and register the global aspect which is the shape the dots make when they are looked at as a whole. The mathematics of tolerance means that topology can accept global data from discrete sets literally removing the 'intolerance' to discrete loci that would otherwise prevent this. The conjoining of topology and tolerance enabled Chen to obtain a solution to the problem of creating a sound theoretical base for Gestalt observations and in doing so he could claim to have finally identified the visual primitives: tolerance-assisted topological invariants.

We are now in a position even before we examine revised Gibsonian theory to apply the neo-gestalt approach developed by Chen and others to the patterns by using the Loop pattern of Bodies as our working example. If the outline of the human body, or any organism for that matter, is deemed the figure, it is segregated from ground by its appearing as a global invariant - global in that it persists across transformations. The Gestalt groupings that apply here are connectedness or surroundedness. Chen shows how the new approach pins these intuitions down theoretically: 'As we speak of 'an object' in a picture, we usually imply that it is connected. Similarly, the Gestalt determinant of surroundedness for figure-ground organization is just, in mathematical language, the topological properties of holes.' (Ibid,

p.569) That is, objects are segregated from ground by appearing as holes in the background itself. If, then, as Chen argues, these visual primitives, these invariants, are the basis of human perceptual organization then they are fundamental to vision, perception and cognition embedded and embodied at the deepest levels of the perceptual system. We might reasonably suggest therefore that the patterns under discussion arises from a mind that is structurally adapted to register topological invariants and that this accounts for their non-volitional deployment in the act of writing. We can also suggest that Chen's revision can explain the sequencing of the pattern: outline/head (short loop). By applying the Erlangen Program's geometrical hierarchy which privileges topological geometry over all others, Chen shows that the perceptual process is organized in the sequence 'global to local' where global means independent of change. Our outline is registered as a global invariant *first* with local detail emerging thereafter viz...head. Chen takes this further by saying that this is more than sequencing 'it implies that global spatial and temporal organizations, determined by topology, are the basis that perception of local geometrical properties depends on' (Ibid. p.570). This latter seems to suggest that as well as being the visual primitives privileged by their topological geometry in the Erlangen hierarchy and registering prior to everything else, global invariants also provide a platform for local detail. Therefore, the invariant itself may be involved in predetermining the detail of local saliency features that then emerge. So the

alternative to FIT in identifying the visual primitive in scene perception has emerged as a universal solution with evidence coming from a range of sources, as we have seen from the neuroscientific findings of Wang et al., Zhou et al. and Shang He.

We can now turn to the work of Chen in the revision of Gibson and his ecological approach, which, albeit coming from a new direction, reached very similar conclusions as the Gestalt thinkers before him. We mentioned earlier that Gibson was moving closer to a new paradigm of visual perception. His main idea flew in the face of orthodoxy at the time by claiming that humans are capable of direct perception: ‘Gibson, in fact, states that space and other qualities of the environment are perceived directly, without the aid of an intervening mental process ...’ (Goldstein 1981, p193) In his ‘Ecological Approach to Visual Perception’ (1986) Gibson announced: ‘the process of perception must be described. This is not the processing of sensory inputs, however, but the extracting of invariants from the stimulus flux. The old idea that sensory inputs are converted into perceptions by operations of the mind is rejected. A radically new way of thinking about perception is proposed’ (Gibson 1986, p.2). Gibson, as we shall see, believed that the cornerstone of vision was invariance: ‘The perceptual system simply extracts the invariants from the flowing array; it resonates to the invariant structure or is attuned to it’ (Gibson 1979, p.249) but as in the case of gestalt theory, Gibson found

himself struggling to turn these ideas, forward-thinking as they were at the time, into a proper theory. As we can see they were very close to Gestalt thinking and were already talking about invariants but typically the thinking, after a certain point was reached, became like Gestalt, disappointingly intuitive – e.g. as we can see from his statement above that the perceptual system ‘...simply extracts the invariants from the flowing array...’ He was unable to say how and lapsed into terms like ‘simply extracts’ or ‘...is attuned to...’ As Chen put it: ‘Gibsonian psychology, like Gestalt psychology also suffered from the lack of a formal and precise theoretical treatment of its basic concepts.’ (Chen 2005, p.624) For Gibson this was a solution that he did not find. He did not employ the ideas of tolerance and tolerance spaces and was left tantalizingly close to a solution. He knew that he had not produced a theory that would explain how invariance worked and complained:

What is lacking is a theory of the invariance that preserved under disturbances...It would simplify matters if all of these kinds of changes in the optic array could be understood as transformations in the sense of mappings, either projective or topological...But unhappily, some of these changes *cannot* [sic] be understood as one-to-one mappings, either projective or topological.’(Gibson 1979, p.310)

Gibson was lamenting the problem facing him that, in mathematical terms, transformations required ‘one-to-one’ mapping which essentially means they are finite and limited to the numbers involved at the start of the transformation whereas in real life the ‘array’ as he liked to call it was

changing all the time. In essence, Gibson saw that the mathematics at his disposal was geared to a finite system when the visual array or flux was infinite. The solution was with tolerances again and their flexibility and just as tolerances could overcome the problem of discrete input to holistic outputs so 'tolerance mapping' could save the day where the array was in flux and not static because as Chen put it '...a tolerance mapping...does not need to meet the assumption of 'one-to-one ' mapping' (Chen 2005, p.527) It is enough for the tolerance to be embedded for the mapping to take place for much the same reason that the discrete points in static arrays can be viewed holistically. Chen makes a final observation: 'With the mathematics of tolerances there is a way out for Gibson's efforts. It is the global characteristic of tolerance spaces that provides a suitable mathematical treatment on ecological invariance perception.' (Chen 2005, p.627)

If these conclusions by Chen et al. are correct then tolerance-enhanced topology and its invariants are the visual primitives of perception. Tracking in the environment is then permitted by tolerance mapping and is the final idea that allows Gibson's 'direct vision' to become a reality. This raises the question of how to perceive the patterns. It has already been suggested that the Loop pattern of Bodies is the topological invariant 'hole'. The sequence of global-to-local in relation to perceptual organization in this pattern i.e. outline first, is borne out by the privileging of topological invariants in Klein's Erlangen program of geometrical hierarchy as well as by

neuroscientific studies of the brain and networking by Wang et al. Zhou et al. and Shang He. If we now take the bouncing pattern of Rooms we can see that the description recalls the geometry of non-topological geometries – the geometries of metrics and lines and edges. We need to restate the category in topological terms and when we think about it ‘centre/edge’ really examines the ways rooms or internal spaces in buildings and sometimes towns – as is noted with the narrow Spanish streets of Hemingway - are described. The pattern usually involves movement from a central point to a wall or from a wall or edge back to a central point. It could be argued that this pattern only differs to ‘landscape’ in the way it is foreshortened by being bounded. Edge is seen here as background against which the objects it surrounds appear as holes just as for the outline/body patterns. So what is different? When we venture beyond the walls through windows and doorways then we begin to see that the terms ‘figure’ and/or ‘object’ and ‘background’ are relative terms, not absolute. So as we progress beyond the wall/boundary what was background now becomes object e.g. if we move away from a wall we see a house or entire building which is now an object against the background of, say, a wood or a hill and if we move even further we see that the previous background wood or hill is now object against the ultimate backgrounds of horizon or sky. Although when we see the earth from space we see the whole planet as a hole *in* space. So the topological invariant that governs all three patterns seems to be the hole, the

first relating to people or living beings and the second two to space. The latter pair only differs in terms of the relativity of object and ground, with any object capable of functioning as ground and vice versa i.e. any background is capable of becoming an object.

If perceptual organization uses topological invariants as the visual primitives which are in turn registered in a global-to-local manner then this global stage, viz. the extraction of the invariant, will require none of the bottom-up/top-down processing required by FIT. The global invariants are, as Chen says, counter-intuitive as, coming first in perceptual organization. But we have seen that some researchers believe that they literally enable local information and act like platforms upon which local features stand. These local features can and do register and as a result it seems that they have been favoured in writing. They are the obvious, salient features, which act as final identifiers in the perceptual act.

A major challenge to Chen's model is the neurobiological structure of the visual cortex and the supporting data on parallel processing. It is broadly acknowledged that the neurobiological organization of the visual system operates through a dual stream of parallel processing: the ventral stream, which determines object recognition and the dorsal stream, which processes motion perception. Both streams originate in the occipital cortex, however, the ventral stream, feeds into the temporal cortex and the dorsal to the parietal cortex. They are commonly described as the 'what and where

pathways' due to their neuronal specialization. (Ungerleider and Pessoa 2008, p.1). It is the ventral stream that is of particular interest here due to its specialization in pattern recognition and form perception although certain aspects of the V6 dorsal region are of interest too due to their processing of self-motion and its potential implication for narrative point of view.

Derived from studies on macaque primates<sup>21</sup>, dual stream vision and its homologous potential for human vision has been of increasing focus (Ungerleider and Mishkin, 1982; Zeki et al. 1991; Goodale and Milner, 1992) and there is now general consensus on the functions of each cortical region within the streams. Labeled V1 to V6 in primates, these regions share similar, if not identical, function within humans and as such, are now common terms of reference for both species' visual cortices.<sup>22</sup>

V1 is the primary visual cortex and plays an important role in both the ventral and dorsal streams. Its neuronal tuning – the visual stimuli that the neurons are designed to respond to – differs depending on response latencies. Therefore, at 40ms early discrimination in V1 is given over to spatial frequencies and colour whereas at 100ms it specializes in topographic mapping for small sets of stimuli and thus, processes the invariant aspects of the object/scene through features such as contrast and shape.

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<sup>21</sup> An early proposal by Trevarthen, C.B. (1968) 'Two mechanisms of vision in primates'. *Psychologische Forschung*, 31, 299–337.

<sup>22</sup> Although it must be noted that the V5 area in primates is often referred to as MT (middle temporal region) in humans as is the V6 area also known as the dorsomedial area. .



Being the primary cortex it feeds forward to V2 in both streams where topographic mapping is maintained and performs similar operations to that of V1 however, it can also process more complex features such as, binocularism, and, importantly for this research, can distinguish between figure and ground. It also maintains strong links with the hippocampal regions and is thus said to establish a neural relationship with memory function.

It is with the expected pathway to V3 that we see a departure for regions in the ventral and dorsal streams. The dorsal regions move from V1-V2 and then on to V5 (motion perception), however the ventral stream bypasses V3 (partially responsible for motion perception) by directing its feed towards V4 and then ultimately to the inferior temporal cortex (IT) where the process terminates whilst simultaneously experiencing a series of feedback operations between the V1- IT as information is updated. V4<sup>23</sup> is important for the ventral stream as this is where selective attention is processed, adding much further specification to the local (salient) details of the stimuli. Although further research is needed in terms of human homologues, the neurobiological research would initially suggest support for Chen's global to local hierarchy in the ventral stream as it moves from topographic distinction of invariant properties in V1 and V2 to the processing of more

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<sup>23</sup> It must be noted that there is no homologous region in humans for V4. However, it was originally termed prelunate gyrus and was only renamed as V4 by Zeki through his work in colour detection in this cortex. In Zeki, S (1978) 'Uniformity and diversity of structure and function in rhesus monkey prestriate visual cortex.' In *The Journal of Physiology*, 277, 273-290.

local features in V4. However, this is not met with universal agreement: for Desimone the issue with Chen's model is that neurobiological data supports an opposing view of local to global operations in V1 and V2 as he comments 'Visual processing at the earliest stage (V1) is based on "local"...analysis of relatively simple visual features, and processing becomes increasingly more "global"...and more attuned to global object properties as one proceeds along the pathway into the inferior temporal cortex (IT)' (Desimone 2005, p.642). After all, in terms of response latency and its impact on Chen's consideration of the visual primitive, it is V2 not V1 which is more tuned to the topographical (and gestaltian) features, such as figure and ground (surroundedness) which are important to Chen's model. There is also the issue with later response latencies (100ms) of topological processing in V1 as opposed to contrast which has a response of 40ms. Therefore, Desimone's data show the difficulties that topological theory has with the biological properties of the ventral and dorsal systems but many, including Desimone, see the difficulties resolved by feedforward and feedback flows 'Recent neurophysiological data suggest that the Chen model may indeed be correct, and that the explanation lies in critical functional differences between the feedforward and feedback flow of information along the occipitotemporal pathway' (Desimone 2005, p.643). Sheng He, however, sees the feed operation as a further obstruction and not a solution to the topological model: problems arise with the neurobiological

loop or circuitous nature of the feed systems in V1 and V2 as they seem to undermine the hierarchical nature of global first then local later. He, in his commentary on Chen's paper in an article entitled 'Beyond "local to global" and "global to local" (2005), comments 'what is not clearly established for the theory is a strong link to the known mechanisms in neurophysiology.' (He 2005, p.671). He bases this on confusion around the feedback and feedforward pathways in V1 and V2 as he comments:

But I am not sure if mapping the local-global and global-local processing to the feedforward and feedback pathways fits with Lin Chen's original intentions. In a sense, this interpretation leaves the fundamental question "what are the primitives" ambiguous, because then the answer to this question depends on where you are standing and which direction you are looking: Features are the primitives for feedforward processing, and global properties (such as topological properties) are the primitives for feedback processing. (He 2005, p.672).

This is one of the chief criticisms on Chen's model and subsequently its explanation of patterning here: the assumption of temporal processing. Chen argues that the global invariants are processed first before local details and thus, invariant properties act as a platform that enables the local, and by implication, the later processing of further specifications such as colour, texture etc. Elliott (2005) is critical of this approach by arguing that a space-time analogy is problematic as a means of perceptual organization. As he comments:

With respect to taking a position on the possibility for space-time analogies it should be noted that the general analogy is suggestive at first sight, but time is different from space. It is one-dimensional (i.e., it is topologically poor), it is oriented in the time-flow direction and

can obviously not easily serve for simultaneously representation of series of non-simultaneous events. (Elliot 2005, p. 656)

Elliot's criticism here lends itself directly to He's problem with the lack of clarity on the feedforward and feedback systems, and brings an element of practical thinking to this problem of temporality despite the heuristic attraction of global registration through feeds. Elliott is further supported by both Donnelly and Pöppel - albeit for different reasons - who argue that continuous temporality of operations within V1-V6 are not explicitly clear in Chen's model. Donnelly is very complimentary on the contribution that Chen's work has on the visual system and agrees strongly with the processing of wholes rather than parts: Chen's paper...serve[s] as a reminder that there is a wealth of evidence demonstrating that wholes are an important, perhaps crucial, unit of analysis when considering the psychology of visual processing more generally' (Donnelly 2005, p.48). However, Donnelly also addresses an issue which this thesis likewise tackles in further detail in Chapter 6 through Beckett and his concern with the 'terrible materiality' of the word surface: how can we ascertain early processing of global invariants that can only be made explicit by the local features? If Chen argues that the global platform enables local features then it must also be argued that this global hierarchy is undermined by the coalescence of the local i.e. it is only with the local features that we can say that the image forms. As Donnelly states: 'Further refinement is required to make explicit the implications of encoding geometrical invariants early in processing for

information that can only be made explicit in later in processing' (Donnelly 2005, p. 651).

Pöppel (2005) goes further and suggests a solution to this problem with temporality. By introducing the concept of complexity reduction, which he terms 'complementarity', he argues that we can resolve the issue of visual primacy in a multi modal system (feed operations) by using system states. 'A system state is characterized by the fact that the before-after relationship is not defined; information within a system is treated as cotemporal. With such cotemporal and thus atemporal zones the brain can create on a presemantic level frames or temporal processing windows within which temporally and spatially distributed activities can be integrated' (Pöppel 2005, p.666). Sheng He also suggests that the continuous temporality problem can be solved through focusing on interactive states. As the title of He's article suggests, 'Beyond "local to global" and "global to local" (2005), it proposes a possible solution which undoes the opposition of global and local by introducing parallel processing wherein '...global and local properties are processed in parallel (but interactive) pathways, with a pathway for global information faster. In a sense the parvocellular and magnocellular are closest to fitting the bill, perhaps the parvo pathway supporting the local properties and the magno pathway supporting the more global properties' (He 2005, p.672).

Therefore, in light of this criticism, can the patterns in this study now also be undermined as a record of the visual primitive? Beginning first with the

broader issue of parallel processing: it is claimed here that the patterns are most likely processed in a holistic fashion – a series of holes in backgrounds – yet the operation of parallel processing would seem to suggest that it would not allow for holistic registration of the visual stimuli favouring instead a partial series of interacting feeds. The patterns – albeit, arriving in salient form – could potentially be explained by a more fragmented operation (local-to-global). For example, we could say this fragmentation within the scene enables the pattern type to emerge: progressive, bouncing and looped. The form (pattern type) does seem to lend itself to partiality as opposed to a holistic constant: house->garden->gate->road->hill etc. Each of these pattern components arrive as fully formed salient ‘recognized objects’ within a frame. The ventral stream has done its job for each – the object is recognized and moves on to the next within the narrative view. Indeed, it could be said that this is the moment where we can gauge the input of the interaction between streams because of the relationship V6 in the dorsal stream has to self-motion. The objects within the patterns are directed by the viewer’s gaze and his/her spatial relationship to that gaze. The issue, however, with this explanation is that it does not account for what we are actually witnessing in the patterns: the types of features that are typically predicated on early topographic invariance i.e. shape. The content of the patterns remain dominated by holistic registration: when the text contains a description of a character’s body it is the outline (contour) that

we see first not the body parts, textures, size etc. which arrive later, if at all, with the Long Loop pattern. The progressive and bouncing patterns would initially counter this claim due to their series of ‘recognized objects’ forming a chain of patterns however, they too, are predicated on the geometry of surroundedness : the space/flux is not infinite inside a text and thus, has an implied boundedness. It is this boundedness that allows us to see the ‘objects’ as part of a whole scene and more importantly it is the very particular spatial relationships between each part that enables the relativity of figure and ground to come in to play. The patterns could not be patterns without each ‘object’ becoming the background for the next but this cannot be any object becoming ground for the next. It is the gestaltian principles of surroundedness and connectivity that explain the transformation of the relativity between figure and ground –holes in backgrounds.

However, that parallel processing is not an explicit feature of Chen’s work does not mean that this dual operation cannot help with explaining the patterns – V6 in the dorsal stream is of research interest here – if anything, it may help explain the questions asked in the next chapter relating to real versus imagined space and the survival of the patterns in the memory system; the inferior temporal lobe in the ventral system may support associative links between physical stimuli and its recollection in literary fiction.

More specifically, the neurobiological evidence discussed by the critics above, particularly the early processing of topographic feeds from V1 and V2, does not appear to diminish claims for global-to-local models. It does, however, become problematic if the claim also supports Chen's implication that there is a hierarchical relationship between the ventral and dorsal systems. As he states: 'With respect to the question of whether motion perception precedes form perception...topological discrimination should occur earlier and determine motion perception' (Chen 2005, 556). His peers have not, as yet, addressed this, however, this argument is suggestive that the ventral stream (form perception) not only precedes processing of the dorsal (motion perception) but also determines it. In a sense, it is heuristically attractive to think that an object is recognized and this determines the potential for action however, this would not support the evidence for circuitous feed processing or the evidence for the interactive relationship between the two streams. One answer to this is tolerance mapping and its potential ability to unite both 'what and where' streams. However, Todd (2005) argues that Chen's formal application of tolerance mapping is too mathematically rigorous to define neurobiological processing:

It is important to keep in mind that mathematics is an idealistic endeavor that demands perfect rigor and consistency. Biology, in contrast, is much more pragmatic...by imposing unspecified boundary conditions on the visual processing of topological structure, there is a danger that the "topology" of visual perception may turn



out to be substantially different from the “topology” of formal mathematics. (Todd 2005, p.641)

Thus, the key criticism of Chen’s work is that the neurobiological structure of the visual cortex does not wholly support global invariance as the visual primitive and an explanation of its operation through a continuous temporality weakens this claim further due to the uncertainty of feed operations – as does his application of formal mathematics to a biological system. However, it must be noted that there are no current data that explicitly demonstrates the temporal relationships between the feeds and thus, whether it supports or negates global first and local later or vice versa, remains an area for further research. Therefore, although it would appear that the feed relationship between the ventral and dorsal streams is still unclear, Chen’s theory is compatible with more than one possible scenario despite his suggestion that this relationship is hierarchical.

### 3.5 Counter examples to the patterns: ‘No Room! No Room!’

Having argued that the patterns are a record of the unconscious visual primitive this section reviews the outcome of when this process is interrupted resulting in non-patterning. This involves an examination of potential violations of both the ability to produce a topological frame and the content of these frames wherein we find counter-examples to the patterns.

From the analysis conducted there are a number of general findings that can be noted:

- 1) The number of topological frames per text varies.
- 2) Generally, when a topological frame is present it is patterned.
- 3) There are certain conditions which prove optimum for pattern identification which produces three further rules: a) The description must not be of a character action b) The visual position of the narrator/focaliser must be established c) The frame must serve the overall purpose of orientation/aesthetic information.

However, with each of these findings there are texts which disprove these general rules:

- 1) As a genre<sup>24</sup>, the data samples of children's literature within the data samples have a very low frequency of aesthetic.
- 2) There are topological frames in which non-patterning is evident unless the narrator's position can be tracked.
- 3) There is at least one sample in which the topological frame performs a function other than aesthetic orientation and other texts in which the descriptions of characters often include their movements (Alice in Wonderland, Peter Pan).

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<sup>24</sup> At this stage in the research, I cannot rule out the influence of cultural trend as the samples only range from 1865-1904.

### 3.51) Variation of Frame frequency

Beginning with the first point, consider the variation of frames per pattern

below from a cross-section of the appendix for the landscape category<sup>25</sup>:

Title	Author	Publication Date	Category
Sense and Sensibility <b>6 samples</b>	Austen, J	1811	Outdoor
Jane Eyre <b>5 samples</b>	Bronte, C	1847	Outdoor
Great Expectations <b>3 samples</b>	Dickens, C	1861	Outdoor
Dracula <b>6 samples</b>	Stoker, B	1897	Outdoor
A Room With a View <b>8 samples</b>	Forster, E M	1908	Outdoor
Dubliners 'The Dead' <b>2 samples</b>	Joyce, J	1914	Outdoor
The Rainbow <b>7 samples</b>	Lawrence, D H	1915	Outdoor
The Temple of the Golden Pavilion	Mishima, Y	1959	Outdoor

<sup>25</sup> The same exercise can also be conducted for the remaining categories of Bodies and Indoor spaces. See appendix for further detail.

<b>6 samples</b>			
The Border Town (short story) <b>1 sample</b>	Congwen, S	1981	Outdoor

These findings for the landscape category would suggest that there is not a consistent number of frames per period nor is the expected volume for novels that have particular focus on scenery much higher, for example, Room with a View. Short stories have a lower frequency but this is presumably predicated on word count. However, children’s literature has a very low frequency: Alice’s Adventures In Wonderland (1865) contains just one topological frame but this single frame is of note because this frame refers to her recollection of the ‘real world’ whilst ‘down the rabbit hole’ and it conforms to the landscape pattern:

Alice had been to the seaside once in her life, and had come to general conclusion, that wherever you go on the English coast you find a number of bathing machines in the sea, some children digging in the sand with wooden spades, than a row of lodging houses, and behind them a railway station. (Carroll 2005 [1865], p.18)

This example may also violate the third general finding: optimum conditions for the production of patterning. The position of the narrator, Alice, cannot be wholly established in this passage however; if she is near the shoreline her description conforms to the proximal (bathing machines in the sea) to distal (railway station) pattern of landscape.

### 3.52) Non-patterning within Topological frames

The position of the narrator may also influence the second general rule: there are passages which appear to be absent of patterning. Identifying passages of patterning is not as simple as opening a text and finding an appropriate spatial category. It involves isolating a topological frame, of which there may be none, and analyzing the view of the narrator/focaliser. There are passages in certain texts which appear as counter examples, however, when the position of the narrator/focaliser is anaphorically tracked the descriptions conform to the patterns. For example, in Hardy's Far from the Madding Crowd (1874) the passage below is a description of Bathsheba's view from her window and on initial inspection appears to reverse the proximal to distal patterning in landscapes:

The sun went down almost blood-red that night, and a livid cloud received its rays in the east (DISTAL POINT). Up against this dark back-ground the west front of the church tower – the only part of the edifice visible from the farm-house windows – rose distinct and lustrous, the vane upon the summit bristling with rays (MID-POINT). Hereabouts, at six o'clock, the young men of the village gathered, as was their custom, for a game of a Prisoner's base. The spot had been consecrated to this ancient diversion from time immemorial, the old stocks conveniently forming a base facing the boundary of the churchyard, in front of which the ground was trodden hard and bare by the players (PROXIMAL POINT). (Hardy 1979 [1874], p.368)

However, when Bathsheba's position is checked it reveals that she is elevated. She is sitting at a window in an attic room and this is confirmed when 'she could see the brown and black heads of the young lads...' (Hardy

1979 [1874], p.368) suggesting that she can only see the boys' hair colour and not a view their facial features. Thus, at her elevated height, Bathsheba's proximal space is the clouds/waning sun and her distal point is the boundary of the churchyard. This also further confirms my argument that the establishment of patterning is predicated on the position of the narrator/focaliser. However, there are certain texts, for example, To the Lighthouse (1927) by Woolf, which pose certain difficulties to the establishment of narrative perspective. For example, in the section of the novel entitled 'Time Passes' it is unclear who or what is narrating the passages and thus, no patterning is present. This is compounded by the fact that this particular narrative presence is moving throughout the house and therefore, does not yield the potential for the presence of topological frames:

So some random light directing them from some uncovered star, or wandering ship, or the Lighthouse even, with its pale footfall upon stair and mat, the little airs mounted the staircase and nosed through bedroom doors. (Woolf 1992 [1927], p.138)

### 3) Optimum Conditions for Topological frames

Spatially, Alice in Wonderland should be a novel in which there are a multitude of topological frames. It is, essentially, a novel which is structurally, metaphorically and psychologically about space. The opening of the novel switches between the 'reality' of Alice's world to a fantasy world as

Alice falls down the rabbit hole. However, despite the thematic dominance of space in the text, on examination there is not a single topological frame aside from the one listed above. There are particular passages in which we would expect spatial delivery via a topological frame, for example, the scene where Alice is confronted with a number of doors in a corridor. This is an enclosed space and has the potential to contain the structure of the bouncing pattern of rooms:

There were doors all round the hall, but they were all locked; and when Alice had been all the way down one side and up the other, trying every door, she walked sadly down the middle, wondering how she was ever to get out again. (Carroll 2005 [1865], p.7)

However, there is no pause here to review her space, she deals with it by moving through it. There is the suggestion of binarity – she walks the edges first and then moves along the centre but this does not constitute a narrative gaze, merely her movement.

Alice's choice to transverse her spaces appear to interrupt any pattering even when she engages with her targeted subject/object visually:

... **she had never before seen a rabbit**<sup>26</sup> with either a waistcoat-pocket, or a watch to take out of it, and burning with curiosity, she ran across the field after it, and fortunately was just in time to see it pop down a large rabbit-hole under the hedge.  
In another moment down went Alice after it, never once considering how in the world she was to get out again. (Carroll 2005 [1865], p.4)

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<sup>26</sup> My emphasis

Therefore, we can rule out visual engagement as a key factor interrupting the presence of any patterning. There are examples in which Alice is explicitly visual about describing her space, for example:

Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her and to wonder what was going to happen next. First, she tried to look down and make out what she was coming to, but it was too dark to see anything; then she looked at the sides of the well, and noticed that they were filled with cupboards and book-shelves; here and there she saw maps and pictures hung upon pegs. She took down a jar from one of the shelves as she passed; it was labelled 'ORANGE MARMALADE'<sup>27</sup>, but to her great disappointment it was empty: she did not like to drop the jar for fear of killing somebody, so managed to put it into one of the cupboards as she fell past it. (Carroll 2005 [1865], pp.4-5)

This leads to two conclusions; firstly, that vision is not isolated to topological frames, it is necessary for all types of spatial representation and this supports my earlier argument that narrative space is predominantly delivered by visual perspective; secondly, it isolates motion, or lack thereof, as a possible determining factor for the production of topological frames. Arguing that topological frames are never traversed by their relevant narrative viewer, I suggest that this is because they are akin to snapshots of space. They are devoid of explicit temporality and motion, pausing the narrative in some way. There is no potential for action except to direct the gaze. However, this presents a problem if Chen's model is employed to explain patterning. As mentioned, Chen states that form is discerned before motion during visual perception and therefore, the lack of explicit motion in

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<sup>27</sup> Author's emphasis



topological frames would support my claim that the patterns are a record of this process. However, my suggestion that Alice's Adventures in Wonderland is a novel for which the constant presence of motion interferes with pattern production may be a redundant argument as it should still hold true that form perception should precede this motion. Yet, Zhou et al.'s work on apparent motion may be of help here: apparent motion is an illusion disrupting form perception (cartoon flicker book) and this may be what is interfering with the presence of patterning in Alice in Wonderland. Alice is consistently involved in action – the whole novel itself suggestive of the act of dreaming – and by keeping Alice in perpetual motion it may be reproducing an effect like apparent motion. She is still recognizing shape, assigning colour, size etc. so it is evident that during narrative production form perception is occurring as these are the salient details that arrive after the global invariant has been extracted. However, this form perception is constantly attached to an action and thus may be obscuring the initial platform of form perception.

The data from the children's text – albeit, a small portion of the data collected which also contain extreme narrative plots - samples varies in terms of category disruption; for example, landscapes and indoor spaces are maintained as the analysis of Alice would suggest but this is also dependent on the frequency of topological frames. However, evidence also suggests that the category of bodies is the group for which the patterns are most

disrupted given their small data representation. The implication of Chen's model is an explanation of how visual perception occurs in the 'real world' and not a literary one and thus the order that that we can witness in in the patterns is entirely derived from a direct perception of this real world. Thus, I ask what if there is no 'real world' animated counterpart to the characters presented to us in children's stories? How do we establish a visual pattern for a fairy or a debonair rabbit on the move? Anthropomorphism is one way around this however, the evidence within the corpus suggests that when a narrator is visually confronted with a character with no 'real world' counterpart, the description is not patterned. This argument could be broadened out to inform landscape and indoor patterns but it does not seem to influence the other two categories to such a degree. Presumably because, despite genre (fantasy/sci-fi), their narrative function remains the same and thus, we can recall previous experience of such dimensions, geometries etc. and impose this previous experience on fantasy versions of them. Data from current neuro-imaging would support this:

Seeing an object on one occasion may facilitate or prime processing of the same object if it is later again encountered. Such priming may also be found — but at a reduced level — for different but perceptually similar objects that are alternative exemplars or 'tokens' of the initially presented object. (Koutstaal et al. 2001, p.184)

This is also supported by the findings in other children's texts such as The Wonderful Wizard of Oz in which the patterns hold for landscapes and

rooms, for example, a landscape pattern is found in a topological frame on the first page of the novel:

When Dorothy stood in the doorway and looked around, she could see nothing but the great grey prairie on every side. Not a tree nor a house broke the broad sweep of flat country that reached to the edge of the sky in all directions. (Baum 2005, p.7)

However, the body pattern does not hold up for a number of these texts, including the latter. Consider, for example, Dorothy's first description of her travelling companions:

Scarecrow:

Dorothy leaned her chin upon her hand and gazed thoughtfully at the scarecrow. Its head was a small sack stuffed with straw, with eyes, nose, and mouth painted in it to represent a face. An old, blue pointed hat, that had belonged to some Munchkin, was perched on his head, and the rest of the figure was a blue suit of clothes, worn and faded, which had also been stuffed with straw. In the feet were some old country boots with blue tops, such as every man wore in this country, and the figure was raised above the stalks of corn by means of a pole stuck up its back. (Baum 2005 [1900], p.23)

Tin Woodman:

One of the big trees had been partly chopped through, and standing beside it, with an uplifted axe in his hands, was a man made entirely of tin. His head and arms and legs were jointed upon his body, but he stood perfectly motionless, as if he could not stir at all. (Baum 2005 [1900], p.33)

And, the Lion:

Just as he [Tin Woodman] spoke there came from the forest a terrible roar, and the next moment a great Lion bounded into the road. With one blow of his paw he sent the Scarecrow spinning over and over to the edge of the road, and then he struck at the Tin Woodman with his sharp claws. (Baum 2005 [1900], p.40)

In these three character descriptions there is no common form of description: The Scarecrow almost conforms to the long loop body pattern but his figure comes last instead of first. Although, he is awarded a narrative gaze where the others are not. The Tin Woodman has no facial description in this frame but the emphasis is on his body and the Lion is introduced through his action rather than an explicit view and. The same holds for descriptions of Tinkerbell in Peter Pan (1904) whereas Captain Hook's description conforms. As does the description of the Wizard of Oz when he is finally revealed as a mere mortal through the short loop body pattern:

For they saw, standing in just the spot the screen had hidden, a little old man, with a bald head and a wrinkled face. (Baum 2005 [1900], p.114)

However, this is an interesting frame as it also violates the third general rule on the function of topological frames – it is also a revelatory frame. Although it is providing a spatial description of the wizard it is also fulfilling the narrative function of the 'reveal'.

It has been long recognised, particularly through the work of Kosslyn, that we process objects differently from faces and this may account for why the patterns are generally maintained in children's literature for landscapes and indoor spaces but not for characters. Kosslyn is seen as a proponent of Perceptual Anticipation Theory, which would describe object and scene processing as:

Perceptual anticipation theory posits that the act of looking for a characteristic in an imaged object or scene leads one to generate an image of that characteristic... in all cases the mechanisms used to generate images rely on processes used to anticipate perceiving stimuli...Generating the image makes the object's geometric properties explicit and accessible to other processes. (Kosslyn et al. 2006, p.119)

And, this would seem to support the argument above regarding the landscape and indoor patterns.

Whereas face processing requires a more specific set of processes, as Sergent argues:

The human face holds a special place among visual objects...from a cognitive standpoint, there are several ways in which the processing of faces differs from that of other objects. (Sergent, Ohta and MacDonald 1992, p.15)

However, in the data samples, and more specifically those which contain topological frames, the face is not viewed in isolation, it is part of a whole body description, as the outline is described first. Also, character descriptions of the body for all the other genres in the corpus generally conform to patterning, so we must exclude the body as a special case of patterning and return to the common denominator of these texts: children.

Having ruled out motion, vision and processing variations as the cause of non-patterning in children's texts for the category of bodies, the remaining suggestion is the lack of real world visual counterparts which behave in a similar manner in terms of speech and movement. Abraham, von Cramon and Schubotz's work on this may support this conclusion. In their study

'Meeting George Bush versus Meeting Cinderella: The Neural Response When Telling Apart What is Real from What is Fictional in the Context of Our Reality' (2008), they attempt to identify the neural signature responsible for activating our responses to fictional characters and if this differs from our engagement with figures from the real world. Basing their argument on the proportion of self-relevance i.e. how socially relevant to us are both the real and fictional characters, they claim that our processing of factual characters draw heavily on episodic memory (autobiographical) whereas we process fictional characters by drawing semantic memory (our knowledge of the world), thus factual characters have more personal relevance:

Although both scenario types recruited neural areas associated with declarative memory processes such medial- temporal lobe structures, contexts containing fictional entities also significantly activated more semantically relevant retrieval areas, whereas those containing real people significantly engaged more episodically relevant retrieval regions. It appears then that one of the means by which we tell reality apart from fiction, at least in the explicit context of reality testing, seems to lie in the manner in which such information is coded and accessed, namely, if it is personally significant or not. The degree of associated self-relevance is therefore a possibly critical determinant factor that enables us to differentiate between what is real and unreal. (Abraham, von Cramon and Schubotz 2008, p.975)

Abraham et al.'s study claims that when we engage with fictional characters we tend to utilize other memory systems as opposed to episodic. However, I suggest that this claim needs further refinement: in the next chapter I show how the episodic memory plays an essential role in our ability to create narrative and this is supported by a number of studies including Hasselmo

who gives a thorough account of the neuro-physiology that enables this process. His research also supports the idea that visual perception survives intact during the translation process into the memory system. Therefore, the survival of the patterns, as a record of visual perception, demonstrates that we do use our episodic memory for fictional engagement. This is reinforced by data from the corpus demonstrating that the majority of the topological frames for character descriptions are patterned. Therefore, I suggest that in terms of children's literature, albeit the extreme form of disruption these samples represent, the pattern production pertaining to characters is interrupted because we have no real world visual experience of, or visual priming, in which to draw upon to survive translation into the episodic system. Some of the characters do have matching counter parts available for visual engagement, for example, the Lion or the Scarecrow however, they are not anthropomorphically animated in the real world as they are in fiction. Thus, as Abraham et al. suggest we need to draw on other memory systems, such as semantic, which may not be influenced by visual perception in the same self-relevant way.

## Chapter 4: Memory, Episodic Future Thinking and Narrative Production.

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Abstract: This chapter addresses the issue of online perception of visual stimuli versus imagined stimuli. Having argued that the patterns are taking the form of the topological global invariant in the previous chapter, it is necessary to understand if the same neural operations are at work for literary fiction. Theorizing that episodic memory is conducive to narrative events, this chapter explores the neurological role that memory plays in narrative production. Fundamentally, this chapter, supported by the work of Kosslyn, Tulving and Hasselmo, argues that the patterns survive translation from the perceptual system into memory networks through neurobiological associative feeds.

### Introduction

By using Chen's topological model of visual perception, specifically his reconsideration of gestalt surroundedness, I have suggested that the narrative patterns assume the form of the global visual primitive: a hole in a background whose sequencing is explained as the change in relativity between object and ground. However, this suggestion is predicated on a model of real world (online) perception not internal representations of space. Therefore, this chapter further suggests that the patterns survive translation from the perceptual system to particular memory networks. By demonstrating that the ability to create narrative stems from our episodic memory system, this chapter will argue that the unconscious registration of the visual primitive remains intact when consciously recalled for the purposes of episodic future thinking. Episodic future thinking enables self-projection, for example, thinking of oneself attending a future event or



completing a task. It functions to allow us to evaluate, plan, project and imagine alternative selves.

Kosslyn is a major contributor to this discussion and has consistently argued the following:

1. Visual imagery has a shared neural relationship with the perceptual system
2. Visual imagery has associated, if not governing, links with memory
3. The production of a visual image is predicated upon a series of componential processes which relies on a number of sub-systems

This is important support for the argument here that the patterns survive translation into the memory system. He argues ‘...numerous researchers have shown that parts of the brain used in vision are also involved in visual mental imagery’ (Kosslyn et al. 1993, p.264). More specifically, whilst establishing the shared neural reliance for both imagery and perception, Kosslyn argues that the production of visual imagery needs to also draw upon a further set of neural operations because of the lack of online stimuli.

As he comments:

Mental imagery occurs when perceptual information is accessed from memory, giving rise to the experience of ‘seeing with the mind’s eye’, ‘hearing with the mind’s ear’ and so on. By contrast, perception occurs when information is registered directly from the senses. Mental images need not result simply from the recall of previously perceived objects or events; they can also be created by combining and modifying stored perceptual information in novel ways. (Kosslyn et al. 2001, p.635)

Neurobiologically, Hasselmo (2009) explains this survival of the visual primitive through episodic memory as a ‘reactivation’ of the perceptual input:

Thus, you could think of retrieval of an environment in terms of the memory of an episodic trajectory through the environment that would reactivate associated objects or views. (Hasselmo 2013)

By employing Hasselmo’s model and using it in conjunction with Hassabis and Maguire’s episodic construction model, which claims that:

Scene or event construction involves the mental generation and maintenance of a complex and coherent scene or event. This is achieved by the reactivation, retrieval and integration of relevant semantic, contextual and sensory components, stored in their modality specific cortical areas, the product of which has a coherent spatial context (Hassabis and Maguire 2009, p.1268)

this chapter argues that the patterning can be thought of as the ‘reactivation’ of the visual primitive that is retrieved in its original form via a series of synaptic relationships between the hippocampus, the entorhinal cortex and a sensory cue during an episodic memory.

A key phrase here in terms of the patterns, is the ‘integration of relevant semantic contextual and sensory components’. This brings us to how the unconscious ordering of the visual primitive can survive translation into the conscious episodic system in the texts under analysis here. In simple terms, we can understand it as the episodic system feeding off associative links (most likely the role that the inferior temporal cortex plays in the ventral stream) in order to enhance the final recalled/recreated/imagined event. These links include, as Hassabis and Maguire point out, sensory

components, particularly visual imagery. If the episodic system is merely drawing upon these links and not manipulating them in terms of original input, we can now propose that the patterns, stemming from the original ordered visual percept, is not altered when it is drawn upon by the episodic system. They, in effect, survive entry into a new but connected system. Therefore, when an author produces a narrative they are drawing upon their episodic toolkit and, as Hasselmo suggests, this would include the ability to internally create spatially coherent environments which are driven by perceptual cues. The argument here is that the patterns of this study are being produced by these processes; they amount to textual evidence of these relationships at work.

#### 4.1 Episodic Memory: the origin of narrative?

Unfortunately, we know relatively little about the neural processes at work during narrative production. Mar in his paper ‘The neurophysiology of narrative: story comprehension, story production and their interrelation’ (2004), states ‘...brain research has not yet risen to the level where it can contribute to models of discourse processing...[A]mong the specific barriers which face a production theorist is the fact that comparatively little neuroscientific research on the topic exists’ (Mar 2004, p.1423). Shah et al. would confirm this opinion in 2011 with ‘Neural Correlates of Creative Writing: An fMRI study’ where they state:

Previous neuroscientific research on creative writing is sparse and thus little is known about its neural correlates. Some knowledge has

been gathered on motor processes associated with writing [Katanoda et al., 2001]. However, the neural correlates of cognitive processes during writing are still unexplored. (Shah et al. 2011, p.2)

However, recent studies on memory, particularly episodic memories (autobiographical memory), have created a potential pathway for theoretically addressing narrative production. This is also confirmed by Shah et al. when they list the following as essential to creative writing, “Creative writing” combines handwriting processes and cognitive writing processes, which are predominantly associated with episodic memory, semantic integration, and a free associative and spontaneous cognitive text production’ (Shah et al. 2011, p.13)

More broadly, Sutton asks, ‘Why is memory so hard to understand? The answer, in part, is that the term labels a great variety of phenomena’ (Sutton 2010). But, what we do understand is that we remember different types of knowledge differently. For example, we know that  $2+2=4$  is a different type of memory than remembering the experience in the classroom when we learned such facts. This is due to the various ways in which we encode, store and recollect this information. To say that we have a number of different memory systems would be to oversimplify matters, however, that being said, we can broadly state that different parts of our of neural architecture work with varying types of memory. As Tulving states:

Memory systems are organized structures of more elementary operating components. An operating component of a system consists of a neural substrate and its behavioral or cognitive correlates. Some components are shared by all systems, others are shared only by

some, and still others are unique to individual systems. Different learning and memory situations involve different concatenations of components from one or more systems. Although there is no one-to-one correspondence between tasks and systems, they are nonetheless systematically related... (Tulving 2002, p.6)

Early theories on the memory as a multiple system stemmed from clinical studies on patients who suffered brain trauma. They established this by demonstrating the survival of some memory types after brain damage but not all, for example: Patient KC in 1981 sustained trauma to his medial temporal lobes which also resulted in bi-lateral hippocampal loss. The resulting effect was that his semantic memory (our knowledge of the world, facts, concepts, beliefs etc.) remained intact but he could not recall any episodic (autobiographical) memories of his life (Rosenbaum et al., 2005). Thus, it was concluded that hippocampal processing is critical to the storage and recall of episodic memories but not semantic memory.

Leaving aside the specifics of spatial patterning for the moment and focusing in broader terms on the influence of memory upon narrative production, it would be fair to say that memory as a multiple system has become a theoretical consensus despite the recent criticism of Howe (2000) and others<sup>28</sup>. With the development of testing tools, such as fMRI, early untested theories, such as Tulving's work (1972), can now be biologically proved. Therefore, a lengthy list of memory types would include, short-term, long term, sensory, topographic, working, flashbulb, declarative (sub-

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<sup>28</sup> See Glenberg 1997, McClelland 1995 and Weldon 1999 for further arguments.

divided into semantic and episodic memory) and procedural memory. All types of memory are able to encode information and retrieve later but what differentiates one from another is the type of information they encode. For example, with episodic memory the information source of its encoding could be a sensation whereas semantic memory would encode for comprehension. However, encoding is only the initial stage of memory operation.

Tulving's 'Precis of elements of Episodic memory' (1984) explains the operation from encoding to retrieval through the process of GAPS, which he describes as:

[T]he componential structure of an act of remembering...The elements of GAPS can be classified into two categories, elements of encoding and elements of retrieval. The encoding part of an act of remembering begins with the perception of an event and ends with an original or recoded engram; retrieval begins with the perception of a retrieval cue and ends with the recollective experience of the event, conversion of ephoric information or both<sup>29</sup>. (Tulving 1984, p.229)

As Tulving explains, encoding's chief function is recognised as 'The process that converts an event into an engram' (Tulving 1984, p.230). An engram, a hypothetical notion, is generally considered to be the product of the encoding operation, also known as a memory trace, which is then converted to long term storage via the hippocampus and stored in the various regions

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<sup>29</sup> Ecphory plays an important role in memory retrieval in that it describes the process which combines the engram and the retrieval cue. The engram is the end product of encoding or rather the information that gets stored and the retrieval cue is the stimuli which results in recall.

of the neocortex.<sup>30</sup> The latter stage of memory operation is retrieval. Retrieval, or recall, relies on ‘cueing’ to come into effect and evidence suggests that the type of memory retrieved depends on the type of cue, as Tulving comments, ‘Engrams have no effect on mental activity unless they are retrieved. For retrieval to occur, two necessary conditions must be met: The system must be in the retrieval mode and an appropriate retrieval cue must be present’ (Tulving 1984, p.230). Thus, the operation of memory, from encoding to retrieval, is predicated on the type of information presented at the source point.

Prevailing research points towards episodic memory as the chief influence on our ability to produce narrative and this is largely due to the information it encodes for – although, this in no way negates the influence of, for example, semantic or working memory during the act of production also. Episodic memory is generally labeled as the system which controls our ‘autobiographical’ memories. A relatively late addition to the bank of established memory systems, such as short and long term memory, episodic memory is described by Tulving as remarkable, both in relation to our other memory systems and more widely as a singularly human achievement (Tulving 2002, p.6). In more specific terms episodic memory is a sub-section of declarative memory which can be described as:

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<sup>30</sup> There is some debate as to the role of the hippocampus and long term storage – new evidence (Squire 2002) argues that the hippocampus functions as a temporary storage role only while others (Penfield and Mathieson 1974) argue that memories are held here for much longer periods before their eventual transfer to the neocortex.

[T]he mental registration, retention, and recall of past experiences, sensations, ideas, knowledge, and thoughts. This memory has a high cognitive basis. The original information must be relayed through either the amygdala or hippocampal nuclear structures before long-term storage is possible. (Mosby, 2009)

Declarative memory is, albeit contentiously, considered to be split into two categories, semantic and episodic, and this is derived from the early work of Tulving (1972) where he argues for the separate functions of both within the declarative system. He organizes both categories in terms of information, operation and application and illustrates their separation by, for example, stating that episodic memory is organised through the temporal structure of events and episodes within these events, whereas semantic memory is organised via conceptual systems; episodic memory operates through subjective experience as opposed to semantic memory which operates symbolically. Further distinction can also be seen in terms of their application: episodic memory is not deemed relevant to a subject's education whereas semantic memory can be expanded by educational exposure.

Although Tulving's work (1972) is regarded as seminal in the establishment of the episodic memory system, he often revisits this early work in order to re-address the separation of episodic and semantic systems or update his theory with results gained with the support of technological innovation. As of 2002, he has this to say about the episodic and semantic divide:

The theory holds that episodic memory evolved out of semantic memory: Semantic memory appeared long before episodic memory. Many nonhuman animals, especially mammals and birds, possess well-developed knowledge-of-the-world (declarative, or semantic,



memory) systems and are capable of acquiring vast amounts of flexibly expressible information. Early humans were like these animals but at some point in human evolution, possibly rather recently, episodic memory emerged as an ‘embellishment’ of the semantic memory system. (Tulving 2002, pp.6-7)

As discussed earlier, both semantic and episodic memories encode different types of knowledge, and this diversity is also paralleled in terms of recall, as

Wiggs et al. confirm:

Retrieving episodic information, as compared to object naming, activated bilateral medial parietal cortex, bilateral retrosplenial cortex, right frontal cortex, thalamus, and cerebellum. Direct comparison of the semantic and episodic conditions revealed bilateral activation in temporal and frontal lobes in the semantic task (left greater than right), and activation in medial parietal cortex, retrosplenial cortex, thalamus, and cerebellum (but not right frontal regions) in the episodic task. These results support the assertion that distinct neural structures mediate semantic and episodic memory retrieval. (Wiggs et.al 1998, p.103)

However, despite these differences – and the increasing neuro-physiological evidence that confirms different neural areas of memory storage– it could be argued that both forms of knowledge can be drawn upon to heavily influence writing.

#### 4.2 Episodic Future Thinking

In order to understand the semantic impact on episodic memory and what this means for the appearance of spatial patterning in these texts, it is first necessary to explain how episodic memory provides the platform for narrative production; the same episodic toolkit that allows for re-experience

also allows for newly imagined experiences – it is called Episodic Future Thinking (EFT).

EFT, also referred to as ‘prospection’ (Buckner and Carroll 2006), ‘proscopic chronesthesia’ (Tulving 2002) and ‘mental time travel’ (Wheeler et al. 1997), describes the ability to project a version of ourselves onto a future event so that we may ‘pre-experience’ the event (Atance and O’Neill 2001). EFT, as defined by Atance and O’Neill, is an extension of Tulving’s idea which focuses on specifying the notion of ‘self-projection’ through ‘pre-experience’ (Atance and O’Neill 2001). This means that we can rehearse future events, plan for them and evaluate outcomes. In essence, it is using past memories to plan for future ones – presumably, a necessarily important component in our evolutionary adaptation. One of the important, and perhaps controversial elements, to EFT is, as Wheeler et al. (1997) describe, the ability to perform mental time travel. Tulving, in an elegant summation, describes this process as stemming from our auto-noetic consciousness:

Time’s flow is irreversible. The singular exception is provided by the human ability to remember past happenings. When one thinks today about what one did yesterday, time’s arrow is bent into a loop. The rememberer has mentally traveled back into her past and thus violated the law of the irreversibility of the flow of time. She has not accomplished the feat in physical reality, of course, but rather in the reality of the mind, which, as everyone knows, is at least as important for human beings as is the physical reality. When Mother Nature watches her favorite creatures turning one of her immutable laws on its head, she must be pleased with her own creativity... [t]he term auto-noetic has been used to refer to this special kind of consciousness that allows us to be aware of subjective time in which

events happened. Auto-noetic awareness (or auto-noesis) is required for remembering. No auto-noesis, no mental time travel. (Tulving 2002, pp.1-2)

Neurophysiologically, a number of studies have been conducted in order to understand the parts of the brain which control EFT and not all of them agree on the specifics, however, for the purposes here, there is enough consensus to agree that the governing structures of EFT are the:

- *Pre-frontal cortex* (dorsal and ventro-medial) – planning, decision-making
- *Lateral pre-frontal cortex* – goal orientation
- *Hippocampus* – memory transfer from short to long (although this is disputed – see Squire et al. 2004 and Atance and O’Neill 2001 for a detailed discussion), spatial navigation
- *Parahippocampal gyrus*- memory encoding, memory retrieval
- *Lateral temporal cortices* – conceptual knowledge
- *Temporoparietal junction* – Theory of Mind: the ability to adopt another’s perspective
- *Retrosplenial cortex* – spatial navigation
- *Posterior cingulate cortex* – memory retrieval

(Maguire 2001; Maguire and Frith 2003; Svoboda et al.. 2006; Cabeza and St. Jacques 2007; Hassabis et al.. 2007; Hassabis and Maguire 2007 and Hassabis and Maguire 2009).

These brain regions form a network of processes which function to execute and support the list drawn up by Hassabis and Maguire – ‘subjective time, connection to the self, narrative structure, retrieval of relevant semantic information, feelings of familiarity and rich multimodal re-experiencing of the event in a coherent spatial context’ (Hassabis and Maguire 2009, p.1263) and to this Atance and O’Neill would also include ‘pre-experiencing’ (2001). Related to this list, and important for the purposes here, is the research of Rubin et al. entitled ‘Belief and recollection of autobiographical memories’ (2003), which looks at the narrative structure of episodic memory. Turner, as early as 1996 in The Literary Mind argues that all cognitive thought is organised around a narrative structure.

EFT is an easily recognisable activity, we do it everyday. Whether planning what to wear for a party or imagining the success of a project, it is endemic to our thoughts. As Speers et al. argue: ‘Knowledge about the structure of events is essential for one to function in the world and is used to fill in missing information, predict what is going to happen in the future, and plan actions’ (Speers et al. 2009, p.307)

What about another’s thoughts though? Buckner and Carroll, arguing for a stronger insertion of Theory of Mind to be included in EFT, emphasise the role of self-projection and our ability to not just understand another’s perspective but to actually immerse ourselves in that role, perceptually and sensorily, as they comment:

A striking feature of mental life is the ability to consider alternatives to events in the immediate environment. We can shift our perspective from the present to vivid memories of our personal past, conceive what others are thinking and imagine ourselves in situations before they happen...[u]sing this description, it is apparent that prospection shares similar processes with other cognitive acts that require projection of oneself from the immediate environment to alternative perspectives. For lack of a more suitable term, we refer to the mental construction of an imagined alternative perspective as a 'simulation'. (Buckner and Carroll 2006, p.49)

It is from Buckner and Carroll's research that we can begin to understand the ramifications of simulation for narrative production. For example, it could be argued that a writer performs the same mental operations during narrative production; they are simulating an alternative perspective, a projection of the self onto another's environment.

Buckner and Carroll focus on the frontal lobe and the medial temporal lobe as the key brain regions which allow us to perform EFT and simulation. Through clinical research with patients suffering brain trauma, they, like Rosenbaum's work on patient K.C., were able to ascertain the function of these areas in relation to behavioural loss. Thus, they concluded that the frontal lobe was important for planning and evaluation, particularly when patients were confronted with a new environment and for simulation this means that '[C]ollectively, these neuropsychological findings suggest that the frontal cortex contributes to the ability to shift flexibly one's perspective beyond the immediate present' (ibid, p.50). The medial temporal lobe however, is responsible for forming a network with the hippocampal region

and lateral parietal lobe which together ensure an intact memory operation. This is supported by fMRI imaging which reveals the activated networking of these regions:

Moreover, if one examines hippocampal networks by placing a seed region in the hippocampal formation and mapping the correlated cortical regions, robust correlations are observed in parietal and frontal regions that overlap the regions that are selectively activated during remembering, prospection and theory-of-mind tasks. (ibid, p. 52)

Buckner and Carroll admit that we are far from a proofed theory of simulation, as other research also shows the importance of the front-polar region to simulation despite being non-selective for the memory domain, however, they argue that we can hold consensus on the fact that ‘contiguous regions in the anteriormost [*sic*] portions of the frontal lobe are concerned with regulating shifts between perspectives’ (ibid, p.53).<sup>31</sup> And, although through this research we can now begin to understand how our episodic tool-kit allows us to manipulate the temporality and perspective of imagined events, we need to now ask: how is the episodic scene put together? In essence, what is it made of?

In trying to answer this we can look to the work of Hassabis and Maguire and in particular their article entitled ‘The construction system of the brain’ (2009). Here they take the idea of EFT a step further by arguing that it is a reconstructive process, as opposed to the recall/recreation of an holistic

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<sup>31</sup> They specifically refer to the work of Frith and Gallagher: Gallagher, H.L. and Frith, C.D. (2003) Functional imaging of ‘theory of mind’. Trends Cogn. Sci. 7, 77–83.

record – a view which they claim hampers the detail in work such as Buckner and Carroll's. Using what they term 'scene construction' as a means of mapping out the neural processes at work when participants are invited to 'richly imagin[e] new fictitious experiences' (Hassabis and Maguire 2009), they argue:

Recently, one important tool in the development of novel tasks has been imagination...In many ways, imagining new experiences can be regarded as the purest expression of construction. All healthy volunteers can effortlessly use their imagination to a basic degree (indeed humans have told stories and delighted in fiction and narrative for thousands of years), and verbally induced imagination of scenes has been shown to be possible and useful in the neuropsychological context. (Hassabis and Maguire 2009, pp.1263-1264)

Essentially, this research argues that mapping the neural networks of episodic memory and EFT gives us limited results in terms of distinguishing the ability to create episodic recall and future planning from the ability to imagine new situations. They argue that brain mapping will only show the same neural regions activated, despite the temporal shifts, therefore, they opt instead to test the participants ability to imagine situations. As they comment:

[A] productive way to investigate recollection of the past and prediction of the future is, ironically, not to study the past or the future at all. We argue that because the core processes underlying prediction of the future can be co-opted by a range of other atemporal cognitive functions, these processes may be best isolated and understood in the context of paradigms where time is not an explicit factor, such as imagining fictitious experiences... Experiences constructed by the imagination, while having much in common with episodic memories, have the advantage of being easier to systematize

and experimentally manipulate...For example, participants can be asked to construct the same fictitious situations, and their performances can be compared and contrasted more directly than would be possible in a standard episodic memory recall paradigm. (ibid, 1263)

By testing this way, Hassabis and Maguire argue that they can manipulate the participant's imagined scenario to focus on some aspects of the scene and not others and this in turn can isolate these components in order to provide further detail on the neural substrate under examination. For example, they ran a series of tasks, which for some required the insertion of a temporal frame, but for others time was not a structural factor.<sup>32</sup> This method attempts to tease out the variations between the properties of EFT and imagined situations, thus, for example, during one task the participants were free from having to associate with self-referential events whether past or future – a framing device of EFT. This revealed further, more specific relationships, than the already established networks of the hippocampus, frontal lobe and medial temporal lobe:

A distributed brain network was implicated involving the hippocampus, parahippocampal gyrus, RSC<sup>33</sup>, posterior parietal cortices, middle temporal cortices and ventromedial PFC<sup>34</sup>. This construction network cannot only account for a large part of the episodic memory recall network and EFT but also bears a striking resemblance to networks activated by navigation, spatial and place tasks as well as those associated with mind wandering and the default

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<sup>32</sup> Testing for (i) vivid recall of recent real memories, (ii) vivid recall of previously created imaginary experiences, and (iii) construction of new imaginary experiences for the first time in the scanner. (Hassabis and Maguire 2009)

<sup>33</sup> Retrosplenial cortex

<sup>34</sup> Pre-Frontal Cortex



network. This suggests there may be a set of key component processes underlying all of these cognitive functions. (ibid, p.1267)

Hassabis and Maguire, take this research even further by commenting that not only are more specific relationships revealed, when employing their methods but that episodic recall and EFT, self-projection and simulation all stem from the neural networks they outline above but that they form unique relationships within this overall network depending on the activity in question. Therefore, somewhat paradoxically, in looking for more specific relationships they appear to have found a broader base in which the ability to imagine operates.

Thus, we believe the construction network is most accurately characterized as being invoked whenever attention is directed away from the current external situation and instead focused inwards towards a rich internal representation of an event, real or imagined. (ibid,)

Arguing further, they describe this ‘construction network’ as the larger network containing all the essential substrates for each of the activities listed above but they activate specific relationships when the activity is altered when, for example, a person is recalling a past event or imagining a fictitious situation. As they comment, ‘[p]rocesses such as theory of mind are only engaged if required, i.e. in the case of EFT or episodic memory recall but not necessarily in imagination or navigation’ (ibid). Thus, it can be said that each component operates independently, if necessary, within the larger network of episodic memory, thus, it can be seen that the precuneus proves

essential in isolating real events, but has no involvement in the imagining of fictitious events, despite the fact that it is contained within the parietal cortex. This seems a rather complex operation, and it is, yet, the episodic memory system proves able to negotiate the real from the imagined, the imagined of the self onto another etc. and it is through this work of Hassabis and Maguire in their attempt to both specify and generalize, that we can see how the patterns are maintained. Their research allows us to understand the neural processes at work when imagining a fictional scene and thus, gives us a platform on which to begin an investigation on how EFT and its potential for narrative production interacts with visual perception and writing. As they explicitly state:

In humans, the use of this constructive process goes far beyond simply predicting the future, to the general evaluation of fitness for purpose. For example, a scriptwriter or novelist who is writing a passage in a film or book may play out the whole scene using their construction system, not with the idea of predicting the future, but instead for the purpose of evaluating its aesthetic suitability. (Hassabis and Maguire 2009, p.1269)

In their mapping of the specific neural substrates, each can be said to bring a unique ingredient to this mental construction, evidenced in the precuneus example above, and that each plays a role in completing the final product. A key element is stability, we know that episodic memory is the most unreliable of all the memory systems yet it must deliver the episode in a 'coherent spatial context' (ibid). The same substrates that ensure we do not confuse a past memory with an imagined event and indeed reality, are the

same substrates that link to other memory systems that provide more stable data, for example the semantic system:

In fact, scene construction is a specific example of ‘associative construction’, which involves visual imagery, binding and also disparate multimodal elements that, when bound together, (re)create an event as a whole. This includes contextual details such as sounds and smells in addition to visual inputs, people, objects, entities and their actions. (ibid)

Initially, a multi-system connection that maintains a direct recording of perceptual information seems implausible, Buckner and Carroll consider this in terms of simulation and their argument implies that they do not agree this is possible as they comment, “The processes of the network [episodic] are characterized by a personal, internal mode of mental simulation in contrast to perceptions that are driven primarily by the immediate external environment (Buckner and Carroll 2006, p.49). They seem to be suggesting here that one system has no role to play in the other however, recent work from neurobiology suggests that the episodic system does link to other systems and that this is controlled via the hippocampus, entorhinal cortex and sensory cues. Generally, Hasselmo’s research on spatial trajectories is a neurophysiological account of how episodic memory can help us re-experience events in a spatially and temporally ordered way so that we can, for example, remember the route home. More importantly for the purposes here, his work provides evidence on how the original visual percept is maintained during episodic reactivation as he explains: ‘Episodic memory

includes the capacity to mentally retrace trajectories through previously visited locations, including re-experiencing specific stimuli...'(Hasselmo 2009, p.559), where 're-experiencing specific stimuli' is a mental reactivation of the visual primitive intact: 'Thus, you could think of retrieval of an environment in terms of the memory of an episodic trajectory through the environment that would reactivate associated objects or views' (Hasselmo 2013).

On a specific level, Hasselmo's episodic model focuses on the synaptic process during encoding, storage and retrieval of space and explains how the patterns survive:

1. Encoding: head direction cells - neurons which increasingly fire when the head is pointed in a certain direction and in essence, provide the visual perspective.
2. Storage: Once this view is captured, entorhinal grid cells (part of the entorhinal cortex in the medial temporal lobe, which acts a network hub for the memory system) integrate this view to create an internal representation of the space. During this process the grid cells also activate hippocampal place cells which form an association with visual sensory stimuli.
3. Retrieval: A sensory cue activates the hippocampal place cells which fire the head directional cells which re-establishes the view and the

previously stored information is reactivated and an internal representation of the space is formed.

Thus, the following passage of a text:

The house seemed to be pressing down low in apprehension, hiding its face, as though it had her vision of where it was. It seemed to gather its trees close in fright and amazement at the wide, light, lovely unloving country, the unwilling bosom whereon it was set. From the slope's foot, where the Danielstown trees began, the land stretched out in a plain as flat as water, basin of the Madder and Darra and their fine wandering tributaries, till the far hills, faint and brittle, straining against the inrush of vaster distance, cut the droop of the sky like a glass blade. (Bowen 1988 [1929], p.66)

can now be described as

1. Landscape TS:  $(P_n \rightarrow M \rightarrow D)$  = Progressive pattern where the pattern follows the head noun phrases.
2. A perceptual record of the global invariant of the visual primitive where the invariant is a series of holes in backgrounds and the sequence is accounted for by each head noun (hole) becoming the background for the next one.
3. The survival of the perceptual imprint as an internal representation for the purposes of narrative production enabled by the episodic memory. The survival of the pattern is explained by the synaptic connection between the head direction cells (view), the entorhinal cortex (memory hub) and the hippocampal association with the original sensory stimuli.

In a thesis that is attempting to understand the presence of spatial patterning in these narrative texts, it is not enough to argue that the patterns are a visual record from our real world perception. They are also the product of internal representations of these spaces and thus, may be impacted by a number of other cognitive processes involved in narrative production, such as evaluation, planning, decision-making etc. Any impact may result in a manipulation of patterning and a change in form leaving us to consider the possibility that it is the creative process of narrative in itself, long championed for its individuality by literary discourse, that may be responsible for the patterning. Thus, we must investigate the cognitive act of narrative production in order to understand the processes that enable spatial representation. Working from the premise that the topological frames are not real world space, they are representations of such, we need to ask: what impact does the act of writing have on the patterns?

## Chapter 5: Textual processing

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**Abstract:** Having demonstrated in the previous two chapters that the patterns originate with the visual primitive and are maintained by our ability to imagine space through EFT, this chapter will investigate whether narrative production – the act of writing – has any impact on the cause of the patterns. Language Tackling issues such as the lack of neuropsychological research on narrative production and spatial language, this chapter will argue that there is strong evidence which suggests neural similarities between narrative comprehension and narrative production. Using comprehension models, particularly Zwaan’s (2003) ‘Immersed Experiencer Framework (IEF) I argue that grounded, or embodied, models of language processing, such as IEF, which rejects the idea of perceptual symbols, support the existence of the patterning as a perceptual record.

### Introduction

This study has, thus far, traced the patterns through a lengthy pathway whose two main features are perceptual organization and memory. The question that has been asked in a number of ways is whether the patterns can survive the act of translation between these systems. Having argued that the patterns are a direct record of the way our visual perception is organised and how this is maintained by memory, I further argue that language processing does not interfere with the translation process rather, it sustains it. However, the lack of research on narrative production hinders this final stage in ascertaining how the patterns survive from perception through to writing. The previous two chapters have discussed the patterns in terms of the neuropsychological operations that allow for network translation to occur. In specific terms this has been described as the synaptic connection between the head direction cells (view), the entorhinal cortex (memory hub)

and the hippocampal association with the original sensory stimuli (visual global invariant).

However, the patterns also challenge certain claims made by IEF, for example, the description of a body in a narrative is perceptually reactivated once and then augmented as the narrative progresses (Zwaan 2003, p.21). This is not what occurs with the patterning. For example, in Jane Eyre the pattern begins anew for the description of Rochester in any topological frame. It may deviate from the short loop to the long loop (including the body) but each originates with Rochester's outline.<sup>35</sup> This tells us that certain assumptions about visual encoding within language may not be true if an overall pattern, like the ones at work here, are governing certain aspects of narrative production.

### 5.1 The shared neural substrates of narrative comprehension and production

Mar believes that neurological research has not afforded studies of narrative production a similar level of specificity. Arguing that narrative has been of interest to cognitive psychology but has not fostered the same attention in neuropsychology, he comments:

Admittedly, there are some formidable hurdles to such an attempt. First, the body of brain research specifically devoted to narrative is relatively young and by no means extensive...The second major hurdle is not so much an obstacle as a caution. Current knowledge of the brain and its functions does not yet approach the specificity at which most cognitive models are described. (Mar 2004, p.1415)

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<sup>35</sup> See Appendix for further detail



And this is further supported by the most recent papers, as Coventry et al. comment: ‘The full range of potential simulations relevant for spatial language comprehension and the conditions under which they are operable remains to be established’ (Coventry et al. 2010, p.212).

However, Mar encourages us to look to comprehension research to understand narrative production. He argues that the neural substrates that support comprehension are the same as those that support production. This is also reflected in the work of Pickering and Garrod ‘An integrated theory of language production and comprehension’ (2013) asserts that: ‘...producing and understanding are interwoven’ (p.329). Wherein they further argue that current models of language processing are

Traditional accounts of language assume separate processing “streams” for production and comprehension. They adopt the “cognitive sandwich,” a perspective that is incompatible both with the demands of communication and with extensive data indicating that production and comprehension are tightly interwoven. (Pickering and Garrod 2013, p.346)

Mar states that there are five key regions that are responsible for the ordering and selection processes involved in both narrative production and comprehension:

1. *Medial prefrontal cortex* – this is also the area which most supports mental inferencing, such as the theory of mind models by Buckner and Carroll discussed in Chapter 3 wherein they argue that episodic future thinking supports the ability to view an imagined event from another’s perspective as if it was happening to ourselves.

2. *Lateral prefrontal cortex* – aside from supporting order and selection this area is, for the purposes of narrative, primarily involved in working memory operation and long term memory retrieval. This would also seem to support my claim that the ability to create narrative stems from episodic memory.
3. *Temporoparietal region* – this area supports the medial prefrontal cortex with mental inferencing and have also been connected to lower level language processing but Mar argues that this does not occur within this region at the level of discourse processing.
4. *Anterior temporal region* – supports theory of mind and also concatenation of both sentences and propositions.
5. *Posterior cingulate cortex* – this area's primary function is not like the others in terms of ordering and selection processes during comprehension and production. Rather, this area is responsible for reactivating prior knowledge, visual imagery, memories etc. Thus, it is heavily associated with episodic retrieval and episodic future thinking.  
(Mar 2004, pp.1427-1429)

Thus, according to Mar, we should be able to look to the neurological operations involved in narrative comprehension and apply them to a model of production. Arguing that the neural relationships at work in the above list are not fundamentally linguistic, he demonstrates how narrative processes

stem from memory – both working and episodic – visual stimuli and theory of mind perspectives. He comments:

Furthermore, these brain areas appear to be unique to narrative-processing, separate from those identified for word and even sentence-level operations. Imaging studies that employ rigorously-controlled stimuli and control conditions, such as those by Robertson et al. (2000) and Crozier et al. (1999), reveal that story-processing activations are not the same as those for sentence-processing... indicat[ing] the importance of right hemisphere areas in sharp contrast to the traditional portrayal of left lateralized language processes (i.e. Broca's and Wernicke's areas). (Mar 2004, p.1429)

This is an interesting find for narrative production: the traditional areas mentioned above (Broca etc.) appear to play a lesser role in narrative production than would be initially assumed. Upheld as the centres for language processing these areas operate on the syntactic level thus, Mar is suggesting here that narrative production is not neurologically bound to language processing. Students of literature would of course concur with such a statement however, on a very specific linguistic level this is an important argument. What can be derived from this is that the language centres in the brain are relegated or even, as Zwaan (2003) argues later, neurally overridden by other cognitive functions such as those listed above. One of the reasons for this may be due to the fact that language processing areas are cytoarchitecturally (cellular) different from other cognitive areas and this is a current debate in neurobiology as Amunts and Zilles state: 'Recent mapping approaches based on cytoarchitecture, transmitter receptor distribution, and connectivity revealed a highly differentiated segregation of

this region far beyond Brodmann's classical scheme (2012)'. Beyond the neural substrates language processing is also different in that it can be agent driven (semantics and pragmatics), it does not it operate at the same speed as that of thought – this is addressed in further detail in section 5.3 here – and, it is typically a conscious operation unlike those areas which service visual processing.

However, the larger argument at work here is that if the traditional language centres are not responsible for narrative processing then it follows that the patterns, manifested in narrative should also not be affected. Yet, recalling Chapter 2 and its illustration of the patterning, the patterns appear at a syntactic level – the patterns can only be understood as such when placed in the context of spatial concatenation. This is further problematized when argued in conjunction with my other claim of narrative function i.e. that the patterns do not have one. However, the patterns are belonging to, or at least embedded in, narrative and they are not predicated on word recognition situations, the type of which would stimulate the Broca region and because of this cannot be isolated from their narrative context. Therefore, at Mar's suggestion, the patterns do not appear to belong wholly to language processing areas.

## 5.2 IEF and linguistic cueing

Furthermore, by outlining these areas above that are associated with a more grounded base for narrative, Mar is essentially undermining previous

research that argues for an amodal view of narrative. Amodality is associated with classical cognitive theories of narrative comprehension; their fundamental difference to grounded theories is that with an amodal system perceptual influence is arbitrary and any subsequent representation of a perceptual experience is arrived at by performing a new and unrelated set of neural processes. As Barsalou describes: 'Rather than extracting a subset of a perceptual state and storing it for later use as a symbol, an amodal symbol system transduces a subset of a perceptual state into a completely new representation language that is inherently nonperceptual' (Barsalou 1999, p.578). In terms of the patterns, they could not be amodal and this is because they are grounded directly to the original perceptual state during the moment of the visual primitive. They exist within a symbolic structure – the representational operations of episodic future thinking – however, they remain as an intact percept and do not become symbols in themselves. This argument is supported by Barsalou when he comments, 'It is essential to see that the symbols in these systems are amodal and arbitrary. They are amodal because their internal structures bear no correspondence to the perceptual states that produced them' (Barsalou 1999, p.578)

Lamenting the lack of neuropsychological work to enable a discourse model of narrative production, Mar turns to cognitive psychology for support. This is important for the explanation of the patterns as a direct perceptual record that are not interfered with during the act of writing. If Mar identifies a

cognitive model of narrative comprehension that is supported by his claims for neural similarity between comprehension and production, then this discourse model can be used to support my claims for non-interference – and, Mar does this. Discussing the divide between amodal models and grounded models of narrative, Mar supports both the growing interest in and claims that grounded models make. In particular he singles out Zwaan’s ‘Immersed Experiencer Framework’ as one which best fits his data. Mar reviews a number of cognitive spatial and language models but has this to say about IEF on particular, ‘The primary contribution of this theory is the idea that words automatically activate experiences of their referents’ (Mar 2004, p.1417).

By supporting IEF’s claim for grounded cognition, described by Barsalou as:

Grounded cognition is often defined negatively as the view that classic theories are incorrect: The core knowledge representations in cognition are not amodal data structures that exist independently of the brain’s modal systems. Instead—according to a positive definition of grounded cognition—the environment, situations, the body, and simulations in the brain’s modal systems ground the central representations in cognition. From this perspective, the cognitive system utilizes the environment and the body as external informational structures that complement internal representations (Barsalou 2010, p.717),

Mar is casting doubt on traditional models of amodal representation.

Favouring the IEF approach, and to a certain extent its predecessor Event-Indexing Model (Zwaan and Radvansky 1998), Mar discusses his imaging data – recalling the list above regarding the medial prefrontal cortex etc. –

and how this supports IEF at a neural level:

The advantage of considering the reviewed research, however, is that the validity of such claims has on some level been addressed and confirmed...Evidence was also found to support the tracking of characters and motivation, as predicted by the Event-Indexing Model and Immersed Experiencer Framework, in the form of theory-of-mind areas like the medial prefrontal cortex, temporoparietal junction, and temporal poles. Partial support for spatial tracking or visual imagery on the part of readers—also predicted by these two theories—was found in the form of posterior cingulate activation. (Mar 2004, p.1422)

As previously stated, Mar's statement above has important consequences for my claims on non-interference because if we look to IEF as not just a comprehension model but also a possible model for production, as per Mar's endorsement, we can see how discourse processing supports perceptual patterning. In particular, Zwaan claims for IEF support what has been argued about pattern translation in the following ways:

1. Words activate brain regions that are close to or overlap with brain areas that are active during perception of or actions involving the words' referents.
2. Visual representations of object shape and orientation are routinely and immediately activated during word and sentence comprehension...visual-spatial information primes sentence processing and may interfere with comprehension.

3. Information that is “in” the situation described in a text is more active in the comprehender’s mind than information that is not in the situation
4. When comprehending language, people’s eye and hand movements are consistent with perceiving or acting in the described situation (Zwaan 2003, p.3)<sup>36</sup>

Beginning with the first point, this shares similarity with the work on mirror neuron activity (Rizzolatti et al. 1996; Rizzolatti, Fogassi & Gallese 2001; Rizzolatti, Fogassi & Gallese 2002; Rizzolatti & Luppino 2001; Rizzolatti, Luppino & Matelli 1998; Rizzolatti & Matelli 2003.) wherein the cortical pathways of the visuomotor neurons (mirror neurons) behave the same whether the action is being observed or performed. There is also some evidence to suggest that mirror neurons are activated upon a linguistic cue, as Fogassi and Ferrari comment: ‘In fact, reading or listening to action-related words and sentences (for example, “He grasps the glass”) activate the premotor cortex and Broca’s area (Tettamanti et al., 2005)’ (Fogassi &

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<sup>36</sup> Zwaan bases this list on previous research carried out by:

1. Isenberg et al., 2000; Martin & Chao, 2001; Pulvermüller, 1999, 2002) (Farah & McClelland, 1991; McRae, de Sa, & Seidenberg, 1997; Miceli et al., 2001).
2. (Dahan & Tanenhaus, 2002; Stanfield & Zwaan, 2002; Zwaan, Stanfield, & Yaxley, 2002; Zwaan & Yaxley, in press a, b) (Boroditsky, 2000) (Fincher-Kiefer, 2001).
3. (Glenberg, Meyer, & Lindem, 1987; Kaup & Zwaan, in press; Morrow, Greenspan, & Bower, 1987; Horton & Rapp, in press; Trabasso & Suh, 1993; Zwaan, Madden, & Whitten, 2000).
4. (Glenberg & Kaschak, in press; Klatzky, Pellegrino, McCloskey, & Doherty, 1989; Spivey, Richardson, Tyler, & Young, 2000).



Ferrari 2007, p.139). The neurological research on mirror neurons would appear to support Zwaan's claims in the first point. In terms of the patterns, the focus on mirror neuron research has been on action related potential, however, the patterns exist in generally non-action states. Yet, it is the empathic operations of mirror neurons and their relationship to linguistic cues that support the patterns in a broad way. Episodic Future Thinking gives us the ability to imagine an event from another's perspective thus, when a writer is imaging a character viewing his space, EFT may be supported linguistically by the empathic operations at work in mirror neurons.

In terms of Zwaan's second point, there are two claims here that need to be addressed with reference to the patterns. Linguistic activation of shape in visual representations suggests that shape is hierarchical in object processing, as Zwaan comments: '[It is] routinely and immediately activated during word and sentence comprehension' (Zwaan 2003, p.3). This would appear to be supported by both Feature Integration Theory (FIT) and Holistic approaches, such as Chen's, to visual perception. If we recall from Chapter 2, FIT list a number of salient properties that arrive in the top-down part of the visual process, we can see that shape is fundamental to achieving saliency. As Treisman and Kanwisher comment 'In order to achieve these representations, multiple sources of information are used, such as color, luminance, texture, relative size, dynamic cues from motion

and transformations, and stereo depth; however, the most important is typically shape' (Treisman and Kanwisherfshe, 1998). Chen's holistic approach also sees shape as a dominant factor but not at the level of saliency (local), rather, he argues that form perception (global) precludes any other type, such as motion. This is supported by the patterns, for example, both the short and long loop patterns that describe a body begin with the outline first. Therefore, it appears that language processing is maintaining prior perceptual stimuli and not altering it, as an amodal system would have, for the purposes of linguistic representation in narrative. The secondary part to his claim 'visual-spatial information primes sentence processing and may interfere with comprehension' would seem to take non-interference further by suggesting that visual perception would actually override any linguistic structure. This may explain why the patterns exist despite the variety of literary periods in my data samples.

Zwaan's third point has not much to add to patterning, however his fourth point is of interest when considered in conjunction with the following statement: 'Spivey et al. (2000) recorded eye movements while subjects imagined or recalled objects that were not present in the visual display. In both cases, observers spontaneously looked at particular blank regions of space in a systematic fashion, in an apparent effort to manipulate and organize spatial relationships between mental and/or retinal images' (Zwaan 2003, p. 25). Spivey et al.'s research, and Zwaan's endorsement, would

support my claim that the patterns are systematic in form and stem from an embodied/grounded writing process.

However, there is a larger argument at work here, IEF would suggest that narrative comprehension is the cue for all the previous operations – from the original visual stimuli to the synaptic operations of EFT – thus, when a narrative is read it initiates a chain of retro processing and brings into being an overall representational symbol whose sub-components are records of the original stimuli – in the case of the patterns this is the visual primitive. Therefore, rather than altering this process – or creating anew as proponents of amodality would have it – language is merely the key which unlocks this chain of processing. For narrative production, Mar would assert that the operation is the same. Thus, the patterns are a part of this perceptual override that can ‘interfere’, using Zwaan’s phrase, with comprehension and to this I would add production.

### 5.3 Syntactic deceleration and the patterns

An issue may arise here in terms of speed. The speed of perception is much faster than that of writing and this would suggest that the patterning could not take the form of the visual primitive. Alternatively, it could be argued that the translation from an internal representation to that of an external merely slows the whole process down so that patterns can be identified – syntactic deceleration. The research discussed in the previous sections of this chapter suggests that language supports perception rather than alters it.

However, it must be noted that the discovery of the patterns is, as far as I am aware, new and hence, would not have been considered in any capacity including that of form manifestation.

Evolutionary perspective on writing may be of help here. Is the act of writing the end product of a number of cognitive processes that are so central to perception and memory that they characterise and shape other functions that emerge thence? One suggestion that takes issue with this idea is that of writing as a 'spandrel'. Spandrels, the term coined by Gould and Lewontin (1979) are described as features that do not owe their existence to evolution directly but which have come into existence as a byproduct of one purpose which were later used for a new one e.g. feathers were seen in some theories as having evolved for temperature control and used later for flight. Current thinking suggests, as we have seen earlier, that our ability to create narrative is an application of EFT (Episodic Future Thinking) which uses episodic memory to create and evaluate a vast range of scenarios and situations ranging from the quotidian to the large-scale. A hunter may reimagine a hunting scene that ended in failure, recreating it to try for successful solutions, a waiter will reorganize a table to fit new dishes being brought to it – and so on. The ability to imagine futures allows us to make up stories, to create fiction. It could be suggested therefore that this ability evolved as a survival mechanism and was then co-opted for writing which would support the spandrel argument. However, it is more likely that it

followed language itself in having a practical use and as such stands on its own two feet as adaptive. Stevan Harnad in his article of 2003 'Back to the Oral Tradition Through Skywriting at the Speed of Thought' argues that language conferred an '..adaptive advantage' over 'trial and error' meaning that if one person can tell another about a solution to a common problem then the receiver of such information has been spared the rigours of finding the answer by trial and error and all that this entails which includes the possibility of failure. He states: 'The oral tradition arose out of this reciprocal altruism. It can be thought of as a collective, serial form of barter whereby we inherit the knowledge of those who have it already.' (Harnad, 2003) The process of being given information is called 'hearsay'. One problem is that those who 'overhear' in a competitive setting have a distinct advantage over those who find the solution in the first place and computer simulation experiments described in 'The Adaptive Advantage of Symbolic Theft Over Sensorimotor Toil: Grounding Language in Perceptual Categories' (Cangelosi and Harnad, 2001) shows that such theft of information gives the 'thieves' a major survival advantage but that such a situation is not stable in terms of evolution as once the ascendant group have the world to themselves they have to revert to doing it the hard way. One interesting observation of this analysis is that outside computer simulations in the real world, humans are in fact capable of receiving information and of using that to create new information. Through a process

which he calls ‘recombinatory knowledge’ Harnad suggests that a person given information can then use it generically to apply it widely:’ the child grounds his first word meanings through direct sensorimotor toil...and can then...acquire all the rest through symbolic theft consisting of recombinations of his already grounded symbols’ (Harnad, 2003). What we have here is nothing less than an explanation of EFT where a subject uses one bit of information – white spots on a red background means poison – to acquire new knowledge by transferring the existing information to future scenarios. This is the use of the imagination and what makes Harnad’s version of it valuable to this study is how it links the use of EFT and the imagination as an act of survival to language. We can obtain other useful insights here when we turn to the written word. Harnad has this to say in relation to the advantages:

Writing leaves a (potentially) permanent record, guaranteeing continuity, allowing fact-checking, copying, copy-sharing, off-line/asynchronous reading, etc. Surely it is writing that made science and scholarship if not possible, then at least far more likely. It is hard to imagine that collective, cumulative, self-corrective, systematic and continuous enterprise arising and enduring within the oral tradition alone. (Harnad, 2003)

The disadvantages are also there:

But writing also had a dramatic negative effect....on the temporal, interactive dimension of linguistic discourse: It instantly transformed it into asynchronous, off-line monologues instead of the synchronous dialogues for which our brains and our thinking capacity are optimized. It either eliminated the interactive dimension entirely, or slowed it to a pace that was almost a caricature of what the human brain is capable of. Writing is asynchronous discourse – out of phase

with the speed of thought and of synchronous mental interaction’  
(Harnad, 2003)

Despite the disadvantages we can see here, we can also appreciate that writing can be seen to augment the survival value of language. Recording it allows ‘hearsay’ to outlive the human entity that prior to its invention was the sole repository of all important information. The written word enshrined knowledge previously only spoken. But the link was direct and strong. Information acquired through perception and stored in episodic memory was then generically reworked in EFT and finally recorded in writing. This suggests that writing should not be regarded as a spandrel but as an adaptation of spoken language and both forms as seamlessly connecting to perception and memory. It is a view that Gibson would have wholeheartedly approved of.

The line ‘Writing is asynchronous discourse – out of phase with the speed of thought and of synchronous mental interaction’ (Ibid.) brings us to the consideration of an idea that has been already mentioned, what I have called ‘syntactic deceleration’. It should be immediately clear that the act of writing as a mechanical undertaking retards the process of cognition even when it is assisted by technology. The speed of thought is itself a concept that requires careful consideration as it can be envisaged in a number of ways e.g. as an operation involving processing by a network in terms of the response speeds of individual neurons. In his article of 1994 – How fast is the speed of thought? - Martin J. Tovee concludes:

It seems that the rapid processing of visual information is facilitated by the continuous passage of information from one stage to the next during the processing of visual information. This allows information to be processed in parallel at different stages in the visual pathways, offset from the preceding stage by 10-15 ms. Most of the information seems to be encoded in the first 50-100 ms of neuronal activity, and 20-30 ms activity is sufficient for the identification and discrimination of even complex visual stimuli. (Tovee, p1127)

This underlines how slow our ability to write is compared to the speed we can think at. This gearing down of the speed of thought may be the very mechanism which reveals patterns which occur too fast at a cognitive level to register consciously. The writing process may now be described as the conversion of perceptually extracted topological invariants and their memory assisted salient loads using multiple phased processing in sequentially firing networks into singular, linear data queues or strings which reveal the patterns of the fundamental processes which created them.

Thus, language/writing does not prohibit or alter the appearance of the patterns, they will always remain as a record of the visual primitive and both neural and cognitive psychology, in the guise of Mar and Zwaan, would seem to support this. However, it may be that narrative production enables the identification of patterning when it would be otherwise too fast to detect.



## Chapter 6: Literary Applications

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**Abstract:** This chapter attempts to provide a literary application to the patterns. Whilst illustrating further patterning in a late modernist and post modernist context, this chapter addresses the problematic relationship with literary texts and their necessary preoccupation with saliency. This was of particular philosophical and aesthetic concern to Beckett and is witnessed by his attempts to overcome the end product of writing in favour of the process. It is further argued that Joyce's punning produces the possibility of overloading the global platform with salient possibilities resulting in a complex and multiple series of accompanying visual images. Finally, Banville is reviewed as a writer who tries to overcome the problematic relationship to what Beckett termed 'the terrible materiality' of literature and the writing process itself by acknowledging the moments in his texts where the visual process remains dominant. It is his search for aesthetic harmony.

### 6.1 Introduction

This final chapter attempts to link the patterns to a literary application.

Having already established that the patterns stem from perception and are reactivated through episodic memory and language processing, it is now imperative that we understand their impact, if any, on narrative structure.

Therefore, this chapter will argue that the patterns exist independently from narrative structure as a form of direct perception – although I would caution against perceiving the patterns as supporting radical forms of embodied cognition, such as Chemero's (2009), as the intervention of episodic memory and its links with representation would disavow such support – rather, that the patterns may demonstrate a hybrid form of representation.

In a sense, they exist in a representative space but are not a representation themselves. Further to this I will argue that post-classical narratology,

influenced by structuralism, can no longer sustain its current notions of narrative space as a 'complete ontological entity' (Ryan 2005) as the patterns reveal a direct cognitive link with the 'actual world' that diminishes the notion of the fictional world and the real world as separate but similar domains.

By proposing that the patterns demonstrate unconscious processes within a conscious operation (narrative production) it points towards the conclusion that literary writers are not entirely in control of the production process. And these patterns expose a cognitive depth to the text that is not currently suspected. However, this does not mean that certain writers were ignorant of the processes behind the salient detail of the text. Samuel Beckett, with his interest in the visual arts, particularly Impressionism, was keenly aware that textual production somehow was not a beginning and an end in itself. In attempting to understand the limitations of language, Beckett looked to the visual arts to help him create texts that dispensed with saliency, as if without the benefits of cognitive science, he knew that the both language and image were the end result of something deeper, as he says:

'And more and more my language appears to me like a veil which one has to tear apart in order to get to those things (or the nothingness) lying behind it...' (Mays 1991, p.258)

And yet, even with Beckett's 'tearing' down of salient aspects of his texts, the patterns remain. Therefore, it will also be shown here that despite

modernism's play on textual surfaces, represented here by the distinctly opposite styles of both minimalism in Beckett and Joycean maximalism, the patterns are manifest. This proves that the patterns operate independently but more importantly they show that there are dominating cognitive structures that override any textual structures. Finally, postmodernism will be reviewed here for pattern manifestation, through the works of John Banville's, particularly his novel Birchwood (1973), as a final robust testing of the patterns existence. By showing that they too are manifest in a different ontology of writing, it will be concluded that the patterns are following a general rule and this is due to the unchanging cyto-architecture of the human mind.

## 6.2 The Production of Patterning and Narrative Didactics

The epistemology of this thesis has been driven by a particular set of research questions:

1. Why do the patterns exist?
2. Do they have a function?
3. What can they tell us about narrative production?

The proposed answer to the first question has been that the patterns are indicative of networking processes that are driven by perceptual input, retrieved and re-presented intact by episodic memory and maintained by language processing. This helps answer the second question; cognitively, they do not appear to have an explicit function. The patterns already exist in

perception; it is how we see the world and this does not change for the purposes of mental representation in a literary text for the categories of space under study here. To find these patterns consistently occurring in literary texts is to witness the translation of the visual primitive between the perceptual, memory and language systems and not the creation of a separate modularity of image for the act of literary narrative. This argument is supported by Hasselmo (2009, 2012, 2013) when he provides evidence for this intact translation via the three stages of encoding, storage and retrieval of an episodic memory. The survival of the pattern is explained by the synaptic connection between the head direction cells (view), the entorhinal cortex (memory hub) and the hippocampal association with the original sensory stimuli. To alter the reactivation of the original stimuli, in this case the visual primitive, would also be to expend further cognitive effort where none is needed. In terms of literary function, the patterns do not seem to add to the experience of writing either, at least on a conscious level. Recalling the data samples in Chapter 1, they do not enhance the reading experience, the text functions coherently without their presence and thus, do not influence the writing or the reading experience. However, in answering the third research question it is argued that the patterns expose a deeper cognitive encoding at work during the act of writing, which is not governed by any narrative structure. Revealing these processes below the textual surface, the patterns can be seen as a form of deep cognitive

embedding and presumably of the kind that is not just the preserve of literary endeavours.

Therefore, in answer to question 3, I will argue in this final chapter that the patterns tell us a number of things about narrative production:

1. The patterns reveal a way in which to see below the surface of the text – they expose a series of neural relationships during narrative production that are not dependant on textual processing.
2. Not all aspects of narrative production are controlled by the conscious mind of the writer. However, and as this chapter will later explore, there are literary writers who attempt to identify and understand the role of cognition in narrative production.
3. Finally, the patterns diminish the classical narratological view of the ‘autonomous literary world’ (Pavel 1986) wherein all aspects of the narrative structure, including its spatial properties, originate within this literary world. By demonstrating that the patterns stem from perception and are maintained by memory and language processing it is argued that their form is pre-determined before the text is both produced and read. This means that the patterns operate independently of the narrative structure but that narrative structure has no control over the patterns inclusion, except for those texts that do not contain topological frames. Thus, the patterns represent new information about the components of narrative structure and may

provide a more specific foundation for contemporary theorists, such as Ryan when she speaks of the ‘accessibility relations’ (Ryan 1991) between the fictional world and the actual world.

That the patterns have no explicit narrative function, such as a causal relationship with the fabula etc., does not necessarily mean that they do not have a didactic function. What the patterns tell us is that literary texts contain a structure that is not currently suspected in contemporary discourse. In their own right, the patterns demonstrate that spatial representation is a much more embedded cognitive action than previously thought and, at the level of discourse ontology, they further the argument for literary universals by critics such as Hogan when he states: ‘literature...is not produced by nations, periods and so on. It is produced by people. And these people are incomparably more alike than not’ (Hogan 2003, p.3).

However, despite Hogan’s rally, the focus on spatial representation within narrative theory is driven by classification and this has resulted in spatial typologies. The need for typology, and the validity of any subsequent criticism, is without doubt fundamental to any study of generalizations and narrative has not been exempt in this benefit, but when Ryan, as late as 2012, can list a number of textual spaces:

- 6) Spatial Frames
- 7) Setting
- 8) Story space
- 9) Narrative (story) world

## 10) Narrative Universe (Ryan 2012)

it would seem that we are not much further forward in the study of narrative space since Zoran performed a similar task in his 1984 article.<sup>37</sup>

Ryan's list is based on earlier works, such as, Searle's original idea on the 'principle of minimal departure' – wherein certain truth values are assigned to a text in which to determine its similarity or departure from the actual world – Pavel's (1986) 'possible worlds' and Dolezel's domain theory amongst others.

Therefore, it is not that narratology did not, and does not, attempt to establish the possibility of a link to the actual world, it is that they base their claims – such as accessibility relations, minimal departure etc. – on philosophical concerns about truth. This is partly due to early theoretical influences of a particular philosophy on narratology – Kripke, Lewis and the analytical school – and later, the influence of structuralists such as Eco, Pavel and Dolezel. Working from the central tenant of the logic of possibility, these researchers sought to explain how a relationship is developed and maintained through a text between the fictional story world and the actual world. The key notion is that the actual world is the central element in which all other possible worlds – those of the text – revolve around. How close that connection is depends on 'accessibility relations' (Ryan 2005), which are explained as:

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<sup>37</sup> See Chapter 1 for a full discussion.

For a world to be possible it must be linked to the centre by a so-called ‘accessibility relation’. The boundary between possible and impossible worlds depends on the particular interpretation given to the notion of accessibility. The most common interpretation associates possibility with logical laws; every world that respects the principles of non-contradiction and the excluded middle is a PW. (Ryan 2005)

This has led to a broad review of space within narrative, resulting in research that focuses on the dimensions and possibilities of this space as opposed to a micro study, like the patterns, that analyses what this space is made of.

The ‘possible worlds’ and all of their spatial properties may be likened to an actual world counter-part, however, as Pavel notes they are ‘autonomous’ which means that they are a separated representation of the actual world. As Ryan states: ‘The principle of minimal departure presupposes that fictional worlds, like the PWs<sup>38</sup> postulated by philosophers, are ontologically complete entities (Ryan 2005)’. The patterns show that this is not true – actual space from the actual world pervades – the patterns are not a representation, they are actual processes at work. In terms of discourse, this means that the patterns diminish the notion of a narrative world which ‘satellites’ (Ryan 2005) the actual one. Furthermore, the processes behind the pattern manifestation provide a clearer path to questions posed by earlier

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<sup>38</sup> Possible Worlds



narrative critics of space, such as Mitchell in his redemptive analysis of the insights that space provides rather than time in the novel Jane Eyre:

Can we also hope, then, to be, like Rochester, on the way to regaining our sight in at least one eye, the eye which traces not just the words of the text, but the eyesight, space, and liberty it projects? (Mitchell 1989, p.101)

We are now in a position to answer this question, with the hindsight of cognition, and say that the patterns liberate space from its former position of 'Other' (Williams 1989) in the narrative structure. The vagueness of the term 'space' in narrative texts can now be redefined in terms of the patterns as:

A narrative component that sheds any notion of representation; the patterns reveal an embedded and direct cognitive link from our actual world perception to the fictional worlds of narrative. They operate independently of narrative structure and this independence, revealed to us in 'topological frames', demonstrates unconscious processes can and do override conscious creativity during narrative production.

### 6.3 Beckett and the end of saliency: A new model of literary criticism.

*The time-state of attainment eliminates so accurately the time-state of aspiration, that the actual seems the inevitable, and, all conscious intellectual effort to reconstitute the invisible and unthinkable as a reality being fruitless, we are incapable of appreciating our joy by comparing it with our sorrow.* (Beckett 2009, p. 362)

*Murphy, all life is figure and ground.* (Beckett 1991, p. 251)

*'We imagine we remember things as they were, while in fact all we carry into the future are fragments which reconstruct a wholly illusory past'* (Banville 1973, p.3)

It is now possible to consider ways in which the insights of this perceptually driven model of literature can be used. The patterns which in their own right have been the focus of the study open a gateway to a new approach to literary criticism, one, clearly, that is scientific in outlook and methodology. Cognitive theories of perception and neuroscience, by providing insight into the links between perceptual organisation and writing can now be expanded into a wider theoretical framework for a new model of literary criticism. One of the primary findings of this new synthesis is that visual primitives or invariants exist which are the platforms for the final product which we call saliency. The term salient is defined here in specific relation to Chen's stages of visual processing i.e. the global invariant registers first (the hole in the background) and once this platform is established it allows for the finalizing details of colour, shape, texture etc. – the arrival of saliency. I have also suggested that in literature the visual primitives of perception imprint themselves on writing and do so in an unconscious manner. However, we are now in a position to suggest that many artists and writers, for this phenomenon goes beyond literature, in becoming aware of these underlying processes have actively sought them out for reasons that we will examine as

this discussion progresses. As we shall see this new cognitive perspective will suggest new solutions to many questions that have previously evaded explanation. To this end, therefore, we will examine the work of Samuel Beckett and his single-minded attempt to emulate the work of artists like the French Impressionists and Jack Yeats, brother of William Butler, in an attempt to reach beyond saliency. Beckett's work will be directly contrasted with the over-saliency of James Joyce and will form the basis for a reformulation in theoretical terms of what are presently referred to as modernism and postmodernism as Postsaliency. Where Beckett sought to reduce saliency so Joyce sought to expand it, each of them, it is fair to say, to a degree that no others had ever attempted before. The results, in terms of the patterns are the same – they are still there. This cannot be otherwise. The cognitive processes of the human mind, particularly those that drive perception, imprint on writing no matter how hard the writer tries to alter it.

For writers the journey beyond saliency was to be more circuitous than it was for artists as the writing process was at a remove from the perceptual system. In the following discussion, insights gained from cognitive analysis will be applied to some of Beckett's central texts. Among other things I will suggest that Beckett achieved a breakthrough in writing similar to that achieved in the visual arts and that this achievement owed a great deal to art itself and his understanding of it. To this end we will examine his sojourns in Germany and the diaries he wrote in 1936-37 to document them as this

period was to be a hiatus during which he formulated what was to become his postsalient *modus operandus*. I will also try to show that Beckett's study of art, both old and new, but particularly the new art of the Impressionists and their peers, was to inform his trilogy and his break into theatre with *En Attendant Godot* and how that play was to provide him with a visual/literary hybrid which broke his deadlock with saliency. As the title of this section suggests, radically new approaches to writing and literature appeared in the late nineteenth and early twentieth century which I shall argue were to spell the end of the dominance of saliency in the arts. In arguing this I will show writing as merely one area of artistic endeavour that began to find saliency wanting. The visual artists, as mentioned earlier, may have been first to move to the new paradigm as they worked directly with the visual e.g. the French Impressionists. French Impressionism was a retreat from the conservatism of the *Academie Des Beaux Arts* and its annual *Salon* competitions. For these new artists, gone was the strict realism of earlier times. Louis Leroy's complaint that Monet's *Sunrise* was like an unfinished sketch was close to the truth. Compared to their antecedents, Impressionist pictures appeared unfinished. It was Monet's impromptu naming of the piece: 'Impression: Sunrise' that gave the movement its name. Leroy picked up on the term and used 'Impressionism' in a derogatory way to describe the new movement. We can now say that what upset the critics was its lack of visual saliency. In the terminology of visual perception, an Impressionist

picture stops short of salient completion. The passive and static role of the observer enforced by the detailed realism of salient art was converted to a participative and dynamic one as the viewers themselves found the image in Impressionist work by extracting the invariant – usually a main if not central feature like the small boat in Monet’s ‘Impression: Sunrise’. It is a perfect example of a topological invariant as defined by Chen – a hole, irregular but independent of and immune to the ‘transformations’ that destroy other geometries. Once the invariant is registered it provides the platform that validates the main salient detail and actually



Fig. 1 Impression: Sunrise (Monet 1872)

permits the salient detail to emerge. It is worth repeating Chen’s assertion that ‘...topological perception (based on physical connectivity) is prior to the perception of other geometrical properties’ (Chen 2005, p.555). Technically, many of the methods used by Impressionists facilitated invariance by retarding saliency. For example they placed wet paint on wet paint without allowing the first coat to dry which resulted in ‘colour-run’.

Edges and boundaries were much more vague and loose as a consequence. Light levels in some pictures were reduced by '*effects de soir*' with similar results. '*Impasto*' allowed paint to be put on the canvas with highly visible brush or knife strokes which drew attention to the artifice involved destroying the illusion of realism so admired by the *Académie*. *Impasto* became a major feature of the work of Jack Yeats and was of great interest to Beckett. The earlier work in this thesis on memory reveals that the ability of an author to write is based on the cognitive abilities possessed by everyone specifically episodic memory and episodic future thinking. The popularity of Impressionism can be explained now in terms of shared cognitive abilities. Impressionist works were works of collaborative cognition whereby the disabling of saliency by the artist facilitated visual completion via topological extraction of the invariant by the observer.

Knowlson, in the biography, unwittingly describes this very process when Beckett was in Germany in 1937 in the home of 'modern art collector' and 'elderly Jewish art-historian' (Knowlson 1997, p.236) Dr. Rosa Schapire. He had been admiring a picture of '...a woman with red hair streaming back, long nose and lip lifted in a dribble of bitter cultivation painted by Schmidt-Rottluff, before realizing that, like several others in the flat, it was a portrait of Schapire herself.' (Ibid p.237) Even more interestingly Knowlson tells us that prompted by this experience Beckett recorded his views about the characteristics of true art in his diary that night, '...restating his own criterion

of true art, in which he not only repeated his view that the authentic poem or picture was a prayer but developed the image further than he had ever done up to that point: 'the art (picture) that is a prayer sets up a prayer, releases prayer in onlooker [sic], i.e. *Priest*: Lord have mercy upon us *People*: Christ have mercy upon us.' This is an attitude few readers will associate with Beckett, yet it was essential to his view of art at the time, whether it was the art of the writer, painter or musician' (Ibid p. 237) What Beckett was trying to describe was not a religious view of the arts – on this Knowlson was right to seem puzzled - but rather what we have described above, art as cognitive collaboration where, in this explanation the artist (priest) 'releases prayer' in the onlooker. Any author pursuing such a path would not be impressed by the traditional salient product and like *avant garde* artists would try to disable saliency in some way. In a piece called 'Until the Gag is Chewed,' Gunn commented that 'the curiosity which stoked Beckett's knowledge of art always had one eye on the possibilities for his own art' (Gunn 2006, pp.13-15). Many of Beckett's cultural experiences in Germany therefore were to drive him along a pathway of disassociation with conventional forms. In another example, he criticises a production of Hebbel's play *Gyges und sein Ring* which he attended in Berlin in 1937. Typically what he finds fault with is what others admire in Hebbel's work: '...he saw enough in the Hebbel to convince him that 'the poetical play can never come off as play, nor when played as poetry either, because the words

obscure the action and are obscured by it.' He argued that the play is 'such good poetry that it never comes alive at all' (Knowlson 1997, p.246). Knowlson recalls another coterie of artists Beckett met in Hamburg and again his preferences among them demonstrates what he was seeking to achieve in writing. 'He greatly enjoyed his visit to the studio of the thirty-five-year old Eduard Bargheer...Although he found Bargheer's painting 'of enormous competence and earnestness, yet he and his paintings say nothing to me. It is the bull of painting by the horns'. Instead it was 'the stillness and the unsaid' of Willem Grimm's and Karl Ballmer's work that he much preferred' (Ibid 239). The 'unsaid' is the literary equivalent of the invariant and therein for a very long time lay Beckett's problem – how does a writer 'unsay'?

To generalise, for the rejection of saliency was a complex and multi-faceted narrative, we can say that artists first and later, writers in many different ways and times and places became aware of the complexities of perception and its relation to the arts. They were not, in the main, to be scientifically informed, but in all cases where it occurred it was conscious. Some, like Virginia Woolf and her peers, thought they were witnessing something new in human psychology but what they were becoming aware of was the operation of cognitive processes. The only new thing to emerge was their own instinctive awareness of it. Many others were caught up in the vogue of the new but Beckett was not interested in striking a pose nor in seeking a



new style of writing merely to be different. His concerns with writing can be more usefully described as philosophical and scientific; despite his metaphor of prayer as the criterion for true art, his world view was essentially scientific. Trinity College Dublin, houses notes that Beckett made in the 1930s comprising of 266 pages. In his article 'Samuel Beckett and Science' C.J. Ackerly reached this conclusion:

'Beckett's attitude towards epistemology was largely shaped by Wilhelm Windelbrand's *A History of Philosophy* (1901), from which, in the 1930s, he took copious notes. In particular he was interested in Windelbrand's insistence that philosophy entails '...the scientific treatment of general questions relating to the universe and human life' (Ackerly 2010, p.149).

Beckett's world view was, essentially, scientific and it shaped at a fundamental level his radical approach to writing and literature. It was one of the main reasons that he had such an open mind. He rejected thought and belief systems that were deterministic hence too, his interest in radical art. His time spent in Germany in the thirties was, as the diaries reveal, a time of intense thought and deep consideration of where he was going as a writer. He drove himself, totally against the grain of his reclusive nature, into meeting group after group in towns and cities all over the country until he became ill. This was not to be the mindless wandering of a tourist. The diaries - still unpublished – were not found until after his death in 1989 and were a huge feat of writing. Mark Nixon in 'Samuel Beckett's German

Diaries 1936-1937' commented: 'The object of my enquiry, the German Diaries, consists of six notebooks found by Edward Beckett in a trunk following Samuel Beckett's death in 1989. Written mainly in English, yet with German and French words and phrases playfully interwoven, the diaries comprise roughly 120,000 words.' (Nixon 2012, pp.2-3). Nixon was in no doubt of the importance of the German interlude to Beckett's development as a writer:

'...although Beckett told MacGreevy 'I do no work' (Nixon 2012, p.2)), there is also a sense in which he was mentally shaping the aesthetic and creative direction his work was to take. Beckett's intense encounter with the visual arts during these six months...offered a new impetus for his writing, as Beckett studied, and took notes on, literally hundreds of paintings he saw in German galleries. Furthermore, both the choice of the diary form as well as the thoughts inscribed in its pages testify to Beckett's increasing concern with notions of authenticity, the moment of writing and the inadequacies of writing' (Nixon, 2012, p.3).

From our contemporary perspective what we see is Beckett beginning to understand that the advances being made in art might be transferred to writing and literature. Indeed it could be argued that he envied the artists' ability to transcend traditional forms and find new ways of understanding how they saw the world. With the insights now available from cognitive criticism we could rephrase Ackerly and say that Beckett, like the

Impressionists before him, was searching for the invariant that underlay the salient. This ‘impressionism-in-writing’ would allow readers a much greater participative role for, by withholding terminal levels of saliency, the artist forced them to extract the invariant from the ‘vaguened’ flux placing much greater demands on their perceptual faculties. As the trappings of traditional writing were removed so readers would be forced out of the passive state that normal writing permits. But the move away from saliency in writing would be a move away from narrative and all the other trappings of tradition. Beckett was highly unusual in that he was willing to take on such an arduous approach knowing that as his grasp of the new writing developed so it became commercially untouchable. Murphy was declined so many times and so often during the German trip that he despaired of ever getting it published. Most found the work incomprehensible and difficult, out of touch with public taste. We know from Knowlson that he even applied for the post of Assistant Curator at the National Gallery in London as a way out of his difficulties as a writer. (Knowlson, 1996, p.173). But as we have seen, art’s attraction for Beckett was the clear success of the Impressionists and the Germans and it gave him the will to persist. Art critics like Rodger Fry had been successfully mediating the new French styles to the British since 1910 with exhibitions, and articles like ‘The Philosophy of Impressionism’. All this was encouraging to Beckett even though his own efforts in prose were running into severe difficulties in

terms of audience and methodology. In a letter – in German – to his friend Axel Braun whom he met on his German trip, he tries to explain his problems with orthodox writing: ‘It is indeed getting more and more difficult, even pointless, for me to write in formal English. And more and more my language appears to me like a veil which one has to tear apart in order to get to those things (or the nothingness) lying behind it. Grammar and style! To me they seem to have become as irrelevant as a Biedermeier bathing suit or the imperturbability of a gentleman’ (Mays 1991, p.258). Beckett, forced to employ metaphor to try to understand what he was doing as well as explain it to others, talks of language as a ‘veil’ and he has no words for what he expects to find if he can ‘tear’ the veil referring only to ‘those things’ or ‘the nothingness’ behind it. But what he says next in the Braun letter is proof that – as he was at pains to point out – that this was no stylistic quest – ‘Grammar and style!’- but a true insight given to him by his study of art:

‘Or is literature alone to remain behind in the old lazy ways that have been so long ago abandoned by music and painting? Is there something paralytically holy in the vicious nature of the word that is not found in the elements of the other arts? Is there any reason why that terrible materiality of the word surface should not be capable of being dissolved...?’ (Mays 1991, p.258).

This is a vital insight by Beckett. The months spent in Germany had confirmed that art in all its forms could go beyond saliency, beyond photographic realism in pictures based on authorial control and viewer passivity to a new place where cognitive collaboration held sway, a collaboration made possible by withholding saliency and replacing it with topological primitives instead. Not that Beckett would have thought of it in these terms. But those hundreds of pictures he studied and analysed in over a hundred and twenty thousand words showed him the way forward in literature - the dissolution of the 'word surface'. Bereft of a vocabulary for what he was trying to do, he resorted to metaphor again with this phrase 'the word 'surface' attempting to suggest that the text had geometric properties, in this case those of a three dimensional Euclidian 'surface'. This is an interesting choice however as geometry does lie at the heart of perception as we have seen and through it, writing. The letter goes on to include music as having achieved a postsalient breakthrough.:?...for example, the sound surface of Beethoven's Seventh Symphony is devoured by huge black pauses, so that for pages on end we cannot perceive it as other than a dizzying path of sounds connecting unfathomable chasms of silence? An answer is requested.' (Ibid.) To summarise we can say that Beckett had arrived conceptually at the notion that writing could be revolutionised by a process comparable to that employed by *art nouveau*. It is important to emphasise however that the breakthrough was conceptual not

technical. He had grasped the concept but a hard struggle lay ahead and it was to be difficult for him. Insights were garnered slowly and in a piecemeal fashion. His philosophical studies at the time bear out yet again the depth of his thinking on this matter. We find C.J. Ackerley pondering Beckett's allegiance - via Wilhelm Windelbrand - to the Greek atomists and his opposition to anthropomorphism in western thought by arguing that Beckett experienced a '...growing suspicion of the unqualified relationship between the perceiving subject and that which is perceived; a distrust which questioned knowledge of the self as mediated by representation and [he] affirmed the need to rupture the lines of communication between subject and object. (Ackerley, 2010, p.149) Statements like these can be seen to dovetail exactly with his burgeoning artistic insight. As we have concluded, the perceptual system favours a 'global to local' sequence and this controls the pattern and order of writing itself but it is astonishing to find someone like Beckett, at a time before such information was available, linking philosophical treatises and the new art and then striving to go beyond the 'word surface'. In all of this he seems to have been acutely aware of the mind's ability to present percepts which in the act of arriving wiped out all traces of the contributing processes. Let us consider again the quotation with which this chapter opens:

The time-state of attainment eliminates so accurately the time-state of aspiration, that the actual seems the inevitable, and, all conscious intellectual

effort to reconstitute the invisible and unthinkable as a reality being fruitless, we are incapable of appreciating our joy by comparing it with our sorrow.

(Beckett 2009, p. 362)

The context for this quotation is Beckett's essay on Proust. Proust's *A la Recherche du Temps perdu* is seen as one if not the great initiating works of modernism. Once again it is important to understand that like Beckett Proust was intensely interested in the mind specifically neurology and this was second only to his reading of philosophy. His family had a medical background, his father Adrien and his brother Robert both well known physicians of some repute. Through them Proust developed a circle of friends in the medical professions:

Proust's main medical connections were to neurology, which led him on a rewarding, lifelong tour of the Parisian neurological intelligentsia. Included in this grouping were Charcot's pupil, Edouard Brissaud who, along with Pierre Marie, founded 'La Revue Neurologique' in 1893, Jules Dejerine, the second successor to Charcot at La Salpêtrière, and Joseph Babinski. (Bogousslavsky & Walusinski. 2009).

Most important of all was Paul Sollier, another student of the famous Jean-Martin Charcot with whom:

'Proust had his closest contact, referring himself to his *clinique* in Boulogne-Billancourt in order to follow a six-week 'isolation cure' to improve his asthma, to re-set his totally desynchronized sleep-wakefulness cycle, and also to accomplish a deep self-exploration to retrieve a 'will' for literary.'

(Bogousslavsky & Walusinski. 2009).

And most interesting of all was that Sollier's field was memory to which he made many important contributions at the time: 'Sollier had studied memory in depth, and he used this knowledge to provoke emotional surges of involuntary memories in his patients. Proust's novel contains over 1,200 allusions to memory, with a specific emphasis on involuntary memory, which was largely inspired by Sollier's theories.' (Bogouslavsky & Walusinski. 2009). The link to Proust was invaluable to Beckett. However, many observers are convinced that *Proust* was, if not a personal manifesto on writing, a vehicle for developing ideas that would be central to Beckett's thinking. This again links to his reading of philosophy and his scientific viewpoint. It is interesting to take Proust's and Beckett's analyses and examine them in cognitive terms. Part of the Beckett's essay is a consideration of Time and how Proust's characters are depicted as its victims because what the subject, i.e. the character wishes for or aspires to is never matched by the object that is eventually obtained: 'We are disappointed by the nullity of what we are pleased to call attainment.' (p.44) This is bound to happen, Beckett reasons, because the character of yesterday is different to that of today so that aspiration and attainment can never match: 'We are not merely more weary because of yesterday, we are other, no longer what we were'. (p.43) The problem as Beckett sees it is that even in the unlikely event that aspiration and attainment do match, the latter, in coming into being, eliminates the former from memory so that we



are not able to compare past and present. This important idea was to stay with Beckett and was to inform his thinking on the ‘terrible materiality of the word surface.’ He borrowed Proust’s idea that ‘Voluntary memory...provides an image as far removed from the real as the myth of our imagination or the caricature furnished by direct perception’ (p.44) which notion was also emerging as we have seen from his reading of Windelbrand. Involuntary memory was a *reexperiencing* of an event whereas voluntary memory was, for Proust, a recalled, partial thing. Armstrong notes how Beckett’s uses this terminology in discussing his work, in the following example on his views on theatre: ‘Beckett...disagreed with symbol systems (enemies of the theatrical presence...mere infusion of the ‘voluntary imagination’ ...described in his excursus on Proust’ ( Armstrong 1990, p.10) The essay on Proust coupled to his study of modern art and his other reading convinced him that the final percepts the mind produces are constructions. In this he was correct but his term ‘voluntary memory’ really only meant normal levels of saliency and ‘involuntary memory’ would be called episodic memory by this study. Let us to recall something already discussed in Chapter 2 of this thesis on perception:

‘If perceptual organisation uses topological invariants as the visual primitives which are in turn registered in a global-to-local manner then this global stage, viz. the extraction of the invariant, will require none of the bottom-up/top-down processing required by FIT making the process so fast as to

render it outside the scope of the mind to register them at any conscious level. But we have seen that some authorities believe that they literally enable local information and act like platforms upon which local features stand. These local features can and do register consciously and as a result it seems that they have been favoured in writing. They are the obvious, salient features, which act as final identifiers in the perceptual act. The global invariants are, as Chen says, counter-intuitive as, coming first in perceptual organisation function at a level that is so fundamental that they operate below the threshold of consciousness.'

Beckett's pejorative use of 'myth' and 'caricature' demonstrate his unwillingness to accept '...the obvious salient features' as the whole story - hence his use of 'veil' - and what could not be reached in normal writing. Beckett's intuition here pains him precisely because as Lin Chen says, the search for invariance is 'counter intuitive'. But we should not be surprised that a writer like Beckett could sense the presence of the invariant platform. In Gibson's metaphor, our minds are resonating to invariance: '...The perceptual system simply extracts the invariants from the flowing array; it resonates to the invariant structure or is attuned to it' (Gibson 1979, 249). Beckett explained the difference between what he saw as 'expression' i.e. saliency and the mystery object that was his quest to Israel Shenker in these terms: 'There seems to be a kind of [a]esthetic axiom that expression is achievement - must be an achievement. My little exploration is that whole

zone of being that has always been set aside by artists as something unusable – as something by definition incompatible with art.’ (Shenker 1956). The phrase: ‘...all conscious intellectual effort to reconstitute the invisible and unthinkable being fruitless,’ is his acknowledgement that he was, indeed that all of us were, missing something. The ‘terrible materiality’ of the word surface was to be put to scrutiny and his prose was to be nothing less than an attempt to identify the processes that preceded the finished text and to think his way back to them. By rejecting the percepts that the mind furnished as final product, the ‘aesthetic axiom’ of expression, Beckett made the writing process or more precisely the cognitive processes underlying writing itself and not its salient content his goal: ‘Grammar and style! To me they seem to have become as irrelevant as a Biedermeier bathing suit’. (Mays 1991, p. 258) The dreadful paradox that haunted Beckett’s prose was that the act of writing was an act of entrapment. Recalling another relevant observation from Chapter 2:

‘If the global invariant is the platform for local features then the rendering in writing of *only* local features will mean the writing is, in a sense, disconnected from its cognitive root. This may result in a deficiency in the writing process, which results in a system-wide dependence on saliency, which fails ultimately to communicate in a way that connects with the embodied experience.’

This seems to describe Beckett perfectly. As the authorial mode took hold so saliency held sway. Beckett understood this. He needed to find a way to emulate the success of the Impressionists and the Germans in art to somehow create a written medium that would arrest saliency. In writing, however, saliency is utterance and the nonsalient alternative can be silence or nothing, hence his search for understanding would migrate to ‘... that whole zone of being that has always been set aside by artists as something unusable – as something by definition incompatible with art.’ So, despite the abject failure of most of his creative endeavours up to the end of 1937, despite the poverty, the loneliness and not least the illness that characterised his life, Beckett had seen a way forward. It would take years to come to fruition but as he commented to Knowlson in 1989 only weeks before he died:

‘I realised that Joyce had gone as far as one could in the direction of knowing more, [being] in control of one’s material. He was always adding to it; you only have to look at his proofs to see that. I realised that my own way was in impoverishment, in lack of knowledge and in taking away, in subtracting rather than adding’ (Knowlson 1997, p. 352).

With the phrase ‘I realised...’ he recalls an epiphany which occurred in Ireland in 1946 when he had been forced to leave France for a time. ‘...something else occurred while Beckett was staying in Foxrock with his mother...’ The ‘revelation’ that he had at that time has rightly been regarded

as a pivotal moment in his entire career. And it has often been related to the 'vision' that Krapp experiences in Beckett's play *Krapp's Last Tape*. (Knowlson, 1997, p.351) In the play the revelation takes place during a dramatic storm on the coast either in Dublin or Dun Laoghaire. In a letter to Richard Ellman in 1987 Beckett clarified: 'All the jetty and howling wind are imaginary. It happened to me, summer 1945, in my mother's little house, named New Place, across the road from Cooldrinagh' (Beckett 1987). This was the other piece of the puzzle Beckett sought, his technical solution to match his earlier conceptual one: salient deceleration, in his own words, '...taking away, subtracting...' This epiphany is often compared to what he told Israel Shenker who interviewed him for 'The New York Times' in 1956: 'The more he knew the more he could. He's tending towards omniscience and omnipotence as an artist. I'm working with impotence, ignorance.' (Shenker, 1956).

When Beckett came to write the trilogy after the war he could take satisfaction in the knowledge that he had, conceptually, found a solution which would allow him to emulate the artists viz. the abandonment of saliency. He saw and understood the technical solutions they had found which have been mentioned elsewhere e.g. *impasto*, *effects de soir*, colour run and so forth. His new challenge was to implement a writing strategy which 'subtracted' and 'took away'. This was to be a task beset with problems. One of the main ways we can understand the exact nature of the problem for

Beckett is to observe the sine-curve of his writing technique as it oscillates between authorial mode wherein he creates characters, locations and plot lines and then breaks away into observational mode wherein he ponders what he has been doing. This is much more than a consideration of technique rather it is a questioning of the process of writing itself. In Malloy we find him imagining two characters A and C:

‘So I saw A and C going slowly towards each other, unconscious of what they were doing. It was on a road remarkably bare. I mean without hedges or ditches or any kind of edge, in the country, for cows were chewing in enormous fields, lying and standing, in the evening silence’ (Beckett 2003, p.9).

Odd as this is – the two characters designated by letters as opposed to names - it is still recognisable as authorially-driven prose. What follows immediately is different. He is interrogating his own writing: ‘Perhaps I’m inventing a little, perhaps embellishing, but on the whole that’s the way it was’. (Ibid p.9) He is aware, and makes the reader aware, that he is conscious of the process of writing, how it is a product of his mind ‘...that’s the way it was’. We see two things here. Firstly we have the salient surface comprising A and C and their converging pathways and their environment. Secondly we see that it is a construction like the facade of a movie sets or a flat in a theatre. Beckett’s commentary on the writing process constantly undercuts the illusion of the ‘word surface’. We begin to see other things at

work chiefly the authorial mind not merely looking at the writing process but looking at himself as writer and us as readers, as entities, and wondering what we are doing. He wants to pause on the threshold to see things from a presalient perspective: 'A and C I never saw again.....And what do I mean by seeing and seeing again?' (Ibid p.15) There are two valid questions here. If we accept the traditional contract of author and reader A and C are two characters and the author simply states that he never saw them again. Remove saliency and the statement that the author never saw them again is illogical. A and C are not real. In the salient 'word surface' we accept such statements without question. If we pause and see all to come as artifice then we move into a philosophical, epistemological place. This is how Beckett describes it immediately after the remarks just examined: 'And what do I mean by seeing and seeing again? An instant of silence, as when the conductor taps on his stand, raises his arms, before the unanswerable clamour' (Ibid p.15). The music is 'the unanswerable clamour' as here, like the 'word surface' it takes the participant away. Again, just as conventional writers and readers see 'expression' as achievement so composers and audiences regard the music in the same way and lose themselves in participation. It is unanswerable in that sense. Beckett shows another way, pausing at the conductor's tap to ask larger questions. This explains why he cut such a lonely figure for much of his life. For him participation destroyed thought. Once he surrendered to content and authorial mode, control was

gone. However, to the casual reader expecting traditional prose, Beckett's style was difficult and unpalatable.

Across the three parts of the trilogy Malloy, Malone Dies and The Unnamable Beckett began to allow the work to become more and more minimalist as saliency was tuned out. Readers and audiences found that he gave them less and less to look at: Malloy opens with the lines 'I am in my mother's room. It's I who live there now. I don't know how I got there. (Beckett, 2003, p7). Malone Dies opens with a more advanced state of obscurity: 'Present state. This room seems to be mine. I can find no other explanation to my being left in it.' (Beckett 2003, p.183). The Unnamable brings obscurity to new levels: 'Where now? Who now? When now?' (Beckett 2003, p.293). In our terminology, Beckett tried to phase out saliency but as, in itself, it is seen to be the stuff of writing, he struggled to say anything at all. The process was extremely slow as well. The increasing scale of salient deceleration seen in our example above took the whole of the trilogy to achieve. But he sometimes succeeds in creating an impressionist invariant as in this example where Malloy is describing his mother: 'What did I see of her? A head always...Veiled with hair, wrinkles, filth, slobber. A head that darkened the air' (Beckett 2003 p.19). The phrase 'A head that darkened the air' is as good a description of a topological invariant as we could wish for – a hole in a background. And this writing process that consciously tunes out saliency has an important connection to



the location of characters that we will discuss later. In The Unnamable Beckett's protagonist sees creations like Malone revisiting him and others, unnamed: 'Others come towards me, pass before me, wheel about me. And no doubt others still, invisible so far' (Beckett 2003, p.301). He rejects these apparitions of what he would have called 'voluntary memory' or what we call saliency with 'One starts things moving without a thought of how to stop them. In order to speak. .One starts speaking as if it were possible to stop at will' (Ibid p.301). He is referring here to the seductive nature of what he called 'expression' and he goes on to explain how he sees its elimination as his goal: 'The search for the means to put an end to things, an end to speech is what enables this discourse to continue...Method or no method I shall have to banish them in the end, the beings, things, shapes, sounds and lights with which my haste to speak has encumbered this place' (Ibid pp 301-302). The list of 'beings' and 'things' is the whole salient package and Beckett is consigning all of it to the dustbin: 'I shall have to banish them'. One of the conclusions arrived at as a result of this comes immediately after this: 'Perhaps it is time I paid a little attention to myself for a change' (Ibid p.302) to which we will return below.

As we said at the start of this section the patterns survive modernism and Beckett as a 'modernist' conforms. Here is an example from Malloy of the landscape or progressive pattern: 'The ROAD<sup>39</sup>, hard and white, seared the

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<sup>39</sup> My capitalisation

tender pastures, rose and fell at the whim of HILLS and HOLLOWs. The TOWN was not far' (Beckett, 2003, p.9). It exhibits the near/far progression typical of this pattern with the 'road' as near and moving away to 'hills' and finally 'the town' in the distance. Another from Malone Dies describes the boyhood of 'Sapo' as the of the long loop body pattern:

At the age of fourteen he was a PLUMP ROSY<sup>40</sup> BOY. His WRISTS and ANKLES were thick, which made his mother say that one day he would be even bigger than his father. Curious deduction. But the most striking thing about him was his big round HEAD horrid with flaxen HAIR as stiff and straight as the bristles of a brush.' (Beckett 2003, pp. 190-191)

Interestingly this example of the body/head pattern says that his head was '...the most striking thing about him...' but it still fails to be mentioned first and adheres to the sequence. In The Unnamable a character referred to only as 'the other' displays the short loop body pattern: 'He is stooping and seems to be dragging invisible burdens. What I see best is his hat' (Beckett 2003, p.300) Once again we have the outline in 'stooping' followed by 'hat' and again the hat is mentioned after his posture/outline despite the statement 'What I see best is his hat'.

Another way that we can use cognitive criticism is to examine the manner in which Beckett locates his main characters. Most critics would describe them as isolated but we will restate this and say that Beckett's prose is essentially that of the embodied mind. This goes much further than saying that much

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<sup>40</sup> The use of 'ROSY' here denotes a move to the facial area and this pattern also constitutes a return to the facial area.

modernist writing is introspective or inward looking. His rejection of the '[a]esthetic axiom that expression is achievement 'led him back to the body as a last refuge, the only thing he could trust: 'I am in my mother's room. It's I who live there now. I don't know how I got there' (Beckett, 2003, p7). 'Present state. This room seems to be mine. I can find no other explanation to my being left in it.' (Beckett 2003, p.183) and 'Where now? Who now? When now? (Beckett 2003, p.293). These quotations each present their protagonist in a progressive state of isolation from his surroundings but it should be noticed that the reduction in saliency results in higher levels of embodiment. It is a major feature of the trilogy. Here is Malloy's description of his mother, notice how she is depicted as deaf, incontinent and recognising her son by smell: '...she having for countless years been as deaf as a post. I think she was quite incontinent, both of faeces and water....She knew it was me, by my smell. Her shrunken, hairy old face lit up, she was happy to smell me. She jabbered away with a rattle of dentures and most of the time didn't realise what she was saying' (Beckett 2003, p. 18). Later he explains that he communicated with her '...by knocking on her skull' (Ibid p.18) and had even designed a code for doing it. The dark humour doesn't conceal the regression from language to direct bodily communication. More often the state of isolation from the world and concurrent raised levels of embodiment are observed in the main character himself. Malone Dies is full of passages that demonstrate this e.g.: 'My body does not yet make up its

mind. I fancy it weighs heavier on the bed, flattens and spreads. My breath, when it comes back, fills the room with its din, though my chest moves no more than a sleeping child's' (Beckett 2003, p.198). John Banville, who will be discussed later, opens his novel Birchwood with a parody of Descartes's 'Je pense donc je suis' saying: 'I am therefore I think. That seems inescapable.' (Banville 1994, p.1) This represents a shift to a new paradigm where writers are attempting to write in a way that reconnects with the reclamation of mind/body unity. We saw earlier that Beckett's protagonist in The Unnamable considers that as an alternative to 'expression' and its associated salient list of 'beings' and 'things' he should pay '... a little attention to myself for a change' (Beckett 2003, p.302). He continues immediately with: 'I shall be reduced to it sooner or later. At first sight it seems impossible. Me, utter me, in the same foul breath as my creatures? Say of me that I see this, feel that, fear, hope, know and do not know? Yes, I will say it, and of me alone' (Ibid p.302). This suggests that Beckett's way forward through the reduction of saliency, did not just lead to a sharp rise in embodied writing but rather necessitated it. The connection is made even stronger by another section. The character is surrounded by an envelope of greyness with the world somewhere on the outside. He envisions having a stick – which seems to be his metaphor for writing – with which to probe the grey: '...I would need a stick or pole and the means of plying it...I could also do, incidentally, with future and conditional participles.' But he

concludes with: 'But the days of sticks are over, here I can count on my body alone' (Ibid p.302). Further on, we find what is possible the most prolonged and intense consideration of the embodied mind in Beckett's prose:

'I know my eyes are open, because of the tears that pour from them unceasingly. I know I am seated, my hands on my knees, because of the pressure against my rump, against the soles of my feet, against the palms of my hands, against my knees. Against my palms the pressure is of my knees, against my knees of my palms, but what is it that presses against my rump, against the soles of my feet? I don't know. My spine is not supported. I mention these details to make sure I am not lying on my back, my legs raised and bent, my eyes closed. It is well to establish the position of the body from the outset, before passing on to more important matters.' (Ibid p.306)

Beckett has reached this point by his process of '...impoverishment, in lack of knowledge and in taking away, in subtracting rather than adding' (Ibid p.306). The main structure of his sentences 'I know...because...' captures the unity that is embodied cognition exactly. 'I know I am seated...because of the pressure against my rump...' It is a far cry from plots and characters, 'beings, things, shapes, sounds and lights...' In The Unnamable he has reached his point of orientation, the fundamental position from which all

else follows: 'It is well to establish the position of the body from the outset, before passing on to more important matters...'.(Beckett 2003, p.

Turning to Waiting for Godot and applying these new insights to the play; if Beckett's work as a playwright was to be consistent with his work in prose - although he hadn't written The Unnamable when he produced the play - what we should expect to find would be a tuning out of saliency both visually and in terms of speech.

The writing of *En Attendant Godot* was to be a solution that combined the visual elements of theatre with a script. The setting for the play is famously empty:

'A country road. A tree.

Evening.' (Beckett 2006)

To put this in perspective by recalling something we mentioned earlier when discussing Beckett's use of Proust's term, 'voluntary memory': 'Beckett...disagreed with symbol systems (enemies of the theatrical presence...mere infusion of the 'voluntary imagination' ...described in his excursus on Proust' (Armstrong 1990, p.10). His use of the visual was to be minimalist. There would be no symbolism, nor attempts at realism. Like the modern art he so admired his settings would reduce saliency. It would not be allowed to overwhelm the audience and distract it. The same would apply to language. If we recall what Beckett said about Hebbel's play *Gyges und sein Ring* which he attended in Berlin in 1937: '...the poetical play can never

come off as play, nor when played as poetry either, because the words obscure the action and are obscured by it.' He argued that the play is 'such good poetry that it never comes alive at all' (Knowlson 1997, p.246), we can see the grounds for this approach. It ties in with what he told Israel Shenker in 1956: 'There seems to be a kind of [a]esthetic axiom that expression is achievement – must be an achievement.' (Shenker 1956) And these ideas should not have been a surprise to anyone who had been reading the trilogy. Utterance was not merely rejected there but denounced. Malloy ends with the lines 'I went back to the house and wrote, It is midnight. The rain is beating on the windows. It was not midnight. It was not raining.' (Beckett 2003, p.176) Writing, utterance is meaningless here. Or perhaps we should say orthodox writing or 'expression', what we call saliency. We can see the erosion of saliency in Malone Dies in the sine-curve of Beckett's approach to authorship. Here he is in writing mode: 'I fear I must have fallen asleep again. In vain I grope, I cannot find my exercise- book. But I still have the pencil in my hand. I shall have to wait for the day to break. God knows what I am going to do till then' (Beckett 2003, p.209.) But all is revised immediately in a new paragraph: 'I have just written I fear I must have fallen etc. [sic] I hope this is not too great a distortion of the truth.' (Ibid p. 209) By sharing his own uncertainty about writing Beckett includes the reader in the process itself. This was his attempt at cognitive collaboration. And we can recall the very strong denunciation of utterance in The Unnamable as a

final example here: ‘The search for the means to put an end to things, an end to speech is what enables this discourse to continue...Method or no method I shall have to banish them in the end, the beings, things, shapes, sounds and lights with which my haste to speak has encumbered this place’ (Beckett 2003, pp 301-302).

In terms of Waiting for Godot, if Beckett’s work as a playwright was to be consistent with his work in prose we should expect to find reduced levels of saliency both visually and in terms of language. And the reduction of both should relocate the work within the human body; in short, journey’s end for the play should be embodied cognition.

The play opens with Estragon struggling to take his boot off: ‘*Estragon, sitting on a low mound, is trying to take off his boot. He pulls at it with both hands, panting*’ (Beckett 2006) and he is to struggle and be associated visually with his boots at many points of the play. As Beckett disavowed symbolism we can say instead that Estragon is embodied and will be associated with low levels of speech, utterance, saliency. His comment on failing to get the boot off: ‘Nothing to be done’ is seized upon by Vladimir as a philosophical comment on life: ‘I’m beginning to come round to that opinion. All my life I’ve tried to put it from me, saying Vladimir, be reasonable, you haven’t yet tried everything. And I resumed the struggle. (*He broods, musing on the struggle*). Vladimir talks. (Beckett 2006). He will be associated with his hat which is the visual cue that this pair is asymmetrical, opposites. It is not symbolic but



embodied, with their difference being measured by the distance between bodily extremities. He will talk and play with language in a vacuous way. His is the saliency that Beckett wishes to tune out. Here we see both the hat and his use of language together: *'He takes off his hat, peers inside it, feels about inside it, shakes it, puts it on again.'* How shall I say? Relieved and at the same time...*(he searches for the word)* . . . appalled. *(With emphasis.)* AP-PALLED. *(He takes off his hat again, peers inside it.)* Funny. *(He knocks on the crown as though to dislodge a foreign body, peers into it again, puts it on again.)* Nothing to be done.' (Beckett 2006) Each of them is a solution to the problems of retarding saliency in prose. In *Godot*, Beckett could reduce or stop saliency by having Estragon be morose or silent. He could undermine the *faux* clarity and confidence of the salient percept of speech and writing by mocking Vladimir's verbosity. For most of the play Estragon has to be prodded into conversation by Vladimir who will pester his companion incessantly:

**VLADIMIR:**

Ah yes, the two thieves. Do you remember the story?

**ESTRAGON:**

No.

**VLADIMIR:**

Shall I tell it to you?

**ESTRAGON:**

No.

**VLADIMIR:**

It'll pass the time. (*Pause.*) Two thieves, crucified at the same time as our Saviour. One – (Beckett 2006)

Vladimir's opening phrase 'Ah yes...' comes from nowhere. It is not a rejoinder and Beckett has him do it quite often to demonstrate the pointlessness of utterance. Estragon's refusal to engage – which defines him – is constantly ignored. And here too is Vladimir's justification for his discussion which again underscores its futility 'It'll pass the time.' Thus, we see the asymmetrical pair in action. Beckett takes it further. When Vladimir succeeds in achieving dialogue we witness the futility of it all in another way – confusion. Language is shown to offer solutions where none exist, to assert certainty when it is absent to create something where there is nothing. In the following exchange we see this happening with Vladimir contradicting himself:

**VLADIMIR:**

It'll pass the time. (*Pause.*) Two thieves, crucified at the same time as our Saviour. One –

**ESTRAGON:**

Our what?

**VLADIMIR:**

Our Saviour. Two thieves. One is supposed to have been saved and the other . . . (*he searches for the contrary of saved*) . . . damned.

**ESTRAGON:**

Saved from what?

**VLADIMIR:**

Hell.

**ESTRAGON:**

I'm going.

*He does not move.*

**VLADIMIR:**

And yet . . . (*pause*) . . . how is it –this is not boring you I hope– how is it that of the four Evangelists only one speaks of a thief being saved. The four of them were there –or thereabouts– and only one speaks of a thief being saved. (*Pause.*) Come on, Gogo, return the ball, can't you, once in a way?

**ESTRAGON:**

*(with exaggerated enthusiasm).* I find this really most extraordinarily interesting.

**VLADIMIR:**

One out of four. Of the other three, two don't mention any thieves at all and the third says that both of them abused him.

**ESTRAGON:**

Who?

**VLADIMIR:**

What?

**ESTRAGON:**

What's all this about? Abused who?

**VLADIMIR:**

The Saviour.

**ESTRAGON:**

Why?

**VLADIMIR:**

Because he wouldn't save them.

**ESTRAGON:**

From hell?

**VLADIMIR:**

Imbecile! From death.

**ESTRAGON:**

I thought you said hell.

**VLADIMIR:**

From death, from death.

**ESTRAGON:**

Well what of it?

**VLADIMIR:**

Then the two of them must have been damned.

**ESTRAGON:**

And why not?

**VLADIMIR:**

But one of the four says that one of the two was saved.

**ESTRAGON:**

Well? They don't agree and that's all there is to it.

**VLADIMIR:**

But all four were there. And only one speaks of a thief being saved. Why believe him rather than the others?

**ESTRAGON:**

Who believes him?

**VLADIMIR:**

Everybody. It's the only version they know.

**ESTRAGON:**

People are bloody ignorant apes. (Beckett 2006)

Notice firstly that in answer to Estragon's question as to who the Savior was and what the thieves were to be saved from Vladimir gives the answer 'Hell'. Later on Estragon checks him when he says the Saviour was going to save the thieves from death with 'I thought you said hell' to which Vladimir replies impatiently 'From death, from death'. He is impatient because he thinks that he is being prevented from making his point i.e. that there being four evangelists who told the story of Christ only one of them mentions the episode of the two thieves. Beckett is satirizing those who put all their faith in language and its ability to provide answers. Vladimir's proof ends in a disaster - almost desperation – and, is offset by Estragon's brutal cynicism:

The exchange ends with Estragon noting, simply, that the evangelists' accounts don't agree but Vladimir wants to push the discussion further to make it a victory for logic and language. However, rather than a victory for Vladimir and a dazzling demonstration of his linguistic skills we see Estragon having the last word and reaching a conclusion that Vladimir did not expect: 'People are bloody ignorant apes'. Even when the pair seems to be cooperating words and language don't seem to work. Here they are worrying about the location of their meeting with Godot. They were told to wait by the tree but as they focus on it, it becomes suddenly elusive:

**VLADIMIR:**

We're waiting for Godot.

**ESTRAGON:**

*(despairingly)*. Ah! *(Pause.)* You're sure it was here?

**VLADIMIR:**

What?

**ESTRAGON:**

That we were to wait.

**VLADIMIR:**

He said by the tree. *(They look at the tree.)* Do you see any others?

**ESTRAGON:**

What is it?

**VLADIMIR:**

I don't know. A willow.

**ESTRAGON:**

Where are the leaves?

**VLADIMIR:**

It must be dead.

**ESTRAGON:**

No more weeping.

**VLADIMIR:**

Or perhaps it's not the season.

**ESTRAGON:**

Looks to me more like a bush.

**VLADIMIR:**

A shrub.

**ESTRAGON:**

A bush.

Tree, bush, shrub, willow the harder they try the more language seems to confuse matters.

**VLADIMIR:**

A—. What are you insinuating? That we've come to the wrong place?

(Beckett 2006)

Notice too that in ‘A—.’ Vladimir was happy to continue the attempt to identify the tree when the implications of Estragon’s comments dawn on him. This is confirmed by Estragon’s immediate response:

**ESTRAGON:**

He should be here. (Beckett 2006)

Beckett’s structuring of the play around pairs – not unlike A and C – reflects the dilemma of the salient-aware author that Beckett has become which we referred to earlier as the sine-curve of his writing style. One of the pair – Vladimir is the author convinced that language and expression are both achievement. The other half – Estragon - is the self-conscious writer wary of language and tending to silence. The famous ‘waiting’ can be seen now as saliency arrested, what he tried to explain in a phrase from Malloy, mentioned earlier: ‘An instant of silence, as when the conductor taps on his stand, raises his arms, before the unanswerable clamour.’(Beckett 2003, p. 15) The old witticism that Waiting for Godot is a play in which ‘nothing happens twice’ is in reality a failure to understand that the deliberate refusal by Beckett to allow anything to happen has a point. Act 1 establishes the salient dichotomy of the asymmetrical pairs. Act 2 brings the play to embodiment. The rush into articulation was for Beckett the rush into saliency. He would prefer to ‘wait’ and, to continue the metaphor of Malloy, refuse to be swept away by the music. Beckett was not interested in the absurd either although many embraced the play for this very reason. Like



the convergent but opposite paths of A and C in Malloy the two pairs in Godot meet, Estragon and Vladimir inbound and Pozzo and Lucky outbound. To analyse the meaning of their 'journeys' is to fall into the salient trap. Looking beyond saliency shows that Vladimir's ability with language and Estragon's disinterest in it are matched by Pozzo and Lucky. If the second pair is a progressed version of the first two then Vladimir will become Pozzo, a returning failure, verbose and re-equipped for a return to the old dispensation with alcohol food and tobacco. Estragon will be Lucky who returns utterly changed and without language. Lucky has gone beyond saliency and language and, in this analysis, *is* Lucky. The 'speech' forced upon him by Pozzo reveals Pozzo as diminished, relegated to a lower status if not a lower state of being. Pozzo admits this at one point when the façade of linguistic control fails. He makes a somewhat pedantic and unscientific observation which is also rather smug that Estragon's bout of crying has 'replaced' Lucky's:

**POZZO:**

He's stopped crying. (*To Estragon.*) You have replaced him as it were. (*Lyricaly.*) The tears of the world are a constant quantity. For each one who begins to weep, somewhere else another stops. The same is true of the laugh. (*He laughs.*) Let us not then speak ill of our generation, it is not any unhappier than its predecessors. (*Pause.*) Let us not speak well of it either.

*(Pause.)* Let us not speak of it at all. *(Pause. Judiciously.)* It is true the population has increased.

**VLADIMIR:**

Try and walk.

*Estragon takes a few limping steps, stops before Lucky and spits on him, then goes and sits down on the mound.*

**POZZO:**

Guess who taught me all these beautiful things. *(Pause. Pointing to Lucky.)* My Lucky!

**VLADIMIR:**

*(looking at the sky.)* Will night never come?

**POZZO:**

But for him all my thoughts, all my feelings, would have been of common things. *(Pause. With extraordinary vehemence.)* Professional worries! *(Calmer.)* Beauty, grace, truth of the first water, I knew they were all beyond me. So I took a knook. (Beckett 2006)

This is clearly the type of nonsense that Beckett too would have abhorred and a form of satire is at work here. The interesting point is that Pozzo – who refers to Lucky normally as ‘pig’ says ‘Guess who taught me all these beautiful things...My Lucky.’ And ‘But for him all my thoughts, all my feelings, would have been of common things...Beauty, grace truth of the first water...’ This information redefines the relation. Lucky has in our

terms abandoned the saliency of old with its hopeless idealism 'Beauty, grace, truth...' and its clichés '...of the first water...' (Beckett 2006). Lucky was Pozzo's mentor and this change in him has left Pozzo directionless. Immediately after these revelations he has a brief breakdown when his loss and confusion pour out:

**POZZO:**

*(groaning, clutching his head)*. I can't bear it . . . any longer . . . the way he goes on . . . you've no idea . . . it's terrible . . . he must go . . . *(he waves his arms)* . . . I'm going mad . . . *(he collapses, his head in his hands)* . . . I can't bear it . . . any longer . . .

*Silence. All look at Pozzo.* (Beckett 2006)

The horror for Pozzo is that of seeing what he aspired to in Lucky being rejected. He has truly lost 'his' Lucky '...the ways he goes on...you've no idea...' (Beckett 2006). The utterance comes out in short incoherent bursts like sobs instead of the grandiose style of utterance we normally associate with him. It is a prelude to his collapse in Act 2, a retreat to the body the destination of all the characters in the prose: *'he collapses, his head in his hands, 'groaning, clutching his head', 'he waves his arms',* and finally and most telling of all *'Silence.'* (Beckett 2006). Lucky's 'Speech' is Beckett's invitation to choose. Attempts to analyse it are like Pozzo's tragic attempts to understand where his friend has gone. Treat it as gibberish, which it is, and we see it as the

final squeaks and buzzes, the residual white noise of the old salient order.

Lucky, in this sense, is Beckett's invariant triumph.

The second act has the first pair reuniting and a good deal of it prior to the return of Pozzo and Lucky concerns Vladimir's attempts to remind a very forgetful Estragon of the events of the previous day. In this it is an attack on language and its ability to create the illusions that humanity holds so dear. The discussions following this emphasise this:

**VLADIMIR:**

You must be happy too, deep down, if you only knew it.

**ESTRAGON:**

Happy about what?

**VLADIMIR:**

To be back with me again.

**ESTRAGON:**

Would you say so?

**VLADIMIR:**

Say you are, even if it's not true.

**ESTRAGON:**

What am I to say?

**VLADIMIR:**

Say, I am happy.

**ESTRAGON:**

I am happy.

**VLADIMIR:**

So am I.

**ESTRAGON:**

So am I.

**VLADIMIR:**

We are happy.

**ESTRAGON:**

We are happy. (*Silence.*) What do we do now, now that we are happy?

(Beckett 2006)

The arrival of the other pair reveals more calamity. Pozzo is blind and Lucky is deaf. They have also fallen and can't get up. At one point all four characters have fallen. When Pozzo and Lucky are finally rescued by Vladimir and Estragon, they immediately fall and the play ends with the original pair, waiting. All of it reveals the same pathway as the prose, the retreat to the body. The rejection of saliency enforces 'waiting' – the pause before the music – but it is not the waiting of absurdists or the indefatigable human spirit. It is the strategic waiting of salient refusal and a reconnection with mind/body unity. Bereft of the comfort of saliency it is a lonely, odd alien place but as Beckett says: 'The search for the means to put an end to things, an end to speech is what enables this discourse to

continue...Method or no method I shall have to banish them in the end, the beings, things, shapes, sounds and lights with which my haste to speak has encumbered this place.' (Beckett 2003, pp. 301-302)

That Beckett, as a modernist, conforms to patterning may not be so unexpected if we consider that he operated away from saliency and like the description of Molloy's mother, a hole in the air, we can say he occasionally achieves an invariant image. However, there is further complexity here: the explanation of how the patterns become manifest implies stages of processing, beginning with the visual primitive and ending with the salient detail within the text. Considering, for example, the following passage: '...the tranquil hills, all reposing in the autumn day's sun' (Bronte 2001 [1847], p.90), if one were to view the following landscape, the hills would be registered first as a hole in a background – the invariant properties of the view – that they are hills and not a hole is only apparent once salient details such as shape etc. are processed after the invariant platform is established. Any further fine-grained saliency arrives with extra detail such as 'tranquil' and 'autumn'.

Yet, it is only through saliency that we can first identify the patterning and then test for which category it belongs, such as a landscape or a room. Saliency brings colour, texture, size and shape etc. and with it the pre-coalescent possibilities of the invariant hole become finite and definable. Thus, it would seem that in order to identify the patterns we must do so

through its salient properties, or else these spaces are all just holes in background. Furthermore, without the salient detail it would be impossible to register the sequencing of any patterning. For example, the progressive pattern of landscapes can only be seen by establishing that a particular hole in a background is sequenced because this hole in turn becomes a background itself. Although, the patterns originate with the invariant properties of visual perception, their identification, sequencing and category diversity are dependant on the saliency of the narrative. To say this may seem paradoxical, particularly when Chen's hierarchical model of 'invariant first and saliency later' model is used here to explain the patterns, however, the identification of the patterns rely on salient clarification.

Although the presence of patterning does not enhance the text, when present, it is clear that it can only survive certain narrative conditions. Recalling the broader argument in Chapter 1 regarding the existence of 'topological frames', I would add further specificity to this and say that when a text contains a topological frame, a balance must be achieved between the invariant and saliency in order for pattern identification to be achieved. Overly salient texts, such as *Finnegans Wake* (1939) run the risk of burying the invariant origin whilst a paucity of saliency, like Beckett, denies the patterns any chance of being exposed.

Joyce, was not so concerned with the processes behind writing in the way that Beckett was. For him, the 'terrible materiality' was not so terrible. As

with *The Unnamable* for Beckett, Joyce's style can be said to have culminated in *Finnegans Wake*. For Joyce, *Finnegans Wake* was the novel in which he claimed 'would keep professors busy for a thousand years' and this is most likely due to the volume of punning in the text.

Both the volume and complexity of puns within *Finnegans Wake* creates a system whereby any invariant perceptual properties may be rendered weak because the global 'hole in a background', the platform on which saliency is delivered, is not necessarily supporting the discernment of a single mental image. Early Gestalt theory addresses this problem with the rabbit or duck scenario however, the way in which Joyce employs a parallelism to his punning is problematized in *Finnegans Wake* because the completion of salient detail is not resting on an aesthetic design which forces a choice between an either/or image. An example of this parallelism is found in 'Chapter 1' wherein the titular character of Finnegan is introduced as 'Bygmester Finnegan...' (Joyce 2012 [1939], p.4).

Bygmester forms a number of puns:

- **bygmester:** (*Danish*) builder; master builder; prime contractor
- ***Bygmester Solness:*** *The Master Builder*, a play by Henrik Ibsen; in the final scene, the eponymous character Halvard Solness climbs to the top of a tower, but falls to his death
- **big mister** → contrasted with **pygmy**



- **Bürgermeister:** (*German*) mayor → cf. the Burgomaster in Whale's *Frankenstein* movies
- **bug-master** → Earwicker; insect/incest; → The Onct & the Gracehoper → Blake's *Vala, Night the Ninth*, features in one paragraph: earthworm, beetle, emmet, centipede, spider, EARWIG, maggot, and GRASSHOPPER; → Beelzebub, meaning: 'Lord of the Flies'; → the Egyptian scarab, symbolizing transformation, also a reference to the *Book of the Dead* (or rather: *of Life*); → immigration: 'Those are nice things, says the citizen, coming over here to Ireland filling the country with **bugs**' [*Ulysses*, Cyclops]; → 'Ahab's soul is a centipede' [Melville, *Moby Dick*]
- **bugge:** (*Middle English*) a 'frightening spectre' (cf. boggart, bogeyman)
- **böögg:** puppet being burned in the celebration of Zurich's *Sechseläuten* (cf. 'Mester Begge (...) saxonlootie' p. 58)
- **bigamy-master:** one who has many affairs, hence the surrounding theme of guilt. (Internet 1)

As does his surname 'Finnegan':

- **Tim Finnegan:** hero of the street ballad *Finnegan's Wake*; he is supposedly an Irish emigré who is working as a labourer in New York
- *Finnegan's Wake:* a popular Irish-American ballad → 'Finn again is awake' → a reference to the common legend that great heroes of the

past are not dead but merely asleep, ready to return in their country's hour of greatest need (e.g. King Arthur, Finn MacCool)

- **Finn MacCool:** Finn MacCool (Fionn mac Cumhail) was an Irish mythical hero; he is sometimes portrayed as a giant
- **fin:** (*French*) end → fin-again → the end of another Viconian cycle.
- **Fionn, Finn:** (*Irish*) fair, fair-haired; white; bright → *Finn* is actually a nickname meaning 'fair' (in reference to hair colour), 'white' or 'bright'
- **Finnegas:** the young Fionn mac Cumhail met the poet Finn Eces (Finneces, Finegas, Finnegas) near the river Boyne and studied under him
- **Solomon:** the third and last King of Israel, renowned for his wisdom, and often associated in FW with the similarly spelled *Salmon* of Knowledge, which was also a repository of great wisdom
- **Finn and Ann** → HCE and ALP
- **egg** → Humpty Dumpty . (Internet 1)

This punning within the passage and its potential mental representations may stem from the vague pre-coalescent flux of perceptual possibility – each pun an interpretative and salient choice to be made from this flux – yet, there is no single Finnegan at work in this passage, no unifying image. Instead it appears that a number of concepts are at work (builder, insect,

bigamist), not all of which are necessarily connected, attempting to portray Finnegan. Thus, in literary terms this means that a number of conceptual blends (Turner and Fauconnier, 1998) are occurring at once via this pun: the homophonic pun (Big Mister, Bug Master), compound pun (Bygmester Finnegan – more than one pun per clause) and these are supported by intertextuality ('Finnegan's Wake', the ballad) and a number of exophoric references (Fionn Mac Cumhail). The resulting effect may be weighing down the global invariant as each concept reaches for a salient mental counterpart.

Despite this extra salient load, the patterns persist. For example, in 'The Dead' in Dubliners, below we have two landscape or 'progressive' patterns existing consecutively:

The morning was still dark. A dull, yellow light brooded over the houses and the river; and the sky seemed to be descending. (Joyce 1996 [1914], p.243)

And

It was slushy underfoot, and only streaks and patches of snow lay on the roofs, on the parapets of the quay and on the area railings. The lamps were still burning redly in the murky air and, across the river, the palace of the Four Courts stood out menacingly against the heavy sky. (Joyce 1996 [1914], p.243)

Ulysses follows suit, for example, the short loop pattern of the body is used when describing Stephens's mother:

Stephens' mother, emaciated, rises stark through the floor in leper grey with a wreath of faded orange blossoms and a torn bridal veil, her face worn and noseless, green with grave mould. Her hair is scant and lank. (Joyce 2008 [1922], p.539)

And finally, the opening line in *Finnegans Wake* is also following the landscape pattern:

riverun, past Eve and Adam's, from swerve of shore to bend of bay, brings us by a commodious vicus of recirculation back to Howth Castle and Environs. (Joyce 2012 [1939], p.1) <sup>41</sup>

Ignoring the historical and biblical punning, in geographical terms, we have a version of this description which moves from the city to the suburbs to the outlying hinterlands.

That we have two modernists employing opposite methodologies in terms of style – and recalling Beckett's statement –

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<sup>41</sup> **Church of St Francis of Assisi:** a Franciscan church popularly known as **Adam and Eve's Church**; it is situated beside the River Liffey, on or near the site of the tavern of the same name. It was originally dedicated to Saint Francis of Assisi, but in 1889 it was rededicated to the Immaculate Conception of Our Lady or **Eve and Adam's**: the Garden of Eden → Eden Quay, Dublin, one of the quays on the River Liffey; it is downstream from Adam & Eve's Church and on the other side of the Liffey.

**bend of bey** → **bay of Bray** (*Irish*: Bré, formerly Brí Chualann): A town situated 20 km south of **Dublin** on the east coast.

**Howth Head** (*Irish* Ceann Binn Éadair) is a headland north of Dublin City in the Republic of Ireland, near the towns of Sutton, Baldoyle and Portmarnock. Howth itself lies on the northern side. Originally an island, it is connected to the mainland via a narrow strip of land, or tombolo. Howth Head forms the northerly bound of the great crescent of Dublin Bay, corresponding to Killiney Head in the south. The earliest mention of the peninsula was on a map attributed to Claudius Ptolemy, where it was called *Edri Deserta* or in Greek *Edrou Erēmos*.

**environs:** the outskirts of a city; neighbourhood. (Internet 1)

‘I realised that Joyce had gone as far as one could in the direction of knowing more, [being] in control of one’s material. He was always adding to it; you only have to look at his proofs to see that. I realised that my own way was in impoverishment, in lack of knowledge and in taking away, in subtracting rather than adding’ (Knowlson 1997, p. 352)

it would seem that neither salient paucity nor salient overload interfere with the appearance of the patterning. This supports the claim made earlier in this chapter that the patterns are:

A narrative component that sheds any notion of representation; the patterns reveal an embedded and direct cognitive link from our actual world perception to the fictional worlds of narrative. They operate independently of narrative structure and this independence, revealed to us in ‘topological frames’, demonstrates unconscious processes can and do override conscious creativity during narrative production.

#### 6.4 Postmodernism or Postsaliency?

*‘But trying to be a painter did teach me to look at the world in a very particular way—looking very closely at things, at colors, at how things form themselves in space—and I’ve always been grateful for that. You have all this space, and you have a figure: what do you do with it? And in a way that’s what all art is. How do we find a place for our creatures, or inventions, in this incoherent space into which we’re thrown?’ (John Banville)*

In the next section we will examine the work of another Irish writer, John Banville. We will examine his work in terms of ‘postmodernism’ and the behaviour of the patterns therein, and later turn our attention to the non-volitional nature of the patterns themselves and consider the implications of

their existence on conventional literary criticism and its belief in authorial control.

Banville - whose politics are famously 'green' - abhors the human arrogance that he says has led to much of the ecological destruction wrought by mankind on the planet and prefers to call himself a post-humanist rather than a postmodernist:

People used to say I'm a postmodernist in days when postmodernism was still fashionable. It no longer is. If I'm anything I'm a post-humanist. I don't see human beings as the absolute center of the universe. I think one of our tragedies and maybe our central tragedy is that we imagined that at some point in evolution we reached a plateau where we were no longer animal. That we had left the animal world and became pure spirit unfortunately tied to this physical body that we have to carry around. (Yoder 2010)

However, literary criticism sees Banville as exactly as that which he says he is not: a postmodernist and thus, we will examine his work as such. As an example of postmodernist writing, the patterns are upheld. In the early short story 'De Rerum Natura' taken from the collection Long Lankin, George and his wife discover his father in his run-down home:

'George and Lucy hardly recognised him. If they had met him in the garden they might have taken him for a tree, burned mahogany as he was, with that long beard like grizzled ivy' (Banville 1991, p.1083)

Here we have the short loop body sequence which works despite being couched in vegetative rather than biological terms. A moment later we see the same pattern applied to George himself:

Although well into middle age, George had the air of a gawky, overgrown schoolboy. His long thin FRAME gave an impression first

of all of paleness, pale EYES and HANDS, pale dusty HAIR.  
(Banville 1991, p. 1083)

Lucy, George's wife is described thus:

She was a PLUMP woman, still PRETTY, with large expressive BREASTS which trembled when she was angry. There was a damp sheen on her NOSE and CHIN, and she exuded a faint whiff of sweat. (Banville 1991 p. 1083)

Here are two more examples of the body loop sequence, the first the short version of the pattern and the second the longer. Both are taken from The Book of Evidence. The first describes Charlie French, an old acquaintance of the novel's protagonist, Freddie Montgomery whom he meets on his return to Ireland in an old haunt, Wally's pub:

He had aged. He was in his early sixties, but he looked older. He was STOOPED, and had a little egg-shaped paunch, and his ashen CHEEKS were a filigree of broken veins. (Banville 1990, p.34)

The second example describes 'the American' who is named 'Randolph' by Freddie and who is a drug dealer:

He was LEAN and MUSCULAR, with a hatchet FACE and boyish close-cropped HAIR. He went in for tight jeans and high-heeled boots and leather with huge buckles. (Ibid p. 12)

Notice that this is the long loop of the body pattern where the outline 'lean and muscular' is followed by the head 'a hatchet face and boyish close-cropped hair' and ends with a reference to the body 'tight jeans and high-heeled boots.'

And here is an example of the landscape pattern, also from The Book of Evidence, where Banville is describing Freddie's headlong flight to Ireland from the island and its moneylenders:

Once we halted for an hour in the middle of nowhere. I sat in the ticking silence and stared dully through the window. Beyond the littered tracks of the UP-LINE there was an enormous, high, yellow FIELD, and in the distance a range of blue MOUNTAINS that at first I took for clouds. The SUN shone.' (Banville 1990, p.24).

The pattern is all there from its starting point at the carriage window to the 'up-line', the large yellow field, then the mountains and finally the sun. We see the landscape pattern again when Freddie Montgomery reaches his mother's home in Ireland, Coolgrange:

I stood there and looked about me. It was all there, the BROKEN GATE, the DRIVE, the LONG MEADOW, the oak WOOD – home! (Ibid, p.40)

In Birchwood we find the centre/edge pattern of indoor spaces in another example. It occurs early on when the boy protagonist Gabriel Godkin is observing his unhappy family as his mother waits for his drunken father to return from one of his 'jaunts' into the city:

I went with her into the dining room and leaned on the TABLE while she arranged the flowers in the bowl. Granda Godkin hovered guiltily by the rosewood cabinet in the CORNER, shuffling his feet, wheezing and sighing, nervously patting the pockets of his jacket' (Banville 1994, p.40)

The occasion is his grandmother's birthday. When his father returns the family proceed to have dinner. As their servant and cook, Josie Cotter, enters the dining room we see the centre /edge pattern clearly:



‘She pushed open the door with her foot and entered. Framed in the doorway, the TABLE and the celebrants floated in a little haven of candlelight. Mama sat facing the FIREPLACE with her back turned to me.’  
(Banville 1994, pp.36-37)

In this reconsideration of the patterns in what is referred to as ‘postmodernism’ we can see that they are clearly present. It is important to restate that the patterns are all conjoined and that the key terms ‘figure’ and ‘ground’ are interchangeable. This is a simplifying concept. Depending on the scale of the object any figure can become ground and vice versa. This idea was mentioned earlier in the section on perception:

‘We have already suggested that the first one, the short loop is the topological invariant ‘hole’. The sequence of global-to-local in relation to perceptual organisation in this pattern i.e. outline first, is borne out by the privileging of topological invariants in Klein’s Erlangen program of geometrical hierarchy as well as by neuroscientific studies of the brain and networking by Wang *et al.*, Zhou et al. and Shang H’.

Linking the other two patterns centre/edge and landscape to this topological definition as follows:

‘The pattern usually involves movement from a central point to a wall or from a wall or edge back to a central point. It could be argued that this pattern only differs from ‘landscape’ in the way it is foreshortened by being bounded. Edge is seen here as background against which the objects it

surrounds appear as holes just as for the outline/body patterns. So what is different? When we venture beyond the walls through windows and doorways then we begin to see that the terms 'figure' and/or 'object' and 'background' are relative terms, not absolute. So as we progress beyond the wall/boundary what was background now becomes object e.g. if we move away from a wall we see a house or entire building which is now an object against the background of, say, a wood or a hill and if we move even further we see that the previous background wood or hill is now object against the ultimate backgrounds of horizon or sky...So the topological invariant that governs all three patterns seems to be the hole, the first relating to people or living beings and the second two to space. The latter pair only differs in terms of the relativity of object and ground, with any object capable of functioning as ground and vice versa i.e. any background is capable of becoming an object.'

In Banville we can find examples where this 'relativity principle' is at work. Consider the following: it begins indoors and we see the familiar centre/edge pattern of enclosed spaces. This changes when the limiting 'edge' is revealed as a set of French windows which go from being 'ground' to 'figure' as they are transparent and 'ground' now becomes the lawn which in turn is grounded by the woods and we are in the outdoor pattern of landscape:

The library is a long narrow room. Its dusty book-lined walls give way at the south end with a hint of gaiety to the white French windows that look across the lawn into the wood.’(Banville 1994, p. 12)

Shortly after we can again see relativity of figure/ground in this:

From the landing I looked down over the lake and the fields to the distant sea. How blue the water was, how yellow was the sun (Ibid, p. 12)

Let us now turn to the question of authorial control. We have just seen how Banville’s work demonstrates a clear adherence to the patterns. This suggests, once more, that these aspects of the writing process are outside the control of the author as the perceptual processes involved operate below the threshold of consciousness. Literary theory examines authorial intention at one end of the scale and reader theory at the other debating to what degree the importance of uncovering authorial intention or determining the degree to which the text is affected by the act of reading, decides what the text actually does. It is clear that the two – author and reader- are the key entities in this transaction. Many studies, however, privilege the author. We can observe this in the work of Joseph McMinn, one of Banville’s main critics. Banville is regarded as a ‘postmodernist’ – troubled as this term is and has been in mainstream literary criticism – and his novels are described by McMinn as follows: ‘These are self conscious memoirs, not just in the conventional postmodernist way in which they draw attention to their own narrative efforts, but in the way their reflective cast of mind regards the competing powers of intellect and imagination.’ (McMinn 1999, p.9) And

‘All of Banville’s novels read as variations upon a premeditated theme, which I take to be the life of the imagination’ (McMinn, 1999, p.1) by which he says he means ‘the metaphors and mythologies’ that serve Banville’s single-minded purpose. All such commentary lends Banville’s work a degree of authority, ownership and control that is fairly typical of this type of criticism but is belied by an examination of the cognitive process that drive it. Despite McMinn’s claim that ‘From his earliest fictions, Banville always knew where he was going...’ and that his ‘... study hopes to show how a single story is told throughout Banville’s work, each fiction experimenting with an increasingly refined metaphorical aspect of that story,’ (McMinn 1999, p.2) Banville contradicts it all in an interview with ‘The Guardian’s’ Stuart Jeffries who observed:

Doctor Copernicus, Kepler and The Newton Letter were...books written by a self-confident man from whom he sounds estranged. ‘Had he been to university, some professor would have warned him off those subjects. But I was free because arrogant, arrogant because free. Some say those are my best books. I think I took a wrong turning with them. (Jeffries 2012)

In the same interview he added: ‘Birchwood, led [me] up a literary dead end. It was my Irish novel and I didn't know what to do next. I thought of giving up. I hated my Irish charm. Irish charm, as we all know, is entirely fake’ (Jeffries 2012). In another interview, he further added : ‘I don’t plan like that. I mean, art is a completely organic business. You throw some seeds on the ground and these green things start to grow. And you follow them.

More and more I think it has very little to do with me; it's to do with the process itself. I just take care of the sentences. The rest looks after itself.'

(Keeler 2012)

Critics like to organise, to fit their chosen authors into a tradition. One of the main problems they create is to postulate that writing is planned or even volitional. McMinn goes further claiming that Banville '...always knew where he was going...' saying 'Banville's work is self-consciously and adventurously in touch with contemporary theory about fiction, aware of the influence and the inheritance of the poststructuralist revolution in thought about the constructed and fictive nature of subjectivity and its language, and of its philosophical challenge to the optimism and reason of Enlightened humanism.' (McMinn 1999, p.2) And while Banville *is* knowledgeable about critical theory, McMinn's claims in this regard indicate how far much contemporary literary criticism has pushed in directions like authorial control. But if we examine this dichotomy from our cognitive perspective we see that the abilities that permit the author to write are shared functions of the human mind. The act of writing employs episodic memory and episodic future thinking to create the text. The reader, however, is not a simple, passive recipient upon which the writer projects. The reader uses the same cognitive abilities to read. These abilities, in turn, are controlled by perceptual organisation and as we have argued imprint on the writing. Any theory of literature or critical study that does not take this

into account will fail ultimately to explain the processes involved. Therefore, my model of topological invariance has neither downgraded the role of the author as per Barthes nor endorsed reader theories – it is, instead, a recognition that in scientific terms, the production and reading of a text is an act of cognitive collaboration made possible by our common cognitive abilities. The famed ‘willing suspension of disbelief’ is now better described by the reader engaging with episodes of future thinking, familiar and vital to everyday life, but in the case of literature, supplied by an author.

Furthermore, writing produces texts that are based on the final product of perceptual organization, saliency, and by definition, fails to register the topological invariant that is the platform that supports it. This leads to two consequences. It creates the patterns themselves which we suggest are the result of the ‘global to local’ sequence of perception surviving into writing non-volitionally and observable due to what we term ‘syntactic deceleration’. The other consequence of salient-driven writing is an instinctive awareness of its limitations by writers and readers and our examples of the work of Impressionist artists and writers like Beckett show how these limitations led to the search for new forms of expression. And this is what we find in Banville. As we shall see he too searched for the elusive ‘something’ behind; the Beckettian ‘word surface’:

‘I’m trying to recreate reality; I’m trying to get the reader to see, to hear, to smell, to taste, the world as it is. Not as other novelists and poets tend to

think reality is, *I want to get at the real thing itself*<sup>42</sup>, which is *behind* our everyday concerns, I'm trying to get at the essence of the thing itself – it's not easy.'(Wootton 2009)

His explanation that he was trying to reach 'reality' modified by his assertion that he is trying to do this 'Not as other novelists and poets tend to think reality is' is his rejection of salient-driven prose mindful of Beckett bemoaning drama which was ruined by its own eloquence. Banville uses the phrase 'the thing itself' or 'the thing in itself' to refer to some deeper element that he feels is missing. In another interview with 'The Elegant Variation' he is asked:

'In book after book, I've noticed this repetition of the term 'the thing itself.' It seems quite a core concern of yours and yet I'm surprised that I never see it taken up in reviews or discussions of your work. It's present in numerous books.' (Sarvas 2009)

Banville's reply is:

'Well, you're right. That's what all my narrators are trying to find – some authentic thing.' (Sarvas 2009)

We will return to this elusive 'thing itself' later when we examine his concept of 'harmony'.

As we have said elsewhere, the very existence of the patterns and their operation across different time periods and cultures suggests that writers are

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<sup>42</sup> My emphasis

not in full conscious control of the writing process despite all the protests to the contrary of their critical commentators. Banville spoke about this whilst describing a kind of epiphany he experienced during the writing of Mefisto which was to be the fourth part of the science tetralogy. His wife was convinced that he had had a nervous breakdown but looking back Banville saw that it changed his basic approach. The key to this was what he referred to as a loss of control:

‘... Mefisto was a big shift for me. I began to write in a different way. I began to trust my instincts, to lose control, deliberately. It was exciting and it was frightening. The writer who wrote Mefisto was a writer in deep trouble. He didn’t know what he was doing. He was striking out into new territory—new for him, at least. It was painful at the time, and it was hideous in many ways.’ (McKeon 2009)

In cognitive terms we would describe this as Banville acquiescing to the operation of episodic memory. It should be recalled that a prerequisite for episodic memory function and, subsequently, episodic future thinking, is that the mind enters the ‘default’ state of operation wherein the live feed from external stimuli is suppressed in favour of an internal one driven by episodic memory. In the writing of Mefisto Banville was relinquishing control i.e. converting to default mode. Abandoning the live feed in this way would have appeared to him as losing control, putting him at one remove from his immediate surroundings like a person entering a state of



contemplation or trance. In all this we have to remember that Banville's occupation as sub-editor for a number of Irish newspapers where he would have exercised a very active and intense skill set so this relinquishing of control would have been particularly difficult for him. In another interview he described the new approach as 'I stopped trying to be in control and trusted myself to dream in my writing' (Jeffries 2009). The phrase '...to dream in my writing...' is an excellent non-scientific way of describing episodic future thinking.

Another aspect of Banville's writing is his focus on the act of writing itself and this is, of course, one of the identifying features of 'modernism' and 'postmodernism'. Brendan McNamee's description of the style of Banville's novel The Book of Evidence could be applied to any of the novels: 'The narrative mode of The Book of Evidence tempted readers to take it as a realistic story while simultaneously undermining such inclinations through Freddie's frequent hints that it was largely invention.' (McNamee) For example in the novel we are expected to believe that Freddie's rambling tale is told directly to his trial judge. Elsewhere he directly contradicts his own narrative. The death of Freddie's father is described initially like this:

'He died at evening. The room was heavy with the day's long heat. I sat in a chair beside his bed in the open window and held his hand. His hand. The waxen feel of. How bright the air above the trees, bright and blue, like the

limitless skies of childhood. I put my arm around him, laid a hand on his forehead...' (Banville 1990, p.51)

This is followed immediately by a complete refutation:

Stop this, stop this. I was not there. I have not been present at anyone's death. He died alone, slipped away while no one was looking, leaving us to our own devices. By the time I arrived from the city they had trussed him up, ready for the coffin.' (Ibid p. 51)

The problem for conventional criticism is that it merely notes that the writing is inclusive of the narrative process and stops there. In keeping with my analysis to date, we should regard this focus on the act of writing as an instinctive rejection of saliency. It might be useful to point out at this point that Banville considered himself an artist when he was young and although he dismisses the quality of his artistic work he did have a prolonged exposure to the medium and this reminds us of Beckett and how his problem with saliency was highlighted by the work of French and German Impressionists and others. He acknowledged this in another interview and interestingly focuses on the concepts of 'figure' and 'space':

But trying to be a painter did teach me to look at the world in a very particular way—looking very closely at things, at colors, at how things form themselves in space—and I've always been grateful for that. You have all this space, and you have a figure: what do you do with it? And in a way that's what all art is. How do we find a place for our creatures, or inventions, in this incoherent space into which we're thrown? (McKeon 2009).

Later in the same interview he discusses writing in highly visual terms in the way that an artist would talk about painting, especially when he mentions 'human beings' as 'figures in a landscape:

Readers ask me, Why are you always telling us about the weather and how things look? I say, Because how things look and the beauty of how they look is just as important to me as the people who are in the foreground. I don't see human beings as essential to the universe. Human beings in my work are figures in a landscape, and the landscape is just as important as the figures (ibid)

Banville cites many people as influences, Beckett, Henry James and Yeats to name a few but he takes his epigraph for Dr. Copernicus from Wallace Stevens' poem 'Notes Toward a Supreme Fiction'. The poem like much of Stevens' work is concerned with writing itself and suggested ways that language and writing might produce 'supreme fictions' which would provide humanity with a fiction that would replace god, According to the *Notes*... a supreme fiction would have to meet three conditions; it would have to be abstract, be capable of change and give pleasure. Banville was drawn to some of the poem's central ideas. The verse he used for Dr. Copernicus is preceded by this:

'Begin, ephebe, by perceiving the idea

Of this invention, this invented world

The inconceivable idea of the sun'.

This is immediately followed by the verse:

'You must become an ignorant man again

And see the sun again with an ignorant eye

And see it clearly in the idea of it.' (Stevens 1942)<sup>43</sup>

The advice to the 'ephebe' concerns one of the main themes of Wallace's work viz. the problematic relation between human perception and 'reality' or, to put it another way, the belief, held by Wallace, that what humans saw was a construction that bore little relation to 'truth'. A familiar pattern begins to emerge. We are reminded of Beckett's metaphors of the 'veil' and the 'word surface' which he too suspected hid something. Scanlon comments: "While form and structure are important to 'Notes Toward a Supreme Fiction,' Stevens' ideas about the power of language and the limitations of personal perception are the poem's defining elements" (Scanlon 2013) The condition – 'It Must be Abstract' that Wallace's 'supreme fiction' had to fulfill means that it should be perceived outside the 'word surface'. The 'ephebe' is told to perceive 'the idea' of the sun, not the word. The suggestion here is that the final salient percept somehow fails to capture the 'reality' of the 'thing in itself', a phrase which we shall see, was used by Banville to denote that which escaped him in the act of writing or perhaps we should say that which eluded the final salient product. To become 'ignorant' was to discard the offerings of saliency in order to see the sun or rather to see '...the idea of it.' In Dr. Copernicus, Banville attempts

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<sup>43</sup> Taken from 'Notes Towards a Supreme Fiction'

to use Wallace's idea by describing how Copernicus as a tiny infant becomes aware of something before he has a word for it:

'At first it had no name. It was the thing itself, the vivid thing. It was his friend. On the windy days it danced, demented, waving wild arms, or in the silence of the evening drowsed and dreamed, swaying in the blue, the goldeny air. Even at night it did not go away....Tree that was its name. And also: the linden. ...Everything had a name, but although every name was nothing without the thing named, the thing cared nothing for its name, had no need for a name and was itself only.' (Banville 2011, p.9)

We can see what Banville was trying to do and also how his attempts to dissociate thought and language are borrowed from Wallace and 'Notes...'. We find the same ideas in Banville's novel Birchwood when the central character young Gabriel Godkin considers the ideas of perception and memory. The book opens with his return to his family's 'big house' after a bloody struggle for possession in which he is the survivor. He announces his intention to recount '...the story of the fall and rise of Birchwood' (Banville 1994, p. 11):

'We imagine we remember things the way they were, while in fact all we carry into the future are fragments which reconstruct a wholly illusory past...I had dreamed of the house so often on my travels that now it refused to be real, even while I stood among its ruins. It was not Birchwood

of which I had dreamed, but a dream of Birchwood, woven out of bits and scraps.’ (Ibid, p.12)

Once again we are reminded of Beckett and Proust and what they referred to as ‘voluntary’ and ‘involuntary’ memory even evoking the ‘madeleines’ that triggered Proust’s reminiscences, ‘These things, these madeleines, I gathered anew...’ (Ibid p.13) This wariness of Banville over the act of reconstructing the past, can be seen in cognitive terms as his attempt to go beyond saliency via episodic memory in an attempt to reach the elusive ‘thing-in-itself’ the cognitive root of perception lost to words, the invariant: ‘They must mean something, these extraordinary moments when the pig finds the truffle embedded in the muck...’ (Ibid, p. 11), and ‘ Still it eluded me, that thing-in-itself, and it was not until I ventured into the attics and the cellars, my favourite haunts, the forgotten corners, that he past at last blossomed in the present’ (Ibid p. 13)

In an interview with ‘The Spectator’ he comments on this:

I don’t think that we really remember things, and neuroscience nowadays is backing this notion up. But I think it’s more likely that we make models of the world, that’s what we carry with us into the future. That’s why when you go back to a remembered room, everything is slightly different, it’s because the models have decayed in our brains over the years, and we are visiting something. It’s not a memory, but imagination...And imagination is much stronger. What fascinates me about the past — and I’ve said it in each book that I’ve written — is its vividness. Why is it so intense?’ he says, looking generally perplexed (O’Malley 2013)

In the example above, Gabriel finds the elusive ‘thing-in-itself’ on one of the few rare occasions in the whole novel. It can be described as a moment

when the salient world connects with its invariant in what Banville came to call 'harmony' and the salient flux suddenly seemed to be unified and meaningful in a new way. One of the main examples comes at a family picnic when Gabriel who was still a child wanders off only to return and find his parents making love in the ruins of an old estate cottage. Prior to his return the landscape is revealed as unlovely and, in ways, repulsive:

'Our wood was one of nature's cripples. ...the trees grew wicked and deformed, some of them so terribly twisted that they crawled horizontally across the hill, their warped branches warring with the undergrowth, while...the roots they had struggled to put down, were thrust up again by the rock, queer, maimed things.' (Banville 1990, p. 31)

This unsavoury landscape is used by Banville to contrast with the harmony that follows. All is triggered by light striking a broken mirror in the ruins:

'The mirror's pale unwavering, utterly silent gaze sent something like a deep black note booming through the wood's limpid song and I felt, what shall I say, that I had discovered something awful and exquisite, of immense, unshakeable calm.' (Banville 1990, p.32) '...all I had found was the notion of – I shall call it harmony. How would I explain, I do not understand it, but it was as if in the deep wood's gloom I had recognised, in me all along, waiting, an empty place where I could put the most disparate things and they would hang together, not very elegantly perhaps, or comfortably, but yet together, singing like seraphs.' (Banville, 1994, p.33)

Banville's explanation of 'harmony' was used by no less a person than Gibson who came very close to devising a theory of topological invariance. We described his belief that humans perceive directly earlier in this paper: 'Gibson...believed that the cornerstone of vision was invariance:'...The perceptual system simply extracts the invariants from the flowing array; it resonates to the invariant structure or is attuned to it '(Gibson 1979, p. 249)



## Chapter 7: Conclusion

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### 7.1 The patterns and discourse potential

This is a literary thesis that focuses on a specific literary issue:

1. Why do these spatial patterns exist?
2. Do they have a literary function?
3. What can they tell us about narrative production?

Current modes of literary discourse have proved unable to assist with answering any of these questions. The recourse to neuroscience in search of explanations on spatial patterning is an appropriate method and a fruitful one. Neuroscience has linked each of the complex relationships between the systems discussed here through an underlying approach of cognitive effort – why would the visual perceptual system design an entirely separate and different system for the purposes of imagining a scene or object when it can avail of an existing structure in the form of the global invariant? Broadly, neuroscience has furnished this thesis with a range of potential explanations; for example, do the patterns take the form of that proposed by FIT or Chen’s global invariance? It has also guided the specific ontology of the patterns to the appropriate research but always with the patterns at the forefront of the initial hypothesis ensuring no absorption into a teleological argument.

The ambiguous labeling of narrative space serves traditional reviews of space well thus, it can be drawn upon to make the case for a diverse range

of analogical literary theories – post colonialism, feminism etc. However, the focus here is on the neglected aspects of space as a structure and this study has refocused the potential research outcomes of narrative structure, particularly spatial representation. Although the patterns do not support a renewed sense of narrative hierarchy in favour of space, they demonstrate that deeper structural relationships are at work in literary fiction. The impact of visuo-cognitive governance has not been considered before in literary studies, however, this thesis demonstrates that new interdisciplinary approaches can yield results for both science and literature.

Generally, neuroscience has informed the literary questions asked in this study, however, there are moments where the processed is reversed. Typically, the scientific research has not been driven by explicit literary questions and the link has had to be made within this research between comparatively separate areas of neurological studies. Thus, for example, the patterns provide significant support for Hassabis and Maguire's (2009) work on episodic memory and imagined situations. They also expand the enquiry about the relationship between the operation of EFT and its unconscious properties, the patterns highlighting a potential issue with how they can remain intact as an unconscious operation of the visual system whilst operating in the conscious area of Episodic memory.

Currently, all claims made here are theoretical, however, this is understood in the context of the potential for further research. The most important and immediate being the testing of a much larger, diverse non-purposive sample randomly selected by a concordancer including a substantial sample of non-English texts. A rigorous retesting of this sample multiple times would be necessary to check for data verification/falsification which may enable the claims made here to go beyond the bounds of theory. This would be a large undertaking however, it could be performed in stages, and if corroborated, could potentially inform each literary genre/culture as it proceeds. Alternatively, smaller projects could review non-English language texts, professionally translated, to test for textual interference, research data could be collected from writing experiments, the relationship to sign language could be examined in order to test for differential outcomes and further work could be found within the literary texts, for example, a larger variance of period data could be introduced to test the overall claims made here or different perceptual systems. For example, Austen's proclivity for matchmaking within her texts and the ubiquitous gossip that follows could test for auditory pattern invariance. It is also hoped that the manual search approach adopted here could influence corpora methodological design in which a more efficient search engine could be created to speed up the process of analysis.

## 7.2 Summation: identification of the Patterns

The initial identification of patterning in this study stemmed from a purposive sampling analysis of *Jane Eyre*, which can be viewed as the ‘control text’ for this study. The naturalistic representation of both her subject matter and narrative style created an ideal spatial platform with which to study landscapes and people in the text. This was, in turn, heavily influenced by the protagonist’s visual relationship with her space so that patterning was facilitated by the high frequency of topological frames within the text. Having captured patterning here, other texts were introduced from different genres and periods in order to test for cultural differences and they too, were purposely chose for their canonical standing but more importantly for the expectation of topological frames within the three categories of spatial study. However, the frequency of topological frames began to vary and this was often due to narrative mode; for example modernism’s tendency to break from a coherent narrative voice, and this posed difficulties for patterning identification. This refocused data collection on topological frame variance and its contents. As outlined in Chapter 1, a topological frame provides the visual components of the surrounding locations - objects and people - where movement or action is suspended in order to relay large amounts of spatial data. Similar to ‘free clauses’ (Labov and Waletzky 1967), topological frames are not fixed temporally to the narrative arc nor are they pertinent to narrative causality. Once it was

understood that the frames were patterned, a typology of space was drafted to check for variation from those found in *Jane Eyre* which focused heavily on landscapes, rooms/indoor spaces and characters. This developed a set of patterning described as progressive, for landscapes, bouncing, for indoors, and two loops of body patterning – short and long. Chapter 1 describes in detail the variation of each of these patterns through their individual subsets and argues that they appear when the spatial relationship between each of the nouns pertaining to location or object is tracked. Thus, landscapes develop a proximal to distal patterning whilst indoor spaces with their smaller surface areas ‘bounce’ between the foreshortened geometry of the rooms. The bodily description of characters is divided into those that provide a shape or outline and remain with the head/facial features, and those that add a further dimension by describing body parts, hence the short and long loop terminology.

An important part of pattern identification lies with illustration. Chapter 1 provides a selection of data from varying genres and spatial types in order to highlight from the beginning the existence of the patterns. However, it also considers their function and demonstrates that they have no effect on the representation of space within the frame and asks what their purpose is if not to serve the narrative? This question consistently informs this thesis, for example, an early idea argued that the patterns were a representational aid and may have supported the deictic activity of the reader through templative

icons. However, this idea became untenable when it was considered alongside Chen's topological model of visual perception and his suggestion of invariance. The patterns cannot be a representational aid because they take the form of the global invariant of the 'hole', which remains intact despite translation through a number of cognitive systems. Thus, the patterns are formed prior to their literary manifestation and are not created to serve representation and therefore, exist at the moment of perception. The patterns' lack of narrative impact on information delivery also supports this.

Before the introduction of neuroscientific discourse to this thesis, traditional methods of explanation were reviewed for critical support. As argued, cultural reasons alone could not explain the patterning in such a diverse range of data and thus, answers were sought from theories such as narratology, which focuses on the structural aspects of narrative. Having reviewed current theories on the definition of narrative space, particularly Ryan's 'Space' (2012), Chapter 2 of this thesis argues that topological frames have not been identified in literary discourse as components of narrative space and this has eclipsed the potential for any patterning identification. Key research, such as early research on deictic shifting, was also reviewed as a potential pathway of explanation but also proved negative in this respect. Zoran's work (1984) is arguably still the most thorough and comprehensive

structural research on space; however, his terms need further specificity in relation to the content of topological frames and their potential for action.

As a final test of pattern identification an analysis was conducted at the end of Chapter 2 to test for periodic disparity and typological variance and the results pointed towards the patterns as a universal, not cultural, manifestation.

### 7.3 Sourcing the patterns

Once cultural influence was removed as a potential controller of the patterns, their components became fundamental as areas of research for causality. Three key components were identified as endemic to the patterning: vision, imagination and language. Vision was highlighted as key to the patterns through demonstration of narrative mode.

Taking the first component, vision, Chapter 3 outlines a number of visual models which attempt to explain sequencing in the act of perception. Order or sequence was seen as important here as it could explain why the patterns were taking a particular form. Prevailing models of the visual primitive were reviewed in order to ascertain if this order matched the patterning. Thus, Feature Integration Theory with its top-down and bottom-up processing was examined, as was Nakayama's notion of associative icons. However, the focus of these models on local details – saliency – such as colour, shape and texture could not account for the particular form of sequencing the patterns assume. Using FIT's organisational principles, we can account for the

sequencing in the progressive patterns of landscape (large favoured over small/near to far) and it can also explain why the outline/shape is processed ahead of the salient aspects of head and body parts. However, it does not help in understanding why head is perceived before body in the Long loop body pattern. These areas are organised in the second phase of FIT's visual processing – top down processing – through feature maps and suggests that larger target features are processed before smaller ones – thus, body should be processed before head and not vice versa. Nor can FIT account for the bouncing pattern of rooms – there is no explicit nor implied favouring of larger objects than smaller within the topological frames of rooms. The binary patterns of edge-centre and centre-edge have no explanation in this theory.

Thus, alternative models of vision were sought and Chen's topological approach was employed as an explanation that covered all aspects of form and motion. Using gestalt notions of connectivity and surroundedness, Chen applies the rigour of Klenian mathematics to demonstrate that the global invariant of the visual primitive is a hole in a background. Through a close reading of Chen's work, Chapter 3 demonstrates how the patterns are a series of holes in backgrounds whose sequencing can be explained as the relative relationship of a hole becoming a background as the pattern progresses. Important too is Chen's argument that form precedes motion



and this lends itself to the lack of motion/activity within the topological frames.

The final section of Chapter 3 reviews counter examples to the patterning in order to test the theory to date but also to understand if certain properties are necessary within narrative for topological frames and patterning to appear. Despite the small amount of data on children's literature, and the extreme narrative forms that they can take, this section demonstrates that these examples violate typical narrative structures. For example, Alice's Adventures In Wonderland contains only one example of a topological frame and this is in reference to outside Wonderland. This section further discusses the issue of narrative causation and motion and argues that the spaces in these novels are not static and therefore, deviate from the typical functions ascribed to literary space and the structure of visual order.

#### 7.4 Maintenance

Chapters 4 and 5 examine the remaining two components of the patterns: imagination and language. In an attempt to understand if the order of the 'hole' could be maintained for imagined space, Chapter 4 attempts to source the neural system that supports the imagination. Highlighting episodic memory as a potential area, due to its cognitive processing of autobiographical memory, evaluative tasks and its ability to control episodic future thinking, memory was revealed as a key facilitator for the imagination. Reviewing research such as Hassabis and Maguire (2009) wherein they

explicitly comment that episodic memory and future thinking influence our ability to write creatively, it was argued that EFT is central to maintaining or diminishing the patterns. EFT is a form of autobiography, however, the work of Buckner and Carroll (2006) illustrates EFT's ability to self-project or simulate. By projecting ourselves unto another's perspective of events, we can, and do, create newly imagined situations that are not necessarily autobiographical. Self-projection allows us to merge with the imagination of others and this is exactly what we do when we produce or read literary fiction.

However, the memory system is not the perceptual system and potential issues arose in terms of how the patterns could survive as an unconscious aspect of perception into the very conscious act of EFT. Hasselmo's work on spatial trajectories supports the idea of low level and unconscious processing retaining its original form within conscious activities. On a specific level, Hasselmo's episodic model focuses on the synaptic process during encoding, storage and retrieval of space and explains how the patterns survive through the entorhinal cortex's relationship to head directional cells and hippocampal storage. Essentially, Hasselmo's work explains how the patterns survive translation from one system to another because cognitive effort ensures that any original associated views are maintained by reactivation and not newly created. Thus, at this point it was

argued that transference from the perceptual system to the memory system does not inter with the patterns form.

The final component - language - was reviewed in Chapter 5 and the expectation was that as products of writing, the patterns might be seen simply as deriving from a textual medium in a way that disproved the hypothesis. Chapter 5 reveals the lack of research on narrative production. In the absence of a contribution from production theorist the thesis turned to Mar who bemoaning this lack suggests enlisting narrative comprehension theory to test for any textual interference on the patterns. Using comprehension models, particularly Zwaan's (2003) 'Immersed Experiencer Framework (IEF) I argue that grounded, or embodied, models of language processing, such as IEF, which reject the idea of perceptual symbols, support the existence of the patterning as a perceptual record. IEF would suggest that narrative comprehension is the cue for all previous operations – from the original visual stimuli to the synaptic operations of EFT – thus, when a narrative is read it initiates a chain of retro processing and brings into being an overall representation whose sub-components are records of the original stimuli – the visual primitive. Therefore, language comprehension reactivates original percepts rather than creating new ones. For narrative production, Mar would assert that the operation is the same. Thus, this would explain the patterns' maintenance in language systems as a perceptual override. I argue that language, through the act of writing, slows

down the speed of processing through the process of syntactic deceleration and reveals the patterns as a record of direct perception where it would be otherwise impossible to detect.

## 7.5 Applications

This final chapter broadens out what has been, up to this point, a particularly specific research question. Focusing on the relationship between the local (saliency) and the global aspects of our visual system, this section reviews the work of writers who wished to understand the processes behind the final literary outcome. By applying what I term as a Postsaliency approach to literature, I review Beckett and his attempts to break through the ‘terrible materiality of the word surface’ (Beckett 1991, p.258). This is demonstrated through the influence of the visual arts on Beckett as both writer and artist and proposes that Beckett attempts to strip his work of salient detail, as seen in the paucity of his language, in an attempt to remain closer to the process of perception. This is illustrated through a close reading of a number of his texts and demonstrates that patterning remains despite Beckett’s attempts at diminishing the language in which they are revealed. This review of Beckett is conducted in direct comparison to Joyce who injects an overwhelming amount of saliency into his texts, particularly Finnegans Wake. Examining this text it seems that Joyce, with the opposite approach to language from Beckett, still conforms to patterning. This

supports the idea the patterns are sourced from the visual primitive and are not the result of language processing whilst understanding that it is language with all of its salient properties that allows for pattern identification. Finally, the work of John Banville and his postmodernist approach to reality was reviewed and, as shown, he also conforms. Banville is explained here as a writer who appears to understand the idea of the 'thing in itself' and the potential falsity of representation through language. However, of the three writers considered in this section, Banville is the one who appears to unite the salient aspects of his textual outcome with the invariant processes behind it through his concept of harmony.

This thesis represents the beginnings of a new field of enquiry; if we recognise that our cognitive architecture influences the relationship between the perceptual, memory and language systems then it follows that the patterns cannot be an isolated phenomenon. Neural pathways are deeply at work in literary representation and literature cannot be considered apart from them.

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