

## Finding and Losing It: Beyond Research Paradigm Loyalties

Discussions among University of Puerto Rico Medical Sciences Campus (UPRMSC) students regarding their research projects sometimes acquire the nature of squabbles. Disagreements about which research method is the best are often reduced to a war of words where students label themselves as quantitative or qualitative researchers. To prove that their approach is “scientific”, they try to show that what they’re doing can be measured.

It was Thomas Kuhn in his extraordinary work “The Structure of Scientific Revolutions” that established that each research paradigm satisfies more or less the criteria that it dictates for itself but it cannot address others dictated by its opponents (1). The central issue is not about the differences in our research methods but about the types of questions that we want to answer.

### **Paradigm**

*Overarching philosophical or ideological stance, a system of beliefs about the nature of the world, and ultimately, when applied in the research setting, the assumptive base from which we go about producing knowledge (2).*

### **Methodology**

*The strategy, the plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes (2).*

### **Methods**

*Techniques or procedures used to gather and analyze data related to some research question or hypothesis (2).*

The methods selected will be those that answer the questions, that is, the differences are more in how is it that we challenge ourselves to understand the world. Beyond the qualitative and quantitative debate, lies the researcher’s paradigmatic positioning: what is his or her understanding of reality (ontological standpoint) and the nature of knowledge (epistemological standpoint). Ethical controversies also play a part in this philosophical understanding (3). These standpoints act like powerful lenses through which we see the world and should be considered when evaluating the possibilities and limitations of our research.

Recognizing the potential importance of these discussions, the UPR 36<sup>th</sup> Medical Sciences Campus Research and Educational Forum held in April 2016, addressed the theme “Traditions in health research: Possibilities, implications and squabbles”. The forum began with a panel of three researchers representing distinct theoretical perspectives: positivist, interpretivist, and

critical (Table 1). While talking about their research projects, Dr. Gregory J. Quirk, Dr. Nilsa M. Burgos Ortiz, and Dr. José Solís Jordán shared experiences throughout their careers, some of which were described as moments of frustration when their scientific inquiry seemed to follow a bumpy trajectory. Moments of enlightenment were also described when they dared to explore “out of the box” alternatives into new epistemological directions.

### **Scientific highlights**

#### **Investigating fear in rats: how far can our paradigm take us?**

Gregory J. Quirk’s research focuses on the neural circuits of fear regulation, using rodent and human models of fear conditioning, extinction, and active avoidance. The Laboratory of Fear Learning, or the Quirk Lab as it is commonly known, uses a variety of experimental techniques including multichannel unit recording, optogenetics, immunocytochemistry, electrical stimulation, and computational modeling. The scientific team focusses on how the prefrontal cortex modulates fear and extinction related activity in the amygdala, thalamus and striatum.

As the title of his presentation suggests, Quirk has run into the predicaments of the positivist paradigm. Through his laboratory work and studies of science and the philosophy of knowledge, he has come to disagree with some of its central propositions, making him more of a post-positivist. As a follower of Kuhn, he rejects the notion of science as truth-seeking and that there is some full, objective, true account of nature. Quirk explains to us how paradigms modify our perception, enabling us see what we expect to see, but also blinding us to what is not expected.

Fear is an important human response and, for better or worse, it guides our behavior. If, as Quirk’s research team have seen in the laboratory, animals can lose their fears not just by erasing old memories, but by learning new ones, we can identify the areas “where the brain learns not to be afraid”. It could then be stimulated with medication or other therapies in patients with anxiety disorders. Resembling the qualitative approach Quirk pointed out that an emerging trend in behavioral neuroscience research is to analyze individual differences between animals, rather than simply averaging across the group. Yet, questions unanswered pose crucial challenges: “Is the positivist paradigm sufficient to explain higher order phenomena such as conscious feelings, desires, choices, regrets...?” Challenges such as these move the neuroscientist into other directions, in search of new approaches that will help understand fear from a behavioral approach (as a learned experience), from an evolutionary perspective (as a critical condition for survival), and from a psychiatric approach (to look into excessive avoidance as a symptom for the diagnosis of posttraumatic stress disorder).

**Table 1.** 36<sup>th</sup> Medical Sciences Campus Research and Educational Forum Discussion Panel Participants

| Name                                     | Short Bio Sketch   |
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| <p><b>Gregory J. Quirk, PhD</b></p>      | <p>Gregory J. Quirk is a neuroscientist and Full Professor in the Department of Psychiatry and Joint Professor at the Department of Anatomy and Neurobiology at the University of Puerto Rico Medical Sciences Campus (UPRMSC). He holds a Ph.D. in Neuroscience from the State University of New York. His research focuses on the neural circuits of fear regulation, using rodent and human models of fear conditioning, extinction, and active avoidance. Dr. Quirk has made a groundbreaking discovery by identifying a new memory circuit in rats that could provide opportunities for the development of treatments for disorders such as phobias and PTSD. He has published over 100 scientific articles and chapters, including journals such as <i>Science</i> and <i>Nature</i>.</p>  |
| <p><b>Nilsa M. Burgos-Ortiz, PhD</b></p> | <p>Nilsa Burgos obtained her Ph.D. from Columbia University School of Social Work in New York City. She worked as a professor and researcher at the University of Puerto Rico, Graduate School of Social Work, Río Piedras Campus from 1983 to 2014. She has written, co-authored, edited and co-edited many books and peer reviewed journal articles. In the book <i>Pioneras de la profesión de trabajo social en Puerto Rico</i> she used oral history and life stories as methods to uncover among other things, the memories of the first professional social workers in the island. In 2015 she became President of The Latin American Association of Education and Research in Social Work (ALAEITS, Spanish acronym). This allows her to participate as an executive member of the International Association of Schools of Social Work (IASSW).</p>  |
| <p><b>José Solís-Jordán, PhD</b></p>     | <p>As a full professor at the University of Puerto Rico, Río Piedras Campus, José Solís teaches sociological foundations of education and principles of research at the Department of Educational Foundations. He completed his Ph.D. in Policy Studies at the University of Illinois at Urbana-Campaign. His most recent book, <i>Insurgencias cualitativas: hacia la investigación crítica</i> explores knowledge constructs. A current chapter “Informed Consent: The Medical Gaze, and Alienation” is part of a broader project on the subject of choice and medicine, approached from the disciplines of the sociology of medicine and public health. Throughout his career as a sociologist, educator and researcher he has presented and lectured on the topics of informed consent; evidenced-based science/medicine: an epistemological examination; commercialization of science, mandated vaccinations, medicalization, and public health: prevention and the public discourse.</p> |

clinicians have recognized that the micro level processes that characterize the interpersonal relationship between them and their patients occur in a social context shaped by the macro level structures of society (4). Within the interpretive paradigm, qualitative methods are chosen to explore ways in which meanings are constructed, negotiated and managed by different individuals and groups in their social and historical realities.

To talk about qualitative methods we invited Dr. Nilsa M. Burgos Ortiz, who has used oral history as a method to uncover among other things, the memories of the first professional social workers in the island, the majority of whom were women. Through interviews, they were able to express a collective subjectivity through the interpretive power of their testimonies. Given that the personal and interpersonal, and the plural and relational can give way to forms of knowledge of those that lack power (5), in Burgos’ study, the reflexive voices of the participants uncovered issues of gender oppression and colonialism.

Burgos was not always a qualitative researcher, but shifted from the dominant positivist paradigm when she decided to study women’s issues. She values the subjective in order to understand the behavior, perceptions, opinions and attitudes of people, but she does not divorce these micro dimensions from the political, economic and cultural/social context. Since there are multiple realities interpreted from diverse perspectives, qualitative research cannot escape from being both, reflexive and critical. Burgos position matches the construct in social epidemiology proposed by Krieger: 1) bodies tell stories about—and cannot be studied divorced from—the conditions of our existence; 2) bodies tell stories that often—but not always—match people’s stated accounts; and 3) bodies tell stories that people cannot or will not tell, either because they are unable, forbidden, or choose not to tell

These new approaches enable us to look into other dimensions that relate to the health of individuals and populations. Dr. Quirk sets the example and encourages his students to be curious of the unknown and to question the status quo in their disciplines. Kuhn and other philosophers are required reading. It is only through this curiosity, says Quirk, that we can set free the power of research.

**Voces sobre la realidad social: Miradas desde la investigación cualitativa**

At the UPRMSC, researchers are increasingly incorporating the social sciences in their studies, using qualitative methods to answer important questions. As an example, some

(6). As an educator, Burgos challenges students that believe that the tools of qualitative research are “easy” because they are free from statistical analysis. “There is nothing more complex than to try to understand the human voice and to analyze the social reality behind people’s testimonies. Qualitative research methods need to be flexible, yet rigorous.” From her interpretivist perspective, the researcher plays the main role in the process of understanding reality.

#### **Beyond a Zero Sum Calculus: A Place for Critical Theory in Scientific Research**

Over a period of 10 years, a commitment to social medicine and public health transformed Dr. José Solís’s career as a sociologist, educator and researcher. He meets Quirk in his critique of classical positivist assumptions but also distances himself from developments in the interpretive school that, in opposing frenetically the positivist paradigm, maintains a micro appraisal of the subject with a relativist conception based on a subjectivist ontology. He analyzes the politics of knowledge and proposes a scientific project that combines, rather than separates, the poles of philosophy and the sciences with a critical theory that explains (scientific method), is practical (interpretive), and is normative. His approach “provides clear norms for criticism and achievable practical goals for social transformation”.

The inability for rational thought to become a self-critical and emancipatory project has resulted in what Solís describes as “tragedies” in the biomedical and health sciences. A market-driven health care system, the rise in costly pharmaceutical consumption, and the increase in deaths due to medical error are topics of his interest. He calls for a recognition of the “significance of place” by addressing the political, economic and cultural factors that shape the elaboration of our research questions and have imposed assumptions about health that do not address the power relations that defined these assumptions in the first place. A well-known example within the behavioral health model is the idea that the poor are responsible for their health. He advocates for an understanding of the unequal distribution of power and resources through critical theory, as a way to develop scientific research with important implications for practice and policy decisions.

#### **Conclusions**

The three researchers agreed on the need to take a pragmatic approach to experimental design and data collection, recommending in certain cases a mixed methods approach.

Neither quantitative nor qualitative methods should be viewed as superior, and while they can be combined, there are instances in which they are logically inconsistent or mutually exclusive. This is certainly a topic for future discussion.

The panel generated much interest during the 36th Medical Sciences Campus Research and Educational Forum. It seems that there is a need for further discussions where members of the academic community debate in a fraternal and scholarly manner their similarities and differences in important scientific topics. Solís ended the panel with questions that in one way or another had also been asked by Quirk and Burgos and should be considered by other researchers: Why do we do science?; Towards what end?; How do the answers to our questions reflect our own ideas, values, perceptions and environment, and the ways in which we do science? Researchers and students at the UPRMSC have both the need and the ability to answer these important questions.

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