The Blue Spark of Creativity

1. What I originally planned to talk about was the intersection of creativity studies and folklore studies, using my current research as my example. But as I worked on this presentation and thought about the things currently fascinating me, I decided to tell a somewhat different story...

2. At 1:31 PM on August 14, 2003, an electricity generating plant in Eastlake, Ohio shut down due to some maintenance problems. A half hour later, the first of several transmission lines failed, when under the heat of an increased load, they came into contact with a tree.

3. Over the next two hours, this pattern would repeat, moving geographically eastward and systemically upward — that is, affecting more important trunk lines between plants — until much of the Northeast was without power in what is now known as the Northeast Blackout of 2003.

4. It was the second most widespread electrical blackout in history, and like others before it, it was the product of what a cascading failure. Such failures, where the failure of one part in an interconnected system triggers the failure of other parts, are known in other disciplines: biology, electronics, physics, finance.

5. The idea that pieces of a larger reality are connected, and that rarely are those linkages evenly distributed along the pieces represents a fundamental change in how many disciplines have thought about reality and has come to be called simply "network theory."

6. Now it just so happens that of the many flavors of creativity studies, the one most amenable to our own field is the "Domain Individual Field Interaction" framework. DIFI, as it is sometimes known, provides an integrated view of individual creativity while highlighting social and cultural contexts.

7. Within the DIFI model, the **domain** is an organized body of knowledge, including any and all specialized languages, rules, and technologies. A **field** contains all individuals who can affect the content of a domain, including not only creators but also audiences. And an **individual** is the generator of works in the system. [All of these map nicely onto terms with which we might be more familiar.]

8. Most interestingly, the DIFI model emphasizes the interactivity of the three subsystems: individuals contribute work to the domain. The field evaluates the work. If the work is accepted, it becomes part of the domain.

9. The field, however, is not an indiscriminate bolus. In our case, neither domain nor field are big lumps of ideas nor indiscriminate congregations of people. Rather, people and ideas have various relationships which they use to negotiate their way through the world.

10. If we continue to map out the relationships of individuals through the ideas they hold in common, or the relationship of ideas through the individuals who hold them in common, then we can arrive at some fairly elaborate mappings of individuals and ideas.

11. Now, I know that talking about the "social graph" is very fashionable, and that much of how the social graph is discussed is in terms of determining our networks of associations so marketers can pursue us, but network theories have been around longer than that, and I don't know that we can hold how popular an idea is against it.

12. What I find compelling in network theory is not only the somewhat systematic vocabulary it offers me but how in trying to master the vocabulary I am drawn not only to think more about the data I have but to acquire more data. (*That is, it's theory that drives me into the field and not necessarily into my study.*)

13. In the particular instance of this diagram of a small subset of relationships within the scope of my current research, I was drawn to ask several questions that revealed, at least in one case, the reasons for the lack of a tie between two individuals.

14. Social network analysis views social relationships in terms of network theory which represents everything as either nodes or ties.[1] Nodes are the individual actors within a network, and ties are the relationships between the actors. The resulting graph-based structures can get very complex.

15. There can be many kinds of ties between the nodes. One kind of relationship, with which most of us are familiar, is the one that is instantiated through citation. There is, in fact, a growing field of bibliometrics dedicated entirely to understanding how science operates through the concrete, measurable practice of citation.

16. One of the more well-known maps of science suggests that the humanities are little more than a peninsula off the continent of the social studies. The map is based on the citation practices, chiefly of scientists, but also of a limited pool of humanists.

17. But relationships are negotiable. This "Map of Science" illustrates the online behavior of Scientists accessing different scientific journals and publications. Colors represent the scientific discipline of each journal, while lines reflect the navigation of users from one journal to another when interacting with scholarly web portals.[2]

18. Whereas maps based on citations favor the natural sciences, this map of science shows a prominent and central position for the humanities and social sciences,

[1] "Several analytic tendencies distinguish social network analysis. First, there is no assumption that groups are the building blocks of society: the approach is open to studying less-bounded social systems, from nonlocal communities to links among websites. Second, rather than treating individuals (persons, organizations, states) as discrete units of analysis, it focuses on how the structure of ties affects individuals and their relationships. And third, in contrast to analyses that assume that socialization into norms determines behavior, network analysis looks to see the extent to which the structure and composition of ties affect norms." (Wikipedia entry is pretty good.)

[2] "Whenever a scientist accesses a paper online from a publisher, aggregator, university, or similar publishing service, the action is recorded by the servers of these Web portals. The resulting usage data contains a detailed record of the sequences of articles that scientists download as they explore their present interests. After counting the number of times that scientists, across hundreds of millions of requests, download one article after another, the research team calculated the probability that an article or journal accessed by a scientist would be followed by a subsequent article or journal as part of the scientists' online behavior. Based on such behavior, the researchers created a map that graphically portrays a network of connected articles and journals." (From the LNNL press release.)

which, in many places, act as interdisciplinary bridges connecting various other scientific domains. This map highlights that many practitioners read in a discipline without necessarily publishing in its journals.

19. All these models are doing is tracking the flow of information. I have shown you biological cells, scientific communities, and a subset of a folk community. What I find fascinating is how the same vocabulary and visualization methods can be used to describe all these phenomena.

20. The ability to engage in a dialogue with various sciences strikes me as interesting, and potentially quite useful in the era of STEM mandates. It's also the case that network scientists are looking to the humanities for complex data sets.

21. But really what I want to do is have the chance to go back and prove this formula true. As Amy Shuman said yesterday, we are at an interesting moment where we can go backwards and forwards at the same time.