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# Visualizing Our Way through Theory Building<sup>1</sup>

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## Abstract

Visualization is fundamental to how we experience and understand the world. Although we make ample use of visual tools in our role of educators, we tend to overlook the potential use of visualization techniques in our research. In this essay, I illustrate how visualization can be fundamental to analysing and making sense of qualitative data.

As educators, we are no strangers to the power of visualization to communicate concepts and ideas in class. Most of us routinely use some combination of white board, PowerPoint slides and videos to focus the attention of students by visually highlighting the core content of our lessons. We draw arrows between words or boxes to show that they are related, and we use matrixes and diagrams to illustrate visually how interactions between different variables produces different outcomes. We use pictures or videos to make our anecdotes more vivid or emotionally engaging, or to communicate more easily what would take too long to explain verbally.

The most artistically gifted among us, or simply the most shameless (e.g., yours truly), produce more elaborate drawings to illustrate subtle or complex ideas. Sometimes we do so just to provide a diversion or to re-capture the attention of the class during long sessions. I routinely disclose my lack of design skills by producing lame sketches of Vespa scooters or Alessi lemon squeezers, and occasionally venture an elaborate, multicolored representation of barges navigating a river through mountains and woods, carrying logs to paper mills and paper rolls to printers, just to illustrate the concept of upstream and downstream vertical integration.

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<sup>1</sup> This essay draws on a keynote speech I was invited to give at the 2<sup>nd</sup> international conference on Visuality, Materiality and Multimodality, Copenhagen, September 22-23, 2016; I am grateful to the organizers, Eva Boxenbaum, Renate Meyer, Silviya Svejenova, Lærke Christiansen, and Dennis Jancsary, for offering me the opportunity and encouragement to develop these ideas in the first place. I am particularly grateful to Eva Boxenbaum and Denny Gioia for their insightful comments and suggestions on early drafts of this essay.

Visualization, however, can be quite useful even outside class – before class – when planning the content of a session, unpacking concepts and examples, envisioning sequences, and highlighting incidentals. Visualizing ideas, for me, is important not only to communicate the content of my lessons, but also to produce and organize that content in the first place. A set of slides can only capture in part the complexity of an interactive session, or offer the freedom and flexibility required to visualize the emerging content of an open-ended discussion. In these circumstances, I find handwritten notes, tentative visual maps of multiple potential lines of discussion, still quite useful to help me think a session through.

The simple fact of the matter, however, is that *visualizing* constitutes an essential mode of understanding for most of us. We're visual beings. We "get it" much more viscerally, emotionally, cognitively, or just differently when we visualize. And visualizing is essential to another of the most basic attributes of our humanness: the way we learn. Visualization is so fundamental to human learning that we sometimes seem to take it for granted, ignoring its crucial role – even when we engage in the most fundamental learning activity we do as scholars – generating new knowledge (i.e., conducting our research). If visualization is so fundamental to our experience, and if so many of us have recognized and implemented visual techniques in our teaching and learning, why have we so underplayed its role in doing empirical research?

Actually, I find visualization invaluable when trying to make sense of the qualitative data that my research relies upon, so I would like to make a case for incorporating more visualization in our research approaches. We might first note that the constant development of technology is providing qualitative researchers with increasingly sophisticated software to support our analytical efforts. We can now more easily code large bodies of textual data by quickly retrieving and reorganizing codes and fragments of text across multiple sources. We can rapidly content-analyze thousands of pages, using the most advanced software to identify recurrent patterns in the words, trying to capture meanings behind the text. Despite these advances, however, the

“creative leap” that lets us move from identifying concepts and tracking patterns in our data to a more general theoretical interpretation remains elusive.

Recommendations for executing case studies are usually very detailed when it comes to explaining how to collect data, but tend to be much more vague about how to theorize from these data. Prescriptions for grounded theory discuss extensively how to move from a multitude of transcripts to a set of codes – the building blocks of an emergent theory – but tell us less about how to put these scattered bricks together into a coherent theoretical framework. Despite the best efforts that some of us have made to unpack how to produce a novel and interesting theoretical interpretation of a phenomenon we observed, this critical step of the analysis largely remains a mystery.

A few years ago, together with Ileana Stigliani, we studied how designers use a variety of visual tools to support the generation of new ideas. Ileana spent several months at Continuum, a design consultancy in Boston, observing everyday how designers worked. As we discussed her observations and the content of her interviews, we were both struck by the recurrent metaphors that designers used – “crystallizing ideas,” “organizing thoughts,” “parking ideas,” “connecting brains,” “building on each other ideas,” etc. – to allude to how the techniques of visualization they used allowed them to physically engage with their ideas, reflect on them, refine them, and combine them into new conceptualizations of products and spaces.

Ileana and I interpreted what we saw as a “materialization of cognitive work,” pointing to how the visual tools designers used acted as cognitive extensions to support mental processes – as an abacus or a knot in one’s handkerchief would – and we wrote a piece about how visual practices and artefacts facilitated how designers collectively made new sense of users, user needs, and products (Stigliani & Ravasi, 2012). These artefacts, we argued, enabled designers to generate prospective new ideas by iterating back and forth – first individually, then collectively –

between the embodiment of provisional interpretations in visual form and the retrospective reflection on these visuals to establish the relevance and soundness of the ideas they embodied.

One of the fundamental objections that reviewers had with our arguments was that they did not seem transferable outside the context of design – an activity, the very outcome of which is the specification of physical objects and spaces. As we responded to this objection, we pointed out that, after all, when trying to theorize about a phenomenon, aren't many of us also using handwritten sketches, boxes, arrows, etc. to visualize tentative ideas and reflect on their coherence? Reviewers did not seem to pay much attention to this argument, and we also left it at that. It was only years later, when trying to explain to doctoral students how to analyse qualitative data, that I was struck by how similar my experience was to what we had observed designers doing at Continuum. When trying to move from a systematic coding of interview transcripts and other texts to a theoretical model – I realized – just like those designers, that I engage in a range of practices that allow me to visually engage with my ideas and support my theorization. In fact, as I retrieved printouts and notes from that study, I was surprised at how our theory-building efforts ultimately had relied on the very same visual practices that we were trying to theorize!

Qualitative research has been described by finer minds than mine as an act of sensemaking – an attempt to bring order to a chaotic flow and mass of cues and experiences, to produce a simplified conceptualization of a portion of social reality. Just like the designers we observed trying to make new sense of people, objects, and spaces, so we were trying to make new sense of how people use visualization processes to support their thinking. Just like those designers gradually shifted from sensemaking to sensegiving, as they became increasingly concerned with presenting a plausible and defensible “story” to their clients, so our analytical efforts constantly kept in mind the need to persuade our editor and reviewers of the plausibility of our

interpretations. And as we did that, we unknowingly relied on visual tools and practices that were very similar to those we were studying.

Just like designers returning from their initial field expeditions used pictures, videos, cards and other tools to share with the rest of the team what they had seen and heard, Ileana shared hundreds of pictures and field notes that had some rare detail (“Daniel enters the project room with a bottle of Dasani water. He seems troubled...”). Designers mentioned how pictures, videos, etc. helped them “recreate their experiences”. Similarly, in our case, pictures and notes were important for me to access at least some of the cues that Ileana had been exposed to in the field – what she noticed and bracketed from the chaotic flow of stimuli she was immersed in everyday – and that had triggered some early attempts to make sense of what she saw.

Just as designers kept doodling during project meetings, to “capture ideas” inspired from what they saw or heard, and to “crystallize” them on paper for further reflection before they faded from memory, so – I realized by looking at my print outs of interview transcripts – as I went through these texts, I frequently scribbled tentative abstract interpretations, intuitive fragments of theoretical ideas stimulated by what I was looking at. Different inks and multiple layers of coloured highlights testified to my shifting attention and evolving ideas as I re-read and re-coded these transcripts multiple times in the course of the editorial process (no ATLAS.ti for me, nor NVivo; just pen, paper, and highlighters. I am old school...). Some of these intuitive ideas eventually developed and found their way into the paper; others inspired other pieces; others went no further.

Just like designers grouped and re-grouped pictures, cards and Post-Its on a wall to “sort things out” and cluster cues to produce new concepts, so we moved fragments of interviews around provisional tables – literally dragging them across pages and cells. Yes, I know, NVivo and ATLAS.ti would let me quickly retrieve all the fragments associated with the same label. I wonder, though, if my reluctance to use even the cut-and-paste option is justified by the

importance, for me, of physically engaging with each and every fragment – the slowness of the process letting me embed these cues more deeply in my memory and facilitating conscious reflection and less conscious detection of patterns amid myriads of cues. Whatever it is, it seems to be working for me, as tables-in-the-making offer me a visual framework to organize cues into emerging concepts, the visual proximity of fragments facilitating their comparison, and helping me assess whether the provisional way in which I am gathering them and labelling them “makes sense.” In fact, I could do even more: a few weeks ago I saw one of my colleagues cutting out cards associated with his first-order codes, so that he could manually group and regroup them to cluster them into second-order ones!

Just like designers used or built visual frameworks to “organize their thoughts,” so attempts to visualize the relevant elements of our theory and the relationship among these elements was central to the development of our theoretical ideas. In fact, when I look at the papers I have published, for each of them I have produced an enormous amount of figures – some simpler, some more elaborate – exploring different visual solutions to grasp and express partly formed, emerging ideas. I would use the back side of printouts for early handwritten sketches (double-sided printing might be good for the environment, but leaves little space to capture theoretical illuminations). Particularly boring seminars would offer an ideal space to elaborate visually on these ideas (this is how I really use the paper blocks they give you at conferences...). These sketches would eventually evolve into more refined figures, and more figures... and yet more figures... with the final published version being but the latest manifestation of an ongoing attempt to focus on the relevant constructs and to clearly articulate their relationships. Different visual solutions placing emphasis on different aspects of a phenomenon and reflecting different lines of thinking.

I find figures helpful not only to support my own thinking, but – when working with co-authors – also to facilitate convergence around a common theoretical understanding. Just like

designers took turns refining a sketch or a drawing on a board, “building on each other’s ideas”, so Ileana and I used the windows of my office (which was furnished in an exquisite way, but left no room for a board) to draft and redraft tentative figures (turns out you can erase markers from a window just like you do with a white board), as we merged and compared our different interpretations into a more robust and convincing one. These sketches remained on my window for months (no cleaning person dared to interfere with science-in-action). They constantly reminded us of our evolving ideas, which we “parked” in those windows (and in a board in Ileana’s office and in piles of printouts) until the editorial process came to a (happy) conclusion.

When working with co-authors across the ocean, I found that exchanging visual representations of an emerging theory – where each element is carefully defined and each arrow is neatly “theorized” on the margin – extremely useful to share early ideas, challenge each other’s interpretations, and gradually converge around a theoretical framework. Doing this, I have found, forces me to reflect on what at this stage are intuitive insights, tentative connections, and to more consciously assess the soundness of ideas that may be still fuzzy. If we cannot persuade each other, how can we hope to persuade reviewers?

As I work on tables and figures, eventually sensemaking and sensegiving begin to merge. Just like designers gathered some of the visual tools produced during the project to “walk the client through” their line of thinking, so we began to focus on the core visuals that we would use to support our arguments. At this stage, all the material that we had produced, and “parked”, helped us “keep the trail of bread crumbs” – as designers would say – to trace our emerging interpretations back to our early engagement with the data, showing how each single table, each single figure helped us move one step closer to the theoretical framework that we proposed.

Reflecting on this experience has drawn my attention to how useful it can be to visualize emerging ideas when theorizing from qualitative data. To engage visually with fragments of data and fragments of interpretations, rearranging and recombining them until a “feeling of order”

suggests to me that my sensemaking efforts may be provisionally put on hold. Until that nagging sensation that something is not quite right – your subconscious telling you that the model in front of your eyes does not quite fit all the cues that you have gathered – disappears. At least temporarily. At least until someone – a co-author, a reviewer – does not point out some inconsistencies, triggering another round of sensemaking (and possibly further data collection).

We tend to think of figures as a way to illustrate our arguments to our readers. I found that constantly scribbling, sketching, drawing actually helps me think better. Making sense to myself, not just giving sense to my readers. I wonder, then, if the secret to the creative leap really lies in the process through which ideas develop: In the practice of thinking – or visual thinking – if you will. Becoming accustomed to engaging visually with our data and with our ideas, then, may be a key to the mystery of theorizing from qualitative data.

Using tables provides us with visual organizing frameworks to support coding efforts, as fragments of data are constantly allocated and reallocated, cells are split or merged, and tentative labels and definitions are revised. Visual proximity helps us assess conceptual similarities and differences, and the stabilization of a spatial organization of textual data reflects the consolidation of an emerging code structure. Using visual representations allows us to engage in a conscious conversation with our (often subconscious) efforts to navigate through all we have seen, heard, and felt out in the field, to “make sense” of it in a way that captures the essential features of a phenomenon, while at the same time accounting for its nuances. Iterating these visual aids back and forth between co-authors gives us a way to sharpen the analysis and build a consensus around a defensible theoretical interpretation before even writing the first line of the paper.

Today, many see in the increasing sophistication of data analytics, computer-assisted content analysis, and qualitative research software a promising – perhaps inevitable – avenue to increase the sharpness and soundness of our studies. Yet, when it comes to capturing meanings,

building concepts, and producing theories – just like when planning the content of a course or a session – perhaps a blank sheet of paper, a pen, and a set of highlighters may really be your best friends.

Most of us are inveterate visualizers. We “think” and comprehend in images – whether those images are literally pictures or more graphic forms like figures and tables or yet more abstract forms like metaphors. Visualizing is an essential feature of our learning and our teaching. I’ve chosen to demonstrate the usefulness of visualization by articulating how the process helps my research and my theorizing, but I believe visualizing has much greater scope than that. I also think we have not given due consideration to the ways in which we can enhance our visual tendencies and capabilities and apply them to develop richer ways of understanding our modes of inquiry. Maybe we should.

## **Reference**

Stigliani, I., & Ravasi, D. 2012 Organizing Thoughts and Connecting Brains: Material Practices and the Transition from Individual to Group- level Prospective Sensemaking. *Academy of Management Journal*, 55: 1232-1259.