Undergraduate Research Award Proposal

Name of Applicant: [Redacted]
Faculty Sponsor: Pamela L. Neidert, Ph.D., BCBA-D, Assistant Professor, Applied Behavioral Science

Project Title: Side Effects of Vicarious Positive Reinforcement

A. Project Description

Introduction
Learning by observing others (often described as observational learning or vicarious reinforcement) is important in the development of young children. However, the process by which children learn skills simply by watching others remains unclear. Additionally, the extent to which children develop this skill independently and whether it can be taught to those who do not learn independently (e.g., children with developmental disabilities) is unclear. Dr. Pamela Neidert’s research lab has been studying vicarious reinforcement with young children for the past two years to determine the extent to which vicarious reinforcement occurs in young preschool children, to examine factors that may likely be the reason for vicarious reinforcement, and to examine factors that may facilitate the emergence of vicarious reinforcement. In other words, we want to investigate how observational learning occurs.

An example of vicarious reinforcement is when a child watches a peer receive reinforcement for engaging in a particular behavior and, subsequently, that child engages in the same behavior even though they have not received reinforcement. One aspect that we want to investigate further is whether there are potential negative side effects of teaching strategies based on vicarious reinforcement. For example, a child who does not receive the same reinforcement that they observe their peer receiving may respond negatively (tantrum, cry, etc.) to the situation.

Significance to the field
Previous research on vicarious reinforcement has been conducted examining the effect on various classroom behaviors among children with and without developmental disabilities. Behaviors previously examined included task completion (Ollendick, Dailey, & Shapiro, 1983), attentive behavior (Kazdin, 1973), in-seat behavior, and problem behavior (Christy, 1975). However, the results of many of these studies are limited because the experimental design did not allow one to determine whether the observing child was simply imitating the behavior of the peer model (regardless of whether the peer model received reinforcement) or whether the observing child was responding both to the behavior they saw the peer exhibit and the reinforce delivered to the peer. Dr. Neidert’s colleagues at the University of Florida demonstrated (with adults with developmental disabilities) that observing the reinforcement of peer models signals to the observer that they are in a situation in which they will likely receive reinforcement (Camp & Iwata, in preparation). Dr. Neidert’s former graduate student, Danielle Gureghian, replicated and extended Camp and Iwata’s study using preschool children. The study included phases in which the observing child did not receive reinforcement for engaging in the behavior the peer model was instructed to engage in. Interestingly, they noticed that the observing children engaged in higher rates of problem behavior (e.g., aggression, property destruction) and negative vocalizations (e.g., ‘no,’ ‘It’s not fair,’ ‘I want candy too!’) during these phases. This suggests that situations in which the availability of reinforcement is unevenly distributed across children may be aversive to those not receiving reinforcement. This has led to our current study to evaluate the potential aversive properties of vicarious reinforcement.

Reinforcement is an important component to early childhood education. However, it is not always convenient for teachers to deliver direct reinforcers during ongoing class activities. If we can find successful ways to enhance vicarious reinforcement effects, we may be able to teach more efficiently. In
order to do this, we must continue to examine the parameters involved in this complex behavioral process. If vicarious reinforcement is aversive to children, teaching strategies based on vicarious reinforcement (VSR) could hinder actually hinder, rather than facilitate learning.

**Methods**
We want to extend Gureghian and Neidert (in preparation) by testing for aversive properties of VSR. We plan to do this by giving the observer the opportunity to terminate reinforcement to the model. Children enrolled in the Edna A. Hill Child Development Center preschool classrooms are participants in the current study. Sessions take place in small session rooms that are adjacent to the child development center. Trained undergraduate and graduate research assistants collect data using the ABC Data-Pro app on handheld computer devices. Data are graphed for visual analysis using GraphPad Prism software. Identical sets of task materials are provided to the children. Imitation tests are conducted in order to ensure that the observing children are capable of imitating a model’s behavior. Before we begin running sessions, peer models go through compliance training to teach them what to do when instructed (to ensure procedural integrity). Control tasks (e.g., a pair of toy horses) and target tasks (e.g., cards to be put in a box) are provided during each condition, and the observer has a “STOP” sign secured to the table in front of them. The dependant variables are frequency of stop sign hits, frequency of engagement in the target task, negative vocalizations, and problem behavior. The positive reinforcers provided are highly preferred edibles. During baseline, neither the model nor the observer’s behavior is reinforced. During the vicarious positive reinforcement (VSR+) stage, the model is told to engage in the target behavior via a bug-in-ear device every 15 seconds, and each response results in the delivery of a reinforcer to the model. If the observer engages in the target behavior, they do not receive reinforcement. If the observer engages in the escape response (i.e., hits the stop sign on the table) nothing happens. Everything is the same during the next condition, VSR+ plus Escape, except now if the observer hits the stop sign, the edibles are removed from in front of the model for 15 seconds thus terminating the availability of reinforcement. During the Direct Reinforcement plus Escape condition, both the model and the observer receive reinforcement for engaging in the target task. Additionally, if the observer hits the stop sign, the edibles are removed from in front of the model for 15 seconds and they cease to receive the edible when they engage in the target behavior. The difference between the latter two conditions allows us to compare termination when the model and observer do and do not have equal access to reinforcement.

To date, we have run three participants through this study. We observed idiosyncratic results among the three. All three participants engaged in problem behavior and negative vocalizations during phases in which reinforcement was not available to them. However, their patterns of behavior were so different across the phases that we cannot conclude that vicarious positive reinforcement is aversive based on the limited data we have. We plan to run participants and observe for a general pattern of responding across participants indicative of whether VSR+ is aversive to observers.

**Timeline:** We aim to run more subjects through the end the Summer 2014. Our results would be presented at the annual conference for the Mid-American Association for Behavior Analysis in Fall 2014. Our goal is for a publication in the Journal of Applied Behavior Analysis by Spring 2015.

**Available Resources:** Dr. Neidert’s research lab has access to the session rooms needed to complete the study and is equipped with all of the materials needed to run the sessions, take data, store and graph data, and communicate with models. Children enrolled in the Edna A. Hill Child Development Center are available to us as potential research participants during their typical school day.

**Human subjects**
KU’s Human Subjects Committee (HSCL) has reviewed and approved this ongoing study (HSCL Project #18921).
B. Significance to the Applicant
I worked on this study daily during the Fall 2013 semester. As a former preschool teacher, I am very interested in the results of continuing this study. Implications drawn from the results could lead to future research projects that could influence teaching strategies across the country. The graduate student I worked under has graduated with a Ph.D.. I learned a lot about research from this project and would be honored to have the opportunity to continue this study. After being an undergraduate research assistant for 2 semesters, I would like to obtain a leadership role. I plan to apply to graduate school next year, and would stand out from other applicants with the leadership experience that this award would grant to me. The funds provided by this award would finance the tuition cost for the research practicum I would need to take in order to continue work on this project. If given the opportunity to take the lead on this study, I will be given an experience that will help me excel in my graduate research endeavors.

C. Applicant’s Qualifications
I have been a research assistant in the Neidert research lab for 2 semesters. I am a senior majoring in applied behavioral science and I expect to graduate at the end of the summer. I have taken extensive behavior analytic coursework, which has provided me with a solid background in the behavioral principles relevant to this study. I have assisted in the implementation of seven research protocols. Most of my fall semester was spent specifically working on this project. Danielle Gureghian, Ph.D., BCBA-D trained me on the procedures of her study. Specifically, I have been trained on how to set up for and run sessions, record, graphically depict and analyze data, monitor interobserver agreement and treatment integrity measures, and present results for discussion to Dr. Neidert and her research team. I am confident in my organizational and leadership abilities. My lab would like to continue with this project and I would be able to provide assistance with supervising the day-to-day completion of the project and training the newer undergraduate researchers.

References