Herein is my application for the MSU Postdoc Association Travel Grant. I am submitting this application to request support for my attendance and participation at the Geological Society of American annual meeting that was held from October 19-22 of this year in Vancouver, Canada. I am applying in the category of “Physical, Social and other based Life Sciences.” I meet all of the stated edibility criteria: I am not currently a member of the MSUPDA Steering Committee; I have not already received this travel award; and I am not applying for support to attend a meeting held at Michigan State University.

My purpose for attending the conference was two-fold. First, I presented a talk summarized in the abstract below; the talk was part of a Geoscience Education session entitled “Supporting Student Success in Colleges and Universities.” Second, I collected survey data at a booth for the MSU Geocognition Research Lab that was in the conference exhibit hall; the purpose of that survey is described in the research plan statement below.

A letter of support from Dr. Julie Libarkin will be sent separately from this application. Thank you for your consideration.

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Abstract of Presented Talk:
JARGON OR GIBBERISH: HOW DOES SCIENCE READ TO UNDERGRADUATE STUDENTS?

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Scientific jargon is perceived as a barrier to student comprehension, whether the jargon is used in speech or in print. By comparison, colloquial language is considered to be more accessible and therefore more likely to yield better outcomes in terms of student performance. In this study, we seek to identify the extent to which scientific jargon may inhibit undergraduate students’ comprehension of science-related reading material. A total of 510 college freshmen completed a survey as part of a university orientation program. Three different versions of the survey were distributed. All three surveys followed the same format: a text passage about convergent evolution was followed by four open-ended questions related to the reading. However, the wording of the reading passages and the questions differed between the three versions. Form 1 was written with scientific terms. On Form 2, scientific jargon was replaced with colloquial language; on Form 3, all the scientific terms were replaced with nonsensical terms, or gibberish. Each gibberish word, however, still fulfilled the appropriate grammatical role in the sentence (a noun was replaced with a noun, a verb with a verb).

We completed a text analysis of the open-ended responses using an emergent coding scheme. We also assigned point values to different codes in order to obtain a total score per question and per survey. Students that received the form with colloquial language left fewer questions blank, used fewer quotes in their responses, and received higher scores. In addition, the students who received the form with the scientific jargon performed similarly to the students who received the form with nonsensical terms. We suggest that these results imply not only that colloquial language is the most accessible format for presenting scientific content but also that jargon is not significantly different than gibberish from the perspective of an undergraduate student.
Research and Travel Plan:
I work with Dr. Julie Libarkin in the Geocognition Research Lab at MSU. Broadly conceived, the lab focuses on questions related to how people, from students to professionals, perceive or understand scientific data about the planet, and how they make decisions or act on that understanding. Coupled with this, Dr. Libarkin and I also share an interest in investigating different aspects of apprenticeship in science. Both of the projects that took me to the GSA annual meeting contribute to these research objectives. Moreover, the GSA annual meeting is the primary conference at which the Geoscience Education community comes together to share results and discuss new ideas.

The findings of our study presented at the GSA annual meeting are consistent with existing literature on the challenge technical terminology imposes on students’ ability to read and comprehend scientific concepts. These well-recognized challenges include the following: the number technical terms in scientific writing rivals the number of words students learn when studying a foreign language; the use of familiar words used in unfamiliar ways; and a style of writing dominated by passive voice and complex phrases. Consequently, one of our major findings, that science content written in colloquial language is significantly more accessible to students than comparable content written in technical terminology, is not particularly surprising. What distinguishes our study, however, is that we are able to put further context on that statistical difference by comparing these results with results from the third version of our survey: the version was written with technical nonsense terms in place of the jargon. We argue that the lack of a statistical difference between performance on the version written with technical terms and the version written with technical nonsense terms brings new urgency to education efforts focused on helping students become more skilled readers. We propose, too, that this study serves as evidence that more consideration should be place on the timing and means by which jargon is introduced into curriculum.

The intent of the survey conducted at the Geocognition Research Lab booth was to acquire data from individuals with different levels of education and experience in the Earth Sciences. The conference served as an opportune venue to obtain data from undergraduates, graduate students, and professionals. In particular, the survey questions were designed to inform our understanding of how different groups perceive the relative importance of others around them, whether peers, protégés, or mentors, to their sense of belonging and career satisfaction. We will consider, as well, how results differ for subgroups such as minorities, women, and scientists with disabilities. This work is supported by several bodies of literature, including studies related to social capital theory, mentoring, and mechanisms for career development and success in the sciences. Common across these areas of research is a fundamental interest in the importance of networks and relationships between mentors and protégés. A key motivation for this study is an ongoing discussion about the recruitment and retention of under-represented groups in the Earth Sciences. Existing studies have focused largely on the success of programs aimed at increasing participation of different groups (e.g. minorities or women); little work has been done to focus more explicitly on the experiences of professional already in the field. We anticipate that the results of this survey will provide new insights into the career development and sense of belonging for Earth Scientists, and hence will be beneficial for efforts aimed at increasing diversity in the community.

Both of these projects have been and continue to be valuable experiences for me as a developing science education researcher. My graduate studies centered more specifically on qualitative case studies of how experts and novices solve geologic problems. Thus, these projects introduced me to new areas of literature as well to new methods of data collection and analysis.

Expenses for the trip included the standard costs of conference registration ($115), airfare ($563), hotel lodging ($696), per diem ($30/day for 6 days or $180). In addition, the total cost of collecting surveys at the booth worked out to $5 per survey and we collected 300 surveys; thus the total expense for the surveys is $1500. I received a grant of $1000 to cover my travel and part of my hotel expenses. In addition, I have received $500 from the Geocognition Research Lab. Because this lab supports a number of students and postdoctoral researchers, it caps travel grants at $500 per person per year. Thus, any assistance with the remaining costs of $1554 would be greatly appreciated.