CO-238

MAKING MORE SPACE FOR ART - A PILOT STUDY

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INTRODUCTION

The transition from traditional cartographic technology to digital cartography brought many changes to the map making domain. Over the past twenty years analog map making has become a niche skill which is often viewed by the geospatial community as being outdated. The purpose of this article is not to "turn back time" but to wonder if technology-centric and non-domain-specific developments have created and nurtured a science and technology focused cartographic domain. Thus, one might wonder: Where is the art in contemporary cartography?

A different domain has started to explore analog spatial representations: Artists have begun to use and extend existing cartographic techniques, principles and rules for their graphic representations. Cartographers usually obey to cartographic rules while artists are "free" to disobey the standardized visual language. As a result, artists have produced many fascinating and innovative map-based artistic expressions. Most of these artistic spatial representations are designed for the general public, some are thought provoking; represent qualitative or quantitative data while others are curious, funny or an exploration of space and place. Many of these novel artistic mappings fascinate the target audience and often act as effective communication vehicles. How can contemporary cartography utilize these artistic approaches?

The research presented here will build on this fascination and explore these new graphic and artistic developments. The goal of the pilot study presented upon here is to create useful and usable analog cartographic representations for facilitating effective public health awareness and risk communication to the general public.

BACKGROUND

Nelkin (1987) describes that the public understanding of scientific research results and novel technology developments are essential in a society that increasingly relies on them for decision-making. The general public usually makes and contributes to decisions at two spatial scales: community-level and individual/family-level. Community-level decisions could e.g. involve environmental impacts of developments in the city or in a neighborhood, while individual decisions might require making e.g. a decision on health, nutrition or exercise related personal preferences. The "science" behind these decisions are often based on newspaper readings, radio or TV broadcasts, and/or science "gossip" (Bucci and Trench 2008).

Traditionally, health science communication is a top-down communication approach which can be described at four different levels. At the highest level, experts usually describe their research findings to a select group of domain experts in specialized scientific journals. These findings are often transferred to a larger group of scientists within the same discipline via "bridge journals" such as Nature and Science. In the science communication continuum these publications are then transferred into the popular level of science newspaper sections or television news reports or documentaries. Once the research findings are established they are adapted into textbooks for educational purposes. Science communication usually has the broadest audience and readership at the popular level (Bucci 2008). The traditional health science communication model provides only a one-way communication from scientists/decision makers to the public. However, current research indicates that the public is often very frustrated with this one-way communication approach and would prefer in many cases (especially on a neighborhood or individual level) the option to ask questions and be involved in a dialogue with the scientists and decision-makers (Stilgoe and Wilsdon 2009). While developing a framework for health information dialogue is out of the roam of this research; it is important to note that visual representations can effectively facilitate a dialogue between the visual representation and the observer, and also within a group of observers.

Health information mapping and analytics has become an important research field within contemporary geovisualization. Much of the current research is directed towards health data exploration and analysis (Cromley and McLafferty 2002). Some research examples are a) the Geo–Explication Portal, a collaboration platform for the dissemination of analyzed health data, b) the Health-GeoJunction portal, an application that maps health information extracted from public health reports and scientific literature, and c) the Pennsylvania Cancer Atlas, an exploration application with linked statistical graphics for county-level

cancer data analysis and exploration (Roth et al. 2008). While these and other applications are useful for health professionals and their expert-level tasks, for the general public they are of little use. Some US states provide web-based health atlases to the public. While these atlases are easily accessible, they mostly contain static and very abstract choropleth maps, which can be downloaded as PDF or as a raster data file. The North Carolina Health Atlas (http://www.epi.state.nc.us/SCHS/gis/atlas/index.html) for example provides over eighty PDF-based maps that visualize the leading causes of death, cancer incidences, vital statistics, and behavioral risks factors. Although the maps are well designed, little is known about public usage, learning impacts, and behavioral changes of health atlas viewers. The World Health Organization (WHO) also provides a Global Health Atlas to the general public. This web-based atlas provides a map library with prepared maps, a data library and an interactive component which allows the user to select thematic datasets (http://apps.who.int/globalatlas/). As with the North Carolina Health Atlas it is not immediately evident which impact the Global Health Atlas might have on public awareness, changing health attitudes and improving healthy behavior. Assuming that many of the web-based visual health information communications might not be effective, the main question becomes: Which form of spatial representation could facilitate public awareness and help improving public health attitudes and behavior?

A FIRST PROTOTYPE

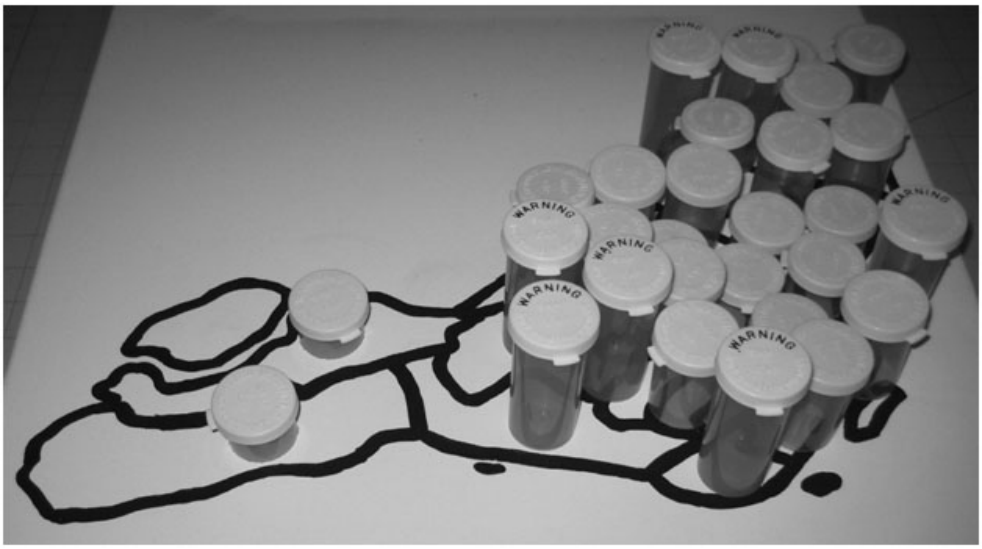
The following research approach was carried out in preparation of the second workshop of the ICA working group on Arts and Cartography in Montreal, Canada. The workshop was held in September 2010 under the title of "Mapping Environmental Issues in the City". The organizers provided an extensive Montreal health database to workshop participants who were asked to utilize the datasets for their research and workshop presentation. The results presented here showcase a first step towards taking a different perspective in designing useful and usable geospatial representations for health information communication.

Basic socio-demographic data for the Island of Montreal was chosen as a sample dataset from the database, provided by the workshop organizers. The selected dataset represented the Island of Montreal and divided the Island of Montreal into twenty-nine Local Community Service Centers (CLSC), health and social services jurisdictions that provided the statistical data for each area. One sample dataset, representing the rate of heart-related illnesses in each section was selected for the health data display.

In order to provide a most simplistic approach to the health information display, an analog representation design was chosen. Thus, the basis of the health data display was a 20x20 inch white canvas that provided the horizontal and vertical axes to place graphic marks. All twenty-nine Local Community Service Areas (CLSC) were projected on this canvas and traced with black acrylic paint on the canvas. Thus, this canvas created the "base" canvas for the health information data.

Twenty nine "classic" orange and white prescription bottles were used as the metaphor for representing medicine to be taken for heart-related health conditions. It needs to be noted that this particular metaphor might only work for the North American public, since these prescription bottles are standard means of distributing medicine in American and Canadian pharmacies. The same metaphor would not work for the European public, since these prescription bottles are almost unknown in that region.

The heart-related illness dataset was broken down into three categories (low, medium, high heart-related illness rates). These three ordinal categories were represented in the health data display by three different prescription bottle heights. The combination of Bertin's (2011) visual variables "shape" (prescription bottle) and "size" (height of the prescription bottle) provided a simplistic health information display (Figure 1). In a second version of the health data display a third graphic variable (color hue) was added to the representation. The prescription bottle caps were colored in yellow, orange, and red; representing the severeness of the heart health conditions in the Local Community Service Areas.



CONCLUSIONS

The initial health data display is a simple prototype that needs further development and refinement. The display represents a general concept of simplifying health information communication with metaphors, visual variables and artistic expressions. At this point, not much is known about the usefulness and usability of these suggested displays. However one must wonder if simplification, effective visual variables, and metaphors could enable dialogue within a family or with health officials so that the main goals of health information communication a) awareness, b) influencing attitudes, and c) changing behavior can be successfully met.

This research approach needs to be extended to understand the implications for simplistic, metaphor-based public health information displays and the requirements for redesign. As Irwin (2009) points out: public health communication needs to include the facts about risks and uncertainty for decision making, but also needs to generate trust through openness. It needs to be investigated if a simple, metaphor-based public health information display can provide such risk and uncertainty information and generate trust. Public health communication is about dialogues. Bucci (2008) outlines that effective science communication could go from knowledge deficit to dialogue, and from dialogue to public participation. Further research needs to assess how interactive public health communication displays could facilitate such a dialogue and provide an opportunity for public engagement in a health discussion within a neighborhood or larger community. The presented health data display could be considered as a step towards such a public health communication and dialogue medium.

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