Developing a Grant Proposal for Research on Adolescent/Adult Sensory Processing in First Episode of Psychosis

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Description
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In response to this emphasis within the field of occupational therapy, and in line with his own interest in function-based interventions for adolescents experiencing a first episode of psychosis, Sean Roush, Assistant Professor of Occupational Therapy, at Pacific University, began to seek funding for research on patterns of sensory processing among this population. His proposed three year study leverages an existing relationship between Pacific University and the Early Assessment and Support Alliance (EASA), serving adolescents experiencing first episode of psychosis in 19 Oregon counties. After consultation with Mark Johnson, Research Professor, Prof. Roush identified the National Institutes of Health R15 grant as a possible funding source, and enlisted our assistance in the grant application process.

Disciplines
Occupational Therapy

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Developing a Grant Proposal for Research on
Adolescent/Adult Sensory Processing in First Episode of Psychosis

Pacific University
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Introduction:

Schizophrenia is a devastating disorder which impacts 1.1% of the U.S. population (National Institute of Mental Health) and cost Americans about $62.7 billion in 2002 (Wu, Birnbaum, Shi, Ball, Kessler, Moulis & Aggarwal, 2005). The onset of the disease typically occurs in mid to late adolescence, and is characterized by hallucinations, delusions, and confused thinking. This break with reality can, and often does, detrimentally impact functioning across occupational areas. Due to the individual and societal costs of severe mental illness, including schizophrenia, AOTA has recently called for increased research on treatment and prevention among vulnerable populations, including youth.

In response to this emphasis within the field of occupational therapy, and in line with his own interest in function-based interventions for adolescents experiencing a first episode of psychosis, Sean Roush, Assistant Professor of Occupational Therapy, at Pacific University, began to seek funding for research on patterns of sensory processing among this population. His proposed three year study leverages an existing relationship between Pacific University and the Early Assessment and Support Alliance (EASA), serving adolescents experiencing first episode of psychosis in 19 Oregon counties. After consultation with Mark Johnson, Research Professor, Prof. Roush identified the National Institutes of Health R15 grant as a possible funding source, and enlisted our assistance in the grant application process.

In order to develop the most competitive application, we met with the psychology department at Pacific University. This meeting helped narrow the focus of our research and allowed for possible collaboration within the two departments. In addition, we contacted the National Institute of Mental Health to identify a fit between our proposed research and the R15 grant. This phone conference helped to more clearly define our research and allowed us to
develop inclusion and exclusion criteria for the application. After this phone conference, we were able to draft letters of support from Catana Brown (co-contributor of the Adolescent/Adult Sensory Profile) and EASA programs in seven counties across the state of Oregon. During this process, we familiarized ourselves with the National Institute of Health website and specific components of the R15 grant including the cover letter, specific aims, letters of support, research strategy, project summary, and project narrative. Examples of some of these narrative portions are included in the final section of this document.

Through this innovative practice project, we became familiar with key components of the grant application process. These include gathering information about the funding source and their requirements, crafting research aims to meet these, and identifying project collaborators. We also encountered several challenges that will inform future efforts to obtain research funding. For example, through our phone conference with the NIMH, it became clear that funded projects are often focused on changes in clinical biomarkers, and not on client functional outcomes. This focus was not consistent with what we hoped to achieve with this research. Additionally, those reviewing the grant applications are not familiar with occupational therapy or our scope of practice, which required us to use application space to explain and describe relevant concepts in concrete, descriptive language. We were also limited by the three year maximum timeline for the R15, since our longitudinal study ideally required 3.5 - 4 years. Another possible challenge to funding this project was that many funding streams assign funds to either pediatric or adult populations, while our study spans age groups from adolescence to adulthood. Finally, only approximately 20% of R15 grants are actually funded, making the investment of application hours a questionable endeavor. We learned from these discoveries the importance of finding grant funding which is in alignment with our research. Finding a better suited grant allows one to
fit the grant to one’s research and not change one’s research in an attempt to make one’s research fit what the grant typically funds.

**Project Narrative:**

Schizophrenia is a devastating disorder which impacts 1.1% of the U.S. population (National Institute of Mental Health) and cost Americans about $62.7 billion in 2002 (Wu, Birnbaum, Shi, Ball, Kessler, Moulis & Aggarwal, 2005). The most promising recent research on the illness has focused on early intervention and prevention among adolescents, but has not linked neurobiological differences to functional outcomes such as school and work participation (Cosgrave, Yung, Killackey, & Buckby, 2008; Klosterkoetter, Schultze-Lutter, Ruhrmann, 2012). The proposed study will clarify the relationship between psychotic episodes in adolescence and atypical processing of sensory information from the environment, impacting participation in daily life activities. It lays the groundwork for innovative sensory and environmental interventions to improve the day to day functioning of individuals living with psychosis.

**Project Summary:**

The investigators will collect Adolescent/Adult Sensory Profiles (AASP), a tool used to determine sensory processing patterns and preferences in order to develop interventions to compensate for specific sensory needs, from clients who are currently engaged in the Early Assessment and Support Alliance (EASA) across the state of Oregon. EASA is a 2 year program serving individuals who are 15-25 years old who are at high risk for or experiencing a first episode of psychosis. The AASP will be collected at intake and 12 months in order to determine if there are statistically significant patterns in the sensory processing of individuals who are experiencing a first episode of psychosis and whether those patterns are stable over time.
Sensory processing refers to how the individual takes in and responds to sensory information from the environment such as sounds, sights, and movements. Each individual processes this information differently. Functioning problems occur when performance in daily life is compromised by the individual experiencing difficulty when screening out excess sensory stimuli or when the individual is unable to register sensory stimulation effectively.

Data collection at EASA will occur over a 2-3 year period in order to obtain a sufficient sample size. EASA data will be compared to existing data from the larger schizophrenia population, the high-risk population identified in the Early Detection and Intervention for the Prevention of Psychosis Program (EDIPP), and the normative sample from the AASP in order to identify patterns specific to the early psychosis population. This knowledge of sensory processing patterns within the early psychosis population will aid in: (a) designing interventions that match client needs, (b) matching environmental demands to the preferences and needs of the individual, (c) negotiating sensory adaptations in home, work, and school environments to support success, (d) providing a potential explanation for symptoms that doesn’t carry the stigma of mental illness, and (e) potentially providing an additional diagnostic tool if the statistically significant patterns are confirmed.

Pacific University has partnered with EASA to provide graduate students in the Occupational Therapy department to work alongside EASA staff in this research. Students will aid in training EASA staff how to administer the electronic version of the AASP. In addition, students will act as research assistants to help with data collection, organization, and analysis, which will lessen the burden for EASA staff as well as provide additional educational opportunities for Pacific graduate students.
General Aims:

Evidence is mounting that there are neurophysiological sensory processing differences in individuals with schizophrenia when compared to controls (Cumming, Matthews, & Park, 2011; Domján et al., 2012; Hahn et al., 2012; Leitman et al., 2010; Perez, Shafer, & Cadenhead, 2012; Rissling et al., 2012; Stone et al., 2011; Valkonen-Korhonen et al., 2012). However, current studies focus on individual sensory systems at the neurobiological level and very few studies have been conducted that focus on sensory processing patterns of the sensory system as a whole and how they affect functional performance.

Occupational therapists are concerned with the intersection and interaction between neurobiological processes and human functioning. Where neurobiological mechanisms impede participation in desired occupations, roles and routines, occupational therapists assist in designing cognitive and environmental modifications to address the barriers. As such, the Sensory Processing Model is applied by occupational therapists in multiple settings to understand patterns and preferences and to use these to form treatment strategies. This model proposes that an individual’s choice of activities and environments will consistently reflect sensory preferences, and that these preferences are influenced by the way that our brains integrate and encode sensory information. Importantly, early research on sensory processing within certain conditions, including autism spectrum disorder, developmental disabilities and schizophrenia, indicate that distinct patterns may exist for each (Dunn, 2001).

Brown et al, 2002 used the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002), a tool used by occupational therapists to determine sensory processing patterns and intervention strategies, to examine the sensory processing patterns of individuals diagnosed with schizophrenia and found that individuals with schizophrenia had higher scores in sensation
avoiding (actively working to reduce sensory input from the environment) and low registration
(missing sensory input that an average individual would notice) with lower scores in sensation
seeking (actively working to increase sensory input from the environment) when compared to
controls. Parham et al (2012) applied the Adolescent/Adult Sensory Profile to the population at
high risk for developing psychosis at the Portland Identification and Early Referral (PIER)
program and found similar results. A larger study, the Early Detection and Intervention for the
Prevention of Psychosis Program (EDIPPP) (<http://www.rwjf.org/en/grants/national-program-
offices/N/national-demonstration-of-early-detection--intervention-and-prev.html>) collected
Adolescent/Adult Sensory Profile data from 12-25 year old individuals at high risk for
developing psychosis across 6 states over a 4 year period and data analysis is now underway
between Pacific University. These two programs focused on individuals who were thought to be
at high risk for psychosis but identifying this population remains elusive and controversial so the
current proposal is to focus on the population of individuals who have experienced a first episode
of psychosis and are being served by an early intervention program, the Early Assessment and
Support Alliance (EASA) based in Oregon.

**Specific Aims:**

#1 Identify sensory characteristics of youth experiencing a first episode of psychosis.

*Challenge:* To measure sensory processing of the sample population to determine if there
is a statistically significant pattern of sensory processing affecting functioning within this group.

*Approach:* Staff occupational therapists will collect Adolescent/Adult Sensory Profiles
(AASP) from 15-25 year old clients who are initiating services with Early Assessment and
Support Alliance in several Oregon counties, including Multnomah, Washington, Yamhill,
Deschutes, Marion, Polk, Tillamook, Linn, and Clackamas counties. The data for the research
population will be compared with normative data, published data on individuals at high risk for psychosis, and published data on the general schizophrenia population for statistically significant differences. Pacific University occupational therapy students will assist in training staff to use the AASP, and will collect, organize and assist in the analysis of data.

**Impact:** Ability to predict sensory processing patterns in individuals with first episode of psychosis in order to design interventions that match client needs as well as matching environmental demands to the preferences and needs of the individual will improve outcomes for clients.

#2 Determine the stability of sensory processing patterns over time.

**Challenge:** Without a longitudinal study design, the stability of initial sensory processing patterns cannot be known, or go on to inform treatment.

**Approach:** The AASP will be administered at intake and at one year post-intake years of program involvement. Comparison of these data will provide information about the expected stability, or variability, in sensory processing patterns.

**Impact:** If sensory processing patterns are to be reliably used in treatment planning over time, it will be necessary to know if, and how, the patterns change throughout the existing EASA treatment program. This data will help to establish or exclude the need for further intervention to address sensory functioning.

#3 Determine the relationship of sensory characteristics of youth experiencing a first episode of psychosis to specific symptoms of psychosis.

**Challenge:** To measure sensory processing of the sample population and to compare sensory patterns with other positive and negative symptoms of psychosis.
**Approach:** EASA occupational therapists will collect AASP data as well as Structured Clinical Interview for DSM Diagnosis (SCID) data. These will be compared and analyzed with students serving as research assistants, coordinate services, trouble shooting in collaboration with EASA staff, and entering data.

**Impact:** This data will provide insight into which sensory patterns are impacting specific symptom groups, and will inform further research on sensory interventions to address difficult symptoms.
References


