

The Relationship Between Parent Stress in Low-Income Families and Children's Self-Regulation

by
Alexa Elliot

A THESIS

submitted to
Oregon State University
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(Honors Scholar)

Presented October 7, 2020
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Self-regulation is a cognitive mechanism that allows children to maintain control over their behaviors and emotions. The importance of this function is well-documented, but there is less understanding of the factors that affect children's development of self-regulation. Therefore, the objective of this study is to examine if parent stress in low-income families is related to children's self-regulation. This was conducted by comparing parent self-ratings of their stress levels and their children's performance of two self-regulation measures: Head-Toes-Knees-Shoulders Revised (HTKS-R) and The Dimensional Card Change Sort (DCCS). The results indicated a significant positive correlation between a stress item measuring how often parents felt on top of things and children's performance on the HTKS-R Measure, indicating a relationship between certain aspects of parent stress and children's self-regulation. These findings suggest more research is needed to fully understand the relationship between parent stress and children's self-regulation in low-income families.

Key Words: self-regulation, parent stress, cognitive development, low-income families, caregiving

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I understand that my project will become part of the permanent collection of Oregon State University, Honors College. My signature below authorizes release of my project to any reader upon request.

Alexa Elliot, Author

Introduction

Self-Regulation

A key area of cognitive function is self-regulation. Self-regulation is a broad construct that includes multiple processes such as cognition, emotion, and behavior that helps children maintain control over their attention, emotion, and action (McClelland et al., 2019). Although the importance of self-regulation has been previously established, a stronger understanding of environmental factors as they relate to early development of self-regulation is needed (McClelland & Cameron, 2012; Ponitz, McClelland, Matthews, & Morrison, 2009).

McClelland and Cameron (2012) explain self-regulation demonstrates aspects of executive function including attentional flexibility, working memory, and inhibitory control. Self-regulation is the behavioral expression of these cognitive skills. Attentional flexibility is the ability to focus on a certain task and retain that focus amidst distractions. Working memory demonstrates the capacity to complete a task while remembering the information pertinent to the current task. Finally, inhibitory control consists of the ability to replace an automatic reaction with a more favorable one (McClelland & Cameron, 2012).

Self-regulation development begins at a very young age and continues to show rapid development throughout early childhood. During preschool, there is a large period of growth in the part of the brain most associated with development of self-regulation: the prefrontal cortex (Schmitt, McClelland, Tominey, & Acock, 2015). This makes preschool a significant time period to examine the development of early self-regulation.

Additionally, self-regulation supports a smooth transition from preschool into kindergarten. Children with stronger self-regulation experience less peer rejection and higher academic achievement in school (McClelland & Cameron, 2012). Specifically, there are strong

positive relationships between self-regulation and children's skills in math, literacy, and vocabulary (Ponitz et al., 2009). Furthermore, strong self-regulation skills are correlated with higher teacher-rated child behavior in the classroom. These relationships demonstrate strong self-regulation helps children adjust to and perform well in the classroom (Ponitz et al., 2009; Schmitt et al., 2014). Furthermore, self-regulation is an effective predictor of long-term success even into adulthood such as in college. These findings hold when controlling for demographic characteristics and initial achievement levels (McClelland & Cameron, 2012; McClelland et al., 2019).

Studies have suggested that self-regulation can be improved through teaching and practice (Schmitt et al., 2015). A key aspect of improving self-regulation skills is understanding how environmental factors play a role in development. The present study examined the environmental factor of parental stress in relation to children's self-regulation skills in preschool.

Poverty and Parental Stress

The Center on the Developing Child at Harvard University (2016) found one environmental factor that can influence the development of children's self-regulation is their parents' own ability to self-regulate. In adults, the capacity for self-regulation is shown through the skills of planning, focusing, and maintaining control over one's behavior and emotions. These skills relate to many aspects of being a functional person in society such as the ability to hold down a job or provide responsive child care (Harvard University, 2016). Adult self-regulation can be impeded by the chronic stressors associated with poverty. These stressors often include, but are not limited to, housing insecurity, poor nutrition, and safety (Harvard University, 2016). All in all, the stressors of living in poverty can negatively impact an adult's self-

regulation skills, including their ability to provide responsive care for their children (Harvard University, 2016).

Studies have found that parental distress affects the quality of care provided to children (Anthony et al., 2005; Harvard University, 2016). For instance, parents who reported higher stress levels also reported more strict discipline and less nurturing parenting behaviors (Anthony et al., 2005). This finding reveals a tendency for parents who are under more stress to exhibit more controlling parenting practices. Similarly, the Center on the Developing Child at Harvard University found that parents who are overwhelmed with stress are less attuned to their infants' cues such as facial expressions which affects their ability to respond appropriately to their infants (Harvard University, 2016). Because parent's self-regulation can be inhibited by the stressors of poverty, it follows that the high amount of environmental stressors resulting from living in low-income settings affects their ability to provide responsive caregiving to their children.

Parental Caregiving and Children's Self-Regulation

The quality of caregiving children receive is important because it can influence their development of self-regulation. Blair and Raver (2012) suggest that both genetics and life experience influence children's development which is referred to as experiential canalization (as cited in Gottlieb, 1991, 1997). The explanation focused on the fact that while adverse life experiences resulting from living in poverty affects the whole family, these experiences also impact the quality of caregiving, which, in turn, can increase children's stress. When parents are not able to respond to their children's signals, children experience increased stress because their needs have not been met. Bernier et al. (2010) similarly concluded that child stress resulting from negative life experiences, such as stressors resulting from living in poverty, has been shown

to be related to brain development structurally and functionally. A lack of responsive caregiving can increase children's stress, which impedes their ability to develop self-regulation skills.

Multiple studies have found evidence of a relationship between caregiving quality and children's self-regulation skills. Anthony et al. (2005) revealed a relationship between higher parent stress and more problems with children's externalizing behaviors and social competence in preschool. These behaviors are indicative of low self-regulation. Furthermore, Distefano, Galinsky, McClelland, Zelazo, and Carlson (2018) found that autonomy supportive parenting was related to executive functioning development in preschool. Parents who practice autonomy support encourage their children to challenge themselves in ways that are appropriate for their developmental level while helping out with tasks that are just beyond their development and commending children's efforts. Autonomy support is crucial for children's cognitive development because it provides a supportive environment to practice age-appropriate problem solving. This type of environment is thought to help children develop internal self-regulation and reduce instances of externalizing behaviors and behavior problems (Distefano et al., 2018).

Additionally, environmental instability, such as inadequate nutrition and lack of sufficient stimulation for children, is more common in households with low-income and promotes immediate reactivity in children rather than development of self-regulation (Blair, 2010). Autonomy support and the state of the household are aspects of caregiving that can be negatively affected by parent stress (Blair, 2010). The relationship between these aspects of caregiving and children's self-regulation reveal some of the mechanisms through which caregiving impacts self-regulation development.

The preschool period is an important time to look at these skills because self-regulation is important for a smooth transition into kindergarten (McClelland & Cameron, 2012). During

preschool, children experience the expectations of early childhood education and how their parents balance having a child in school with the other aspects of their lives. Children's self-regulation performance towards the end of preschool reflects these experiences. Therefore, the present study examined how parental stress is related to children's self-regulation in the spring of preschool before their transition to kindergarten.

Present Study

Although the connections between parent stress and children's self-regulation have been documented in the literature, there are few studies comparing parent's stress levels with their children's performance on directly-assessed measures of self-regulation. This study investigated the relationship between parental stress and children's self-regulation in the spring of preschool. Therefore, the research question for this study is:

Does higher parent stress in low-income families relate to lower self-regulation in children in spring of preschool?

Based on the conclusions drawn about the cognitive effects of childhood adversity by Blair and Raver (2012) and Harvard University (2016), it is hypothesized that greater parental stress among low-income families will relate to lower self-regulation skills in children during preschool. In addition, children's age, gender and language (Spanish-speaking or English-speaking) were included as covariates based on previous research finding that these variables are related to children's self-regulation (McClelland et al., 2014). This will be an important contribution to the understanding of why self-regulation develops differently across children. Specifically, this study will increase our understanding of how parental stress can affect the development of children's self-regulation in preschool especially for children from low-income families.

Method

Participants

This study was part of a larger study through the Kindergarten Readiness Research Program at Oregon State University. The goals of the Kindergarten Readiness program included developing a measure of self-regulation and strengthening self-regulation skills through a school-based intervention. The main study followed Oregon preschoolers from low-income families in Head Start classrooms over the course of a year, collecting data in the fall and spring of preschool.

The present study examined data collected from preschoolers at the second time point (spring) in preschool. Data was collected from 188 children in 10 preschool classrooms. A demographic form was sent to the children's homes via mail in January following data collection in the first time point (fall). This form asked parents to fill out information about themselves, their children, and characteristics of their family. Eighty-five demographic forms were returned, yielding a response rate of 45.2%. Forms were available in both English and Spanish to allow for greater participation. Of the forms returned, 65.8% were in English and 34.1% were in Spanish.

Independent Variables

The demographic form included questions for the parents about their stress levels in the last month. The three stress items included on the form were from the widely utilized Perceived Stress Scale which was designed to determine how much stress the respondent perceives in his/her life (Cohen et al., 1983). Respondents rated how often they experienced each item in the last month on a scale from 0-4 where 0 indicates never and 4 indicated very often. The first item asked *In the last month, how often have you been upset because of something that happened unexpectedly?* Of the demographic forms returned, the response rate for this question was 95.3%

($n = 81$). The second item asked *In the last month, how often have you felt that you were unable to control the important things in your life?* The third item questioned *In the last month, how often have you felt that you were on top of things?* This item had a response rate of 96.5% ($n = 82$). This question had a slightly lower response rate but higher average score than the other two items at 89.4% ($n = 76$). Correlations will be executed separately for each item and the results will indicate the need for regression models.

Covariates

Covariates included in the analysis were child age, gender, and language based on previous research finding that these were important predictors of children's self-regulation (McClelland et al., 2014). Child age is an important covariate to consider because children's self-regulation develops as they age, so it is expected that in a comparison between a three-year-old and a five-year-old child, the five-year-old would have stronger self-regulation skills. Child gender was included as a covariate to rule out any difference in self-regulation related to gender. Additionally, child language could be a covariate because a child who speaks a language in the minority of their community may face more barriers in school, which could affect their self-regulation development. To account for their possible effect on the relationship, the covariates were included in a linear regression model.

Procedure

For this study, the measures were delivered to Head Start preschoolers by trained assessors. The measures were delivered in random order and answers were recorded by the assessors. The preschoolers were assessed twice in the same year in the fall and spring.

Language Screener

Children whose parents indicated their home language was not English were given an English proficiency screener called the Pre-Language Assessment System (preLAS; Duncan & De Avila, 1998). Two sections of the system were used in this study: Simon Says and Art Show. If a child scored high enough, they were assessed in English, and if not, the following measures were conducted in Spanish. This system is widely used to measure language acquisition and it has been shown to have strong validity and reliability (Rainelli et al., 2017). In this study, slightly above a quarter (26.7%) of the children in the sample were assessed in Spanish.

Self-Regulation Measures

Head-Toes-Knees-Shoulders-Revised (HTKS-R)

HTKS-R tests the three main components of self-regulation: attentional focusing, working memory, and inhibitory control (McClelland et al., 2014). HTKS-R has been shown to have strong reliability and validity. The measure has strong construct validity because children's performance on the measure is highly correlated with other measures that test the components of self-regulation individually (McClelland et al., 2014).

There are four sections of the task and each item of the task is rated by the assessor while observing the responses of the child. The first section asked children to respond verbally to the assessor with the opposite word after head and toes were previously established as opposites. For example, when the assessor said "head", the correct response from the child was "toes". In the second section, children were assessed with the same set of opposites but asked to demonstrate by touching their head or their toes. The third section adds another rule where the commands were to touch knees or shoulders with the expectation that the participant would demonstrate the opposite action. After practice with the new rule, it was assessed along with the rule from the

second section. For the final section, the rules were changed so that the pairings of opposites are head with knees and shoulders with toes. For each section, the child would move on in the measure if they scored 4 or more points in the previous section. If the child scored less than 4 points in a section, the assessment was ended. Children were scored on a scale of 0-2 where 0 indicated an incorrect response, 2 indicated a correct response, and 1 indicated a self-corrected response.

The Dimensional Change Card Sort (DCCS)

The Dimensional Change Card Sort (DCCS) is a task used to measure self-regulation specifically focusing on cognitive flexibility (Zelazo, 2006). It is meant for use with children between the ages of three and five, which fits well with the age range of preschoolers. This measure has strong construct validity because the results from this task are significantly correlated with results from other assessments of executive functioning (Zelazo, 2006).

There are three sections of card sorting in DCCS, using cards with blue and red shapes of rabbits and boats. In the first section, children were asked to sort six cards by color. The second section asked children to sort six different cards by shape instead of color. In the third section, some cards had a border around them while some did not. The assessor explained to the children that a border card indicated they are supposed to sort the card based on its shape while the lack of border indicated sorting by color. This ability to change between rules demonstrated a child's cognitive flexibility ability. In each section, the child is scored with either a 0 indicating an incorrect card placement or a 1 indicating correct card placement. The child was only assessed in the final section if they scored 5 or more points in the second section.

Results

Descriptive Statistics

Descriptive statistics were run on the demographics, independent variables, and covariates. The average age of the children in the spring was 58.1 months (4.83 years; $M = 58.1$, $SD = 6.31$). Slightly over half of the sample (51.6%) was female. There was some variance in the ethnicity of the sample with 58% identifying as Latino, 26% as white, 7% as Pacific Islander, 6% as African American, and 2% chose other to describe their ethnicity. Furthermore, the average reported education level for the parents was 11.27 years although the range was 2-17 years ($M = 11.27$, $SD = 2.30$).

The average answer for the first stress item was 1.47 ($SD = 1.01$), revealing parents almost never felt upset by the unexpected. For the second stress item, the average answer was 1.26 ($SD = 1.12$), indicating parents almost never felt unable to control important thing. The third stress item had an average answer of 2.14 ($SD = 1.30$), indicating parents sometimes feel on top of things.

Table 1. Analytic Variables

Variables	Item	Mean (SD) or Percentage
Independent Variables		
	Stress 1: <i>upset by unexpected</i> ($n = 81$)	1.47 (1.01)
	Stress 2: <i>unable to control important things</i> ($n = 82$)	1.26 (1.12)
	Stress 3: <i>on top of things</i> ($n = 76$)	2.14 (1.30)
Covariates		
	Child age in months ($n = 180$)	58.1 (6.31)
	Child gender (female) ($n = 188$)	51.6%
	Language (Spanish) ($n = 187$)	26.70%

Descriptive statistics were run using the data collected from each measure. The highest possible score for HTKS-R was 118. The sample ($n = 149$) yielded a mean score of 38.4 ($M = 38.4$, $SD = 31.1$). For DCCS, the highest possible score on the measure was 24 and the range for this sample ($n = 178$) was 5-21 points. The average overall score was 9.04 ($M = 9.04$, $SD = 4.87$).

Table 2. Self-Regulation Measures

Assessment	Observations (n)	Mean (M)	Standard Deviation (SD)	Range
HTKS-R	169	21.60	21.61	1-110
DCCS	178	9.04	4.87	5-21

To examine the relation between parental stress and self-regulation in the Spring of preschool, Pearson correlations were run looking at child age, child's sex, child language, the three parental stress questions and the two measures of self-regulation (Table 3) to determine any relationships between the variables. Upon examination of the matrix, a significant positive correlation was found between the third stress item *In the last month, how often have you felt that you were on top of things?* and the HTKS-R task ($r = 0.40$, $p < 0.01$). This indicated a moderate positive linear relationship between how often parents felt on top of things in the last month and their children's performance on the self-regulation measure during the spring of preschool. The relationship between these variables demonstrated parents feeling of being on top of things is related to stronger self-regulation in their children. Correlations between other stress items and the HTKS-R task were not significant. Furthermore, there were no significant correlations between the stress items and DCCS, so the relationship was not further analyzed in a regression model.

Additionally, children's performance on HTKS-R was positively correlated to child age and negatively correlated to child language. These findings indicated that older children were

likely to have stronger self-regulation compared to younger children, and children who spoke Spanish as their primary language were likely to have lower self-regulation compared to English-speaking children. These relationships reinforced the importance of using the covariates as adjustments in the regression model. These findings are consistent with previous literature (e.g., McClelland et al., 2014).

Table 3. Correlations of Covariates, Stress Items, and Self-Regulation Measures

Item	1	2	3	4	5	6	7	8
1. Child Age	-							
2. Child Gender	0.164*	-						
3. Child Language (Spanish)	-0.194*	-0.0231	-					
4. Stress 1 <i>unable to control things</i>	-0.257*	-0.0152	0.0308	-				
5. Stress 2: <i>upset by unexpected</i>	-0.0647	-0.013	-0.206	0.697***	-			
6. Stress 3: <i>on top of things</i>	0.131	0.0570	0.570***	-0.0128	-0.0043	-		
7. HTKS-R	0.455***	0.0347	-0.340***	0.0168	0.173	0.4033**	-	
8. DCCS	0.395***	0.0163	0.287***	-0.034	-0.060	0.212	0.449***	-

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A linear regression model was run to examine the relationship between the third stress item of the demographic form and the HTKS-R while adjusting for child age, gender, and language. After accounting for the covariates, the relationship between the third stress item *In the last month, how often have you felt that you were on top of things?* and HTKS-R performance was still significant ($\beta = 0.260$, $p < 0.05$). Child age was also significant ($\beta = 0.359$, $p < 0.01$). The results of the model are displayed in Table 4.

Table 4. Linear Regression Analysis of HTKS-R

Item	HTKS-R Model β (SE)
Child Age	0.359** (0.536)
Child Gender	-0.238 (10.57)
Child Language	-0.0196 (7.050)
Stress Item #3: <i>on top of things</i>	0.260* (2.96)

Note: * $p < 0.05$, ** $p < 0.01$

Discussion

It was hypothesized that there would be a relationship between increased parental stress in low-income families and lower self-regulation skills in children in the spring of preschool. There was some support for this hypothesis from the moderate positive relationship between parents who felt on top of things and stronger self-regulation in their children. This suggested that parents who were less overwhelmed by stress in their lives were more likely to have children with stronger self-regulation skills. This demonstrates the resilience of families in the face of strong stressors. After accounting for covariates of child age, gender, and language, the relationship was still significant. These results suggest the amount a parent feels on top of things is related to child self-regulation after accounting for covariates related to self-regulation outcomes. This finding suggested that some parents feel less on top of things than others which may contribute to a higher level of stress for them and their children.

There was not a significant association between children's self-regulation and the amount parents felt upset because of unexpected occurrences or the extent to which parents felt they were unable to control important things. These stress items had low average answers, indicating that these parents almost never felt this way. It was expected that the answers would indicate higher amounts of stress in these low-income families, but that is not what the results indicate. Also, these first two stress items were not correlated with the third stress item that measured how

often parents felt on top of things, indicating the items may measure different aspects of stress. When Cohen et al. (1983) created the Perceived Stress Scale, they aimed to measure how much participants “found their lives unpredictable, uncontrollable, and overloading” (p. 387), using all of the ten stress items together. The first two stress items are negatively phrased, relating them to perceptions of life being unpredictable and uncontrollable.

However, the third stress item asks about feeling on top of things and is phrased positively. This item is more related to coping with stress rather than feeling stress. How a person or a family copes with stress changes how the stress affects them and their children’s development (Harvard University, 2016). A parent who feels on top of things likely has better coping skills than parents who do not feel very on top of things. Furthermore, a parent that has better coping skills and feels more on top of things may be better able to provide care to their children, aiding in their development. These results reveal the resilience of families in the face of chronic stressors from poverty. All in all, these results suggest some aspects of parent stress in low-income families, such coping or resiliency, may be more related to children’s self-regulation development than others.

Limitations

Due to the complex nature of cognitive processes and the design of the study, a causal relationship between parental stress and children’s self-regulation cannot be inferred. Since only a few questions from the Perceived Stress Scale (Cohen et al., 1983) were used, the measurement of parent’s stress in this study was not the most comprehensive. Use of the entire scale or use of questions more directly related to stress, such as *In the last month, how often have you felt nervous and “stressed”?*, may provide a more accurate measurement of parent stress.

Additionally, although children were able to interact with an assessor speaking both English and Spanish when necessary, the parents filled out the demographic forms translated to Spanish on their own. The children and the assessor were able to work together to overcome any potential language barriers while even though the forms were written at a sixth-grade reading level, the parents had to do their best to understand the demographic forms on their own. This may have affected how the parents understood the questions on the demographic form and if so, that would affect the results for the stress measures. Also, these forms were self-reports from the parents, so they could be affected by social desirability or tendency to answer questions in a way that reflects positively on the respondent. It's important to remember the responses are relative.

The collection of data in the Spring was also a limiting factor in this study. By this point, the preschoolers have already experienced the structured environment of a preschool. Experience in this type of environment may positively impact the self-regulation scores of the preschoolers.

Furthermore, this study did not consider other possible effects of the child's health or medical conditions which could affect children's cognitive development and the relationship examined in this study. Lastly, more than half of the sample (58%) identified as Latino, so these results may not be applicable across all racial/ethnic backgrounds. Additionally, the sample was all low-income families. These points affect generalizability of the responses, and future research should include families for various backgrounds and economic levels.

Further research is needed to conclude long-term effects of parental stress on children's self-regulation development. An examination of self-regulation in comparison to parent's stress levels at multiple time points during early childhood would aid in understanding the possible long-term implications of increased parental stress in low-income families.

Conclusion

This study was conducted to examine how parental stress in low-income families may be related to differences in children's self-regulation during preschool. A positive relationship was found between the amount that parents felt on top of things in their lives and children's self-regulation skills, revealing that even in the face of multiple stressors related to poverty, parents who reported feeling more on top of things had children with stronger self-regulation. This indicates parents with better coping skills and resiliency are more likely to have children with stronger self-regulation. Social scientists can use these findings as a starting point for future research on how environmental factors relate to the development of self-regulation in early childhood.

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