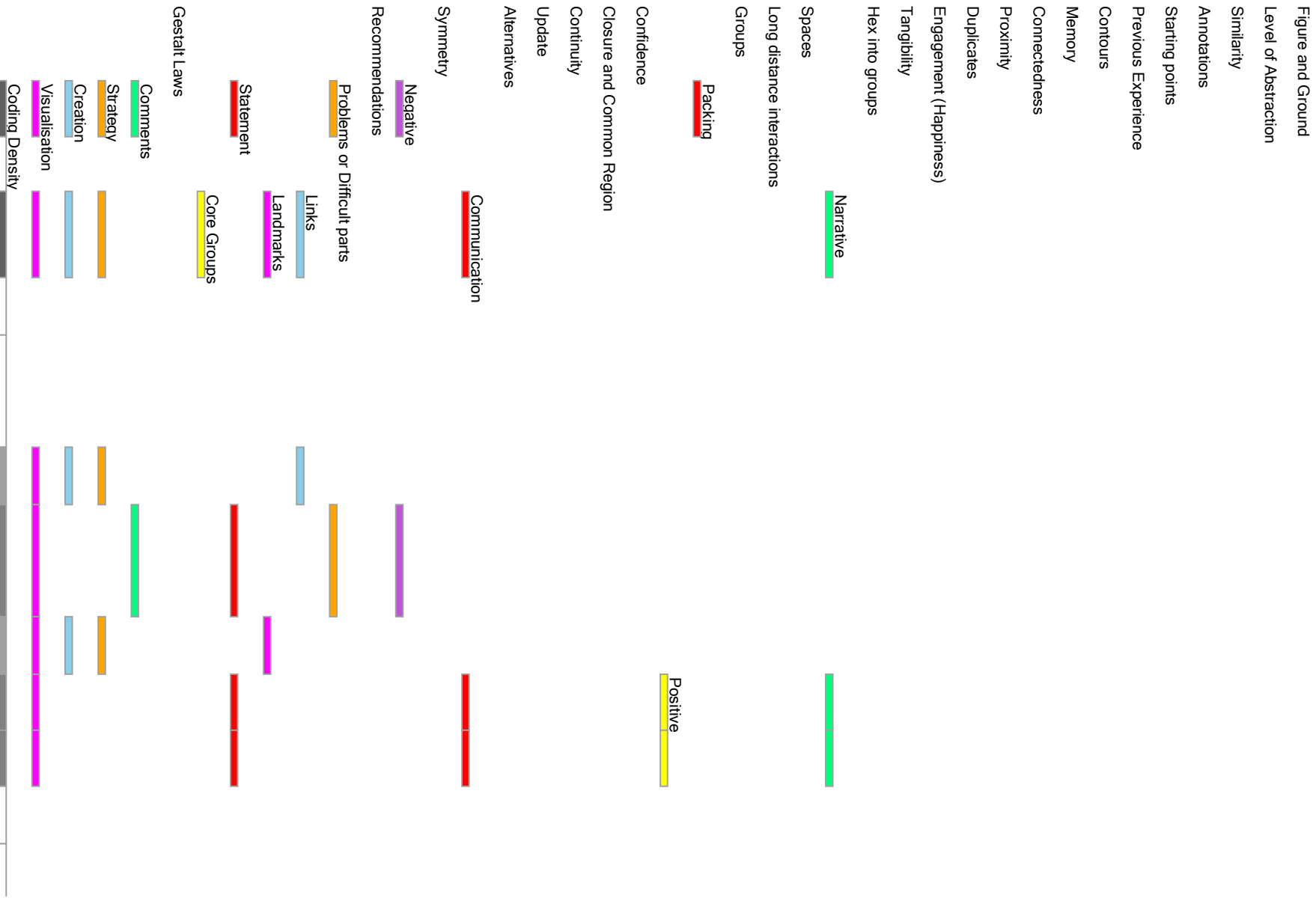
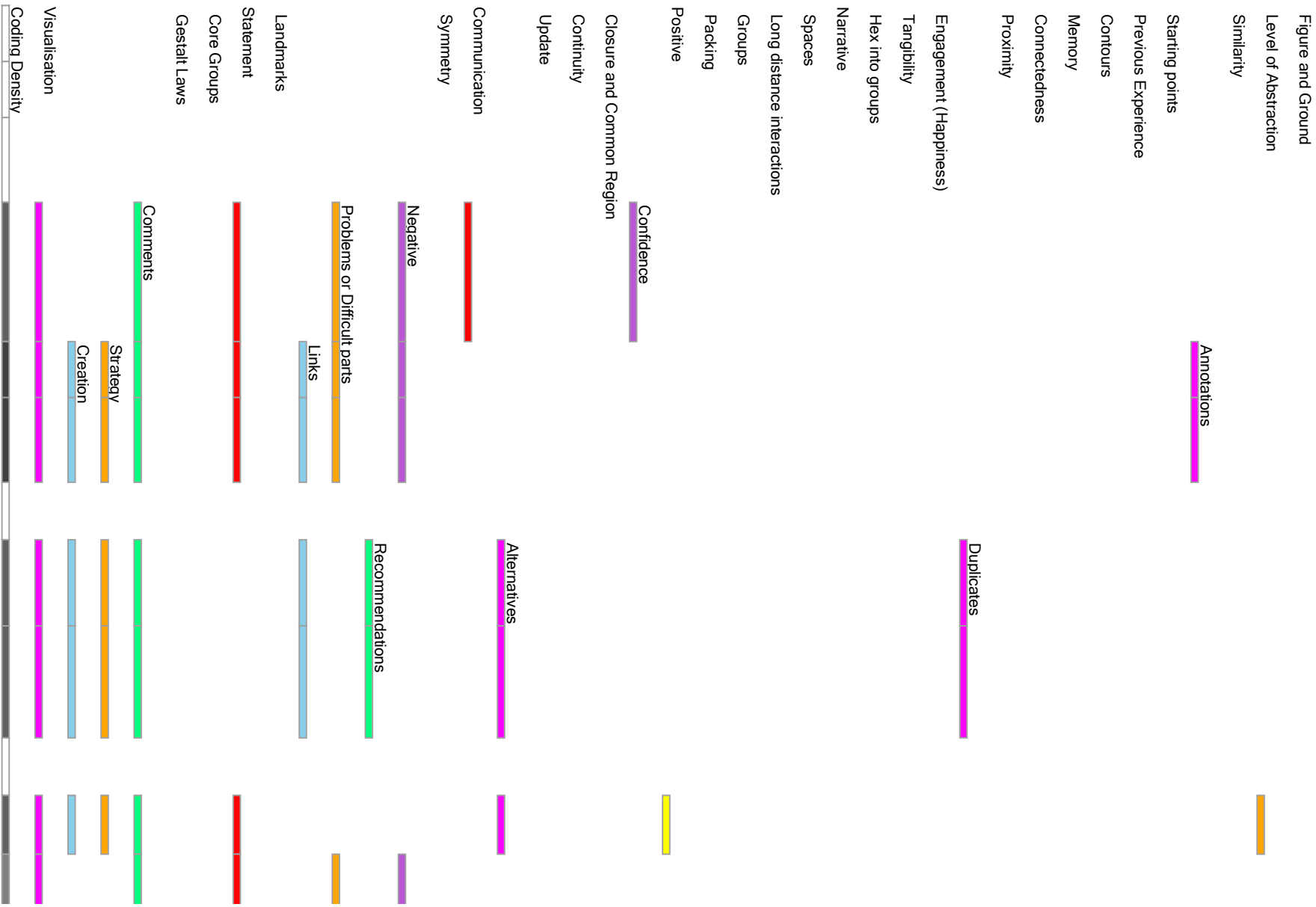


	Timespan	Content	Speaker
1	0:00.0 - 0:08.6	I think that's my first attempt. It's scattered 'round a bit.	
2	0:08.6 - 0:13.6	Right, so there is no right answers. So, don't mind me.	SP
3	0:13.6 - 0:35.2	So what I was thinking was, erm, what people are most going to be interested in are themselves. So I put people at the center, and then we branch off into things people are concerned about: Health, Food, Fuel, Politics, Community, Technology.	
4	0:35.2 - 0:47.4	So then we lead off into community, things like schools, society, services, markets, and all sorts of culture, religion, art, related things.	
5	0:47.4 - 1:23.4	Policies would lead over to culture and to climate, wars, problems with the oceans, water, problems in Africa. Arctic and the ices and also fuel. Problems with carbon, aerosols, nuclear and solar alternative fuels. Fuel also leads over to plant-based fuels, which ties into food and science based around investigating foods. So species, genetics, cell research. Viruses and bacteria leading to evolution...	
6	1:23.4 - 1:38.0	...and that would tie into drugs research and health. So you've got different areas of health research. And I've used the brain to link across to imaging 'cause a lot of people imaging of the brain and other medical issues.	
7	1:38.0 - 2:04.8	Which ties along to technology. This is more abstract technology, things like computer analysis of data. From there we go to sort of 'purer' science, things that most people aren't necessarily going to be as informed about. So, astronomy, quantum physics, particle physics. Lasers I had to put up there, was a bit annoying, because lasers I could fit in over here if I wanted.	
8	2:04.8 - 2:15.6	And data then and science ties into designing buildings, structures, and that ties into security, which leads back to people.	
9	2:15.6 - 2:19.2	So you're kinda doing like a story, right? Or, yes...	SP
10	2:19.2 - 2:21.1	Yeah.	
11	2:21.1 - 2:31.6	That's very interesting. I was just wondering, I'm going to ask you a few questions, right? Do you mind if I record those, because it's just a little bit easier than typing them.	SP



12	2:31.6 - 2:34.0	I thought you already were?	
13	2:34.0 - 2:42.6	Kinda, but I kinda feel like I should ask before anyway. Just in case they no 100%.	SP
14	2:42.6 - 2:45.3	Well, I think this said you were going to record it, so... I was okay with it.	
15	2:45.2 - 3:01.5	Yeah, but I tend to ask twice, maybe two, three times. I'm sure some people don't like being recorded. But anyway, it's just so I don't write and... Erm, I was just wondering how happy do you feel about your overview?	SP
16	3:01.5 - 3:28.4	Some things I don't think tie together quite well. I've tried to link things together in some way. Erm... I could, for example, swap 'religion' and 'language' over, because unfortunately in today's world 'religion' and 'war' tie very closely. What I don't like, is this grouping in here. I couldn't really find any way to tie it across to 'community' and 'society'	
17	3:28.4 - 3:44.6	Yeah. So... I mean... so you're finding that... you can swap some of them, or... or maybe they... they are related?	SP
18	3:44.6 - 4:03.1	A lot of things are inter-related. Or you can draw links between them. And in some ways, two-dimensional space isn't really enough to represent all the relationships. But we've only got two-dimensional space to work with, so we've got to do the best we can.	
19	4:03.1 - 4:18.5	Yeah, so I was wondering, say for example, if you could make, or you could have two cards for each, for example if you had two 'languages'... or if you had multiple ones of them, well that help, or...	SP
20	4:18.5 - 4:41.1	That would certainly allow for some more interesting things... you could, for example, have 'lasers' over with 'health'. You could have 'solar' and 'nuclear' research over with 'science' and 'stars'. 'Measurement' sort of fits in with health measurement and science... I'm grouping that as 'science'	
21	4:41.1 - 5:10.0	I wouldn't want 2 of everything. 'cause a lot of them you wouldn't need two of. But what's... because this is all currently black and white. What might have been an interesting idea is if certain ones could have been colour-coded. So you could have, for example, two 'lasers' and if they were both the same colour, then a person seeing it could associate them as being the same thing appearing in two places.	
22	5:10.0 - 5:15.6	Yes, okay. Actually that's a good idea, actually. [Laughs] Erm...	SP



23	5:15.6 - 5:24.3	And then you could colour-code the diagram as well. That would provide another visual aspect to the understand for the viewer.	
24	5:24.3 - 5:35.7	Yeah... huuh. I was also wondering if there's any area that you really don't like, or thing 'well this... this area is really wrong'.	SP
25	5:35.7 - 5:36.6	[Whispers] I don't like that bit...	
26	5:36.6 - 5:38.0	Do you know why, or...?	SP
27	5:38.0 - 5:46.9	It just doesn't seem to fit with anything around it except 'data'.	
28	5:46.9 - 5:55.1	Erm, I'm not fully sure what the meaning of the card 'flow' was either. It not what flow represents to me.	
29	5:55.1 - 5:57.3	It's raw materials and things like that.	SP
30	5:57.3 - 6:19.4	Yeah, 'cause I can understand 'reactions' as being chemistry, 'materials' as in such material science, 'design' the concept of designing things you have to work with. 'structure' could then lead into buildings and... but 'flow' to me... didn't really mean very much.	
31	6:19.4 - 6:34.8	Yes, okay. It's supposed to be like that a little bit. So, you get a little bit... somethings... so we can see how you play with it. Erm... Let me ask you a little bit about how you actually build this.	SP
32	6:34.8 - 6:37.3	How I built it in the first place?	
33	6:37.3 - 6:43.1	Yes, yes, yes. I mean did you start with some kind of... how do you start this, did you have some kind of strategy in your head?	SP
34	6:43.1 - 7:24.1	Being scientific myself, I tried to categorise things. My main categories were: science, computing, biology, geography, and society. So, this block up here would mostly have been society related things. You know, markets, culture and art, people... erm. Geography would have been Africa, various physical geographical scenarios. Biology I sort of just grouped all the different health and food and life related areas together.	

Figure and Ground

Level of Abstraction

Similarity

Annotations

Previous Experience

Contours

Memory

Connectedness

Proximity

Duplicates

Engagement (Happiness)

Tangibility

Narrative

Spaces

Long distance interactions

Groups

Packing

Positive

Confidence

Closure and Common Region

Continuity

Update

Alternatives

Communication

Symmetry

Negative

Recommendations

Problems or Difficult parts

Landmarks

Statement

Gestalt Laws

Comments

Strategy

Creation

Visualisation

Coding Density

Starting points

Hex into groups

Links

Core Groups

35	7:24.1 - 8:12.4	But once I had my main categories, I started looking for links between them. So, I could see that, erm, fuel could tie into geography because you have to get the fuels. It could tie into biology because research into biofuels. It could tie into solar and nuclear power for science. There's an obvious link between biological research and health. Very very close link. But they're not quite the same thing. Because on the one side you've got researchers looking at the health of people and the human body and things. Where on the other hand you've got people looking at biology for the purposes such as GM crops and improving food supplies and that sort of things.	
36	8:12.4 - 8:25.4	Health to me, when I saw the word 'brain', I thought, 'perfect, medical imaging.' Immediate tie-in to technology when I saw that one there.	
37	8:25.4 - 8:50.4	Going round the other way, nope, didn't really think of much links across from community, to what mostly ended up being geography at this point, but... that was my main approach, was to come up with categories and to start linking them together. I didn't choose 5 'cause it was any magic number, it's just where things happened to end up.	
38	8:50.4 - 8:54.9	Okay, right. That's interesting. Erm...	SP
39	8:54.9 - 9:01.4	And I wanted 6 things in the middle 'cause it looks nice with the hexagon shapes.	
40	9:01.4 - 9:25.7	[Laughter] Okay, yes. So I was just wondering about that... erm... like the way you place things. I mean, for example, you have this one here... did you meant to do it like that? Was it really annoying that there was one outside and it doesn't form a perfect shape? Was that something that you were thinking when you were doing it?	SP
41	9:25.7 - 9:48.0	It wasn't something that was coming into my head immediately, no. I was more looking at it as branching from the centre outwards. So to me, 'data' would have branched off into this 'design' area and 'computer' area. 'Theories' would have then branched off into universes and starts and onwards into the other bits of science.	
42	9:48.0 - 10:11.2	Yeah, I'm just wondering... things like, for example, you have 'security' here and you have it close to 'market' and 'population', but then a little bit father away, you have 'services' and 'schools'... are those still related to 'security'... or were you thinking 'well, that's not related to it'	SP
43	10:11.2 - 10:48.3	Erm... 'security', to me, I was thinking as 'market' and 'population' would then lead to financial security. By putting it close to 'design' and 'structures' I can look at physical security. But... it's not directly a service in the same way that that schools and financial markets are. But people still want their schools to be secure, they still want the public to have law and order. So, I wouldn't have said that they completely disconnected from security.	

Figure and Ground

Level of Abstraction

Similarity

Annotations

Starting points

Previous Experience

Contours

Memory

Connectedness

Proximity

Duplicates

Engagement (Happiness)

Tangibility

Hex into groups

Narrative

Spaces

Groups

Packing

Positive

Confidence

Closure and Common Region

Continuity

Update

Communication

Negative

Recommendations

Links

Landmarks

Statement

Core Groups

Gestalt Laws

Strategy

Creation

Visualisation

Coding Density

Comments

Strategy

Creation

Visualisation

Coding Density

Alternatives

Symmetry

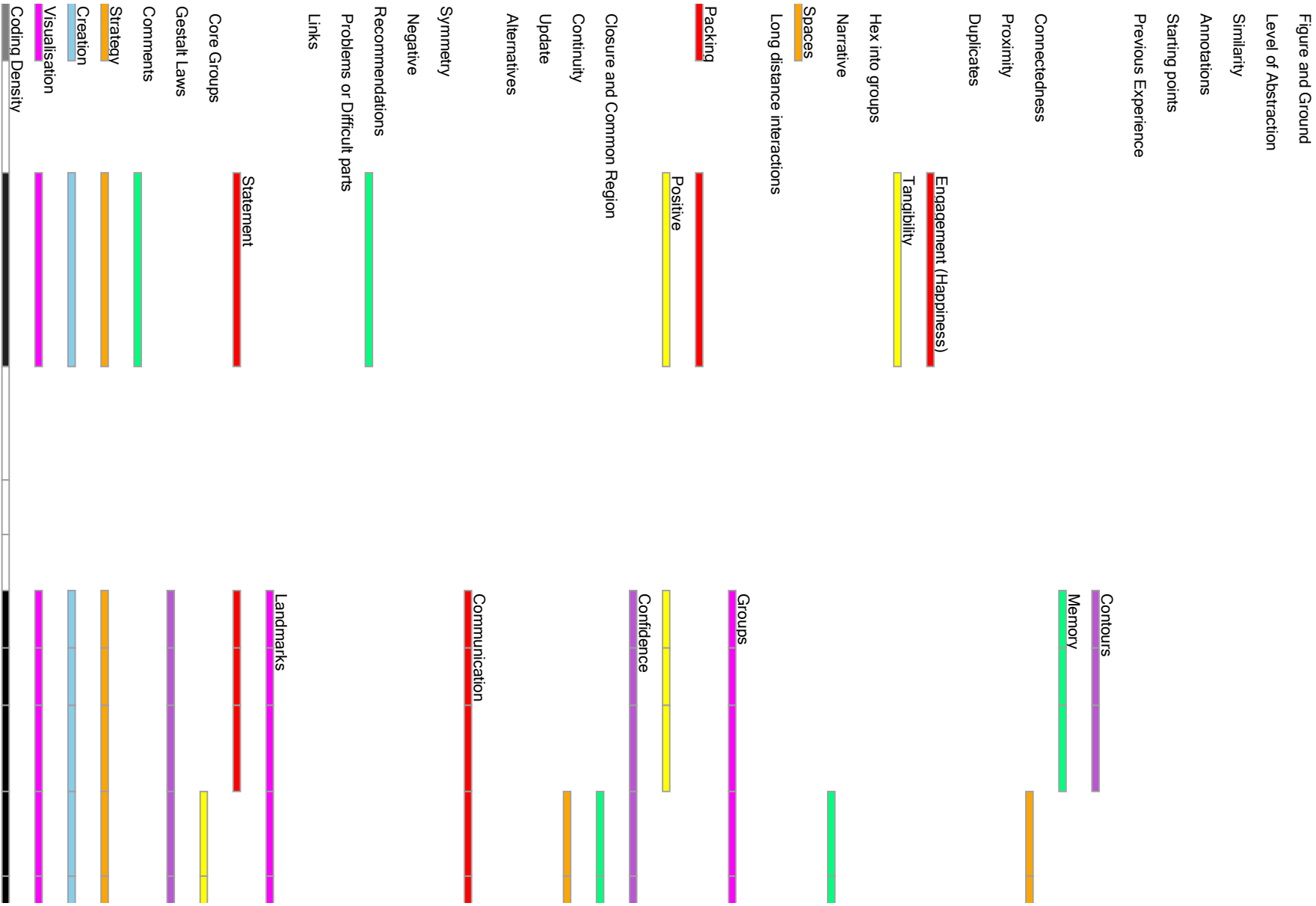
Problems or Difficult parts

Long distance interactions

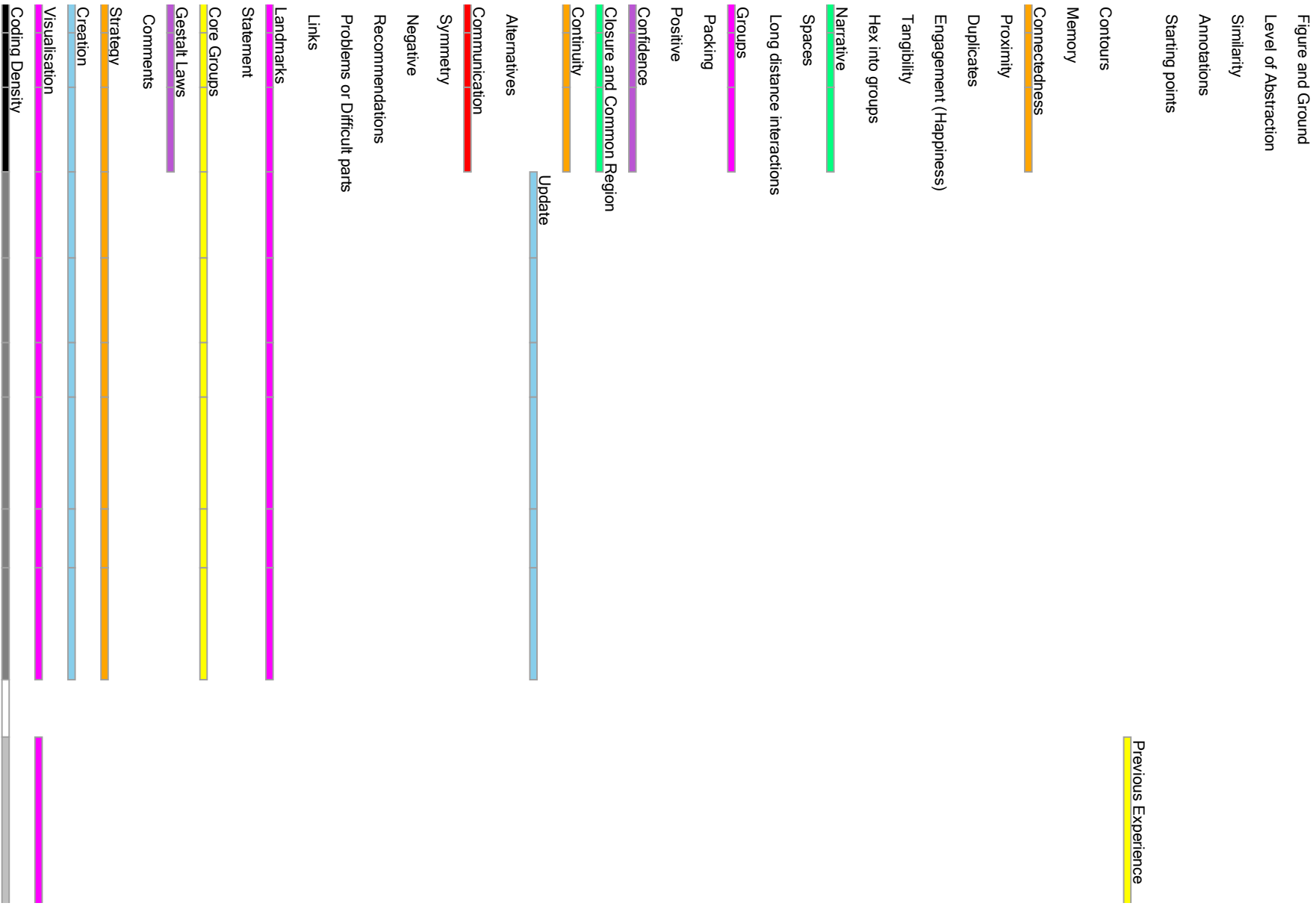
44	10:48.3 - 10:59.9	So, were you thinking... if I say to you, how far away are they going to be connection, or if they are a few tiles away are they already disconnected? Or...	SP
45	10:59.9 - 11:02.3	I didn't come up with a...	
46	11:02.3 - 11:07.6	Or, you didn't thought about that and you were just thinking that maybe the whole group...?	SP
47	11:07.6 - 11:36.4	I personally was looking at it either, well it was a bit inconsistent. Sometimes it was looking at it as groups. And sometimes it was looking at it as up to two tiles away. Erm... so this one's quite long and elongated. I wouldn't have said that 'solar' was inherently linked to 'war' for example. And in some cases I've used like 'animal' and 'drug' are to link two groups together, without being part of either group inherently.	
48	11:36.4 - 11:58.0	So I could do some more with it, if I wanted to. I could split off erm, the fuel concerns more directly, for example. Carbon being produced by fuels, nuclear and solar. 'Plants' could come across if I wanted to, so it would link it.	
49	11:57.9 - 12:12.7	But the other thing I through was if I split things up into too many small shapes you lose the overall shape of the design. And then it just looks like lots of floating hexagons.	
50	12:12.7 - 12:23.2	True... I just noticed that you have some spaces here, that you didn't put anything. Do you think those spaces need to be filled, or...	SP
51	12:23.2 - 12:57.3	I wouldn't have said so... Because then if I put something like, let's say 'particles' in the middle... that implies 'particles' can be related to 'lasers', 'magnets', 'stars', the 'universe' and 'quantum'. And while... as a scientist... I could probably find you a link for all 5, it's not something we really have to draw attention to. Where as, I did deliberately put 'art' directly in the middle of 'language', 'culture', 'religion', 'history', 'film' and 'music' because those all have a strong influence on art.	
52	12:57.3 - 13:10.2	Yeah so... So it's kinda like... things that are really closer together are more similar, or... they are supposed to be like that.	SP
53	13:10.2 - 13:21.2	Or there... erm... are easy connections that you can draw between them. They [touching hexagons] influence each other in some way.	
54	13:21.2 - 13:50.4	Okay, that's good. So... you tried to do some flow with your story, you can say, here. Did you thought that it needed to be a little bit symmetrical. I mean, I can see a littel bit from the middle bit where you put 6 of them and made them symmetrical. But, do you think, maybe, you needed something here [empty space] to balance it a little more, or that didn't come into your heart?	SP



55	13:50.4 - 14:40.1	It wasn't something I was inherently thinking of. The 6 in the middle was only used because of the fact I'd been given hexagons. So in that sense, the shape of the pieces inherently biased me towards 6-fold symmetry. The... I think if you tried to force too much symmetry on it, it actually limits what you can do. So I did try and... as much as I could have an outer ring, this sort of breaks the ring slightly. But I wasn't trying to be too strict on maintaining symmetry. There is quite a lot of empty space up there. It's possible we could bend things around a bit to try and fill it. Then again there is also quite a lot of space just here.	
56	14:40.1 - 14:47.1	Do you actually through the space was enough for you, or...	SP
57	14:47.1 - 15:22.0	Erm... I only really noticed running out of space down here, when I was trying to link health and technology in this particular diagram. Other than just this edge... I had enough space to do what I wanted. It's possible that if I'd spun the whole thing 90 degrees, I could have rearranged it slightly and not needed that constraint at all. This could have gone more down and this could have gone more up and that would fit it in, that way. But then we're making the whole design vertical rather than horizontal.	
58	15:22.0 - 15:48.7	Okay, very interesting. Let me ask you a few questions about, like, what do you think... say for example, about that actual... erm... how you did it, no... about the actual experiment. So, say for example, if I'd had this as an interface on the iPad, will you prefer that, or do you like actually like handling the small cards?	
59	15:48.7 - 16:41.1	I like having the cards, erm... because... when you initially start, you need to actually have the space to start putting things down and organising them. And if you've got the cards you can stack them up. And on the iPad, you've then got the interface issue of 'how do I look at what's been hidden behind other pieces?' Where as in real space you can just pick them up and look. On the iPad you'd have to drag all the ones on top off, and clutter up the screen to get to the one and the bottom and then drag them all back on again. So, I personally prefer doing it in physical space, but actually... design a professional version to be used, I'd want it to be a computer-based design because you could everything really neat. But this, I think, is a very... much better way of prototyping	
60	16:41.1 - 17:03.4	Yes, okay. Right, so. Okay, that's good. I was just wondering, say for example, if you leave today, say you've finished and someone asks you 'can you explain me what was the research of all this, can you explain your overview' do you think you would you feel confident of doing this?	SP
61	17:03.4 - 17:07.5	Would I have a copy of the overview there with me?	



62	17:07.5 - 17:14.1	Errr... probably not. Say someone in the coffee...	SP
63	17:14.1 - 17:29.7	I could give a rough summary. Say I was grouping things into related areas that I thought people would care about. I'd probably be able to manage that quite well. I wouldn't be trying to remember all 75 words.	
64	17:29.7 - 17:38.3	No, but do you think you will have the like the overview will be... or you could explain to someone more or less what was it in simple terms.	SP
65	17:38.3 - 17:59.4	I think I could. In part that's because I framed it as a hexagon and I can easily remember the shape. So I could work my way around my own mental image of the design. Someone else coming in and looking at this... I'm not sure they'd immediately see the hexagon that I have in my head.	
66	17:59.4 - 18:19.3	Okay. Riiiiight. Okay. Do you think that's because... yes, there's too many things, or? But do you think they will still get, like, the whole... they will get more-or-less the pattern and things?	SP
67	18:19.3 - 18:20.4	I'd hope they would.	
68	18:20.4 - 18:25.6	I can see a little bit of a pattern, yes.	SP
69	18:25.6 - 18:46.2	The idea was to have lots of individual things in the center to draw your attention to... this is focussing on the center and have all the large clusters around the outside so someone could start in the center and then follow wherever their vision happened to go, and follow a path to the outside and then wander.	
70	18:46.2 - 19:04.4	Yes, okay. Let me just do one more thing. Say for example, if say, I just told you that I forgot to give you 3 pieces and you had to put these 3 pieces somewhere... I mean you don't need to put them, but how would you do it? Do you think that would be quite difficult, or...	SP
71	19:04.4 - 19:36.3	'Sediment'... I'd have said 'sediement' would go up in geography. That said... I'd probably... quite like to swap it next to 'ocean' and 'earth', but that would be a fairly quick change for me. 'Sediment' would go in their quite quickly.	
72	19:36.3 - 19:47.9	'Protien' would almost certainly go between 'animal' and 'plant', being related to food, I'd put that there very fast.	
73	19:47.9 - 20:22.3	'Energy' though, 'energy' is a tricky one. 'cause energy could go over in society. People wanting, for example, be secure in their fuel supplies and make sure they have reliable energy prices. You could put it over with 'fuel' because energy is inherently linked with fuel because we have to get it from somewhere. Or I could stick it over	



		in pure science. I would be leaning towards putting it at the center of fuel.	
74	20:22.3 - 20:32.6	Yes, okay, but would you think about doing a new group with them, or... or do you just prefer to attach them to the ones you already have.	SP
75	20:32.6 - 21:01.1	I'd have preferred to put them into the design I already had. Because, the three you have me didn't seem to be linked. So either, I would put into what I already had... erm... and find where I thought they fitted. Or I'd take everything back in and re-categorise the whole lot and they naturally end up where they got categorised. And then... build the design again. Those would be approaches	
76	21:01.1 - 21:10.0	Okay, that's good. One more question. I was just wondering how much experience you have in 2D graphics, 3D graphics and things like that.	SP
77	21:10.0 - 21:49.3	Very little. My undergrad was in ultracold atomic physics. Which was essentially nothing graphical at all, it was purely abstract theory and computer simulation. I'm now working in a field related to graphics, in that, what I do is I design diffractive optics. And the point of the diffractive optics is to get good looking images displaying when you shine lasers through the devices. But, as graphics myself, I've not really got much experience in it.	
78	21:49.3 - 21:54.2	What about layouts and things like that. Layouts of websites... or...	SP
79	21:54.2 - 21:58.1	Not really, I tend to just improvise. No, no real experience.	
80	21:58.1 - 22:04.2	That's brilliant. So that's all my questions done!	SP

Figure and Ground
Level of Abstraction
Similarity
Annotations
Starting points
Previous Experience
Contours
Memory
Connectedness
Proximity
Duplicates
Engagement (Happiness)
Tangibility
Hex into groups
Narrative
Spaces
Long distance interactions
Groups
Packing
Positive
Confidence
Closure and Common Region
Continuity
Update
Alternatives
Communication
Symmetry
Negative
Recommendations
Problems or Difficult parts
Links
Landmarks
Statement
Core Groups
Gestalt Laws
Comments
Strategy
Creation
Visualisation
Coding Density