How and/or on what were the URISC funds expended?

URISC funds for this project were used as salary for my time, which included working 100 hours at $10 an hour. The URISC award allowed me to continue my research under the direction of Dr. McClelland.

A brief summary of the work conducted

Introduction

Although many children make a successful transition from preschool to kindergarten, there are a growing number who do not have the required self-control, or self-regulation, required to thrive in kindergarten (McClelland, and Cameron, 2012). Having poor self-regulation is particularly troublesome as preschoolers move from a fairly unstructured environment to a more structured, academically-focused environment in kindergarten. Although early education programs such as the No Child Left Behind Act have focused on emergent literacy and math as essential to academic success (NCLB, 2001), early self-regulation is important because it provides a strong foundation for school achievement (Blair, 2002; McClelland et al., 2007; Ponitz, Rimm-Kaufman, Grimm, & Curby, 2009). Self-regulation consists of three parts: attention, working memory, and inhibitory control (McClelland et. al., 2007). In young children, this includes a child's ability to pay attention, follow instructions, and refrain from inappropriate actions (McClelland et. al., 2007). However, there has been a lack of reliable and valid ways to assess children’s self-regulation especially in classroom settings. This study compared children’s behavior in a classroom setting to an individually-administered self-regulation task, called the Head-Toes-Knees-Shoulders (HTKS) (McClelland et al., 2007).
This study compared children’s scores on an observation measure that assessed self-regulation and social behavior in the classroom, called the Observed Child Engagement Scale (OCES) (Ponitz, Rimm-Kaufman, Grimm & Curby, 2009) with self-regulation as measured by the HTKS Task (McClelland et al., 2007). The OCES used in the study includes eight factors: self-reliance, positive affect, negative affect, attention, disruptive behavior, cooperation with peers, compliance, and engagement. This study investigated how observed behaviors in the classroom from the OCES are related to directly assessed self-regulation. It investigated the following research questions: 1) How is the OCES observation overall composite score related to children’s self-regulation on the HTKS task? 2) How are the individual OCES observed factors (self-reliance, positive affect, negative affect, attention, disruptive behavior, cooperation with peers, compliance, and engagement) related to children’s directly assessed self-regulation on the HTKS?

Methods

I analyzed the data from 177 preschool and kindergarten children (50% female) gathered during the Spring of 2011 and 2012. For children’s observed self-regulation in the classroom, the Observed Child Engagement Scale (OCES) (Ponitz et al., 2009) was used. For the OCES, eight-minute observations were conducted in classrooms by trained graduate assistants to assess aspects of self-regulation and social behavior including children’s self-reliance, positive affect, negative affect, attention, disruptive behavior, cooperation with peers, compliance, and engagement. Observations occurred in both prekindergarten and kindergarten classes during various classroom activities. Children’s self-regulation was directly assessed using the Head-Toes-Knees-Shoulders (HTKS) task, a short game that assesses attention, working memory and inhibitory control. The HTKS requires children to remember rules and do the opposite at the
prompting of the assessor. The HTKS has been found to be reliable and valid with diverse samples of children around the world (McClelland et al., 2007; Wanless et al., 2011).

For my first research question, I expected that children having higher observed self-regulation scores on the OCES would have higher self-regulation scores on the HTKS. A past study of kindergarteners found that direct assessment of self-regulation at the beginning of the kindergarten year was significantly related to classroom engagement later in the year (Brock, Rimm-Kaufman, Nathanson, & Grimm, 2009). For my second research question, I expected the ‘cooperation with peers’ dimension of the OCES would be significantly related to HTKS scores because previous research has found that aspects of cooperation significantly relate to self-regulation (Setknan, McClelland, Acock & Morrison, 2010). The OCES defines the cooperation with peers dimension as consisting of two factors: behavior with peers, and sociability.

An average score on the ‘behavior with peers’ factor requires the children to exhibit neutral to moderately cooperative behavior with peers. A high score is characterized by being highly sociable, playful, and frequent attempts to engage other children in social play or conversation. A high rating on sociability is demonstrated by extremely pro-social peer interaction.

Based on the preceding definition, cooperation with peers would be expected to be significantly correlated with HTKS scores because competence in cooperation with peers requires the ability to self-regulate, which the HTKS measures. Self-regulation is composed of inhibitory control, working memory, and attention. In order to engage positively with peers children have to be able to self-regulate their behaviors, and allow their peers to talk and participate in the play activities. Children also have to be able to pay attention to their peers and remember what their peers are saying and remain attentive to their peers without getting
distracted by other things in the classroom in order to sustain engagement.

**Results**

*Is the Composite OCES score significantly related to the HTKS Self-Regulation Score?*

First, this study looked at whether children’s composite observed score in the classroom (OCES score) was significantly correlated to children’s score on the HTKS measure of self-regulation. There were 317 prekindergarten and kindergarten children who took the HTKS and of those, 154 were also observed using the OCES. Running a pairwise correlation revealed that the composite score of the OCES measure was significantly correlated with the HTKS score ($r = 0.193$, $p = 0.016$). This meant that having stronger observed self-regulation and social behavior in the classroom was significantly related to stronger scores on the measure of self-regulation (the HTKS).

This study also examined the relationship between the OCES composite score and the HTKS score using a sample of prekindergarten children, and a sample of kindergarten children. In the prekindergarten sample, 239 children had taken the HTKS, and of those, 100 had also taken the OCES. There was a significant relation between the OCES composite score and the HTKS score in preschool ($r = 0.217$, $p = 0.030$) showing that higher observation scores in the classroom were significantly related to higher HTKS scores of self-regulation. The kindergarten sample consisted of 78 children who had taken the HTKS and of those, 54 had taken the OCES. In contrast to results for the prekindergarten group of children, there was no significant correlation between the OCES and HTKS scores in the kindergarten sample of children.

*Are OCES Dimension Scores Significantly Related to the HTKS Task of Self-Regulation?*

The second question examined if there was a significant correlation between the individual OCES dimensions (self-reliance, positive affect, negative affect, attention, disruptive
behavior, cooperation with peers, compliance, and engagement) and children’s scores on the HTKS measure of self-regulation. Analyses were run using data from a full sample of both prekindergarten and kindergarten children, then only prekindergarten children, and lastly only kindergarten children.

Using the full sample of prekindergarten and kindergarten children, 137-154 children had been assessed on both the OCES and the HTKS, depending on the individual OCES dimension being analyzed. Only the cooperation with peers dimension of the OCES was significantly related to the HTKS, \( n=137, r = 0.358, p = < 0.001 \), although there was a significant trend for positive affect being significantly related to HTKS scores \( n = 154, r = 0.147, p = 0.069 \). This meant that higher scores on the cooperation and positive affect dimensions were related to higher scores on the HTKS measure of self-regulation. The six other dimensions of the OCES were not significantly related.

The prekindergarten sample consisted of between 95-100 children, depending upon the OCES dimension being analyzed. Similar to the results for the full sample, only the cooperation with peers dimension \( n=95 \) was significantly related to scores on the HTKS \( r = 0.334, p = < 0.01 \). All seven other dimensions were not significantly correlated with the HTKS. The kindergarten sample size was 42-54, depending upon the OCES dimension being analyzed. None of the dimensions were significantly correlated with the HTKS scores.

**Discussion**

The present study examined if observations of children’s self-regulation and social competence in the classroom was significantly related to their individual performance on a self-regulation task.

**Composite OCES Scores and HTKS Scores**
First, this study investigated whether children’s composite OCES scores were significantly correlated with children’s scores on the HTKS. Results indicated that the composite OCES score of self-regulation and social competence in the classroom was significantly related to HTKS self-regulation scores in the full sample of prekindergarten and kindergarten children, which is what was predicted. This finding parallels the findings of a previous study of classroom engagement and self-regulation (Brock, et al., 2009). Self-regulation has been shown to provide a strong foundation for academic success. Thus, the OCES score’s significance with HTKS scores suggests that, to some degree, a child’s readiness for school can be determined by observing their early behavior patterns in a classroom. The OCES serves as a convenient method to help decide whether a child is ready to make the transition from preschool to kindergarten and from kindergarten to first grade.

This study also compared the relationship between the OCES composite score and the HTKS score the prekindergarten children, and the kindergarten children separately. In an analysis of the prekindergarten and kindergarten children separately, only relations for the observation composite score and children’s performance on the self-regulation task were significant for the prekindergarten sample. Relations between the observations and the self-regulation assessment in the kindergarten sample were nonsignificant, which is contrary to what was predicted. It was predicted that scores on the OCES would be related to HTKS scores because many of the behaviors rated on the OCES tap children’s ability to self-regulate. This difference between the prekindergarten and kindergarten sample might be caused by differences in the type of classroom environment that is typical in prekindergarten versus kindergarten classrooms.
Kindergarten environments tend to be more structured than preschool classroom environments. In a more structured environment, it may be more difficult to demonstrate some of the elements of the OCES dimensions. For example to receive the highest score on the self-regulation element of self-reliance, a child must be able to maintain control of themselves and their surroundings in a loosely structured environment. This can make it hard for a child to demonstrate the highest level of self-regulation in a more structured kindergarten classroom environment. The cooperation with peers dimension of the OCES is also harder to score in a very structured environment if the daily routine reduces or inhibits opportunities for socialization with peers.

The lack of a significant correlation using the kindergarten sample could also be caused by the small sample and limited observational time. Each of the children in the sample was only observed once, for eight minutes. With only a single observation, it is possible that the child did not demonstrate typical behavior when they were observed. More frequent and longer observations may result in a more accurate sense of a child’s classroom engagement. This would allow for a more accurate analysis between children’s observed OCES and the directly assessed HTKS scores.

**OCES Dimension Scores and HTKS Scores**

For the second research question, the individual dimensions of the OCES (self-reliance, positive affect, negative affect, attention, disruptive behavior, cooperation with peers, compliance, and engagement) were compared to HTKS scores. When looking at the full sample of prekindergarten and kindergarten children, cooperation with peers was significantly correlated with the HTKS scores, as predicted. The positive affect dimension of the OCES was almost significantly related to HTKS scores. OCES defines the positive affect as a display of a general
good mood and pleasant state from the child. This is demonstrated through both physical and vocal expressiveness during interaction with peers and adults. Positive affect and HTKS scores might have been related because HTKS measures self-regulation, which is needed to effectively interact constructively with adults and peers. If children are able to self-regulate, allowing them to interact in a positive and healthy way, then they would be more likely to enjoy themselves and gain a sense of happiness and pleasure from the interaction, scoring higher on the positive affect dimension.

In the sample of only prekindergarten children only the cooperation with peers dimension was significantly related to HTKS scores. None of the dimensions in the kindergarten sample were significantly related to HTKS scores.

**Implications and Limitations of the Study**

Results of this study suggest that working with preschoolers and kindergarten children to improve constructive and positive classroom behavior with teachers and peers may help prepare children for academic success. Individual analysis of the OCES dimensions seem to indicate that cooperation with peers and positive affect may have a bigger impact on school readiness than the other dimensions. Therefore teachers should focus on developing children’s ability to interact cooperatively with peers and children’s enjoyment of classroom activities. Outside the classroom parents can help their children by teaching their children how to play cooperatively with friends. However, it is important to note that this study only determined a correlation between OCES scores and HTKS scores, and not a causal relationship. Another limitation is the small amount of data on each child. There was only one observation done on each child to determine their OCES scores. To provide a more accurate level of children’s engagement, it would be necessary to have more observations on each child.
Conclusion

The results of this study add to existing research showing the relationship between aspects of observed classroom behavior and self-regulation. Specifically, this study demonstrates the link between the abilities to cooperate with peers and having high positive affect, with better self-regulation measured directly. These results can be used by researchers, parents, and teachers to foster behavioral regulation in preschool, cooperation with peers and positive affect to successfully transition children into kindergarten.

State the benefits from the URISC

The URISC award allowed me to continue contributing to Dr. McClelland's Touch Your Toes, Kindergarten Readiness Study, which I joined when I was accepted to the Undergraduate Research Awards Program (URAP), last year. As a recipient of a URISC award, I was able to investigate the correlation between self-regulation in early childhood, and observed classroom behavior. Throughout my time researching this topic, I consulted with Dr. McClelland and collaborated with many undergraduate students in the process of gathering data. I also consulted with Dr. McClelland and several graduate students in the formation of my analysis and conclusions. The results of my research add to the work of Dr. McClelland and her graduate students who are currently writing a paper which will be published in the future.
References


