

Indiana University of Pennsylvania

Annual Progress Report: 2010 Formula Grant

Reporting Period

July 1, 2013 – June 30, 2014

Formula Grant Overview

Indiana University of Pennsylvania received \$9,268 in formula funds for the grant award period January 1, 2011 through December 31, 2014. Accomplishments for the reporting period are described below.

Research Project 1: Project Title and Purpose

Executive Function as a Predictor of Tobacco Dependence and Response to Treatment - This project will examine the relationship between executive function and tobacco use, dependence, and response to treatment. Executive functions represent a set of higher order regulatory abilities associated with the frontal lobes of the brain. While executive dysfunction has been well linked to addiction across many drugs, the relationship between executive dysfunction and tobacco dependence has received much less attention. This project will compare executive abilities across nonsmokers, previous smokers, and current smokers using a battery of neuropsychological tests. Executive abilities will also be compared across time and as a function of success in participants enrolled in two forms of tobacco cessation treatment.

Anticipated Duration of Project

1/1/2011 - 12/31/2014

Project Overview

There are two major research objectives of this project. The first research objective is to investigate the relationship between executive dysfunction and vulnerability to tobacco dependence. Project participants will be administered the Delis-Kaplan Executive Function System (D-Kefs), a battery of neuropsychological tests designed to measure multiple aspects of executive function. Participants will also complete the Frontal Systems Behavioral Scale (FrSBe) a self-report measure of daily activities linked to executive functioning. The results will then be compared as a function of nicotine use and dependence which will be measured using a widely validated measure of tobacco dependence, the Fagerström Test for Nicotine Dependence (FTND). The second research objective is to examine the relationship between executive dysfunction and participant's response to tobacco cessation treatment as a function of treatment type, treatment success, and across time. Participants enrolled in one of two types of tobacco cessation therapy (Nicotine Replacement Therapy using the nicotine patch and Motivational Interviewing Therapy or Motivational Interviewing Therapy alone) will be compared using the

D-Kefs, FrSBe, and FDNT. Treatment success will also be validated using the NicAlert system, a saliva based test which measures the extent of recent nicotine use. Participants will be assessed prior to the initiation of treatment and at three and six months after the start of treatment. While the focus of this project is on tobacco, it is also important to note that participant's use and dependence on alcohol and other drugs will also be assessed using the Michigan Alcoholism Screening Test (MAST) and other questions of use modified from the Monitoring For the Future Study (MTF). This project will also examine the relationship between executive dysfunction and other variables related to drug addiction and therefore participants will also be administered a demographics questionnaire, the Perceived Stress Scale (PSS), and the Zuckerman Sensation Seeking Scale (SSS-V).

Principal Investigator

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Expected Research Outcomes and Benefits

Tobacco consumption has been clearly linked to increased mortality and a variety of negative health outcomes such as stroke, cardiovascular disease, respiratory disease, and cancer. A greater understanding of the variables which influence vulnerability to tobacco abuse and dependence as well as an appreciation for variables which alter treatment success rates have the potential to impact the millions who are directly and indirectly impacted by tobacco dependence. While the role of frontal lobe dysfunction and its subsequent impact on executive abilities is well documented across the addiction literature, relatively few studies have addressed the executive dysfunction in nicotine dependence. This project should clarify the extent to which executive abilities are impaired among those who develop tobacco dependence compared to nonsmokers and thus help characterize the extent to which this impairment is a fundamental element across the addictive process and in the process may aid in identifying populations in which to target treatment interventions. Moreover, the extent to which changes in executive function accompany recovery from treatment represents a new and growing body of literature. By examining the extent to which executive function varies by abstinence, treatment type, and time in treatment, this research will likely contribute to our growing understanding of variables that influence treatment outcomes.

Summary of Research Completed

Aim 1: To investigate the relationship between executive dysfunction and vulnerability to tobacco dependence

Progress: Data collection and scoring of neuropsychological tests was completed for this aim during the period covered in this annual report. The goal of this part of the study was to collect data on 300 participants and data for 334 subjects was acquired. The target number was exceeded because extra materials were available due to fewer participants enrolling in aim 2 of this study and the ability to use time point one data from the second aim in this study. During the period covered by this annual report, data on 116 participants was collected and scored.

Aim 2: To examine the relationship between executive dysfunction and participant's response to tobacco cessation treatment as a function of treatment type, treatment success, and across time

Progress: Data collection and scoring for the second part of this study has also been completed. Due to unexpected issues related to data collection some aspects of this study have been altered, however, the ability to examine the primary hypotheses of this project remains. Few participants expressed interest in receiving Motivational Interviewing Therapy alone for tobacco cessation and therefore, the majority of participants received Motivational Interviewing Therapy with the Nicotine Patch. Therefore, study participants undergoing tobacco cessation therapy were collapsed into a single group. A total of 30 participants were tested prior to beginning tobacco cessation therapy. Eighteen participants were tested at time point two (Mean = 48.55 days, Std. Deviation 13.13). It is important to highlight that a lack of data at subsequent testing sessions is an important piece of information in this study given that poor executive function may be reflected in an inability to plan, schedule and attend testing sessions and thus may reflect an ecologically valid measure of executive function. Only 3 participants were tested at the third time point. The difficulty in collecting data at the third time point is likely due to the fact that students were no longer associated with the course through which they were recruited for this study (Introductory Psychology) and because the third time point often fell over the university's winter and summer breaks.

A control group of participants who did not undergo tobacco cessation treatment was also added to this study to examine the effects of repeated testing because it became apparent that this was required to assess changes in executive function across time, especially given the lack of established test re-test reliability of the D-kefs and other measures. In this control group 20 participants were tested at time one and 17 participants were tested at time two (Mean = 38.65 days, Std. Deviation 7.36).