ISOVISTS REVISITED. Egocentric space, allocentric space, and the logic of the Mannequin

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ABSTRACT

The description of the spatial entities used in space syntax is growingly taking on a direct cognitive character, where for example axial lines are often equated to ‘lines of movement’, convex spaces to ‘spaces of being’, and isovists to ‘visual fields’. While developments of these have served to deepen our understanding of spatial configuration in many ways, it is of importance to revisit the origins of the spatial entities used to investigate spatial syntactics and study the implications of alternate definitions. This is a question of what kind of analysis can be performed and on what sort of objects, but also of positioning of the research field. This paper argues that while the perceiving subject is one valid point of interpretation of the spatial entities studied syntactically, other interpretations enable other questions to be investigated and consequently other results to emerge. In this paper the focus lies on how a de-centralisation from e.g. subjects’ visual fields unearths qualities in the isovist and its consecutive systemization into spatial syntactic relations that risk pass by. It furthermore aims to discuss the theory base for analyses of certain phenomena (‘the logic of the mannequin’). This discussion revolves around a concept already highlighted in space syntax theory: allocentricity, i.e. the quality of spatial cognition to recognize the situation of ‘elsewhere’, and discusses the impact of such understanding through systemic operations and through the ‘elsewhere’ of inanimate objects.
The description of the spatial entities used in space syntax is growingly taking on a direct cognitive character, where for example axial lines are often equated to ‘lines of movement’, convex spaces to ‘spaces of being’, and isovists to ‘visual fields’. Many works have also, while not necessarily literally making these simplifications, worked from the point of view of for instance the isovist as situated experience or perception, investigating such things as narratives and sequences of vision (e.g. Psarra, 2009; Zamani, 2009), the visual contexts created in various locations (e.g. Zamani & Peponis, 2007; Koch 2009; Tzortzi, 2009), or following movement routes (Heo, Choudhary, Bafna, Hendrich, & Chow, 2009; Lu, Peponis, & Zimring, 2009). While these works have served to deepen our understanding of spatial configuration, showing how in many situations these are reasonable or even explanatory descriptions, it is of importance to continuously revisit the definitions of the spatial entities used to investigate spatial syntactics and once and again question what they are and the implications of alternate definitions.\(^1\)

The point of such a discussion is not to disqualify any of the findings, but rather to investigate how alternate definitions can contribute to our understanding of spatial syntactics. It can also be claimed important in order to refine theory, while potentially of less direct importance for more pragmatic applications. Furthermore, it may allow for a wider set of analyses to be made. This discussion constitutes not so much a re-description as a refocusing, owing large parts of its approach to Hilier’s (2003) discussion on allocentric space. I will argue that the entities of space syntax are representations of spatial relations, and hence abstractions, and that this means that they must be held separate from that which they represent (compare: Châtelet, 2000). As Châtelet, I will further argue that these abstractions are inherently transformative and thus may capture other things than the property from which they are originally derived (see further: Knoespel, 1999, 2002). This discussion will proceed through three iterations, one addressing some implications of different ways of understanding and describing analytic entities ‘in themselves’ (‘egocentric space’), one discussing the transformations of entities into systems (‘allocentric space’), and one discussing how such allocentric and ‘non-perceptual’ understanding can further elucidate how processes of spatial cognition and interpretation participate in our reading of inanimate objects (‘the logic of the mannequin’). The last step is used also to investigate the relation between analytical question and theoretical base of models so as to see how theory and modelling can adapt to one another. From this discussion it is suggested that certain analyses of syntactic relations, while possible to describe as visual connections, are better explained by not involving vision as the structuring element of the syntax. Tying it together is a discussion on how an allocentric and transformative understanding of analytic entities, which will be the main discussion in the conclusion. This conclusion will further discuss how the transformative operations that the abstractions used in space syntax analysis do not necessarily depend on the entities themselves being perceived either directly or indirectly, which may explain some found results but also open up for some future theoretical refinement and analytic possibilities.

EGOCENTRIC SPACE: OF SUBJECTS AND OBJECTS

To begin with, the focus will be put on the ostensibly most experientially based entity used in space syntax research, namely the isovist. Isovists are commonly defined as representations of what you can see from a certain point – a definition which also is the original one defined by Tandy (1967), derived from A C Hardy and studies of landscapes, and brought into Syntax research via the work of Benedikt (1979). While thus defined in this way from the beginning, and derived from studies of vision, this very definition of ‘visible

\(^1\) It is worth noting that this kind of definition based on situated experience is nearly absent in e.g. The Social Logic of Space (Hillier & Hanson, 1984), and also has a background role in Space is the Machine (Hillier, 1996) or Decoding Homes and Houses (Hanson, 1998).
from a point’ holds key to its deceptive capacity, illustrated by Turner, Doxa, O’Sullivan and Penn’s (2001) comment that:

“The appeal of the concept is that isovists are an intuitively attractive way of thinking about a spatial environment, because they provide a description of the space ‘from the inside’, from the point of view of individuals, as they perceive it, interact with it, and move through it.” (p. 103)

So, how is this a problem? Is ‘fields of view’ not an explanatory description? Several publications show that for many situations, this is quite informative (e.g. Hillier, 2003; Rohlloff, Psarra & Wineman, 2009; Tzortzi, 2007; Choi, 1999; Peponis, Dalton, Wineman & Dalton, 2004; Koch, 2005, 2009; compare: Lu et al, 2009; Heo et al, 2009). The questions to be raised here could be formulated as: How is it a representation of experience ‘from the inside’? Perhaps more pointedly: What are the implications for our understanding of analytic results and e.g. integration models that is embedded in this understanding of the isovist? Rather than the more commonly noted problems of the isovist lacking dimensions or directions (e.g. Penn, 2003; Montello, 2007), I wish to focus on another issue with stronger but more indirect impact: the more deceptive character of the definition to be centred upon here is the implied basis of the isovist, and anything analysed through it, as a description of where someone is or could be and what someone sees or could see. This ostensibly innocent connotation by implication ties together experience, ego, and representation as inherent parts of one another, which is the source of its attraction as well as its problem, similar to how:

“The attraction of the cone of vision model for a critical theory of visual representations is the explicit place it allocates to the subject as inherent part of the system of representation. The major disadvantage of the model is that it maintains the object as external to the subject, existing in an untroubled relation of ‘outside’ to the subjects ‘inside.’ As I observed, the predominance of the optical model has encouraged the confusion of real space with psychical space, the confusion of the psychoanalytic object with the real object.” (Burgin, 1996, p. 67)

While Burgin’s critique is directed at another representational model, that model holds the same basic problem – namely that it puts an inherent emphasis on the seeing subject. A subject that to certain extents is always singular, located, and static [compare Figure 1], but also understood as perceiving rather than projecting. This leads to explanations of analysis attempting to tie the individual entity to the originating subject (compare: Chatelet, 2000).2 The point here is, it must be noted, another than the one Penn makes when problemising the relation between directionality of vision and circularity of the isovist (Penn, 2003, spec. p. 57; compare: Wineman & Peponis, 2010). For the current argument, the problem is not that the isovist is inadequate as a model of representation of people’s vision because it deforms the properties of seeing (I agree with Penn’s critique under these conditions), but in the very implication that it would represent individual experience in that sense to begin with. In the extension of this, tying the isovist to a seeing subject has implications for the rest of the model to be about objects, and even objectification:

“I believe that the metaphor of the ‘cone of vision,’ predominant in theories of representation since the mid-1970s, is itself responsible for a reductive and simplistic equation of looking with objectification. In so far as this metaphor is drawn from physiological optics, it is inappropriate to the description of psychological functions. In so far as it is drawn from Euclidian geometry, it is inadequate to describe the changed apprehension of space which is an attribute of so-called ‘post-modern’ culture.” (Burgin, 1996, p. 40)

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2 The degree to which this is done varies greatly, and it tends to be in analysis of individual behaviour or narratives specifically but can also be found in reasoning around agent analysis and isovist graphs. It can, however, be traced in tendencies to tie the isovist analysis to analysis of agents with vision (e.g. Penn & Turner, 2003; Penn, 2005) or in the Rational Choice/Game Theory discussion of Markhede (2010).
Figure 1. The Principles of Parallel Projection, from Daniel Fournier, A Treatise on the Theory of Perspective, 1761. The figure illustrates the principles of perspective drawing, but also indirectly the necessity of the viewing subject for the principles to be working.
That is, if the isovist represents the subject, then everything else becomes object, even other people - a claim that is inherently problematic but can be resolved by excluding other people from the equation in favour of a subject-object relation of people and building (or people and material objects). If this is done, the only person left is the subject who is also the origin of the isovists. Notably, this is a common way of making use of isovist analysis or VGA - the behaviour of people in response to space rather than people-person-space complexes. It is even embedded in the methodology even if explanations of found results at times incorporate people-person relations in found emergent patterns. Thus the implication of the isovist as originating as vision from an ego, also places an emphasis on the relation between a subject and external objects. With this said, it must be noted that an interpretation focusing on individual perception is heavily argued against in for instance Hillier and Penn's (2004) rejoinder to Carlo Ratti, and we can also see how Sailer and McCulloh (2011) propose the potential correlations between syntax and performance of offices to be found not via observable movement or direct perception/interaction but via social (actor) networks. Furthermore, Penn (2003) elsewhere argues that the original approach of space syntax was to research societies as distinct from individuals and investigating "what external and common to all individuals" (p.31). Somewhere around this problem we also find a key to the ongoing discussion, which can be illustrated by Lawrence, Payne and De Roue’s (2006) figure of 'egocentric' and 'omniscent' co-presence [Figure 2]. Rather than it being as simple as that one is a multiplication or combination of the other, these are fundamentally different. One is something else than the other at the ontological level of what sort of entity is under scrutiny (individual or collective). The first is dealing with perception and ego in the sense that it handles the question of co-presence with a person, whereas the other deals with collective co-presence which has nothing inherently to do with perception.

![Diagram of space syntax](image)

Figure 2: ‘egocentric’ and ‘omniscent’ co-presence as defined by Lawrence, et al. Figures at first glance remarkably similar to convex spaces and isovists, perhaps further illustrating the implied ego-centricity of the isovist itself. From by Lawrence, Payne and De Roue’s (2006).

The question then arise as to what extent the situated body is a relevant spatial descriptor as the foundation for the definition of the spatial entity used to measure network connectivity in a comparison to social network analysis? If we focus on the reasoning of Penn above that correlations are based on ‘external’ descriptions of space, further supported by e.g. Hillier (2003) stating more strongly that space is inherently
allocentric, what consequences does this have for the isovist, and how can we make it less centred around the perceiving ego? To begin to unpack this, starting at the level of the individual isovist, I will for now illustrate it through a simple observation of something at times employed within the field – the simple act of inversion. That is, to consider the point of origin of the isovist that which is looked at, rather than that which sees;

"Isovists, in the guise of ‘convex isovists’ (the union of all points isovists within a given convex space) have been used for illustrative purposes in space syntax analysis since they provide a clear representation of the strategic views from (or of) a given location." (Turner & Penn, 1999, p. 1)

The simple comment in parenthesis may thus be of great importance. Let us continue by example of the argument for ‘Positioning Analysis’ (Markhede & Koch, 2007). This analysis argues that office space is better understood as described by isovists originating from positions in space commonly inhabited by co-workers than through an analysis of isovists in a general grid. The investigation provides convincing statistics for this being the case by comparing isovists overlapping vertexes of origins (work places) with degree of face-to-face interaction by each worker’s desk. However, there are some problems with the analysis which stems from exactly the argument above – unreflected connections made between the results and the point of origin of the isovist as the seeing subject. The correlation is equally explained by a re-definition of the isovists into an analysis of how many workplaces each workplace is visible from. That is, the exposure possible to measure through isovists rather than the seeing. It is not clear whether the ones who see more actually interact more, while it is clear that those who are visible from more workplaces also interact more.

It also may account better for the relative independency of the found correlation to actual occupancy of desks. Similar results are reported by Wineman and Peponis (2010), working with directed graphs:

"As we deal with directed graphs, a distinction is drawn between degree ‘in to’ and degree ‘out from’ a node. To be consistent with the terminology of previous studies, we will use the term connectivity rather than degree. We will show that ‘connect in to’ a node is a good predictor of behaviors. It is important that our measure of connectivity is not confused with similar measures as applied to nondirected graphs.” (p. 100)

This illustrates beautifully the point being made here in regards to our understanding of individual positions in the spatial system, not as positions of acting from, but position of being moved to. What differs Wineman and Peponis’s argument from the one above, is that ‘the exposed’ is space rather than workers (or objects) – but it is a logically simple operation once the isovist is inversed to simply remove any object (even potential object) from the point of origin as it is no longer logically required. That is, what becomes apparent is how the inversed isovist is fundamentally independent of anything existing at the point of origin, whereas the isovist as a field of vision is fundamentally dependent on a perceiving subject – even when discussed as ‘potential locations for’ this subject.

The findings of Wineman and Peponis also gives a key to understanding VGA analysis, and how it operates in behaviour (most seen in certain respects more important than closest to get from). The interesting part here is then not the potential or syntactic position when there, but the movement to it. Their findings have importance for what an isovist ‘is’, but while unlocking a simple origin-location connection between isovists and behaviour, the results still revolve around a subject-focused understanding of the isovist, even if generalized. It presupposes that it is a question of someone seeing and/or going.
ALLOCENTRIC SPACE: ABSTRACTED CONFIGURATIONS

The apparently logical conclusion above, correlations dependent on either seen or seeing from, is a rhetorical point which serves as a vehicle to take us into the next step of the discussion, namely that of the transformative effects of systemizing individual entities. That is, it may be that compared to integration, both explanations are weak because they are both heavily focused on seeing. It has been repeatedly stated that some of the findings within the space syntax field has less to do with any of these directly experienced properties and more to do with other properties (see Hillier & Iida, 2005; Penn, 2003; Hillier, 2003; Hanson, 1998). What I intend to do here is to discuss how this transformation through systemization has implications for the definition and use of the entities themselves. Thus, it can be pointed to how Turner et al. (2001) states that:

“First, we must select an appropriate set of isovists (in fact an appropriate set of generating locations, according to some criterion) to form the vertices of the graph. Second, given a particular set of isovists, we must determine which relations between them are significant, or are of interest, to form edges in the graph.”

(p. 106)

This is the basis from which emerges the common practice for VGA to use an equidistant grid to generate vertexes which serves as points of origins for isovists, a practice that is chosen because it is considered to be a neutral distribution of origin vertexes.\(^3\) Compared to analyses such as Lu et al. (2009), Markheide and Koch (2007), or Benedikt (1979), this may be so on the level of distributing vertexes, but is it the same when it comes to what it does with the isovists? That is, when deployed in a grid – to what extent do isovists retain their role as descriptors of vision, and even more individual vision, and to what extent are they transformed?

First, it may be interesting to just briefly note that this, analysed through various syntactic measures commonly in the form of different kinds of integration, has been a successful predictor of certain types of behaviour such as movement in a wide range of objects (e.g. Rohlloff et al., 2009; Tzortzi, 2007; Choi, 1999; Peponis et al., 2004; Koch, 2005, 2009; compare: Lu et al, 2009; Heo et al, 2009). However, as with many other results within the fields these tend to be on the level of aggregate patterns rather than individual level (compare: Penn, 2003).

Second, it is of value to compare isovist results with those of other spatial entities in space syntax theory. At this point, I will therefore point to how both the convex space and the axial line in the ‘original’ definition had either social (collective) or geometrical definitions rather than cognitive. That is, rather than lines of vision and movement there was an emphasis on geometric abstraction (compare: Hillier & Hanson, 1984, p. 16-17). Furthermore, it is worth pointing to that in order to construct axial or convex maps, the entities are inherently dependent on their configurational role for their individual definition. Convex spaces are non-overlapping, and axial lines are fewest and longest. It is of vital importance for the axial line itself not that it is ‘a line of vision and movement’, but that it has a system property of representing the fewest but no less than the minimal amount of non-trivial rings in the system (compare: Turner et al., 2001, p. 105). Arguably this system definition of the line is more important than whether the axial line is in fact traversable or not. Furthermore, as Turner (2009) shows, at certain scales of analysis the axial line becomes more or less equitable with road-centre lines. While a specific interpretation of his findings, this seems to suggest that at certain scales network connectivity is more important than the specific perceptual qualities of the individual

\(^3\) Originally compared to either strategic locations or isovist fields as discussed by Benedikt (1979), where the former is a process of selecting the subset of possible isovists that capture the smallest set of isovists that cover ‘all’ points needed to describe the space – a process Benedikt himself acknowledges as providing ‘many possible solutions’.
network entities themselves. Comparing to Hillier (2003) it seems that the specific definition of the entity can be of changing importance depending on scale already at the level of individual places.

Interesting in this discussion is how several different correlations appear when using models of different ‘scales’ in libraries, one incorporating all furniture (compare: ‘kneesovists’, ‘permeability’), one incorporating everything blocking vision (compare: ‘eyesovists’, ‘visibility’) and one incorporating only the ‘building’ (walls, floors, et cetera) (Koch, 2004; 2005). Briefly described, the analysis showed correlation between movement and configuration in all scales. Perhaps more importantly, however, it turned out that when splitting out observations so as to test movement flows compared to the ‘highest level of abstraction’ (i.e. largest scale in which the gate where the flow was measured had a material counterpart), and only to this level, the highest correlations were found for all scales. The overall highest correlation compared movement flows to the building scale (‘basic scale’ in the paper).

While some definitions are unclear and conclusions remain to be developed, this shows that configurative analysis performed on a system of lines (or isovists) made from a spatial model which entities are not perceived directly (they can, at best, be deduced through process; compare: Turner, 2003) has high correlation with behaviour. If this is true, it follows that navigation is not necessarily tied to ‘directly perceivable’ entities, while still being related to material (reduced and simplified) configurations (compare: Zimring & Dalton, 2003). It further suggests that in navigation, space is continuously simplified as far possible (that is, the most reduced but still relevant version operates in navigation behaviour), and that rather than the measure, it is the model (i.e. the scale of objects taken into consideration) that may change between different kinds of behaviour. This corresponds well with Kuipers, Tecuci and Stankiewicz’s (2003) of navigation skeletons that change their level of detail and points of reference depending on purpose and situation, and that of Tversky (2003) discussing different scales of cognitive space including ‘navigational space’. To a certain extent it further corresponds to the foreground/background network as discussed by Hillier (2010) in that the foreground network could be seen as its own ‘model’ in which navigation could take place regardless of the background network.

Figure 3: The ‘scales’ used in the libraries, drawing axial lines based on all furniture (‘detailed spatial scale’), visibility (‘average spatial scale’) and architectural elements (‘basic spatial scale’). The lines are drawn strictly as spatio-geometrical connectivity descriptors. Note that half of the library is not in the illustration, and that there are lines connecting floors reaching outside the floor plan. (From: Koch, 2005, p. 374).
Also important is that the construction of the axial map in itself is performed in a strictly geometric-configurative manner [see Figure 2], emphasizing the spatial configurative connectivity rather than cognitive units. This provided better correlation than one that modelled after the entity understood as perceptual-behavioural unit (i.e. one that models ‘reasonable’ or ‘possible’ walking paths). This is comparable to findings from urban analysis in that it is environments where modelling can follow clear geometric spatial boundaries such as traditional cities that tend to provide higher correlations. Comparatively, environments where modelling depends more on interpretation of perceptual boundaries tend to provide weaker correlations. It should be recognized that the parallel made here is a parallel; there is no consistent evidence that the problem is in the modelling – but, there is not yet any thorough and consistent testing of different modelling principles in areas offering weak correlations. In a sense, common practice seems to assume that what is modelled is movement, whereas there is little obvious reason that the connection between axial integration and movement would be that the axial line is a movement unit. That is, the link between space and movement can just as well be because we navigate spatial connectivity as that the spatial model is constructed through units somehow intrinsic to movement ‘in itself’ (compare: Zimring & Dalton, 2003, p. 9).

This offers a possible explanation as to why VGA often works better in interior spaces: the ruthless grid implementation of isovists in VGA does exactly the same as a ruthless spatio-geometrical deployment of axial lines does in cities or in the studied libraries – it removes the consideration of where you ‘would’ walk from the model and subscribes this interpretation of ‘would’ entirely to the analysis. Continuing this line of argument, it can be claimed that it is the de-subjectification through deployment of multiple isovists in an equi-distant grid rather than any inherent subject-experiential quality of the isovist itself that provides the correlation between walking and integration in VGA analysis. I argue this is so for a large range of (but not all) cases, and that it is supported by research into spatial cognition as, for instance Tversky (2003) describes that:

“One remarkable feat of the human mind is to conceive of some large spaces as integrated wholes rather than piecemeal as they are experienced. Similar to the space around the body, the space of navigation is a mental construction that is schematized. Certain information, such as exact metric information, is systematically simplified and even distorted.” (p. 72)

That is to suggest that the main operation of isovist (VGA) and axial analysis is capturing the systematic simplifications and distortions of space, which can adapt to different scales of action by adjusting the model used for the analysis. The important question for these models then becomes what it is they capture, rather than if the entities have a perceptual counterpart such as ‘eyesovists’ or ‘kneesovists’. Tversky continues by describing how spatial relations in the ‘space of navigation’ are relative to reference frames which by no means have to be the location of the navigating individual – or rather, that it is not (people move, not the world). Thus the aim for a spatial description that captures movement conceptually and theoretically does not have to be tied to situated experience or direct perception. In fact, some syntax results, as noted here, speak against it.

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4 For instance when moving into suburbs modelling tend to shift from spatial-geometric definitions of lines towards behavioural-perceptual definitions (e.g. following walking paths), in effect emphasizing the ‘perceived’ unit over the network description and simultaneously lowering the degree of correlation to movement. Compare e.g. Ståhle’s, Marcus’ and Karlström’s (2005) or Klasander’s (2001) modeling of suburban environments, which here can be used not to point fingers but because they make use of common modeling practice in the field.

5 The superiority of the axial model over the isovist model reported in the libraries can be questioned – the isovist model offers a wider and more detailed range of correlation points and thus is not subject to a max-max procedure such as the one used for axial model, and different models (axial and VGA) in the paper treat elevation differences differently. Indeed, implementing the same way of describing elevation differences on the isovist model as on the axial model raises correlation for the former (see e.g. Koch, 2009).
So, is this to contradict findings such as working with very local perceptual properties measured via isovists (compare: Rohloff et al., 2009; Tzortzi, 2007; 2009; Heo et al., 2009; Lu et al., 2009)? I would argue it is not. It can also be pointed out that while consistent on the larger scale, the correlations on the finer scale found in the libraries were not found in for instance department stores (Koch, 2009; also Penn, 2005), which seems to indicate that even though larger scale skeletons seem to be generally relevant, on a smaller scale other spatial properties or influences can have greater impact. In line with Tversky’s overall argument, it indicates that cognitive skeletons with their reductions start to take precedence when movement turns towards more global. This is furthermore consistent with findings in office studies where global scale analysis have shown correlations between movement and integration, but more local flows or other forms of activity deviate and correspond better to other measurements (e.g. Sailer, 2007; Steen & Markhede, 2010). The model used to analyse this skeleton, then, would not need to be built on perceptually explicit elements, but rather capture connectivity in reduced cognitive spatial models even if it leads to the use of analytic entities never ‘actually’ perceived.

For this to be feasible it must be recognised that the systemic implementation in itself is a transformative operation performed on the entity, that makes its possibility to define as individual unit unimportant or even problematic. That is, there is a transformation of what the isovist represents from showing local perceptual properties to capturing global systemic connectivity. It may even be that these roles of the isovists are fundamentally irreconcileable but valid at the same time. What this points to, is that similarly to how the entity of the ‘isovist’ can be questioned as representation of ‘what is seen from a point’ through internal examination, it can be questioned as such from a systemic point of view.

THE LOGIC OF THE MANNEQUIN: ALLOCENTRIC SUBJECTIVITY

The two discussions above serve to elaborate on space as allocentric and systemic, partly as a result of the interconnection between these concepts. It is from this argument, spatial analysis where analytic entities are de-coupled from individuals or people, that certain knowledge from the cognitive field can be tied to space syntax research. It also shows how analysis is not dependent on units as perceived ‘in themselves’ (or representing direct perception). This theoretically and operationally situates the analysis so that there is more freedom in how to construct the analytic models, and through this it is possible to raise other questions. In order to discuss this we may return once more to situated experience but in a different sense, via what Vanessa Osborne has termed ‘the logic of the mannequin’:

“The logic of the mannequin proposes that shop windows contribute to a tendency to imbue material objects with a capacity to embody individual identity by creating scenarios that invest a wax mannequin with a narrative produced explicitly by its context by, the clothing it wears, and the products that surround it.

This marketing practice constructs a new body promoting viewers to narrativize and subsequently desire or identify with the interchangeable and inanimate yet idealized bodies of mannequins surrounded by appealing commodities in the window’s scenarios.” (Osborne, 2008, p. 187; my emphasis)

Part of the logic of the mannequin is thus identification with the inanimate wax doll, both in an ideological/identity sense and in a situated, bodily sense. That is, the role of the mannequin is to make us imagine ourselves in its place wearing its clothes. A logic that connects its purpose with that of the dressing room (Iarocci, 2008) as well as that of the specifically situated experience of shopping (Chua, 1992). This is, it should be noted, not to claim a mysterious or magical ‘out of body’ perception but a simple act of imaginary cognition similar to how in reading we often quite literally imagine ourselves ‘elsewhere’ (Verschaffel, 2010),
and are able to perceive the environment in which a narrative takes place (compare: Ricoeur, 1981). Thus the ‘logic of the mannequin’ is not a unique process inherent in the mannequin, but rather the ‘logic of the mannequin’ is a specific case of a ‘potential imaginary elsewhere’ that is actualized through the mannequin in that it (a) offers a specific ‘elsewhere’ to be inhabited defined by a de-subjectified body as focal point which (b) encourages this cognitive relocation and identification specifically by this body being in-between identity and non-identity that requests, albeit indirectly, completion. That is, by a certain degree of abstraction. It can thus be argued that it specifically makes use of our capacity to ‘see ourselves in others’ by demanding the ‘other’ to be constructed by means of taking its place.

The parallel to reading supports such a claim, in that the ‘elsewhere’ in reading always is given more detail than what information we have have been provided with, and that we when lacking information ‘complete’ the picture best possible from logical deduction (Ricoeur, 1981). In the case of the mannequin this becomes quite clear if we compare three placings of mannequins as in Figure 4 (or in plan in Figure 5) and the extent to which they relate e.g. to visitors, to each other, and to a wider spatial context. The processes of identifying with these mannequins partially entails establishing a sense of the situated practice of dressing in which it belongs (Entwistle, 2000), and for this the 360° setting captured by an isovist contains important cues for the identity of the fashion on display. This means that where information is lacking, perceptual cues of this missing content will be integrated in our understanding prior to actual knowledge hereof. However, this still resides within a discussion of individual isovist analysis, whereas objects are not singular and their identity depends on how they relate to other objects both conceptually and spatially (compare: Baudrillard, 1996), something that is true especially for fashion, which is a constant play of system identities used to formulate fashion identities through situated dressing practice (compare: Entwistle, 2000; Barthes, 2006).
Figure 4: Mannequins are placed in different situations as in how they relate to space, each other, and the visitor. (compare: Stavroulaki & Peponis, 2003). Photographs by the author.

Figure 5: Two ends of a department store, plans made grey to better show the mannequins (dark grey) and their facing.
To further understand this we can turn to the investigation of Gianna Stavroulaki and John Peponis (2003) of the placing of statues in Castelvecchio, showing how their facing construct a narrative by connecting statues to one another directly or through the visiting subject [Figure 6]. If we, however, consider these ‘inanimate gazes’ to also be opportunities for identification with, and taking the place of, the statues, the narrative can be argued to not only come from their ‘exosomatic’ or ‘external’, objectified, structural narrative, but through our allocentric capacity to ‘take their place’ to experience their relations to one another through one another (compare: Desanti, 2000). Furthermore, in addition to where they are looking, allocentric understanding of spatial experience suggest that how they are looked at by other statues also becomes an integral part of the identity of each individual statue, which in the case of Castelvecchio is also capitalized on. This can be compared to the mannequins and the various directions from which they are or can be seen, and are looked at by other mannequins [figure 5]. A density of mannequins thus does not only work directly through representation of the importance of body and body shape (see Koch, 2007; 2012), but also indirectly through the extended production of gazes and exposure as the mannequins ‘look’ at each other, similar to the statues in Castelvecchio. A presence of the ‘Other’ as collective is generated through indirect and imprecise representation, where ‘I’ can be any of these bodies.

Figure 6: The spatial construction of seeing at Castelvecchio, figure from Stavroulaki & Peponis (2003, p. 66.4). The topmost shows the ‘viewsheds’ of the statues, and the bottommost shows the intersection of gazes where a visitor would ‘complete’ a potential set of viewing connections with the statues.
So far individual relations built into narratives of one to the other. Continuing on this argument it can be pointed to how Stavroulaki and Peponis discuss what in effect is the same as what Turner and Penn (1999) call ‘second order’ relations – how the viewer can become the connector of the gaze of two statues. In this way relations are extended beyond direct gazes. Such argument, even if important, stops at second order relations, however. The question emerges how we can understand relations of third, fourth, fifth (and so on) orders. To begin unpacking this it is worth returning to Ricoeur’s statement that “[t]he art of narration, as well as the corresponding art of following a story, therefore require that we are able to extract a configuration from a succession” (1981, p. 268); that is, we can piece together both story chronology and story connections from a sequential narrative that may play with both for dramatic effect. Similarly, it can be claimed that the systemic/syntactic relationships between mannequins can be extracted from the sequence in which they are perceived. The understanding of the narrative of Castelvecchio, or of the identity of the dress fashions which the mannequins wear, is then only partly dependent on the sequence in which they are encountered, and only partly on how they are individually situated, as their configurative position in the system (as far as it known) plays a part as well regardless of sequence of encounter (regarding sequence and expectation, compare: Kaye, 2000). Consequently, for the process of fashion presentation and interpretation through mannequins, the question is not only how these mannequins offer individual possibilities of identification, but also how they construct systems of positions in space, and how they in this process are dependent on not only direct context and the spatial configuration, but also on their position relative the viewer, other viewers and other mannequins.

In this way, consumption space offers a description of both sides of fashion semiology (Barthes, 2006; Entwistle, 2000) in that it plays with both system and singular bodies. More importantly it can be claimed that a systemic analysis of mannequin placement is the only way to understand their identity description fully, even as situated bodily practice. At this point it becomes clear how an analysis of ‘visual clustering’ of mannequins [Figure 7] can be theoretically and conceptually argued for as fundamental for their commercial function even on clustering levels above the first and secondorder, although which clustering measurement that is most descriptive remains to be investigated. The way it is done in the figures here is by angular deviation in the closest spatial connection (i.e. angular distance). This is an extension of varying sorts of analysis of spatial category construction (e.g. Koch, 2007; 2009; Zamani & Peponis, 2007; Tzorti, 2011) in that it adds relations of several orders (here interpreted as increasing angular distance).

This can also be studied as the clusters formed at a specific level of clustering, as in [Figure 8]. In this figure, the cluster connections are represented as their angular connections through space. This illustrates how clear clusters emerge at certain levels, and how these are of different size and including differently many mannequins. In a pair of cases, these clusters appear differently than a simple hand-drawn deduction would suggest which is because of the analytic process of clustering by average position. However, there are logical, spatial-contextual arguments for this sort of clustering as we are speaking not of simple direct connections but of contextual formulations.

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6 The measurement is further by ‘average position’, which means that it connects the average position of each lower-level cluster to make clusters on a higher level; the software also allows for closest or furthest position analysis, as well as metric, which give at times radically different pictures. It is thus important to note that the figures are to illustrate the concept. The selected measure can be claimed they capture something that is informative for how it is experienced on-site, but full empirical studies remain to be made.
Figure 7. Clustering of Mannequins in Åhlens City 2005 on the Men’s fashion floor (top) and Women’s fashion floor (bottom). The clustering is built on angular distance, and the clustering process uses ‘average position’, that is, for every higher level of category the average position of the mannequins in the lower level category is used to find the next mannequin to include in the category. The analysis is made in SPOT 19, developed by KTH & AEDAS R&D, programmed by Pablo Miranda Carranza and Åsmund Gamlesæter (see Markhede, Miranda & Koch, 2010).

Extending this argument it can be seen how analysis of spatial relations between objects is not dependent on direct perception of the analytic entities (isovists, axial lines, convex spaces) or on that they represent perceptual position, but that they can capture what may be registered and remembered (and hereby ‘perceived’) through their syntactic relations independently of the location of the perceiving ‘ego’ (compare: Ricoeur, 1981; Tversky, 2003; Hillier & Iida, 2005). Such an argument is also made by Stavroulaki and Peponis. Followingly, any object can be used as origin of isovists, in relation to any object and/or space. The argument here is that this allocentric syntactic description is as valid as any description that has to do with ‘seeing’ directly, or with situated experience.

However, we can take this one step further by suggesting than rather than specific clusters, it is the clustering density that is important. That is, not only third or further order of relations between mannequins, but spatial positions in relation to these clustering relations. A way to show this is as in [Figure 9], where all closest angular paths between mannequins are included, providing a figure of the distribution of density of relations of co-belonging in clusters. To a certain extent, this can be claimed to describe the degree to which various parts of the space is included in an indirect density of mannequins, and also to what
extent it is in a complex or simple relation to them – which in itself is highly informative. If we are speaking on the relation to body and Other represented in consumption space, these densities and complexities make a suggestion on the configuration of these relations and the positions in this configuration not only directly but in a larger scale system.

**Figure 8.** The specific clustering studied as halfway between no clusters (clustering degree 0) and all clusters (clustering degree 1) of the floors in figure 7. The grey line running through the dendogram indicates the level at which the clustering is cut off. The analysis is made in SPOT 19, developed by KTH & AEDAS R&D, programmed by Pablo Miranda Carranza and Åsmund Gamlesæter (see Markhede, Miranda & Koch, 2010).
Figure 9. All shortest path lines between the mannequins of the floors presented in Figure 7. Clear differences in density as well as position and complexity of positions can be seen both between the floors and within the floors. The analysis is made in SPOT 19, developed by KTH & AEDAS R&D, programmed by Pablo Miranda Carranza and Åsmund Gamlesæter (see Markhede, Miranda & Koch, 2010).

Of note here is that rather than the mannequin in itself being in focus, it is rather used as a rhetoric vehicle since, first, it is a deliberate act to produce ‘re-embodied’ perception, and, second, it is easy to move in two direction from it: ‘mannequin’ is possible to understand both as the inanimate object and as living mannequins. As an inanimate object it can potentially be extrapolated into other inanimate objects, via various stages of bodily implications (e.g. seats, compare: Baudrillard, 1996), to any object, further into any spatial location (similar to Hillier’s argument of our capacity to experience, without being there, how it would be to be in the centre of a group of people). This then covers the analysis of Stavroulaki and Peponis (2003) analysing statues (bodies-as-objects) and Koch (2009) analysing objects in consumption space, and extends into general VGA analysis. As a living mannequins it can be further extended into any Other, which can be said to be the operation performed by Markhede (2010). It can be argued that the inanimate mannequins play on this very intermediary position possible to extend in all directions: they can be, and are, objects, another, the Other, and ‘me’.

At this point, somewhat ironically, we can note that it may well be in the fact that the isovist is 360° that it in certain situations can be claimed to represent situated (or re-situated) experience rather than in that it somehow constitutes a field of vision or direct perception, and that this is because of allocentric spatial cognition rather than egocentric perceptual qualities. The discussion here, however, is more focused on the
capacity to analyse spatial relations of objects through VGA or other syntactic or systemic isovist analysis ignoring whether these are relations ‘of visibility’ or not (or more specifically: relations of where someone can be and see the other point(s) of analysis). It provides, however, also a deeper understanding of the logic of the mannequin as we can at this point turn the argument from being about the isovist as a consequence of the logic of the mannequin, to explaining the logic of the mannequin as a result of the understanding of the isovist. That is, the mannequin works through its capacity as an abstracted representation which is deployed contextually and syntactically to give not only individual description but a situated description that thrives on space as syntactic and allocentric through this very abstraction. The mannequins are, in a certain sense, concretisations of abstractions of concrete situated bodily practices. Operations that are transformative in themselves, but also invite interpretations of allocentric, syntactic character (i.e. an understanding of oneself in the place of the mannequin, as situated both in its direct local context and larger syntactic position). It plays with the duality of seeing-being seen deliberately to further enhance this contextual syntactic definition within which it acts.

CONCLUSION

To conclude this discussion it is time to return to the effects of abstraction which is part of all syntactic analysis. Remaining with the isovist, it can be reiterated that it is an abstraction and therefore, as Châtelet (2000) argues, inherently a transformation and deformation. While originating from ‘field of vision’ it is transformed into something else by the operation through which it is constructed, and more importantly, this is irreversible. That is, while extracted from ‘field of vision’, it neither is nor represents the same, in that it cannot be re-concretised into vision without significant additional interpretation. Rather than opposing this transformation, or seeing it as problematic, however, it is something that can be taken as part of the analysis itself. What we can see is that beginning with ‘vision’, abstracted in several steps from cones to volumes to slices and fields to isovists multiplied into grids and systems, moving back to concretion can take us another way and end up in a perfectly valid description that is more or less independent of the origin of the initial abstraction. The problem then becomes to elucidate how this transformation operates, which is what this paper has discussed in different iterations. Furthermore, the systemisation of elements into VGA analysis unearths properties that exist only on the system level, and thus are not necessarily explainable via the individual entity (‘field of vision’ or not). Something that is expressed in the Social Logic of Space as that “[s]aying that global form arise from individual behaviour is not the same as saying it is reducible to individual behaviour.” (Hillier & Hanson, 1984)

If we call this attempt to capture another view of what the isovist ‘is’ both in itself and in syntactic analysis a re-concretisation, then this re-concretisation is also a processes of transformation that although leading the end-result to a different place than the initial, may well be informative. It can be argued that the vehicle through which such re-concretisation can be made, is a treatment of the isovist ‘as such’ through its formal definition as geometric object, such as there is, in Benedikt’s (1979) paper, a stringent definition of isovists: “This enables one to reword definition (1) of Vx as the set of line segments joining the vantage point x to points v’ on the boundary surfaces δVx − Rx .” (p. 52)

Deploying this geometric abstraction of space into an abstraction of spatial configuration such as in VGA, it is conceptually easier to experiment with analysis of spaces with what is commonly referred to as higher or lower ‘resolution’ as the insistence on ‘visibility’ is let go of. Analysis can then be performed on resolutions unrelated, or at least only vaguely related, to vision (compare: Koch, 2005). Rather than increased resolution
leading to better precision, it may be that decreased resolution, contrary to what may be expected, increases precision. It is a geometric abstraction that captures connectivity on a level on which the analysed problem operates, which for some but not all cases corresponds to perceptual entities. This furthermore allows for better understanding of emergent patterns that are difficult or impossible to reduce to individual behaviour or direct cognition. If syntactic integration arise from axial lines or isovists as cognitive elements, this does not mean it is reducible to lines of seeing and going or fields of vision.

With this said, it is important to note here is that in many cases, the definition/interpretation of isovists as tied to experiencing subjects and their vision is entirely valid, and such analysis can shed light on perceptual-behavioural questions investigated. The point is not to disqualify these propositions, which greatly contribute to our understanding of relation between space, perception, and behaviour, but that there are other aspects of spatial cognition – or at least of space – that do not follow this very direct and concrete understanding, and that if we allow ourselves only to read the isovist as the former, then potential knowledge risk passing us by. From this perspective it seems of importance to bring these strands together into a more comprehensive discussion on what form of spatial representations the field is working with, and in such a discussion the isovist turns out to be the most suitable example as it best illustrates relations between concrete geometry, situated experience, abstraction, systemization, and the transformations that are an inherent part of abstraction or diagrammatisation that makes the representation other than the initially represented (Chatelet, 2010). One point of the paper is an investigation into how taking the representation (axial line, convex space, isovist) at face value as what it is ‘on paper’ rather than through what it may or originally was meant to represent, to see what this may lead to – i. e. using the representation itself as vehicle for analysis and research in similar ways as was done already in the Social Logic of Space. The main point, however, is how the extended reasoning from such an approach enables a discussion such as the one regarding the logic of the mannequin above, as it is questionable whether any explanation of foundation based on vision will provide a reasonable theoretical framework for it, whereas other understandings can.

The purpose, and conclusion, is thus to conceptually open up a wider field of syntactic analysis and point to fields of exploration. Some of this is already done, as noted, with various expansions into theoretical implications, whereas other remains to be investigated. This includes analyses of scales or of systems that are at current little explored, and which deserve further attention, as well as continuous efforts in remodelling and revising architecture in order to elucidate if there are consistent relevant scales, and if so which they are. Finally, it has been discussed how syntactic relations between objects and positions through space can be conceptualized beyond first and second order relations, and how this is more reasonably explained letting go of direct perceptual description in favour of a system-cognitive interpretative understanding.

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