

Classroom Working Memory Assessment and Reading Outcomes in Children

Faculty: Jean L. DesJardin, Assistant Professor, Education Department

Student: Kayla Poole, 2014, Psychology-Early Childhood Education Certification
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Start Date: May 27, 2014 for 10 weeks

Description of the Project

This SOAR project will investigate the relationships between working memory (executive functioning) and reading skills in elementary school-aged children. This project is an extension of an Independent Study project during the 2013-2014 school year, investigating working memory (executive function) in children under the direction of Dr. Jean DesJardin and Dr. Sarah Johnson. In the Spring of 2014, a pilot study assessing the validity and reliability of a classroom tool, *Childhood Executive Function Inventory* (CHEXI) (Thorell & Nyberg, 2008) (Appendix A) was implemented in a first grade classroom in a Bethlehem area school to identify the strengths and challenges of this particular classroom tool. This observation measurement was developed to be an easily assessable tool for general education classroom teachers. Previous research has indicated a link between specific behaviors children exhibit in their classrooms that are indications of their executive memory function. Educating teachers about a measurement tool that can be used to assess students' working memory could give the educator a better understanding of why their students are displaying certain behaviors in the classroom (e.g., off task behavior, disorganization, need for repeated learning, difficulty with attention).

SOAR Project: Faculty and Student Collaborative Roles

Current research on executive functioning also indicates that measuring working memory can help determine if children are at risk for reading delays. This SOAR project extends Kayla's prior knowledge of working memory as it relates to reading outcomes in elementary school-aged children. The selected SOAR student, Ms. Kayla Poole, will (1) research and write a complete literature review investigating the relationships between working memory and reading skills in elementary-school aged children, (2) write three research questions to investigate these relationships, (3) assess the validity and reliability of the CHEXI using the observation tool with elementary-school aged children in the 4-week reading clinic at Moravian College, (4) collect data on the CHEXI

and reading skills of the children in the reading clinic, and (5) create a user-friendly guide for classroom teachers on the importance and application of the CHEXI in the general education classroom (see Table 1 for a complete listing of student and faculty tasks).

Ms. Kayla Poole has conducted a successful Independent Study project with me for a whole school year. I have the most confidence that she is well prepared to work on a prospective research project (i.e., library research creating a thorough literature review, research hypothesis to statistical summary and results), and be able to create a useful guide for classroom teachers. Kayla demonstrates excitement for the project, initiative to seek out resources and literature, and is also eager to work with Dr. Elizabeth Conard (Director of Reading Clinic and Professor for Masters Reading Assessment summer course) and myself in the 4-week summer reading clinic at Moravian College. I have obtained permission from Dr. Conard for Kayla to work with her and myself in the reading clinic. Dr. Conard is very excited for the project as it is cutting-edge research in the field of reading disabilities, and she would like Kayla to present her findings to her graduate students attending her graduate course this summer.

Summary of Benefits to the Student

The benefits of participation in this project for the student are numerous. This opportunity provides Kayla with very clear, specific, scholarly activities that align directly with the field of early childhood education. As Kayla prepares to student teach in the fall, it is essential for her as an effective teacher, to identify student behaviors that may indicate the need for further testing for reading challenges. Kayla also plans to further her education by pursuing a Master's degree in Speech and Language Pathology. This research project would give her additional research experience on how working memory may link to children's language and reading skills. The opportunity to conduct direct prospective research in the reading clinic at Moravian College is an incredible hands-on experience to truly understand how children's behavior in the classroom may impact their processes of learning language and reading. The presentations in the summer (SOAR students, Graduate students who are all elementary school-aged teachers, and for the student teachers this fall), provides Kayla with the opportunity to discuss her findings with the greater education audience who are invested in learning new ways to measure and support young children during the reading process.

Budget

Kayla will work 40 hours per week for 10 weeks; \$300 per week x 10 weeks = **\$3,000**. Kayla is requesting on-campus housing for the 10-week period of the SOAR program.

Related Pertinent Information

Last summer (2013) was my second opportunity with the SOAR program. Ms. Lindsay Galasso and Ms. Megan Davis worked closely with me on a longitudinal NIH investigation. They completed all goals with the highest quality. Both young ladies worked diligently on all aspects of the research process – from literature review to presentation/publication. With their unprecedented efforts, I was able to present the findings at a Keynote Address at the Indiana School of Medicine – where I recognized the contribution of the SOAR program and the wonderful support of Moravian College. Both ladies will also be presenting at Moravian College's Scholarship Days in April, 2014. The SOAR program would be a wonderful opportunity for me as an untenured faculty member to continue collaborating with students, instilling the love of continued learning and scholarship through this faculty-student relationship.

Table 1. Proposed Timetable and Project Milestones (start date: May 27th, 2014):

Dates	Student Project(s) and Purpose	Faculty Role Descriptions
May/June, 2014	<p><u>Literature Review</u> – In order for Kayla to establish a strong foundation for the subsequent project, it will be valuable for her to read current literature in the field on the relationship between working memory and reading abilities in elementary school-aged children.</p> <p><u>The student will:</u></p> <ol style="list-style-type: none"> 1. Write a brief, yet thorough, literature review of the construct stated above to extend her prior literature review (3-5 pages); 2. Write three research questions for summer inquiry. 	Dr. DesJardin will familiarize Kayla with the literature to support this project in order for her to write a complete and thorough literature review with at least three research questions.
June, 2014	<p><u>Implementation of Project:</u> Kayla will submit the appropriate protocol to HSIRB at Moravian College; Meet with Dr. Jean DesJardin and Dr. Elizabeth Conard to go over the summer reading clinic protocol (i.e., classroom set-up; times; reading assessments, weekly goals, meet the Masters' students in the graduate reading assessment class)</p>	Dr. DesJardin will assist in the writing of the HSIRB protocol; Set up meeting with Dr. Conard (Director of reading clinic).
July, 2014	<p><u>4-Week Data Collection in Reading Clinic</u> – Upon approval of HSIRB, Kayla will conduct CHEXI observations (10-15 minutes per child) in the model classroom (PPHAC 302) with each student (approximately 4-5 children per week); Collect reading scores from Dr. Conard; and input data into SPSS-20; Work with Dr. Jean DesJardin on statistical analyses and summary of findings; and Present project to the summer SOAR students and graduate students.</p>	Dr. DesJardin will mentor student during data collection on a weekly basis; Assist in data collection and data input; Run all data analyses with Kayla, and guide statistical summary.

DesJardin SOAR Proposal – Summer 2014

End of July/August, 2014	<p>Development of Teacher Guide to Assess Working Memory Kayla will use the literature review above to write a user-friendly teacher guide on the importance for and use of the CHEXI as a classroom assessment.</p> <p>Faculty and student submit a 1-2 page report to the SOAR director assessing the project.</p>	Dr. DesJardin will collaborate with Kayla on the development of a guide that teachers can use to assess students' working memory function.
October, 2014	Kayla will share the results of the study and teacher guide with the students in EDUC 370 - Student Teaching Seminar	Dr. DesJardin will facilitate presentation in EDUC 370.
April, 2015	Student participates in the Moravian College Scholar's Day.	Faculty and student participate in Moravian College Scholar's Day with other SOAR students.

Title of the Project: Working Memory Assessment and Reading Outcomes in Young Children

Faculty Advisor: Dr. Jean DesJardin, Assistant Professor, Education Department

Student: Kayla Poole

Date of Project: May 27, 2014 for 10 weeks

This project will investigate the relationships between working memory and reading skills in elementary school-aged children. I am very interested in cognitive psychology and how different aspects of working memory control certain behaviors. I have participated in two independent study projects under the direction of Dr. Jean DesJardin that examine different aspects of working memory, such as executive function (2013-2014 school year). This section of our working memory has become the most interesting to me as a future educator. Through my previous research, I have learned that the assessments that educators use to assess working memory function are closely correlated to diagnostic criteria for ADHD. Thus, when children are being assessed using certain working memory assessments, they are at risk for being misdiagnosed with ADHD. Researchers in this field have indicated that this is a significant issue. Thorell & Nyberg (2008) are two researchers from Sweden. They are the most recent researchers to develop an assessment observation tool for general education teachers that is easily assessable and does not overlap their diagnostic questions with those that can indicate a diagnosis of ADHD. Their assessment tool is called *The Childhood Executive Function Inventory* (CHEXI). Presently, I am using this particular observation tool in a first grade classroom in the Bethlehem School District. I had to obtain HSIRB and principal permission and eager to complete my investigation this spring.

I am very passionate about early childhood education and how teachers can best support students in the classroom. This SOAR project would allow me the opportunity to further explore the area of working memory as it pertains to reading processes for young children. I would like to investigate the following research questions: (1) How reliable is the CHEXI?, (2) Is it effective in predicting reading outcomes for early school-aged children?, (3) What is an effective way teachers can use this assessment in their classrooms to support their students?, and (4) Are there specific interventions that can be put into place if the CHEXI indicates a deficit in working memory linking that to reading skills for elementary school-aged children?

Through my experience with the SOAR program, I hope to expand my knowledge of working memory through a thorough literature review and to explore specific research questions. I would be able to gain first hand knowledge of conducting a prospective research project from research questions to data collection and analyses, to presentation. Being able to work with a faculty member who has extensive knowledge of research in the field of early childhood education and specifically, with children who have reading challenges is so very beneficial to my education. The information gleaned from this investigation can also be very beneficial for Dr. DesJardin in educating future and current teachers. I will be student teaching in the Fall of 2014 and having this experience would help me better understand how students learn in my classroom. In addition, I plan to pursue a Master's degree in speech and language pathology. This SOAR experience will better prepare me for this particular field. I believe that my active participation in the SOAR program at Moravian College is essential for my future educational endeavors.