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**How Integration Into the Scientific Research Discourse Community Affects Perception Of
The Field As A Whole.**

Introduction:

The process of scientific research is somewhat of a black box; it passes largely unnoticed by the public eye and is brought to light primarily when a novel breakthrough contributes directly to mainstream global problems. These breakthroughs often take the form of a revolutionary treatment for cancer or diabetes, or a new drug that alleviates symptoms “better” than current options. Despite what appears to be “occasional” findings in the realm of science, in actuality thousands of peer-reviewed articles are published in journals that detail novel findings across the globe every year. Over all disciplines, this number has been steadily rising, from approximately 22,000 to 28,000 journals over the past decade (Mabe, Ware 2015). In the biological/medical/physical sciences, Mabe and Ware also note that the average journal publishes 140 science-related articles per year, which yields a rough figure of 3-4 million articles! This apparent paradox in actual output versus the public perception of output is explained by the fact that researchers occupy a very specific discourse community that is virtually impossible for the general public to interpret. Parkinson and Adendorff support this point when discussing the rigorous “filtering” process that students go through while being introduced to science as a whole, since, “...one reason for the scientific discourse community being a relatively small one is that science is represented as being so conceptually difficult that

only the highly intelligent can understand it” (2009). This rigor does not dissipate even on a professional level, seeing as even cross-disciplinary research can appear “alien” to scientists from different subject areas: a scientist working on plant pathology would have a difficult time understanding the work of a neuroscientist, and vice versa.

Outside of the scientific discourse community, the public perception of scientific research laboratories is quite varied. Research is primarily cast in a positive light, again through its ability to produce amazing breakthroughs in cancer, Alzheimer’s, and diabetes research, but opinions can swing the other way through protests for animal cruelty and unethical conduct, which tends to cast research laboratories in a “sinister” light. Despite this, there are two sides to every problem, and integrated members of the research discourse community often view contended issues through an entirely different lens. From my own observations, the overarching goals and methods of communication of the research lab I work in as a whole, are drastically different than the goals and communication of the lab staff and that of inter-departmental relations. To investigate the discrepancies between public and members’ perception of research, I surveyed the undergraduates working in UC Davis’ Hunter Lab in order to compare and contrast the differences between their initial view of the lab discourse community, and their current views as an experienced worker.

I have a unique perspective with regards to researching this discourse community, since I have had the opportunity to view the lab as an outsider; as someone in awe and overwhelmed by this “black box” of research. After having worked in my lab for almost three quarters, I feel I harbor an insider’s perspective of lab work, as a side effect of being integrated into the community. This switch of perspectives has given me the motivation to research this discourse community. I feel most outsiders view “research labs” as teams of people working flawlessly,

obtaining results and publishing them for the betterment of the world. This is quite different from how I view the lab, as almost a spiderweb of interconnected ideas as puzzle pieces, trying to translate data into concepts, navigating the internal lab workings, and finally contributing the small pieces to make an idea as a whole. Through this research project, I hope to gain a better picture of the before-and-after scenarios of how current undergraduate workers in the lab view their position and involvement in research.

Methods:

In order to capture Hunter Lab researchers' reflections on their roles in this discourse community, I created a survey on Google Forms, and forwarded it to all the undergraduates working in Hunter Lab (30 students). The survey consisted of 6 questions, beginning with how much the student knew about the lab and its corresponding scientific basis before they were hired, what their overall impressions of the lab were during their first week, what their overall impressions of the lab are now, and if their perspective on research has changed since being integrated into the scientific discourse community.

Results:

Of the 30 students the survey was sent to, I received 10 responses. I was surprised to see that the results were surprisingly consistent across the questions, despite the fact that there was a wide range of how long each undergraduate had been working for the lab. 40% of responders had been working in the lab 1-3 quarters, 20% had been working 3-6 quarters, and the remaining 40% had been working 6-9 quarters.

Question 2 asked, "How much did you know about the lab and some of the scientific knowledge used in the lab before you were hired?" As evidenced, I did not provide much context for the responders to answer the question, and yet the replies were very consistent. They

ranged from two-word answers (e.g. “very little”, “barely anything”) to a slightly more elaborate explanation, detailing how exactly they knew or didn’t know what the lab did research on.

Question 3 asked, “Did you look into any research beforehand?”, which was presented in the form of a linear scale from 1-5. The answer 1 was correlated with “no, not at all” and the answer of 5 signified “yes, I wanted to know as much as possible going in”. Of these results, 60% answered 3, while 20% answered 1, and 10% answered 2 and 5. Nobody gave an answer of 4.

Question 4 asked, “What were your overall impressions of the lab during your first week (intimidating, complex, mundane, exciting, orderly, etc.)? Why?” One side effect of this question I did not anticipate was that many respondents picked one of the words I provided to describe their feeling. All of the responses used “exciting” and “intimidating”, and built upon these answers in different ways. I found this interesting, but not necessarily surprising, that the somewhat contradictory positive and negative emotions coexisted so prevalently.

Question 5 asked, “What are your overall impressions of the lab now? Are you more comfortable with your position, and why/why not?” Similar as to question 4, many of the responses used the term I provided, “comfortable”, to explain their answer. They followed a very straight trend, with everyone reporting a more beneficial mindset as compared to question 4.

Question 6 asked, “Do you think your perspective on research has changed since being hired for the lab? How so?” Unwittingly on my part, this question did not provide many terms or threads for respondents to use in their answers, which I believe in hindsight was more beneficial as a whole. Only one replied that their perspective had not changed; everyone else saw a marked difference and detailed exactly why they felt that way.

Discussion:

Since the responses followed a similar trend for all the questions, I was able to draw several interesting correlations. Firstly, I could establish that the uniformity of responses was irrespective of the length of time people had worked in the lab, considering that the responses came from undergraduates who had worked for the lab a wide range of quarters. This is important, since even a short time as a member of the discourse community can affect one's outlook on research, and that outlook remains relatively unchanged over time.

For question 2, the general trend was that people knew very little about the lab (representative of the scientific discourse community), and the knowledge they did have was obtained from their (required) biology courses. These results correlate with Adendorff and Parkinson's hypothesis that scientific knowledge is regarded as very difficult, and therefore is closed off from public knowledge. I would suggest that the trend observed from my survey results would be observed across a wide population, including the general public, if asked a similar question about any research laboratory.

Many respondents knew very little about the lab and its research before being hired, and about two-thirds of respondents looked into articles directly relevant to the lab's research in order to prepare (as evidenced in question 3). The responses were uniform for question 4, regarding what first-week impressions were. All answers stated a mixture of exciting and intimidating; citing their little background knowledge and preconceptions of an orderly, complex environment. One response provided an almost word-for-word description of what members of a discourse community share as defined by Schmidt and Vande Kopple, which states members spend a, "...significant amount of time focusing attention on the same issues and things.... have a firm sense of why you focus on those issues and things... will share many ways to think and communicate about those issues and things, as well as many ways to evaluate thinking and

communicating” (1993) The response picks up on these fundamental ideas, saying, “There were a lot of scientific terms that other people said during journal club that I did not understand. There were also many experimental steps that I needed to remember.”

When asked what their overall impressions of the lab were now, corresponding to question 5, everyone said they felt much more comfortable. Responses ranged from, “I have learned enough to feel confident in what I have to do,” to “the more experience I have the less overwhelming it seems,” to “what I do now is second nature.” These answers are testament to the fact that integration into the scientific discourse community changes your perspective, in that viewpoints are familiar and therefore many ideas and ways of thinking are adopted.

The final question asked, “Do you think your perspective on research has changed since being hired for the lab? How so?” All respondents except one replied with “yes.” For this response, the reasoning behind this varied quite a bit. One answer said, “I have realized that sometimes lab research has little to do with progressing human knowledge than it is a race to publish newfound information against other labs.” Some placed emphasis on the nature of lab work itself, saying things such as, “it can be very rewarding even if the tasks are tedious and mundane”, “the realities of the arduous and strenuous nature of lab work has been actualized”, and even led up to “It definitely has shown me that there is no way I can do research as a career.” I thought that these responses were the most personal, and truly illustrated the difference that being an insider versus an outsider to the scientific discourse community made on perception. Outsiders (in question 4) viewed the lab as exciting yet intimidating, and had little prior knowledge about knowledge and principles used (questions 2, 3). However, after spending time in the discourse community, they as insiders felt comfortable (question 5), and viewed the entire

field through a different lens after having been exposed to this new set of ideas and experiences (question 6).

Conclusion:

Overall, the uniformity of responses made it very simple to answer my overarching question. Public perception of scientific research laboratories casts them in an exciting, yet intimidating light that stems from an unfamiliarity with the topics being studied. However, being exposed and integrated into the discourse community leads to a feeling of greater comfort, since members are able to analyze and navigate the previously unknown complexities. This also changes an insider's perspective of the scientific discourse community as a whole, and allows them to make new judgements about the field based on their knowledge of the discourse community. Through my project, I was able to show a small-scale case study of a single research laboratory that modelled these principles, and can likely be extended to demonstrate the place of the scientific discourse community in both public and research communities.

References:

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