MRI Investigations of Those at Elevated Risk for Psychosis

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Introduction

From July 2013 through the present, I have worked in the Seidman Neuroimaging Laboratory at Massachusetts General Hospital. This lab investigates the biological and genetic bases of disorders such as schizophrenia, bipolar psychosis, and attention-deficit/hyperactivity disorder. Many of the research studies in this lab involve examinaing of the first-degree relatives of persons with these disorders (who are at higher risk to develop the disorder themselves) or those who are at clinical high risk for psychosis (meaning they display some of the symptoms but do not meet diagnostic criteria). This lab uses a combination of different MRI techniques, including functional and structural MRI as well as diffusion tensor imaging scans.

Activity

Under the direction of Heidi Thermenos, Ph.D. and assistance of Richard Juelich (the senior laboratory research assistant), I have been involved in multiple research studies, all at various stages of the research process. I took part in the following activities:

- Administration of MRI scans to subjects of our studies
- Interactions with the human subjects, including informed consent and screening procedures, behavioral data acquisition, anxiety management during MRI scanning
- Data analysis, while also learning some Unix and Matlab programming skills to help in the data analytic process
- Assisting in the literature searches for, as well as the writing, reviewing, and editing of multiple scientific manuscripts (e.g. see Figure 1)
- Assisting in the anonymous peer review of scientific manuscripts submitted for publication

Outcomes

As a result of my experiences in the lab to date, I have gained valuable knowledge and skills that will serve to help me in my career. Specific accomplishments include:

- Being listed in as an author on a scientific manuscript that is ready to be submitted for publication;
- Being listed in the acknowledgement section of another manuscript that has been published (1).

Outcomes Continued

Specific Skills acquired that will be critical to my developing career that will likely involve academic research include:

- Methods to efficiently conduct literature reviews on multiple topics related to schizophrenia and the psychosis prodrome
- Learning how to write concise scientific papers
- Gaining experience in the peer review of scientific manuscripts submitted for publication
- Acquiring skills in consent and participation interactions with human subject, and the technical acquistion of MRI scans
- Skills in computer programming and statistical analysis of neuroimaging data

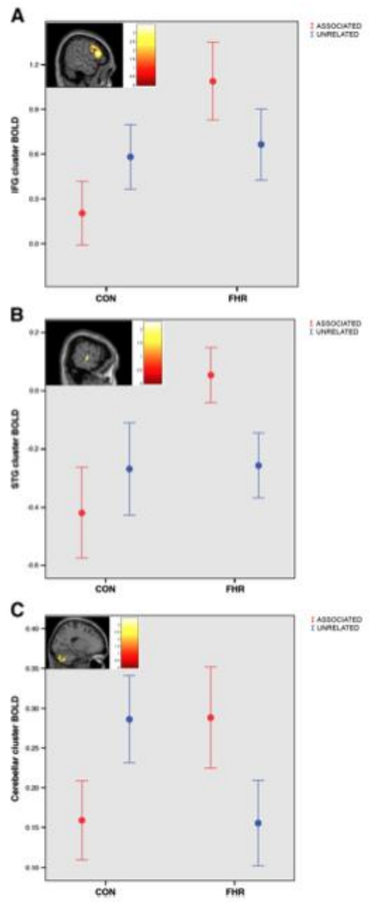

Figure 1. Compared to controls, FHR subjects showed an opposite pattern of modulation when comparing associated (red), versus unrelated (blue) word pairs in the (A) left inferior frontal gyrus (IFG), (B) right superior and middle temporal gyrys (STG), and (C) left cerebellum (1).

Reflection

I have gained valuable skills from this co-op experience, and I know that these skills will be an asset in my future career. I have learned many technical skills as well as general knowledge about specific topics which I am interested in. This knowledge base has helped me to narrow down which topics interest me most in the field of clinical psychological research.

I learned that clinical research, specifically the area of clinical research that this lab works on, interests me immensely. Although I still have a lot to learn about this type of research, I have learned more about it than I would in any class I could take.

This experience has also impacted the way I view my career. Previously, I thought I wanted to strictly be a clinician and work with patients because I had the impression that research could be boring and monotonous. However, after having this experience and talking to some of the other members of this lab, I have learned that research is a good way to stay relevant as a clinician. I also learned that it is good to balance clinical work with research because doing clinical work full time can be emotionally exhausting. Through my experience at this lab, I have decided that I want to incorporate research into my career goals, as it is something which genuinely interests me, and it will ultimately help me better serve my patients.

Literature cited

1. H.W. Thermenos, S. Whitfield-Gabrieli, L.J. Seidman, G. Kuperberg, R.J. Juelich, S. Divatia, C. Riley, G.A. Jabbar, M.E. Shenton, M. Kubicki, T. Manschreck, M.S. Keshavan, L.E. DeLisi. Altered language network activity in young people at familial high-risk for schizophrenia. Schizophrenia Research - December 2013 (Vol. 151, Issue 1, Pages 229-237.

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