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Reading data together

Data Visualization is a field that needs to be framed in theories, in order to comprehend how to read visualizations. Visualizations are products of a complex process, and their complexity is often not visible. This text approaches the reading of data visualization through a humanistic point of view, which considers the fact that all the readings are different and a common reading is fundamental to understanding visualizations in the correct way, and to advance the culture of visual reading. Visualizations have to be read in a thoughtful way, and each individual comprehension has to be shared with colleagues. Through what we could call discourses, information can freely circulate and then create what is called culture in the text. Finally, culture is the shared knowledge that gives rules and context to reading an artifact, such as a visualization. Thus, the text simply says that cultivating a common dialogue is the only way to advance in visual reading.

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This is a paper that invites us to take images seriously. A few years ago, my father was invited to do a blood test, a simple examination in order to get information about his medical condition. Sometimes my father could appear to be a hypochondriac; it is not always the case, but at that time he did seem that way. My father went to the hospital, did the blood collection, and then received the results at home after few days. The letter, sent by the hospital, contained an infographic of the results; at first glance each value was within the limits, except one. My father, who for this occasion was very much being a hypochondriac, was seriously worried. He made the week before the doctor's appointment very stressful for my mother because one value was passed the limit. After one week elapsed, my father went to the following appointment. Once he entered the doctor's office, he started asking a series of questions – with my mother at his side, looking embarrassed. The minutes passed, and at a certain point the doctor stopped my father, took a serious glance at the exams and said: “Dear Claudio, your medical condition is extremely good for a man of your age. You're simply becoming old, and you don't have to worry about this blood value. It doesn't deserve great attention.” After a while, my father was euphoric and healthy, and my mother finally relaxed.

This short story introduces us to visual information reading. For visual information I am referring to infographics, tabular data, images, diagrams, or data visualizations, and, broadly, visualizations. Orit

Halpern, recently employed by Parsons, the New School of Design, claims that visualizations appeared in 1883 to “depict the formation of mental images of things not actually present in sight. Visualization slowly mutated from the human psychological processes to the larger terrain of rendering practices by machines, scientific instrumentation, and numeric measures. Visualizations now make new relationships appear and produce new objects and spaces for action and speculation” (Halpern 2014, 21). Halpern explains in few lines how visual languages appeared in everyday life, how visualizations became necessary over two hundred years, and how visualization comprehension represents the fundamental act of understanding the meaning of these visual languages. Although that introduction seems appropriate for a psychological discussion, I would move away from any cognitivist approach, and, as a consequence, the primary focus of this text is the understanding of visual information.

Understanding is related to the act of reading. When I use the word “reading” I am also implying the act of comprehension; consequently, understanding and reading are intertwined in a unique process. I strongly believe that reading is a unique act because each person has an individual way of understanding and each result is different (Drucker 2001, 29). In the 1980s, Hal Foster edited a book in which he introduced the notions of *vision and visuality* (Foster 1988). For Foster, vision is an act performed by a human with the intention of looking at something in order to comprehend it. On the contrary, visuality is the unique understanding that each human gets through an act of vision. Introducing the contradiction between the visualization and the act of reading, Foster invites us to think about the tension between the visualization as an object, and the personal way of reading that belongs to everyone. He focuses on the fact that there are infinite ways to look at a visualization, and looking at one visualization should always signify a relationship between the visualization and the observer. For example, my father had a different visuality compared to the doctor’s. In this short anecdote, we see three different reading experiences: my father thinking that visualization is a sign of a physical disorder, my mother dealing with a hypochondriac crisis, and the doctor thinking that the blood collection was fine. But what do these different readings represent?

Gillian Rose, professor of Geography at the Open University, in the United Kingdom, introduces the concept of *culture* in his book “Visual Methodologies”(Rose 2001, 5). Rose says that “culture is a complex concept” because culture is the context of reading, to which everyone belongs. Culture is our background, our childhood, our education and our friendships. Culture is everything that leads us to the reading direction. Consequently, culture is the reason my father, my mother, and the doctor had three different ways of reading the same blood collection. My father had an exaggerated reaction because he was worried, indeed he was the subject of the reading. The doctor had studied medicine, and he has looked at thousands of blood collections in his life; the collection he read was not serious compared to other ones. My mother had a different reading because she knows my father. However, culture is not just something personal, culture is also shared through people’s

interactions. Discussions, for example, are a way to enrich personal culture, or, in other words, to modify the potential of a reading.

Indeed, greater knowledge is the result of discussions. Knowledge is about reading data together. Based on the doctor's opinion, my father and my mother changed their point of view, and their culture. Think about X-rays. I broke many bones when I was younger, and I always saw the same scene, two doctors having a discussion together in front of an X-ray, trying to come to a mutual opinion. Bernike Pasveer thinks about X-rays as a technological mediator, acting to produce representations of phenomena invisible to the eyes, such as a fracture (Pasveer 2006). He simply discerns between technologies, substituting human sensorial apparatuses with technologies that act as mediators. If the first offers doctors the results, the second produces something that has to be interpreted. X-rays and data visualizations are always mediators because the interpretation is given to the observer.

Knowledge is composed of all of the observer's readings. Circulation of these readings is fundamental to constituting a discussion, but also to form common opinions. Data visualization becomes the mediator to start discussion and give form to opinions. Data visualization is even a way to get knowledge circulating. Artifacts of data visualizations are designed objects that can trigger critiques about a subject, or about themselves. All these fluxes of movement in the cultural level of reading are confirmed by research previously done in the area of art by Lynda Nead (Nead 1988, 4) (Rose 2001, 136), who interpreted the notion of *discourse* by Michel Foucault in his book, "The Archaeology of Knowledge."

In conclusion, reading a data visualization, especially in the medical field, is an act that should be performed seriously. When I use the word "seriously", I don't mean to imply that people are not educated, but simply that a larger analysis of the context gives a better quality of reading. First, in data visualization we have the production and the reading levels. The production of a visualization is as serious of a task as the reading. Understanding the context in which the visualization is created is fundamental to the reading. For example, why a visualization was created, by whom it was created, and for which purpose. On the other hand, reading visualization has to be an act of thoughtful interpretation because visualizations are not perfect, they are always a reduction of reality (Latour 2007, 171-225) and are immersed in a cultural context. And culture is a result of what we experienced all along in our lives. Culture is the very last production of a visualization through an active reading. In other words, culture is the production of the collective action of reading and discussion. No culture exists without discourses - without the circulation of opinions among people, but, in particular among scholars and practitioners of a specific field, breaking and changing rules and convention are assumed to be a black box. This is the reason why we have to read data together.

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