A CORPUS-BASED APPROACH TO DANISH TOILET SIGNS

by
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This article relays the findings of a small corpus study of pictograms for public toilets conducted in collaboration with a group of students at International Business Communications at the University of Southern Denmark, Slagelse. The corpus consists of 97 images of public toilet pictograms collected by the students with mobile phone cameras during September and October 2012. The article presents a tentative approach to corpus-based studies of graphic form and, to that end, proposes a descriptive scheme with two formal systems, SHAPE and ENSHAPENING, which in concert with a fractal-derived principle of self-similarity adequately accounts for graphic form in public toilet signs.

1. Introduction

From the point of view of the semiotics of places, public toilets are rather enigmatic: At once indispensable, ubiquitous and completely ordinary, yet at the same time, at least for many people, intensely private bordering on embarrassing. Public toilets as material places are enmeshed in a social order characterised by these tensions and so make public toilets and the discursive patterns related to them a rich field of study for semioticians, linguists, anthropologists and sociologists alike. Literature seems to pivot on their role in the dynamics of societal inclusion and exclusion, for example their relation to issues of gender and segregation (e.g. Lacan & Brandt 1973; Anthony & Dufresne 2007; Davies & Knox 2007; Overall

2007; Jeyasingham 2010; Cavanagh 2011; Moore & Breeze 2012; Schapper 2012) and equal opportunity (e.g. Kitchin & Law 2001; Siu 2006, 2011).

This article approaches public toilets as places in a different way. It places less emphasis on public toilets as material places but rather focuses on the ways in which toilets are announced in the urban environment using graphic signs, such as those depicted as (1) and (2) below.

Figure 1: *Pictogram for women's toilets issued by United States Department of Transportation, designed by American Institute of Graphic Arts (AIGA).*

Figure 2: *Pictogram issued by Danish Standards (under the Danish Ministry of Business and Growth).*

In other words, the article investigates toilet signs as graphic phenomena. On casual observation, public toilets announce their presence to the public in much the same way using for example the ubiquitous ''severed head-people'' shown in (1) and (2), which are very likely inspired by the pictograms developed for the 1964 and 1972 Olympic Summer Games in Tokyo and Munich respectively. (Abdullah & Hübner 2006: 64). On closer inspection, however, graphic toilet signs are quite different. Mostly, they do their job in the urban environment clearly, quietly and modestly, but every now and again a sign will make more of a show of itself. Or rather, whoever is responsible for the sign will have made a flashier choice. A likely point of departure for a discussion of this is the distinction between 'pictograms' and 'icons' made by typography and design experts Rayan Abdullah and Roger Hübner, who write:

> Pictograms are used to warn, guide or protect and need to be immediately decipherable. They must get right to the heart of the matter by visually conveying a vital piece of information in such a way that it cannot be misunderstood […]. Consequently, in terms of design they are bound by much stricter, formal constraints that demand great discipline. […| Icons, in contrast, are primarily used to communicate messages in a fun way and therefore enjoy much greater freedom of design. (2006: 6)

It is likely that toilet signs fall in both categories. Sometimes, the responsible party will announce the presence of a toilet in a quirky or fun way. At other times, they will be announced in a more detached manner. This article asks whether Abdullah and Hübner's 'pictogram' and 'icon' categories can be captured descriptively and whether the distinction somehow converges with the sort of place in the urban environment, in which the toilet sign does its work.

One study from Turkey (Noyan 2006) is superficially similar to the one I present here, but takes a very different line of inquiry.

Based on 200 images of toilet signs (2006: 13), Noyan takes a diachronical, cultural-historical view on how public toilet signs reflect developments in representations of male and female identities in Turkish visual culture since the formation of the Turkish republic. In contrast, the present study takes a synchronic perspective. It aims to explore how the descriptive scheme for graphic form suggested by Johannessen (2010, 2012) can be applied in a corpus-based study of a particular practice of graphic communication. The aim of the article is two-fold: First, it presents a tentative approach to corpus-based studies of graphic form. Second, it discusses how its findings can be interpreted in terms of the toilet pictogram's appearance in environments regulated by larger discourses, such as public transportation or the restaurant business.

2. Hypothesis

The study is based on the following assumptions: First, it assumes that **a public toilet pictogram can be assigned status of autonomous text irrespective of its material situatedness** in or around an actual toilet space. This is not meant to disregard the way in which that situatedness constrains people's perception of the pictogram or their actions as they interact with it in the urban environment. Rather, it is a methodological requirement, the fulcrum around which the analysis pivots. The corpus is described using a scheme, the categories of which are explanatorily justified by graphic conventions reflected in graphic production technology such as Adobe Illustrator™. One such convention is Illustrator's 'pen-tool', which allows the articulation of an infinite number of shapes with only very few different kinds of points of interaction, the so-called 'anchor points'.

This is tied to the second assumption; that **public toilet pictograms as texts are constrained by graphic conventions that have emerged out of graphic acts** over time spans ranging from decades

to centuries or even millennia (Johannessen 2010: 162) as performers have enacted **graphetic articulation**. The term 'graphetic' is used as a graphic counterpart to phonetics (cf. Johannessen 2010: 118) and 'articulation' is used in a broader-than-usual, multimodal sense (ibid.: 121): ''Articulation occurs when a performer, as an effect of his communicative intent, acts bodily to manipulate the material substance of a semiotic mode.''[1] The backdrop for this use of 'articulation' consists of enactivist[2] approaches to sensorimotor knowledge (O'Regan & Nöe 2001a, 2001b; Nöe 2004, 2009), direct realism in phonetic perception (e.g. Fowler 1986) and James J. Gibson's ecological approach to visual perception (1966, 1989[1979]) more specifically his theory of affordances (1989[1979]: 127ff) and their status as organism-environment relations as outlined by radical embodied cognitive science (Chemero 2009: 135ff). On this view, the production of public toilet pictograms, considered as a class of acts, is a subset of graphetic articulation. Other such acts include the production of letterforms, numerals, musical notes, maps, logos, wallpaper patterns etc. Thus, the study opts methodologically, albeit not theoretically, for a performer's perspective on graphic texts.

Third, the study assumes that **toilet pictograms are the material result of an articulatory event**. Over the course of some time span, someone has **articulated** the pictogram. This entails someone having done something with her body to manipulate some kind of material or immaterial substance, the results of which are pictograms. On the enactivist view, no act of articulation and so no articulatory event can occur, if it is unsupported by human biology. This follows O'Regan and Nöe (2001a, 2001b) and Nöe (2004, 2009), according to whom a human phenomenological experience or perceptory event cannot occur unless it is made possible by our bodies. In other words, we cannot articulate outside the possibility space afforded us (cf. Gibson 1989[1979]) by the relations between body, substance and environment. Acts of articulation commence at one point in time and end at a later point in time. The interim is 'the event of

articulation', and it can be analysed further into smaller sub-events on different time scales (cf. Uryu et. al. in press) such as 'stroke events' and 'micro events' (Johannessen 2012: 163ff) even as it can be regarded as a sub-event to larger toilet designing events.

Thus, the hypothesis pursued in the study is that the articulation of public toilet pictograms is constrained by two different levels of conventionalization: At a general level, graphic articulation as such is constrained by graphic conventions that have arisen on a very long time scale. These are the conventions by which surfaces in the urban environment are graphically treated so as to reflect light differently thus sub-dividing the surface into regions of "[…] visual invariants that are co-extensive in a topological-continuous visual field" (Thibault 2007: 121). On a more specific level, the articulation of public toilet pictograms is constrained by conventions specific to discourses of e.g. public information or marketing and branding, such as those exemplified by e.g. Abdullah and Hübner (2006).

3. The image corpus

The study was conducted in collaboration with a group of undergraduate students enrolled in a course on multimodal social semiotic text analysis and design at the University of Southern Denmark.[3] The students collected the image corpus and gave their input to the interpretation of the results during class sessions.

The study is based on a small corpus of 97 photographs of pictograms from the doors of public toilets from all over Denmark (though primarily from the larger Copenhagen area). A selection of the pictures can be seen as (3).

The students took all the pictures in September and October 2012. They were instructed to take pictures of 'pictorial signage' from public toilets in Denmark wherever they happened on it and

Figure 3: *Selection of the 52 pictograms for women's public toilets*

submit the pictures by e-mail with a caption stating (i) where they had been taken and (ii) which (if any) company or organization was responsible for the pictogram. They were instructed to ignore written signs and instead focus on depictions of the two genders. There is a slight over-representation in the data set of pictograms for women's toilets (the ratio is 52 for women's and 45 for men's) as well as pictograms from train stations, cafes, restaurants and fitness centres, which is, in all likelihood, due to the slight overrepresentation of female students in the class (17/12) and the general life situation of Danish university undergraduates. The data sample is very small, and the criteria on which it was collected are only loosely defined. Thus, the greatest value of the study is in its suggestions on how corpus-based studies of graphic conventions can be carried out.

4. Graphic form in multimodal social semiotic literature

The data was analysed using a trimmed version of a descriptive scheme proposed in Johannessen (2010, 2012). The scheme was originally developed for use in forensic analysis of graphic trademarks, or logos, in order to achieve inter-subjective transparency in legal disputes over possible trademark infringements. Thus, it was not intended for quantitative studies of larger corpora of graphics texts but rather for in-depth comparative analysis of sets of two instances of graphics, those of the plaintiff and the defendant involved in a complaint. As a result, the scope and level of delicacy in the original scheme would be unmanageable in studies such as the present one.

The original descriptive scheme was developed in recognition of what seems to be inadequate descriptive readiness for graphic form in multimodal social semiotics, especially when faced with structurally very simple texts such as most logos, typographic letterforms or, indeed, public toilet pictograms (ibid.: 108). At heart, it is a question of how we approach 'shape' descriptively. Shape is often mentioned in passing in theoretical overviews of multimodal resources (e.g. Arnheim 1969; Kress & van Leeuwen 1996: 54ff; Meng 2004: 35; Alias 2004: 68; Lim Fei 2004; van Leeuwen 2005: 212; Thibault 2007: 136), but none of these accounts develop the concept as a formal resource to the point of descriptive usefulness. For these schemes to be descriptively adequate, they would need to move beyond their very general discussions of shape in relation to the ''good shapes'' (Roberson et. al. 2002) of gestalt psychology, general geometrical shapes, such as ellipses, rectangles etc., and distinctions between regular and irregular shapes. Seen through the lens of such descriptive schemes, many letterforms or indeed toilet pictograms appear to be similar, because they haven't been worked out to capture the differences that hide in the minutiae of graphic shape. The crux of the critique in Johannessen (2010, 2012) is that the literature is ''[…] more preoccupied with the level of analysis at

which individually meaningful elements are structured into texts'' (2010: 108ff) at the expense of a carefully worked-out theory of the materiality of multimodally constituted texts. Crucially for the study of graphics, this includes the shape of individually meaningful elements and thus the question of how they acquire meaning in the first place.

5. Graphetics and graphology[4]

The theory of graphic form, which is proposed in Johannessen (2010, 2012) in order to remedy this shortcoming, describes graphic form in relation to two distinctly different fields of study: 'Graphetics' and 'graphology'. Graphetics studies the first-order[5] (cf. Thibault 2011) possibility space for graphic articulatory dynamics including the affordances of the body, graphic tools and substances. It is comparable with articulatory phonetics and studies specific kinds of energetic flow through systems. Graphology studies the second-order (cf. ibid.) abstract potential for distinguishing graphic meaning, and is comparable to phonology.

For the purposes of the corpus-based approach to public toilet pictograms proposed here, I consider primarily second-order graphological features of the signs. However, graphetics are always in play, because the very graphic conventions captured in the descriptive scheme are hypothesized to have emerged out of countless first-order (whole-bodied, sensorimotor) acts of graphic-based attunement between co-acting agents. The most basic set of conventions underlying graphic expression is currently manifested or so I argue, in the features built into the user interface of e.g. Adobe Systems'™ Illustrator™ software.

> The potential of shape is infinite. Intuitively, a software application capable of producing any shape must therefore also

> be infinitely complex. However, this is far from the case. In Illustrator and similar software applications, an inventory of only a handful of different kinds of points of interaction with the represented shape allows remarkably simple and intuitive articulation of any two-dimensional shape. (Johannessen 201: 153)

In other words, on the assumption that most contemporary public toilet signs have been articulated using vector-based graphics software, the analysis of the corpus has been conducted using categories derived from such digital environments. Together, the categories form a simplified version of the original descriptive scheme from Johannessen (2010). It distinguishes two overall systems, SHAPE and ENSHAPENING: Two systems are required in order to capture descriptively the fact, that any region of a surface of a given shape can be rendered, or 'enshapened' in a number of different ways – with no consequence for our analysis of the shape proper. Consider, for example, the three different versions of the pictogram for women's toilet (articulated by the author based on DS-2301-1 issued by Danish Standards under the Danish Ministry of Business and Growth) shown as figure (4)-(6):

At a certain, ideationally informed level of observation, the three pictograms consist of coloured regions with identical shapes[6] depicting an anthropomorphic figure with a circular disc for a head, arms held out from the body, legs held together at the ankles and also appearing to wear a skirt or dress. Note also the identical circular curvature at the ends of arms, legs and shoulders as well as on the hem of the skirt. These three instances of **the same shape** have been rendered, or enshapened, differently, using different figure-ground structures: In (4) the shapes are rendered using uniform black areas (a bi-variate figure/ground relation), in (5) a black outline is used (a tri-variate figure/interior-ground/exterior-ground relation) and

Figure 4: *Bi-variate figure-ground relation*

Figure 5: *tri-variate figure/interior-ground/ exterior-ground relation*

Figure 6: *level L-1 figure/ground relations combine to compound a level L figure*

(6) uses a multitude of uniform black areas, the sum of which have the same shape as (4) and (5) (level L-1 figure/ground relations combine to compound a level L figure). The systems SHAPE and ENSHAPENING have been developed to capture these similarities and differences in a way that is descriptively adequate for the purpose of a corpus-based study such as this one. These categories have been chosen, because they feature saliently in software for graphic articulation. On the one hand, the producer articulates the 'shape' using vector path tools such as the pen tool, on the other hand, she articulates the 'look' of the shape by choosing filled or stroked shapes, dashed lines, patterned fills etc.

Furthermore, in order to address issues of recursivity in the system networks and achieve a greater level of accuracy in the description, a fractal-derived principle of self-similar structure is introduced.

In the next three sections, I will introduce the two systems as well as the underlying organizing principle of self-similarity at some length before demonstrating how they apply to the corpus collected by the students.

6. Shape

Given that one's perspective is on paradigmatic systems of choice relations rather than syntagmatic structure, I will argue that any instance of graphic shape can be analysed satisfactorily with a very small number of variables. In order to do so, one has to take into consideration that those variables are structured in a **self-similar** way reminiscent of mathematical fractals. My use of 'self-similarity' here follows Van Holden, Orden and Turvey (2003) who describe a fractal pattern as a structure, which "[…] repeats similar features across nested scales of space or time" (2003: 333). I shall return to the self-similar structuring of SHAPE and ENSHAPENING in a little while, but first we need to specify the kinds of features they describe.

The unit of analysis for our purpose here is a visuospatial **difference that makes a difference** (following Bateson 1972). The choice relations have been abstracted from how one articulates and interacts with vector shapes in Adobe Illustrator™ using the pen, convert direction point, and other selection tools (which allow you to (i) create and delete so-called anchorpoints, (ii) toggle their status as angles or curves, (iii) specify their angle or amount of curvature and (iv) move them around).

At the most general level of delicacy, the system SHAPE (Fig. 7) represents the observation that any instance of shape falls in one of two categories: 'Straight' or 'Un-straight'. There can be no instance of shape in the world, which is neither straight nor un-straight. Furthermore, no single instance of shape (remember that our unit of analysis is a difference that makes a difference) can be both straight and un-straight at the same time. Straightness and un-straightness are structurally distinguishable by the number of spatial dimensions in which they specify something's extent.

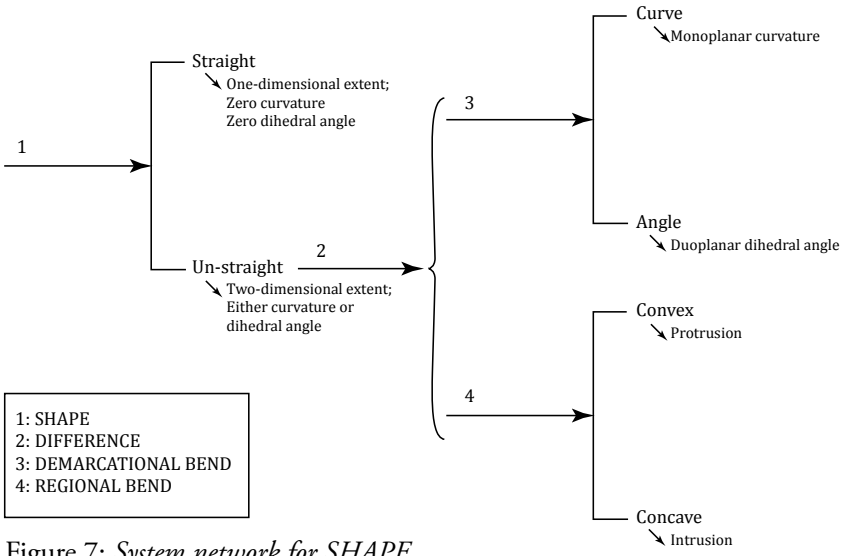

Figure 7: *System network for SHAPE*

Disregarding spatial orientation, straightness can be regarded as a strictly one-dimensional property of a structure. It specifies only the length of that which is straight and **no difference** beyond that. Un-straight, however is a two-dimensional[7] property, which specifies a difference beyond length: A curvature or a dihedral angle.

The system DIFFERENCE (Fig. 8) represents the simultaneous choice between two kinds of difference. On the one hand, a difference in an expanse demarcates two regions from one another. This demarcation can be regarded as 'planes with more or less bend' (zero bend means no two-dimensional difference, and thus an instance of Straight). The system DEMARCATIONAL BEND represents the choice between monoplanar and duoplanar bend in a demarcation. A bend in a single plane (monoplanar bend) is a 'curve', a bend in the intersection between two planes (duoplanar bend) is a 'dihedral angle'. One could pursue these choices into still more delicate clines representing potential amount of curvature or potential angle of a dihedral, but I find that unwarranted here.

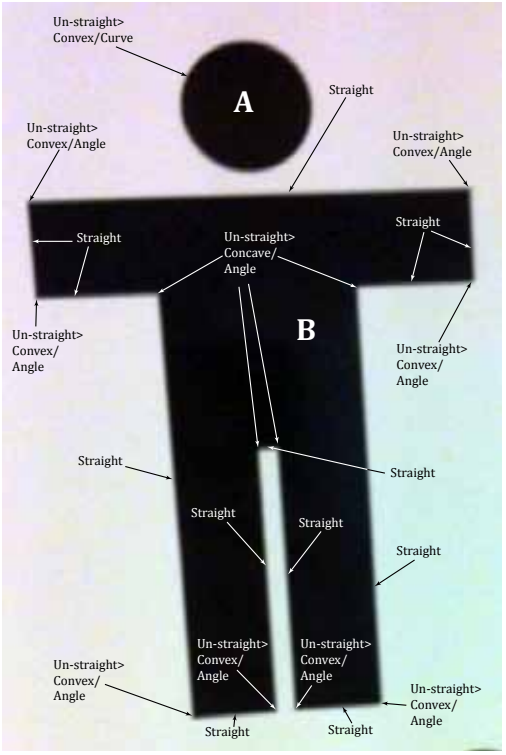

Figure 8: *Analysis using SHAPE*

Figure 9: *All angles*

Figure 10: *All curves*

On the other hand, the regions thus demarcated can be subject to two kinds of bend irrespective of whether that bend is a curve or an angle. The system REGIONAL BEND specifies the choice between whether a bend in a demarcation protrudes from the region or intrudes into the region. A protrusion from out of a region is a 'Convex', an intrusion into a region is a 'Concave'.

Altogether there are four possible permutations of choices in DIFFERENCE: Un-straight>Convex/Curve, Un-straight>Concave/Curve, Un-straight>Convex/Angle and, finally, Un-straight>Concave/Angle. Adding Straight to this list of possible choices yields 5 kinds of difference, which can make a difference in relation to something's shape.

They have all been instantiated in at least one of the three pictograms from the corpus shown as figures (8)-(10). All three pictograms adequately denote Men's. Note how all differences that make differences in figure (9) are either Straight or Un-straight>Angle (the latter in both Convex and Concave varieties) whereas in (10) they are all Straight or Un-straight>Curve (even the bends at the waist, the armpits and the groin). Figure (8) is predominantly a mix of Straights and Angles, but one region (A) consists only of one distinguishable instance of shape: Unstraight>Convex/Curve.

7. Enshapening

A necessary condition for something to count as a graphic phenomenon is that it demarcates an expanse into at least two distinct regions, one of which must be a 'figure' region, the other a 'ground' region. In other words, we cannot disregard the importance of the legacy of gestalt theory for our understanding of graphic form (e.g. Rubin 1915; Wertheimer 1935; Arnheim 1974):

> Two-dimensionality as a system of frontal planes is represented in its most elemental form by the figure-ground relation. No more than two planes are considered. One of them has to occupy more space than the other and in fact has to be boundless; the directly visible part of the other has to be smaller and confined by a rim. One of them lies in front of the other. One is the figure, the other the ground. (Arnheim 1974: 228)

If SHAPE represents the potential differences of straights and bends in the demarcation of one region (or "plane" in Arnheim's words) from another, the choice relations in the system network (11) represent the potential for differences in figure-ground constellations as they pertain to regions of given shapes. The system ENSHAPENING represents the simultaneous choice between three kinds of differences, all of which pertain to figure-ground relations in the graphic structure:

FIGURE TYPE describes the difference between shapes that pertain to figure or ground respectively. If a shape pertains to a figure, it is a 'positive shape'. If it pertains to the ground, it is a 'negative shape'. (See Fig. 11)

FIGURE COMPLEXITY describes the choice between whether a shape pertains to a single, monoregional figure, a 'Conjoined shape', or figure made up of multiple regions, a 'Compounded shape'. The latter choice is described by Baldry and Thibault's (2005) notion of ''functional clusters'' and Boeriis' (2012) notion of ''structural affinity''.

GROUND COMPLEXITY describes the choice between figure-ground relations of varying complexity. If such a relation only demarcates two regions, one figure and one ground, it is a 'Massive shape'. This description adheres to figure (4). If, on the other hand, a figure-ground relation demarcates three regions, one figure, one interior ground and one exterior ground, it is an 'Outline shape'. This may be observed in figure (5).

At a general level of observation, the three simultaneous choices of the ENSHAPENING system yield eight different permutations, all of which are shown in the chart in figure (12). These are, of course, idealized examples. In many cases one can expect to find several of these enshapenings realized in the same structure.

If one analyses the three pictograms in figures (13), (14) and (15) according to the features described in the ENSHAPENING

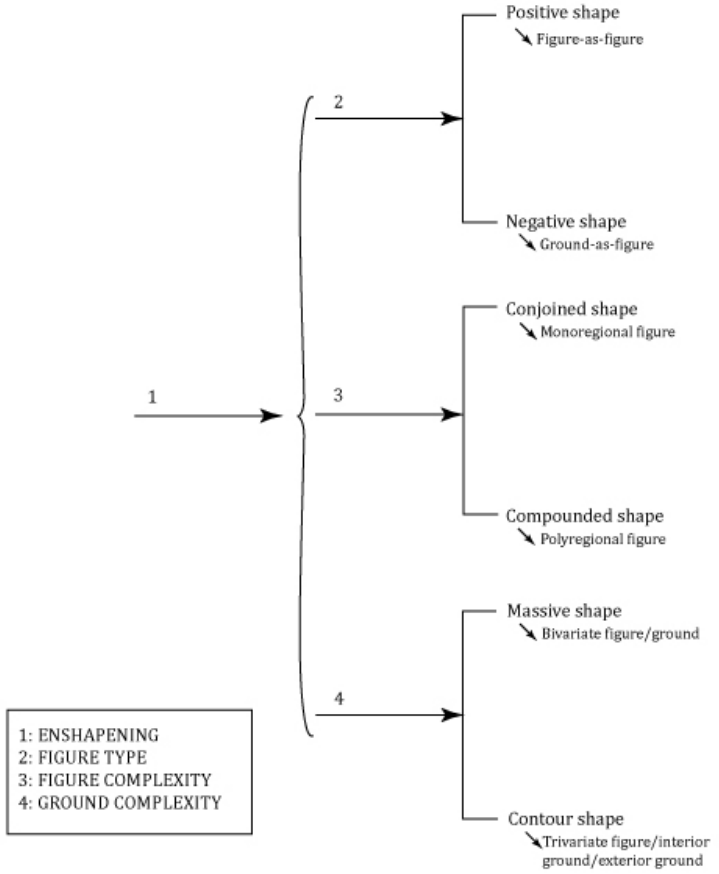

Figure 11: *System network for ENSHAPENING*

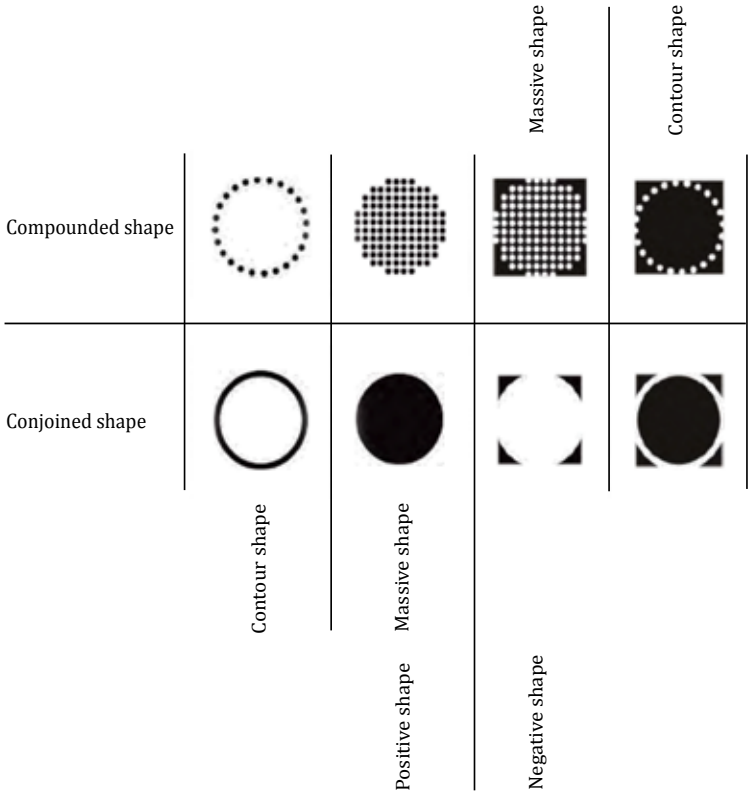

Figure 12: *Chart of permutations of choices in ENSHAPENING.*

chart, (13) is Positive/Compounded/Massive, (14) is Positive/Compounded/Contour and (15) is Positive/Conjoined/Massive.

The analysis of many of the pictograms in the corpus using SHAPE and ENSHAPENING is quite straightforward, as I have just demonstrated. However, as the number of distinct regions in a compounded structure increases, so does the complexity of the analysis. We've already seen this in the analysis of figure (8), in which it was neces-

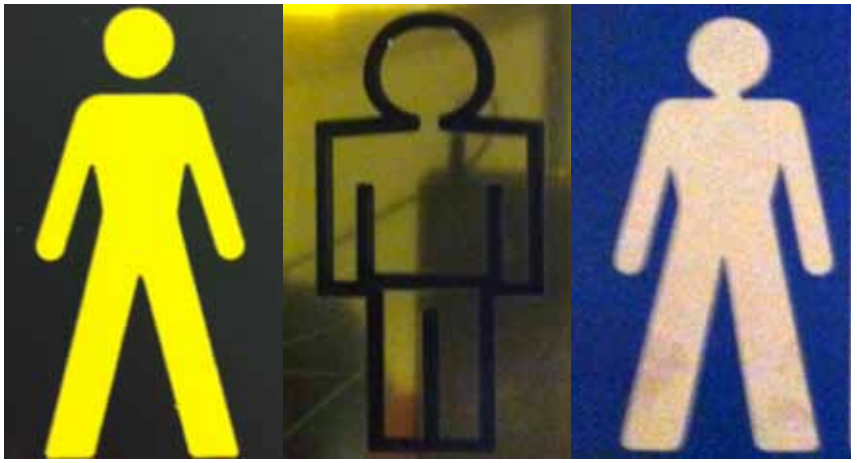

Figure 13: *Positive/Compounded/Massive*

Figure 14: *Positive/Compounded/Contour*

Figure 15: *Positive/Conjoined/Massive*

sary to distinguish two different regions, A and B. But this analysis still counts as relatively straightforward. How, on the other hand, do we go about describing the shape of the pictogram in figure (6)? How can the same analysis accommodate (i) the shape of the anthropomorphic figure and (ii) the shape of the 363 massive disks of which she is made up? I propose to do so using *scalar hierarchical analysis* (cf. Salthe 1991; Lemke 2000a, 2000b; Thibault 2004), which allows us to capture analytically the self-similar organization of SHAPE and ENSHAPENING. Consider the simple commutations shown as figures (16)-(21).

Figure 16:
Level L curves

Figure 17:
Level L and L-1 curves

Figure 18:
Level L, L-1, and L-2 curves

Figure 19:
Level L angles

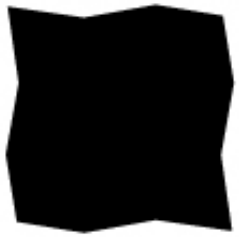

Figure 20:
Level L and L-1 angles

Figure 21:
Level L, L-1, and L-2 angles

All six pictures are instances of Positive/Conjoined/Massive in the ENSHAPENING system. Furthermore, in accordance with the SHAPE system described in figure (7), figures (16)-(18) are made up **entirely** of Curves, (19)-(21) **entirely** of Straights and Angles. We readily recognize figure (16) as a circle and (19) as a square. Of the six examples, they have the smallest variety of SHAPE features, because they have only convex instances of curves and angles. In the remaining examples, instances of curves and angles have been added, alternating between convex and concave. Interestingly, we can still appreciate the relative 'circleness' and 'squareness' in the complex organizations of curves and angles of figures (18) and (21).

I am suggesting that this has to do with self-similar organization of SHAPE features in graphic form, and with the fact that shapes must be understood as ''natural fractals'' (Van Orden et al. 2003: 334), which Van Orden, Holden and Turvey describe thus:

> Fractal patterns are identified by scaling relations. […] In mathematical fractals, the same patterns can appear across an infinite range of scales, a precise form of self-similarity. Yet natural fractals are not pristine mathematical objects. Natural fractals display a rougher, more irregular form of self-similarity, statistical self-similarity, across a limited range of scales. (Van Orden, Holden and Turvey 2003: 334)

The analysis of scaling relations has already found its way into those branches of social semiotics preoccupied with the relation between meaning-making and ecology, most notably represented by scholars such as Paul J. Thibault (e.g. 2004) and Jay Lemke (e.g. 2000a, 2000b). In other words, the relations are used as a framework for understanding the interfaces (cf. Halliday and Matthiessen 2004: 24) between, on the one hand, second-order phenomena such as lexicogrammar, discourse and text (the semiotic system) and, on the other, first-order biology (the human organism-environment relation).

According to Salthe, scalar hierarchies are remarkably useful meta-theoretical tools for analysing any subject matter involving differences in scale (1991: 252). Meronymic relationships of parts and wholes, such as the nested shapes within shapes that are of our concern here, provide good examples. The logic is pretty simple: Big things, such as texts or organisms, are made up of smaller things, paragraphs and organs, which are made of still smaller things: sentences and words, tissues and cells. Or, in the case of graphic shapes, larger features (say, convex curves) are made up of smaller shape features (alternating convex and concave curves). Consequently, in

order to be true to its subject, an analysis of a scalar hierarchy must always investigate at least three adjacent scales. This is because the dynamics constitutive of one scale are isolated from the dynamics on other scales.[8] If one only observes the binding relations between two adjacent scales in a system, one cannot claim to have described qualities of the system as a whole (Salthe 1991: 252).

I have adopted the annotation of scalar hierarchies used by Lemke (2000a), according to which the focal scale for an analysis is 'L', the scale nested within it is 'L-1' the scale within that 'L-2' and so on. On this view, the squareness of the L shape of figure (19) is still recognizable in (20), even though a flag-like L-1 shape is introduced. Furthermore, the Convex/Angle and Concave/Angle of the flag-like L-1 shape are still distinguishable although further instances of Convex/Angle and Concave/Angle are introduced on L-2. Thus, I am suggesting that in our quest for descriptive adequacy in relation to the SHAPE and ENSHAPENING features of graphics, we ought to consider their status as natural fractals in which the same features are repeated across a limited range of scales. The anthropomorphic figure in figure (6) has a shape on L, which is similar to the shapes on a similar scale of (4) and (5). But in figure (6) it is enshapened as a compound of L-1 shapes, all of which are Enshapening>Positive/Conjoined/Massive disks (Shape>Un-straight>Convex/Curve).

Of course, there are boundaries for shape features as communicative phenomena: If one were to look at the examples under a microscope, one would find shape features in the way the fibres in this paper have absorbed pigment, but these features have in all likelihood not been articulated by the performer as an effect of his communicative intent. Thus, these are natural fractals (cf. Van Orden et. al. 2003), not ''pristine mathematical objects''.

9. SHAPE and ENSHAPENING in public toilet pictograms

The 97 pictures of public toilet pictograms were submitted to quantitative analysis of level L enshapening. Furthermore, selected pictograms were submitted to qualitative analysis of shape in order to examine the relation between L and L-1 shape features.

9.1 Level L enshapening

The distribution of enshapening features in the 97 pictograms gives a fairly consistent picture of how public toilets are announced in the urban environment. The distributions are shown in Table 1.

Positive/Compounded/Massive	65%
Positive/Compounded/Contour	
Positive/Conjoined/Massive	21%
Positive/Conjoined/Contour	8%
Negative/Compounded/Massive	
Negative/Compounded/Contour	
Negative/Conjoined/Massive	
Negative/Conjoined/Contour	
Unaccounted for by the descriptive scheme	6%

Table 1

Note that 6% of the sample is unaccounted for by ENSHAPENING. Two of the signs, a henna-painted woodcut found in an Indian restaurant in Copenhagen and a sign painted with acrylic paint on fibreboard found in a bar in the town of Odense, are depicted as figures (22) and (23).

Recall that the students, who collected the sample of toilet signs, were instructed to take pictures of ''pictorial signage from public toilets in Denmark''. One might argue that the inability of ENSHAPENING to account for these specific cases indicates that the

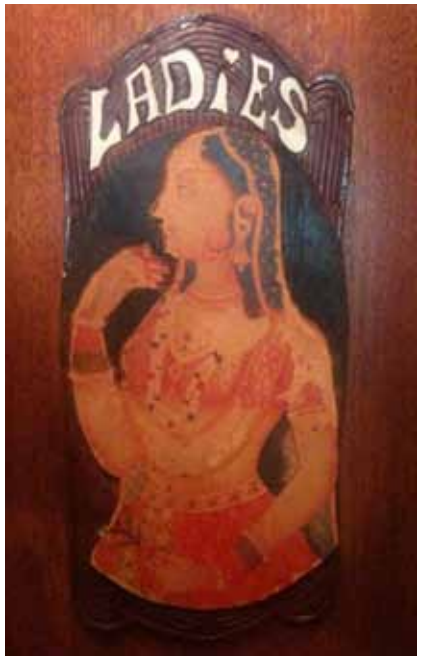

Figure 22: *Indian restaurant, Copenhagen, Denmark*

Figure 23: *L.A. Bar, Odense, Denmark*

system is descriptively inadequate. I do not believe this is quite right. It is beyond question, however, that there is a flaw somewhere in the description, but SHAPE and ENSHAPENING can adequately account for most cases of what we generally refer to as 'graphic' (e.g. typographic (cf. van Leeuwen 2005; Stöckl 2005) or signographic (cf. Stötzner 2003)). I rather think the flaw must be sought at the level of description on which we distinguish 'pictorial' from 'graphic'. Many different kinds of pictorial practices are commonly labelled 'graphic'. They range from CGI-effects (computer generated imagery) in movies over manipulated photos to wallpaper designs and letterform design. We have yet to determine the necessary and adequate conditions for something to count as graphic. At a more

Figure 24: *Café Vivaldi, Næstved, Denmark*

Figure 25: *Copenhagen Airport, Kastrup, Denmark*

Figure 26: *Prøvestenscentret, Helsingør, Denmark*

Figure 27: *Café Blomsten og Bien, Odense, Denmark*

Figure 28: *Soup bar, Soupanatural, Copenhagen, Denmark*

Figure 29: *Café Norden, Copenhagen, Denmark*

basic level, I believe the flaw is in our understanding of the nature of the differences referred to by multimodal social semioticians as 'mode'. However, this is not the place to go into that particular problem. Rather, we must simply point out that resources of sculpting, colouring, shading etc. employed in the small, unaccounted for subset of the sample fall outside of the way we understand 'graphic' in this study.

The corpus reveals a strong tendency (65%) at the focal L-scale in Danish public toilet signage to choose the Positive/Conjoined/Massive enshapening (figures (24)-(29)). Only 21% of the pictograms are of the Conjoined type showing an anthropomorphic figure using a single shape such as figure (15). I would suggest that this finding is consistent with the widespread use in Denmark of a series of pictograms, DS-2301-1, issued by Danish Standards under the Danish Ministry of Business and Growth. Examples from the corpus of this particular design can be seen as figures (24)-(26). Pictograms of the design issued by the United States Department of Transportation (1) or derivations thereof also feature prominently in this group. The tendency to depict anthropomorphs as two conjoined regions, (i) detached and (mostly) circular head and (ii) body, is very clear in the corpus. This can be seen as indicative of the strong influence of the 1964 and 1972 Olympic pictographic programmes on Danish (and, likely, global) toilet sign practices.

9.2. Level L and L-1 shape in the corpus

The 97 pictograms were also analysed in terms of shape features with focus on the relation between level L and L-1 shape in order to investigate the significance of the self-similarity of shape features on toilet signs. The result is shown in table 2.

Only level L shape features	68%
Level L and L-1 shape features	26%
Unaccounted for by the descriptive scheme	6%

Table 2

At 68%, the corpus indicates a strong preference in Danish toilet signs for anthropomorphic figures using close to the minimum number of shape features necessary to denote the presence or absence of a skirt (for Women's or Men's respectively). Examples of pictograms using only level L shape can be seen in figures (1), (2), (8), (9), (10), (13), (14), (15), and (30). A smaller number, 26%, employ shapes nested within those used to denote head, arms, legs and skirt or no skirt.

Consider the toilet signs shown as figures (31) and (32). Just like their structurally simpler counterpart in (30), they can be described exhaustively using SHAPE. It merely takes a little more work because they entail a greater number of differences which make a difference. If we compare the shapes which make up the heads of (30) and (31), they both seem to be made up of level L Un-straight>Convex/Curves. In other words, they are circular. The head of (31), however, sports several protrusions. These are clearly not meant to denote 'people with odd cranial shapes' but rather denote the topknot and bows of an elaborate 18th century hairstyle. In other words, the use of a minimum number of level L shape features results in a stylized, generic representation of an anthropomorphic figure. The overall addition of level L-1 shape to denote clothing detail, texture and bodily posture adds ideational meanings of individuality and particularity. Consider also the shape features of the protrusions on figures (15) and (31). Both adequately denote legs on level L. However, in (32) L-1 alternations between convex and concave features embedded in the level L leg-shapes denote thighs, knees and calves of the depicted ballerina.

Figure 30:
Restaurant RizRaz, Copenhagen, Denmark

Figure 31:
Restaurant Bella Milano, Slagelse, Denmark

Figure 32:
Tivoli Amusement Park, Copenhagen, Denmark

There is a significant convergence in the corpus between the presence of L-1 shape and finding places in restaurants and bars. In contrast, many of the toilet signs found in train stations, shopping centres and universities are the results of more generic level L-shape choices. This indicates that, in restaurant or bar settings, Abdullah and Höfner's (2006) fun and quirky 'icons' seem to be the preferred choices, whereas in public administration contexts the more detached, the principled 'pictogram' type seems to be preferred.

10. Conclusion

In this article, I set out to examine how Abdullah and Höfner's categories of 'icons' and 'pictograms' cash out in practices of announcing, by the use of signs, the presence of public toilets in the urban

environment. The article demonstrates how a corpus-based study of a graphic practice can be carried out using a descriptive scheme for graphic form with two systems, SHAPE and ENSHAPENING, in concert with a fractal-derived principle of self-similar organization according to which shape and enshapening features have smaller shape and enshapening features nested within them. Applying these descriptive schemes to the corpus indicates that the practice of public toilet signs in Denmark is highly conventionalised. The 97 signs seem to fall into two distinct categories roughly corresponding to the 'icon' and 'pictogram' types proposed by Abdullah and Höfner:

On the one hand, 65% of the toilet signs in the corpus are of the level L enshapening type Positive/Compounded/Massive. 68% are made up of level L shape features and contain no level L-1 shape features. There is a high degree of correspondence in the data between these two choices, and this observation is consistent with shape and enshapening features of stylized toilet signs such as those issued by Danish Standards and the United States Department of Transportation.

Abdullah and Hübner characterise pictograms as ''[getting] right to the heart of the matter by visually conveying a vital piece of information in such a way that it cannot be misunderstood'' and thus ''bound by much stricter, formal constraints that demand great discipline'' (2006: 6). The lack of level L-1 shape would seem to be a formal characteristic of these requirements. These kinds of signs seem to be extremely common, especially in domains such as transportation and public administration; they may be hypothesized to converge with a wish to announce the presence of a toilet in an inconspicuous, non-offensive way.

Conversely, the 26% of the signs that use level L-1 shape to specify clothing or other details are consistent with Abdullah and Hübner's description of icons, which ''communicate messages in a fun way and therefore enjoy much greater freedom of design'' (ibid.). In the corpus data, these signs converge with finding places in restaurants,

cafés and and bars, and are probably used in concert with other interior design resources to create a specific ambience for the place.

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Notes

1. The most radical interpretation of this definition is that we must regard graphetic articulation as a biological or even metabolic process by which energy is transformed, from nutrient state, to work which leaves a more or less permanent trace in the world. Furthermore, in line with the argument in Johannessen (2012: 157), I distinguish between articulation$_1$ and articulation$_2$. In articulation$_1$ the pictogram is crafted as a graphic text. It lands somewhere between a semiotic 'type' and 'token' (cf. Peirce 1938: sec. 4537): at once (i) a token of the toilet pictogram type and (ii) a type, on which countless material tokens on actual toilet signs all over the world is based. In articulation$_2$ the thus existent pictogram is actualized in composite texts on toilet signs along with various other visuo-spatial invariants such as colours, framing devices etc. This study focuses exclusively on articulation$_1$.
2. The central claim of the enactivist approach to perception is that ''[…] our ability to perceive not only depends on, but is constituted by, our possession of […] sensorimotor knowldge'' (Noë 2004: 2)
3. The author wishes to credit students from IVK22 2012-2013 at International Business Communication, University of Southern Denmark, Slagelse, for their commitment to the study and indispensable help with it: Anna Constance Klitgaard Henriksen, Caroline Berg, Sanne Bruhn Rasmussen, Nina Hansen, Johan Cornelis Schoonhoven, Julie Fjelsted Eriksen, Julie Riber Schifter, Selma Ceric, David Samucha, Elisabeth McNair Rahbek, Hans Toft Nielsen, Therese Søderlund Larsen, Mette Kjeldsen, Jaqueline Marion Jensen, Christina Elmann, Line Samsø, Camilla Rasmussen, Mette Bjerregaard Poulsen, Christina Overgaard Wetterberg, Ina Garmannslund Andersen, Christian Knudsen, Steven Gettermann, Peter Steffen Andreasen, Andreas Alexander Christian Thomsen, Peter Hummelshøj Jacobsen, Metin Hjelt Hassan, Izzet Kevir, Christian Qvist Hald, Jasper Sonne Jørgensen.
4. 'Graphology' is not meant here to refer to the study of handwriting styles and their correlation with personality types, but rather to the study of second-order (cf. note 4), abstracted, convention-based, meaning-differentiating features of graphic form. It is thus comparable with phonology.
5. Humberto Maturana (1970) first implied that a distinction between first-order 'languaging dynamics' and second-order 'language' was possible. However, he never made the distinction explicit, but rather used the term 'languaging' to refer to ''[…] a complex behaviour oriented to the creation and sustaining of consensual domains'' (Thibault 2011: 215). The notion has since gained traction among those who subscribe to Roy Harris' critique of synchronic linguistics and what he calls *The Language Myth* (1981) as well as Nigel Love's critique of the code view of language (2004). Indeed, Nigel Love first made explicit the distinction between the first and second orders of linguistic phenomena (1990). On these views, semiotic phenomena must be treated within the framework of a dual ontology. According to Stephen J. Cowley (2007), the two orders are mutually constraining, yet irreducible to one another in much the same way as macrophysics in the realm of which there is 'being' without 'knowing' and quantum physics in which there can be no 'being' without 'knowing'. In this analogy, first-order languaging is 'like' macrophysics in that it can be measured independently of experience whereas second-order language is 'like' quantum physics: No second-order phenomena can exist independently of someone knowing them. From the point of view of the first order, semiotic phenomena must be regarded as biosocial, whole-bodied sensorimotor attunement sense making between co-acting agents. The second order, on the other hand, is easily recognized from the point of view of social semiotics. Synchronic, structuralist linguists have worked within this ontological framework since Ferdinand de Saussure.

Arguably, the second order is the realm of lexicogrammar, discourse, and text, in short, everything social semioticians have come to refer to as 'the semiotic system'. The crux of the critique is not that synchronic, system-oriented linguistics are wrong per se, only that they tend to mistake the system and the systemic view with the actual object of study.

6. Note also that at a different level of analysis of figure 6, there are only circles none of which are the shape of an anthropomorphic figure.
7. Or indeed a three-dimensional property, if one discusses the shape of volumetric form such as in sculpture or industrial design.
8. The underlying principle is called the 'adiabatic principle' Lemke (2000b: 279), "[…] which insures that levels [in a scalar hierarchy] are relatively insulated from one another if the time scales of their characteristic and constitutive processes are sufficiently different so that they cannot exchange significant amounts of energy on each other's relevant time scales" (Lemke 2000c: 103).

References

Abdullah, Rayan & Roger Hübner. 2006. Pictograms, Icons & Signs. A Guide to Information Graphics. London: Thames and Hudson.

Anthony, Kathryn H. & Meghan Dufresne. 2007. Potty Parity in Perspective: Gender and Family Issues in Planning and Designing Public Restrooms. Journal of Planning Literature 21(3). 267-294.

Arnheim, Rudolph. 1969. Visual Thinking. Berkeley: University of California Press.

Arnheim, Rudolph. 1974. Art and Visual Perception. The Psychology of the Creative Eye. Berkeley: University of California Press.

Baldry, Anthony & Paul J. Thibault. 2005. Multimodal Transcription and Text Analysis. London: Equinox.

Bateson, Gregory. 1972. Steps to an Ecology of Mind. Collected Essays in Anthropology, Psychiatry, Evolution and Epistemology. Chicago: University of Chicago Press.

Boeriis, Morten. 2012. Tekstzoom. In: Andersen, Thomas Hestbæk & Morten Boeriis (eds.) Nordisk Socialsemiotik. Pædagogiske, Multimodale og Sprogvidenskabelige Landvindinger. Odense: Syddansk Universitetsforlag. 131-153.

Cavanagh, Sheila L. 2011. You Are Where You Urinate. Gay & Lesbian Review Worldwide 18(4). 18-20.

Chemero, Anthony. 2011. Radical Embodied Cognitive Science. Cambridge, Mass.: The MIT Press.

Cowley, Stephen J. 2007. The cognitive dynamics of distributed language. Language Sciences 29(5). 575-583.

Davies, Christyn & Elena Knox. 2007. Disturbing the Dialectics of the Public Toilet with The Water Closet. Hectate 33(2). 120-134.

Fowler, Carol. 1986. An event approach to the study of speech perception from a direct-realist perspective. Journal of Phonetics 14(1). 3-28.

Gibson, James J. 1966. The Senses Considered as Perceptual Systems. London: George Allen and Unwin Ltd.

Gibson, James J. 1989[1979]. The Ecological Approach to Visual Perception. Hillsdale, N.J.: Lawrence Erlbaum.

Halliday, Michael & Christian Matthiessen. 2004. An Introduction to Functional Grammar (3rd Edition). London: Arnold.

Harris, Roy. 1981. The Language Myth. London: Duckworth.

Jeyasingham, Dharman. 2010. Building heteronormativity: the social and material reconstruction of men's public toilets as spaces of heterosexuality. Social & Cultural Geography 11(4). 307-325.

Johannessen, Christian M. 2010. Forensic analysis of graphic trademarks. A multimodal social semiotic approach. Ph.D.-thesis. Odense: Department of Language and Communication.

Johannessen, Christian M. 2012. Hvordan håndterer vi multimodal enkelhed? In: Andersen, Thomas Hestbæk & Morten Boeriis (eds.) Nordisk Socialsemiotik. Pædagogiske, Multimodale og Sprogvidenskabelige Landvindinger. Odense: Syddansk Universitetsforlag. 155-176.

Kress, Gunther & Theo van Leeuwen. 1996. Reading Images. The Grammar of Visual Design. London: Routledge.

Kitchin, Rob & Robin Law. 2001. The Socio-spatial Construction of Inaccessible Public Toilets. Urban Studies 38(2). 287-298.

Lacan, Jacques and Brandt, Per Aage. 1973. Det ubevidste sprog: psykoanalytiske skrifter. Copenhagen: Rhodos.

Lemke, Jay. 2000a. Material Sign Processes and Emergent Ecosocial Organization. In P. Andersen et al. (eds.) Downward Causation. Aarhus: Aarhus University Press. 181-213.

Lemke, Jay. 2000b. Across the Scales of Time: Artifacts, Activities, and Meanings in Ecosocial Systems. Mind, Culture, and Activity 7(4). 273-290.
Lemke Jay. 2000c. Opening Up Closure. Semiotics Across Scales. In: J. Chandler & G. van de Vijver (eds.) Closure: Emergent Organizations and their Dynamics. Annals of The New York Academy of Sciences 9011. New York: New York Academy of Sciences. 100-111.
Love, Nigel. 1990. The Locus of Language in a Redefined Linguistics. In H.G. Davis & T.J. Taylor (eds.) Redefining Linguistics. London: Routledge. 53-117.
Love, Nigel. 2004. Cognition and the Language Myth. Language Sciences 26. 525-544.
Maturana, Humberto. 1970. Biology of Cognition. BCL Report 9.0. Urbana: University of Illinois.
Molotch, Harvey & Laura Norén (eds.). 2010. Toilet: Public Restrooms and the Politics of Sharing. New York: NYU Press.
Moore, Sarah & Simon Breeze. 2012. Spaces of Male Fear: The Sexual Politics of Being Watched. British Journal of Criminology 52(6). 1172-1191.
Nöe, Alva. 2004. Action in Perception. Cambridge, Mass.: The MIT Press.
Nöe, Alva. 2009. Out of Our Heads. Why You Are Not Your Brain and Other Lessons From the Biology of Consciousness. Cambridge, Mass: The MIT Press.
Noyan, Nazli. 2006. WC Signs: An Investigation of Modernization Process and a Reading of the Construction of Local Identity in Turkey. International Communication Association 2006 Annual Meeting. (Published conference paper). 1-13.
O'Regan, J. Kevin & Alva Nöe. 2001a. A sensorimotor account of vision and visual consciousness. Behavioral and Brain Sciences 24. 939-1031.
O'Regan, J. Kevin & Alva Nöe. 2001b. Acting out our sensory experience. Behavioral and Brain Sciences 24. 1011-1021.
Overall, Christine. 2007. Public Toilets: Sex Segregation Revisited. Ethics & the Environment 12(2). 71-91.
Peirce, Charles S. 1931-58. Collected Papers of Charles Sanders Peirce. Hartshorne & Weiss (eds.). Cambridge MA: Harvard.
Roberson, Debi, Jules Davidoff & Laura Shapiro. 2002. Squaring the Circle. The Cultural Relativity of 'Good Shape'. Journal of Cognition and Culture 2(1). 29-51.
Rubin, Edgar. 1915. Synsoplevede figurer. Copenhagen: Gyldendal.

Salthe, Stanley. N. 1991. Two forms of hierarchy theory in western discourses. International Journal of General Systems 18(3). 251-264.
Schapper, Jan. 2012. The writing is on the wall: the texture of women's toilets in Australia. Gender, Place & Culture: A Journal of Femininist Geography 19(4). 494-517.
Siu, Kin Wai Michael. 2006. Design Quality of Public Toilet Facilities. International Journal of Reliability, Quality & Safety Engineering 13(4). 341-354.
Siu, Kin Wai Michael. 2011. Public Toilets for Visually Impaired Persons: Application of the Principles of Universal Design. International Journal of Interdisciplinary Social Sciences 6(2). 117-126.
Stöckl, Hartmut. 2005. Typography: Body and dress of a text – a signing mode between language and image. Visual Communication 4(2). 76-86.
Stötzner, Andreas. 2003. Signography as a subject in its own right. Visual Communication 2(3). 285-302.
Thibault, Paul J. 2004. Brain, Mind and the Signifying Body. London: Continuum.
Thibault, Paul J. 2011. First-Order Languaging Dynamics and Second-Order Language. The Distributed Language View. Ecological Psychology 23(3). 210-245.
Uryu, Michiko, Sune V. Steffensen & Claire Kramsch. in press. The ecology of intercultural interaction: Timescales, temporal ranges and identity dynamics. In S. Steffensen & A. Fill (eds.) Language Sciences Special Issue on Ecolinguistics: the Ecology of Language and the Ecology of Science.
van Leeuwen, Theo. 2005. Typographic Meaning. Visual Communication 4(2). 137-143.
Wertheimer, Max. 1935. Untersuchungen zur Lehre von der Gestalt. Psychologische Forschung 4. 301-350.