On the design of the G-section signs of the Convention using the “nesting and stacking” technique

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• Professor at Princeton University's Department of Psychology
  – 2006: How we reason
Discourse comprehension: 3 phases

1. There is an **utterance** coded into a phonemic or **graphic representation** (here, the judgement of an official engineer is coded into a road sign)

2. The driver codes that into a **propositional representation**, that is still similar to the information conveyed by the road sign. But there are two types in the 1968 VC:
   1. **Stacked signs** (“translated”, verbal like)
   2. Diagram signs (“recognized”, map like)

3. There is a **Mental Model** build up to confirm what has been understood. For some sign to be true, this should be the mental model of the world that holds
Helping international drivers’ expectations and interpretation of complex traffic signs

• **Anticipation**: a prior action that takes into account or forestalls a later action

• **Prospect**: a mental picture of something to come

• **Scheme**: a systematic or organized configuration

• …
Simple and complex signs, and signs that are bad altogether (?)

Hiper-complex stacked

Hiper-complex diagrammed
NOTE: Advance direction signs G, 1 may bear the symbols used on other signs informing road users of the characteristics of the route or of traffic conditions (for example: signs A, 2; A, 5; C, 3e; C, 6; E, 5a; F, 2).
TWO EVOLVING STRATEGIES (I)

“They were walking together”

SAGUNTO 75
VALENCIA 95
CASTELLON 98

“She was walking by his left”

CASTELLON 98
VALENCIA 95
SAGUNTO 75

• Stacked information
• Propositional verbal-like representations
• Spatial indeterminacy
• COMFORT

• Diagrammed information
• Images-Mental Models
• Spatial determinacy
• ACTION

This is not the real map!

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TWO EVOLVING STRATEGIES (I)

“They were walking together”

SAGUNTO 75
VALENCIA 95
CASTELLON 98

• Stacked information
• Propositional verbal-like representations
• Spatial indeterminacy
• COMFORT

“She was walking by his left”

Ok, this one may do

SAGUNTO 75
VALENCIA 95
CASTELLON 98

• Diagrammed information
• Images-Mental Models
• Spatial determinacy
• ACTION

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TWO EVOLVING STRATEGIES (II)

↑ SAGUNTO
VALENCIA →
← CASTELLON

• Stacked information
• Propositional verbal-like representations
• Spatial **determinacy**
• ACTION

SAGUNTO
CASTELLON
VALENCIA

• Diagrammed information
• Images-Mental Models
• Spatial **determinacy**
• ACTION
TWO EVOLVING STRATEGIES (III)

- Stacked information
- Propositional verbal-like representations
- Spatial determinacy
- ACTION

• Diagrammed information
• Images-Mental Models
• Spatial determinacy
• ACTION
TWO EVOLVING STRATEGIES (IV)

↑ SAGUNTO 5
VALENCIA 25 ↗
➙ CASTELLON 28

• Stacked information
• Propositional verbal-like representations
• Spatial determinacy
• ACTION

SAGUNTO 5  ➔
CASTELLON 28  ➔
VALENCIA 25  ➔

• Diagrammed information
• Images-Mental Models
• Spatial determinacy
• ACTION
TWO EVOLVING STRATEGIES (IV)

- Stacked information
- Propositional verbal-like representations
- Spatial determinacy
- ACTION

- Diagrammed information
- Images-Mental Models
- Spatial determinacy
- ACTION
Some conclusions

Stacked signs

• It is not clear where to place the additional event in the stacked panel:
  – Before city
  – After city
  – Between city and distance
  – Etc.

• But stacking information needs less surface on the panel

Diagrammatic signs

• It is easy to know where to place the additional event, service, traffic issue and the like

• The problem is that we need more space on the panel... or we need to focus on just one part of the diagram
Some examples
G, 1 signs Netherlands

Stack

Diagrammatic
G, 1 signs Norway

Stacks

Indeterminacy perhaps useful?

Diagrammatic

how many elements per stack?

New arrows
G, 1 signs Sweden

Stack

Diagrammatic

3 stacks
Where to place additional information? Why?

3 stacks

G, 1 signs UK

Stack

Diagrammatic

S = stacking
D = diagramming

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Two tools for communicating

**Stack road signs**

- [Propositional representations]
- Drivers don’t know their **syntax structure** (the structure that give sense to the elements on the sign) it is not clear, must be inferred

**Diagram road signs**

- [Mental Models]
- Drivers know their syntax structure because diagrams/maps are structural analogues of reality, so the syntax structure is clear, and can be easily recognized
G, 1 signs (UK)

...to non primary routes (a, b) showing stacks

From primary routes picturing places in diagrams...
Elements on G, 1c: overview

- Number of stacks 1 to n (max. 4)  
  “the no more than 3 stacks rule”

- How many locations per stack? 1 to n (max. 4)
  - Always placing miles/kilometers: depends on desire for (in)determinancy

- Where to place the arrow indicating advance direction:
  - Arrows placed in coincidence with real directions? (next page)
  - Arrows placed in panel in coincidence with exits to places?
  - Assign a fixed place for arrows (left, right) on panel?

- Which type of arrow to indicate direction of exit:
  - Straight vs bended
  - Which arrow head?

- Where to place the symbols/silhouettes?

- How many per stack?
Play with arrow angles for an easier recognition and differentiation.

4.5 Figure 4-5 shows how the arrow may be inclined to suit the direction being indicated. Arrows may be vertical or horizontal or at any angle between in increments of 22.5°. Arrows shown in broken outline are used only in special circumstances. A special arrow may be used to indicate U-turns (e.g. at a roundabout on a dual carriageway); further details are given in section 14.

“the 22.5° rule”

True layout of junction 22.5°

Not true layout of junction but clear 45°
Other parameters that count: overview

• Road type:
  – motorways
  – Rural, single lane roads

• Road section:
  – Info on main trunk
  – Info on exit, entrances, nodes, roundabouts

• Trip goals:
  – From A to B (long trips)
  – Short stops
  – Diversion, detours to B
To be continued...
THANKS FOR YOUR ATTENTION

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