

Report on the Orientation Study of
THE PERCEPTUAL FORM OF THE CITY
by William Alonso
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The author makes his apologies that the following is a somewhat rambling document in his attempt to gather some of the loose threads of the study and to plot something of a future course.

First, let us see what we have or can have for each individual:

- (1) information as to his stereotypes;
- (2) a verbal and map summary of his schema;
- (3) information with regard to his thematic recognition and location of selected points throughout the city, in the photo test;
- (4) his own map, including
 - (a) sequence of drawing,
 - (b) a translation into the basic concepts of point, line, and area,
 - (c) a distortion grid;
- (5) a field trip transcript and notes;
- (6) personal information.

Of this data, Nos. 2,3, and 4 (schema, photo and maps) give us information on how the person views the city, and what he knows of it. No. 5 is supplementary to No. 2. No. 1 and no. 6 give us a different type of information about the subject.

The three parallel sources (No. 2,3,4) can be compared directly to each other. Where they agree, this may be viewed as evidence of reliability; where one makes a statement and the other remains silent (e.g. if in the verbal material the South End is not mentioned but in the map he draws it with all the trimmings), they may be regarded as additive; where there is disagreement (e.g. if in the map he draws the relationship Scollay Square – Court Street – Washington Street, but in the verbal material he makes a direct connection of Scollay and Washington), there is need of a theoretical explanation, in terms of confusion, logical requirements imposed by the interview situation, trend to geometric regularity, etc. Thus, by

comparison and addition of these three parallel sources a more complete picture of the subject's schema, both in terms of theme and structure, can be built, making clear what he knows well, indifferently, or not at all, what his confusions and outright errors are.

So far, the matter has been one of pooling and recording information which has been gathered by various means, and to code that information in terms of our concepts; the result is consequently descriptive. The next two steps fade into each other: one is that of surface correlation, the other that of latent correlation. They require inter-subject comparison, either of all the subjects or groups of them.

Surface correlation of all the subjects is the "most often mentioned" type of thing: the area of agreement among all the subjects. Now, this type of analysis can work with loose or increasingly stricter criteria. For instance, probably the loosest criterion is mere mention of an element. Thus, a grand combined map might be done, assigning to each element mentioned so many points per person who mentions it. I would suggest that, there being three sources per person some scale be set, giving a mention in one of the three a weight of two or three, and then a point for each further mention. The unit of mention being the source, then the maximum number of points any individual subject could accumulate in a single element would be four or five. Then all the subjects could be added, element by element, and a map prepared, indicating the total weight of each. A word of warning, though: drawing a map may favor mention of some elements and neglect others. For this reason there should not be a mixture of people for whom one of these sources is not available. (A-I for details)

Now, if such a map were prepared, what would it tell? The principal things it would tell would be: (1) what types of elements (in points, lines and areas) are best known; (2) how these elements cluster, and

in what density they are distributed over the whole study area. However, the things it would not tell are a great many: it would not tell (except by inference) of the relationships between elements. One should be careful not to assume that because, e.g., Tremont Street and Scollay Square are both known, that the relationship of these two is known. The map would not give information as to themes. In the case of areas, it would not tell whether some streets were boundaries or internal structure. In the case of point it would not tell whether they were fixed or floating.

There may be other methods of obtaining surface correlations for all the subjects, but they are likely to be cumbersome and not very meaningful. The problem of handling themes is a serious one, and a suggestion for an approach is made in appendix A-II.

The matter of obtaining surface correlations for groups of subjects is likely to prove more fruitful, though probably in combination with latent correlations. The surface correlation is wasteful, but may stumble onto great things. The latent correlation is a manner of testing theory.

In making a surface correlation, one picks one source of data, and compares that source among all the subjects, trying to divide them into clear groups, using criteria that refer to the source as an object, without questioning the meaning of these divisions. For instance, the subject's maps may be divided into those that cover all or only part of the study area, those that have tight continuous drawings and those who have discontinuous, loose drawings, those that have an outline and those that do not. The photo test may be divided into those who have fairly accurate locations and those who do not. The verbal material analysis may be divided by similar criteria or by other relevant to it (e.g., kernel vs. stable, overall structure; those having six areas or more, those having less than six areas, etc.). From the personality data (or the stereotype data, should any method of analysis be developed – see A-II) some other division might be found: familiar – unfamiliar, male – female, car driver – pedestrian, by place of work, etc.

Having made any such division in one of the sources, all the other material is divided accordingly, and examined to see whether there are other characteristics that correlate with the original division. For instance, one may find that all South End residents have an outline to their maps, or those having more than six areas have lived longest in Boston, or anything else. The point is that the sources are compared per se, and any correlation that is found simply points to something that requires explanation. To know that all South Enders put an outline around their maps is trivial, unless one has an explanation. If one finds an ad hoc explanation to such a fact in terms of our theory, then some advance has been made, though slight. (see A-III for two possible methods).

The latent type of correlation is the other pole of this method. The division into groups is done on the basis of theory rather than by surface morphological division of the sources, and the analysis of the resulting groupings is also done on the basis of theoretical or latent variables rather than surface or manifest. I doubt that our theory is developed enough to carry us far in this direction. One example of a study that would approach this would be to apply the latent variable of familiarity to the distortion map. Any area in Boston where the subject has lived or worked is called familiar; the rectangle of the grid into which it falls is then examined for its distortion. In this manner residents in Boston's Beacon Hill or the South End, workers in the downtown area or in the Park Square area are equated on the basis of familiarity. Should a meaning (latent variable) be theoretically derived for the meanings of different types of distortion is the issue: for instance, whether enlargement means familiarity or shrinking, lack of knowledge. Or whether shrunken or enlarged, if the rectangle maintains its shape there is structural clarity. The important thing is that correlation be obtained between theoretically relevant variables. Such a correlation, if found, might be explained ad hoc, but if, after theoretical considerations certain correlations are found as predicted (i.e., the correlation is first deduced, then confirmed), it is, of

course, more reliable.

In doing these divisions by groups we are trying to gain in precision what we lose in universality. We are certainly not interested in individual idiosyncracies in schema-forming. By dividing into groups we would obtain "typical" schema for these groups, and this is an advance over the purely personal, private schema. Still, what we want is something like a "public schema", much as an anthropologist gets a picture of a culture which belongs to a people, rather than to any one individual. I believe that the addition of surface characteristics or items from our sources will yield something more than the agreement procedure. But, unquestionably, what we want is not some document to which we can point and say "there is a schema for Boston." We want to be able to predict how the physical reality of a city will be read as a public schema. Such a prediction would guide design, by setting hypothetical realities and alternative schematic pictures: by pinpointing sources of confusion, etc. However, it is at this point where I fear our analysis stops. We can, to a certain degree, come up with a public schema for Boston – the principal structural elements and thematic characteristics that compose the picture. But we have now only the language for such a description, and only a very vague intuitional understanding of the psychological and sociopsychological processes that lead such a picture to be formed from a given geographic reality. The latent correlations for the whole group of subjects would be between the physical reality and these schema-forming processes. Some of the "processes of visibility" may have some relevance to this problem, but I do not believe they are the complete answers.

Supposing that an interpretation of public schema can be achieved, intercity and inter area comparisons can be made. (See my preliminary comments on Los Angeles.) The thing of interest, for me, at any rate, would be the relation of theme to structure. Los Angeles, because of its different structure to Boston, seems to have different relations among the themes. I have some ideas about this, but they are too vague to try to set on paper, and I have spoken of them to other members of the project at one time or another. The principal opinion I have to offer, however, is

that, given the stage of our study, our non-mathematical approach, etc., the best line of attack is, again, through the use of typologies rather than either item or untyped – system comparisons.

Finally, in this main section of the current report, let me argue for a “field” rather than an “aggregate” approach to the study of schemata. I think everyone in the project feels the field approach is correct, and is willing to concede, at a high level of abstraction that it is correct. But we lack the middle level, that one in which these ideas acquire some meaning for analysis.

Perhaps it is easier to conceive of a field approach in the structural variables of the schema. I shall give some examples. (1) There are several cases in which there are sets of streets which are near-equivalent: Washington – Tremont; the longitudinal Back Bay streets. This suggests that their importance is not in the unique element but in the function it serves in the overall structure of the city, and that these elements are near-equivalent because of the similarity of their function. This function argues for a field or system at a higher level, to which this word “function” refers. (2) When the subject makes a major error in either his verbal or map data, such as squaring the Commons, he often remains consistent in the consequent rotation of large portions of the city. Similarly, in the few occasions in which I have checked the pointings at various stations by the subjects, these pointings, when in error on an accurate base map, were in agreement and quite correct on the basis of distortions in the overall structure which we establish from other data. Another aspect of this is the ease and comparative accuracy of pointings by subjects, even when they are uncertain of their location and when the elements to which they point are floating. This would argue that even in cases where the location is uncertain, there is an independent or semi-independent variable of direction which continues to operate. In a way this is like something mathematicians do at times: they assume that the dimensionless point is just large enough to have directions or coordinates within it. In other words, it would seem that the point

has not the traditional circular shape, but rather that it is a cross or a compass. (3) When there is large scale construction work, or some buildings are taken down, the subjects appear more thoroughly confused than the occasion seems to merit. It would seem that the disturbance spread through a good portion of the system, disturbing a great many relationships. Similarly, Hotchkiss points out that the long-time residents of Los Angeles rely more on the grid and less on the new freeways than new-comers, suggesting that for the older residents incorporation of the freeways is something that requires total restructuring of the schema, and not just addition of the new elements, which would be a fairly simple matter.

I cannot present even as much evidence in defense of a field or a system approach to themes, as different from the items or aggregate approach. What I believe to be true is that themes do not behave in combination as an arithmetical sum, each with an independent value, but that they affect each other. (See also A-II). Further, I believe that not only do the themes for an element act as mutually dependent variables, but the themes for a whole city work as a system, mutually affecting each other. The point about the different thematic criteria for different elements (see A-II) would be supporting evidence if true. Some of Dober's work on analogues may also be of importance. Inter-area thematic comparisons by subjects also suggest this. There is one interesting case, in which R.S. says that the houses of Chinatown are just houses: nothing distinctive about them. But they are just houses only in Boston, where they appear as a theme in several other areas. This example uses a common thematic substratum; one that showed the influence of dissimilar themes of different elements on each other would be more telling. I have had the impression, in reading through the interviews, that this happened time and time again, but have not noted (partly through not looking for them) any explicit examples.

There is however, a strong argument in the logical necessity for a theme to extend beyond the geographic surface which the object embodying the theme occupies. I have discussed the matter with D. Crane, and have a few other half-formed arguments up my sleeve. I will only give one here.

Suppose that you have an area where a certain type of house is the thematic unit. But there is one spot within the area where this type of house does not occur. Yet the area of this bare spot is within the element defined by the type of house. If we draw a section of the element in which the theme of houses is shown by the vertical dimension, if the theme is coincident with the houses we obtain this:

{see diagram in PDF of original}

If we allow that a theme extends beyond the base of geographic coverage of the unit, repetitions of the unit will extend to cover small bare spots. Graphically:

{see diagram in PDF of original}

The same argument serves to explain a case such as the relation of Cambridge Street to Beacon Hill. The type of house that is characteristic of the Hill is found to some extent on the other side of Cambridge Street. Thus, if we do not consider the thematic effect of Cambridge Street, and take into account the mutual reinforcement of thematic units within the Hill we get:

{see diagram in PDF of original}

However, if we allow that the theme of Cambridge Street is contrary to that of the Hill, and destructive to it (see A-II), we obtain:

{see diagram in PDF of original}

Then we only need the auxiliary concept of the need for a minimum threshold before a theme can be perceived to explain the total disappearance of the Beacon Hill theme on the other side of Cambridge Street.

These concepts could be further elaborated, with concepts similar to those of Kurt Lewin's hodology, dealing in valences, regions, boundaries, etc., but it seems unwise at this point. One last parting shot: if we accept the concept of field or systems approach, then the item or aggregate approach is inadequate. However, though we may recognize the schema as a system, we do not yet know how to handle it as such. For this reason, I again emphasize the need for analysis by means of types and classes rather than by individual items or elaborate analyses of individuals.

Appendix A-I

Surface correlation map for all subjects

Take a great many 3 X 5 cards, and label each with the name of the element as needed.

Divide cards thus:

{see diagram in PDF of original}

Thus, one takes a subject, and takes, say, his map. If he mentions the element there, put one check on the "number of people," one on "map". If he does not mention it in his map, go to the photo test, and if mentioned there, check "people" and "photo". For each subject who mentions an element there should be one check under each of the sources on which he mentions it, and one check only under number of people. If he never mentions it, there should be no checks at all.

For those elements in which either the partial or complete mentions are possible, there might be separate cards. Thus, one may have one card for Washington Street as a whole, another for downtown Washington Street.

Appendix A-IIThematic Criteria Differences

One of the biggest problems is the combination of the thematic aspects of private schemas into a public schema. Thus, if subject A mentions themes a,b,c,d, and subject B mentions c,d,e,f, and subject C mentions a',b,e,g; can we say that the total thematic picture is a,a',b,c,d,e,f,g; or is it a,a', 2b,2c,2d,2e,f,g, by a simple process of aggregating, assigning greater force to those themes mentioned more than once. In other words, we need to consider whether the thematic references by different subjects to the same elements are: (1) additive, in the sense that a complete listing of these themes from various sources is a valid thematic summary for the element; (2) whether, if they are additive, frequency of mentions corresponds to vividness; (3) whether some themes are alternative to each other, such that anyone who mentions theme a cannot mention theme b and vice versa; and (4) whether some themes are not destructive of each other, so that an element may have themes a,b,c,d, or themes b,c,d,e; but that the combination of a,b,c,d,e, reads as b,c,d, by a and e nullifying each other.

A method of thematic analysis for elements, which goes beyond the mere listing of all themes mentioned for each element may be possible. I have noticed that different types of themes are mentioned for different types of elements. Thus, it seems that architectural style is mentioned and/or in residential areas but not in commercial areas; that street activity is mentioned in commercial areas but seldom in residential; that different thematic emphases are placed in ethnic and non ethnic residential areas. To get to this I propose that the following procedure be followed:

That a chart be prepared in this manner:

{see diagram in PDF of original}

Then, taking some or all subjects, proceed to check in the proper box for the element and type of theme mentioned. The difficulty is in picking good and well defined categories for the types of themes, such that they will get to the differences between types of elements. This will require nimble, subtle, sensitive, and intelligent selection of these categories, and probably several revisions. Thus, architectural style may have to be broken into components, or two other categories may have to be divided into three.

What I expect would be found would be that some of these criteria are mentioned in connection with certain special types.

Now as to why certain types of themes are relevant to certain types of areas, perhaps some guesses can be made. A profession of faith is made in the main

Appendix A-II continued.

body of this report as to the advantages of a "field" versus an "items" approach. What the methods outlined might yield is the nature of facts, phenomena to be explained, rather than explanations.

Appendix A-IIIGroup CorrelationsA. Table

Prepare a master list of subjects, and, either on the same page or on matching moveable sheets, mark by major sources and types:

{see diagram in PDF of original}

In this table, some sample breakdowns or types are shown for each source, and I have made several of them correlate: e.g. "density" (No. 1) with "structure" (No. 2); outline (No. 1) and "number of areas" (Nos. 1 and 2). Many other breakdowns are possible, some of which may yield partial or perfect correlations. Should anyone have the patience, it would be possible to try out some multiple correlations.

The advantage of keeping moveable sheets on this is that, as long as the subject list remains the same, the information for any kind of breakdown can be retained and compared to any new breakdown.

A point on approach: the sample categories I have shown in the chart are

Appendix A-III continued.

essentially summary statements. Those I have are summary statements, but each one of them is capable of rather rigid mathematical interpretation. It would be possible to have more subjective summary contents, ranging from "great élan" to "little élan" and from "sensitivity" to "obtuseness." It is also, of course, possible to enter item categories such as "mentions Almagundi's", "does not mention Almagundi's;" "recognizes and discards all Italian photos," "thinks one or more of them are Boston." Overall, the most fruitful approach is likely to be that of summary statements susceptible to exact definition, but it might also be interesting to make correlations within and among the other types.

B. Map Addition

When various maps are on a standard base, such as the maps produced in the verbal analysis, it is a very easy matter to add these maps element by element directly in map form. Lines and points can be added indicating totals by width and diameter, and showing partials for loose and clear by means of a color key. Areas can be added by a color scale. It would be laborious to describe the procedure in detail here, but Bill Demiene has done one and will know how to do others. Anyhow, it is easy to figure out, and I attach a sample to this report. (A-IIIx) This map shows the addition of five individuals who have the Beacon Hill kernel type of schema, and shows the high degree of correlation among them. (Red lines: clear lines; yellow lines: unclear or floating; black points: fixed; grey points: floating) By and large, the use of this type of mapping is to present in a clear way a type of schema. Addition of different types would yield a less meaningful map.

Appendix A-IVDistortion maps

This type of mapping yields an overall picture of the distortions in the individual's map, regardless of the items he includes. The method is simple: draw a grid on a Boston base map. Then, on the bases of points and lines in the subject's map, the grid is interpolated. Those grid intersections that are clearly fixed in the grid should be drawn in heavier; those intersections that are interpolated from other intersections should not. Bill Demiene has done several. They seem to take between one half and one hour a piece.

The method can break down if the subject has a lot of completely misplaced elements. However, we have not yet come across any such extreme cases.

As to what can be obtained from such a map, it is pretty much an open question. Contradictions and expressions and rotations can be seen very clearly, however, and by visual inspection it is easy enough to see certain things such as the relative lack of distortion of Back Bay, the effect of assuming that the Garden – Commons are rectangular, the shrinking of unknown areas, the enlargement of known areas.

Mathematical analysis is possible. The original map grid can be represented by an equation, and so can any distortion map. The transformation of the regular into the distorted grid becomes a gradual transformation of the distortions and may therefore be easier to handle.

It is possible that to handle the whole grid may be rather complex, and may even require machine computation. I would suggest that a mathematician with a bent for the exotic be found to look into the matter. On the other hand, it is possible to handle transformations for three points rather easily by anyone with a minimum of mathematics after the method of doing it is explained. The question is whether just three points would tell us anything.

{see map in PDF of original}

{see map in PDF of original}

{margin: Cummulative map of
5 individuals of the kernel
type of schema (Beacon Hill).
(P.v.H., E.E., N.D.,
R.G., M.S.)}

Appendix A-VProposal for an analysis

I have spoken in several places of a typology of overall structure which divides into a continuum with the kernel type at one end and a stable type at another. I would try a method of analysis to see whether the detail (i.e. knowledge) is more evenly distributed for the others. The procedure is simple, though there are a couple of problems.

First, divide the subjects into the clear kernel and stable types, discarding the intermediate. Then, taking the distortion grid over the subject's maps, count the number of elements in each square of the grid, arrive at the average number for each square for all the subjects. Then compare the members of each of these groups to these averages. The core or kernel people should be higher than average in the squares of the core and possibly in the first ring around them. They should be lower than the average in the more distant squares. The stable structure people should be near the average all over if the kernel people were evenly distributed over the city. But as the kernel people seem to be concentrated around Beacon Hill, the pattern will be that the stable structure people will be below average at and near this core, and above average away from it. (The use of a ratio may make this comparison easier, in this manner:

$$\text{ratio of relative density} = \frac{\text{no. of elements in square X for subject C}}{\text{average no. of elements in square X}}$$

This analysis would permit translating the kernel and stable types into terms of something like a differential density of known elements. It would support the assumption that the kernel type has a concentration of reference points, while the stable type has a more balanced distribution.

Appendix A-VINotes on one proposed method of analysis for the color sequence maps
(July 30, 1956)

So far, the methods we have considered are by comparison within individuals. Thus, we expect to find out who builds from the center, who builds from the edges, who builds from a framework of streets, hangs points and areas, and who disposes areas and then threads streets through them. The approach proposed here is an addition to that type, not a substitution.

The procedure is simple. One selects an element of interest then looks through all the available maps and notes in what color they are shown, and how many times in each of the seven colors. Two forms of graphic representation are attached, for a dry run on 28 maps. Sheet No. 1 shows in absolute numbers the number of mentions in each color for each element, forming a sequence profile. Sheet No. 2 shows the percentage distribution in bar form for each color for each element.

I had hoped, when preparing these two sheets, to find in sheet No. 1 some "typical curves" for types of elements, and some progressions in Sheet No. 2. There is some of this in each, but not as clear as I had hoped. It seems, therefore, that this type of analysis will yield best results in conjunction with the other types, rather than by itself.

Some things are noticeable, however. Areas receive later mention than streets of comparable frequency. Those elements which receive many mentions tend to receive earlier mentions than elements of the same type receiving fewer mentions. Mass. Avenue, and Embankment Drive and the Charles River receive their mention at the very first or not at all. Since these two are our strongest boundaries, I checked other streets that might be considered boundaries, and they too received a high proportion of early mentions. Areas seem to receive middle ground mentions, confirming the predominance of hanging areas on a street network. Points seem to receive somewhat earlier mention than areas. Some other comparisons

might be strained out of the data, but it seems unnecessary at this point.

A word may be necessary on an assumption which I have made. That is, that a map says (1) that certain things are important and noteworthy enough to be included in the map, and (2) that these things are located in certain relationships to each other. I assume that the map corresponds to the structure of the subject's schema for Boston to a large extent, and that those things which he draws first will in general be things he needs to locate the things which he draws later.

Lastly, I want to note a third way of representing correlations graphically. Thus, if we want to find out for those who draw Copley Square and Commonwealth Avenue, which one they draw first, we can do this:

{see diagram in PDF of original}

Representing the number of people in each box by a bar or circle of proportional size. Thus, all in the upper right quadrant drew Copley first, those in the lower left drew Commonwealth first. The distance from the diagonal line represents how much later.

Frequency of mention and distribution by sequence
colors of selected elements in 28 maps.

{see diagram in PDF of original}

28. Downtown shopping Washington St.	L 20. Beacon St.	A 8. North End C 8. Joy St.
L 24. Commonwealth Ave. & clear Back Bay net	L 18. Mass. Ave	C 8. Mt. Vernon St.
F 22. Commons & Pub. Gard.	P 17. Copley Sq. P 16. Scollay Sq.	P 8. Mass. Gen. Hosp. P 7. John Hancock
F 22. Charles River & / Storrow Drive	P 16. South Station	L 6. Water – Milk or Summer – Winter Streets
A 21. Beacon Hill	L 15. Cambridge St.	P 6. Faneuil Hall
L 21. Charles Street	P 13. North Station	
L 21. Boylston St	X 10. Park St and Park Street Station	Frederick Cape Lulna
P 21. State House		

{see diagram in PDF of original}

In the narrow box on the right, enter those who put in Copley Square but not Commonwealth; on the bottom enter those who put in Commonwealth but not Copley Square; in the little box on the lower right enter those who put in neither.

The logic of this thing runs something like this: given two elements A and B; if all of those who put in both put in A and B; some put in A, but not B, and none put it B without putting in A, we may conclude that B is dependent and fixed by A. (Not as proof, but as supporting evidence.)