Self-regulation in Low SES 4-year-old Preschoolers Predicts Picture Vocabulary and Phonological Awareness

Jia Borror[1], Sarah Ransdell[2], Jenna Binaco[3], April Feeser[1], and Mya Moran[3]

[1]Department of Curriculum and Instruction, Nova Southeastern University
[2]Department of Health Science, Nova Southeastern University
[3]Department of Psychology and Neuroscience, Nova Southeastern University

Nova Southeastern University, Fischler College of Education, 3301 College Avenue
Fort Lauderdale, FL, 33314, USA.

Abstract

The aim of this research was to examine whether or not early literacy skills are anchored by self-regulation and social emotional learning (SEL) in preschool children. It was hypothesized that children who are better self-regulators would have higher cognitive performance than those who are not. Four assessments were administered: Social Behavior Checklist (SBC), the Preschool Self-Regulation Assessment (PSRA), the Phoneme Elision subtest of the Comprehensive Test of Phonological Processing (CTOPP), and the PPVT-5, a norm-referenced instrument to evaluate receptive vocabulary. Results revealed cognitive and social development by all measures are predicted by age, especially vocabulary. Children who are only older by months are more likely to be less disruptive in class, have better self-regulation strategies, more phonological awareness, and higher receptive vocabulary than younger children in the same class.

Key words: self-regulation, preschool, social emotional learning (SEL), literacy, academic success, social development

I. Introduction and background

Self-regulation skills and social emotional learning (SEL) competencies benefit preschoolers in many aspects of their lives, including learning to read and write, because they are associated with academic achievement and overall school success (Lin et al., 2019; Smith-Donald et al., 2007; Reyes et al., 2012). These skills may be especially important for children in low socioeconomic status (SES) environments. The present sample of 22 four-year-old low SES children in a small private preschool are at the height of preoperational thinking and are veritable learning machines. All of the children, 10 girls and 12 boys, are enrolled in the same 4-year-old class. Like all their age, they have some written literacy skills and can identify letters of the alphabet on sight as measured by the Alphabet Cookie Game, which predicts PPVT or picture vocabulary (Ransdell & Borror, 2019). Many of the children can also read words and short sentences (Ransdell & Borror, 2019). They can follow words in a book and repeat the words after the teacher during small group reading instruction, and some can read the words for themselves. It is a very dynamic time of cognitive life. From this hotbed of cognitive processing lies the heart of early social development. A strength-based approach helps children learn how to establish healthy relationships with others and utilize coping skills when problems arise (Taylor et al., 2018). The purpose of this research is to learn how early reading and writing skills are anchored by self-regulation and SEL. SEL can strengthen children's early literacy skills.

Smith-Donald et al. (2007) created a reliable measure of self-regulation for the very young called the PSRA, or Preschool Self-Regulation Assessment. The PSRA was selected for this study to evaluate self-regulation among preschool children in the behavioral, emotional, and attentional domains (Smith-Donald et al., 2007). The PSRA has been shown to be a good predictor of early literacy skills and academic success. Self-regulation is measured in the PSRA by evaluating a set of simple behaviors such as waiting for a signal to complete a task or following insructions such as tapping once when the assessor taps twice.

Most children at this age, and therefore in this sample, can regulate their own emotions to some extent. A few have attention-seeking problems and/or hyperactivity, and a couple have what might be true behavioral problems. Learning is very rapid in the preoperational child and is therefore a valuable place to see how emotion and cognition are related. It is also a very flexible time in cognitive and emotional development. Piaget found that all children proceed through the same developmental stages, just at different speeds (Mensah, 2011). Brooks and Kempe (2014) remind us that there is a biological window or critical period for language during the first few years of life, when literacy skills develop and language use grows rapidly. Additionally, social and emotional competencies are cultivated during the early childhood years, which has a positive relationship with academic success and mental well-being (Sapra, 2019). Aggressive or defiant behavior may be the result of challenges in the area of social and emotional development for some children. Factors that may lead to difficulty in the development of social competencies include lack of attachment during infancy, limited socialization with family members, peers, or caregivers, poverty, and/or domestic violence to name a few (Sapra, 2019).

Research has shown that children with higher levels of emotional regulation skills are more successful in school, establish healthy relationships with others, and experience fewer conduct problems (Ulutas & Omeroglu, 2007). In order to ensure children's healthy development, promote higher levels of emotional intelligence, and establish a positive learning environment, many propose SEL be incorporated in preschool classrooms. SEL allows teachers to establish expectations in the classroom, promote success in school, and teaches children how to handle themselves in social interactions. SEL also helps children to understand and manage their emotions effectively, promotes independence, self-control, confidence, and adherence to classroom rules. Due to many diversity considerations that must be taken into account in today's early childhood classrooms, SEL can help to level the playing field with regard to academic achievement. Numerous diversity factors such as varying abilities, special needs, child rearing practices, home language, cultural background, economic conditions, family structure, and the education level of parents can influence the behavior of children, as well as the experiences they have prior to attending preschool. No matter their background, children with higher levels of emotional regulation skills achieve more success in school (Ulutas & Omeroglu, 2007). Researchers have long reasoned that children who exhibit less disruptive behaviors will benefit more from instruction and make better progress academically.

The Collaborative for Academic, Social, and Emotional Learning, or CASEL (2019), identifies five core competencies that encompass SEL: relationship skills, social awareness, self-management, self-awareness, and responsible decision-making. Although there is limited consensus about how to effectively measure these competencies among the youngest students in a reliable and valid assessment, researchers are working to establish precise SEL assessments. One of the goals of the present study is to build on the CASEL idea to measure and show the interdependence of those competencies. There are concerns about the accuracy of teacher ratings, peer ratings, and self-evaluation of SEL competencies due to the fact that responses may be biased and internal processes in young children are difficult to determine and assess (Taylor et al., 2018). Because SEL is developmental, cognitive ability and thought processes of students may vary depending on their level of maturity and how they process information. It is suggested that a strength-based approach is utilized when assessing SEL competencies rather than a diagnostic approach, which is often used in the field of mental health and aims to identify children's deficits. A strength-based approach helps all children learn how to establish healthy relationships with others and employ coping mechanisms when problems arise (Taylor et al., 2018). For the present study, strength also means measuring reliable behaviors rather than teacher or parent ratings of SEL.

Ransdell and Borror (2019) found that picture vocabulary measured by the PPVT can reliably predict social learning behaviors. An early behavior checklist predicted PPVT over and above age or classroom. Accurate and reliable predictions about early literacy skills among preschoolers can be made using a behavior checklist that includes behaviors associated with pre-reading skills such as showing excitement for reading, participation in sounding out words, and making predictions about the next letter in a word.

Furthermore, SEL behaviors associated with focus and attention such as looking at the reading material, repeating words and phrases, and singing along to melodies during circle time reliably predicted PPVT scores among children ages 2-5 (Ransdell & Borror, 2019).

In the present study, emotional regulation and disruptive behaviors are measured by a behavior checklist called the Social Behavior Checklist, or SBC. It is hypothesized that children who are better self-regulators, and older by only months, will have higher cognitive performance than those who are not (Tominey et al., 2017). Children gain the most from instruction when they can regulate their own emotions. This is especially important in low SES preschools where high emotional regulation can help children benefit from their school environment. The SBC, the PSRA, the CTOPP Phoneme Elision Subtest, and the PPVT-5 will all be correlated with age even in children who only vary in age by months.

II.   Method

2.1 Sample

Twenty-two 4-year-old children from a private preschool participated in this study. The preschool serves mostly Caribbean-American children living in low SES environments. The average family income in the zip code of the school is about 17,000 USD annually in 2019. The children were on average four years and one month old with a standard deviation of .34; the youngest were three and a half, and the oldest four and a half by definition to be in the class. See Table 1 for demographics of each assessment and age.

For this study, the research team consisted of two university professors and three undergraduate research students, or research assistants, who completed Collaborative Institutional Training Initiative (CITI) training on research ethics and compliance prior to implementation. Following CITI training and before working with the preschool children, the university professors trained the research assistants on protocols and procedures for the specific assessments selected. Training videos were created for each of the assessments to allow the research team to review protocols and information prior to administering a new assessment and to ensure consistency.

At the preschool, teachers collected consent forms for each of the 22 children enrolled in the 4-year-old class. Preschool teachers were engaged with children during daily instruction and literacy activities throughout the morning when the research team was present. A specific SEL curriculum was not being implemented, but many of the lessons focused on positive character traits, friendship, cooperation, and treating others respectfully. Over the course of six weeks, four assessments were administered to the 22 children to evaluate whether or not early literacy skills were correlated with self-regulation and SEL.

2.2 Instruments

The Social Behavior Checklist, or SBC, was the first assessment administered by the researchers during whole group reading instruction, followed by three more assessments conducted individually with each child during the following weeks. The four assessments selected and utilized in this research project were: the SBC, Preschool Self-Regulation Assessment (PSRA), Phoneme Elision Subtest of the Comprehensive Test of Phonological Processing (CTOPP), and the Peabody Picture Vocabulary Test, Fifth Edition (PPVT-5).

2.2.1 Social Behavior Checklist (SBC)

The SBC, a measure of SEL, was developed by the researchers to measure how emotional regulation skills anchor and predict cognitive skills related to literacy, such as phonological awareness, oral language, and vocabulary. The SBC (Appendix A) was the first assessment utilized by the research team during whole group reading instruction for the first two weeks of the study. On Tuesday and Thursday mornings of weeks one and two, children were given a lanyard with their subject number to wear during the observation period. During the approximate 20-minute whole group reading and circle time, the research team marked each instance of a child who exhibited one of the behaviors on the checklist by writing down the subject number of the child in the appropriate box. Interrater reliability was established to ensure accurate data collection.

Questions for the SBC were adapted from the Social Skills Improvement System Social-Emotional Learning Edition (SSIS-SEL) Teacher Edition Rating Form developed by Gresham and Elliot (2017). Because the SSIS-SEL was designed for students from kindergarten through Grade 12, the SBC was created specifically for preschoolers (ages 3 – 5) based on relevant items from the SSIS-SEL and behaviors observed during naturalistic observations with this age group, and therefore empirically derived.

Selected SSIS-SEL items incorporated into the SBC are as follows (with item numbers): 3) Comforts others, 4 and 34) Says please and/or thank you, 6) Asks for help from adults, 7) Completes tasks, 16) Has temper tantrums, 19) Says bad things about self, 20) Stays calm when teased, 30) Respects the property of others, 32) Acts sad or depressed, 35) Follows classroom rules, 43) Says nice things about self without bragging, 45) Makes eye contact when talking, 47) Speaks in appropriate tone of voice, and 51) Acts anxious. Reliability of the SBC ranged from about .40 to as high as .85. Independent observations of the children by all five raters showed the SBC to be reliable.

2.2.2 Preschool Self-Regulation Assessment (PSRA)

The PSRA was selected to evaluate self-regulation in behavioral, emotional, and attentional domains among the preschool children (Smith-Donald et al., 2007). The PSRA has been shown to be a good predictor of early literacy. Self-regulation is measured here by a set of simple behaviors like waiting for a signal to complete a task or tapping once when the teacher taps twice (Smith-Donald et al., 2007). One member of the research team conducted the test with the child in a quiet area of the preschool to limit distractions, while another recorded the scores using the PSRA data sheet. Results of the amount of time needed to complete each task on the scoring sheet were recorded by mentally counting the number of seconds. There were 10 tasks administered in the same order each trial. To ensure the order of the 10 tasks remained in the same order each time, flashcards were made with the number corresponding to each task from 1-10. Instructions were followed word by word as stated on the task flashcards. These flashcards contained the title of the task along with a brief explanation and a script for each task.

The first task was *Toy Wrap*, in which the child was asked not to peek while the assessor noisily wrapped a surprise. The latency to peak was measured in seconds and was recorded once the child covered their eyes and ended once the child opened their eyes. The maximum waiting time for this task was 20 seconds. The second task was *Toy Wait,* in which the child uncovered their eyes while the wrapped surprise was placed in front of them. In this task they were directed to refrain from touching the wrapped surprise. The latency to touch was measured in seconds once the surprise was placed in front of the child. The task was over once the child decided to touch the surprise. The third task was *Snack Delay,* in which an M&M candy was placed under a clear cup and the child was directed to wait for a signal before being able to find the M&M under the cup. This task was measured using the level of waiting (1-4). The maximum waiting time for this task was 60 seconds. The fourth task was the *Tongue Task,* in which both the assessor and child placed an M&M on their tongues. The child was instructed to wait and see who will eat the M&M first. The latency to eat the M&M was recorded and the maximum waiting time for this task was 40 seconds. The fifth task was *Balance Beam,* in which the child was instructed to walk along a line on the ground for five seconds with the assessor, and then directed to conduct the same task but as slowly as possible. The number of seconds needed to complete this task was recorded. The sixth task was the *Tower Task,* in which the child was instructed to take turns with the assessor placing blocks to build a tower. Ten blocks were used in this task and the assessor alternated in placing the blocks with the child. Level of turn-sharing (0–1) was measured in this task, in which the child was assessed for either successfully being able to take turns with the assessor or not being able to take turns. The seventh task was the *Pencil Task*, in which the child was to tap once when the assessor tapped twice and tap twice when the assessor tapped once. Percentage of correct responses out of four tries was measured in this task. The eighth task was the *Tower Cleanup Task,* in which the child was instructed to clean up the blocks from the *Tower Task*. Latency to complete cleanup was measured in this task and recorded in seconds. The child was to clean up all ten of the blocks from the previous task. The ninth task was the *Toy Sort*, in which the child was asked to sort and put away small toys without playing with them. The toys used in this study consisted of a barrel of plastic toy monkeys in which the monkeys were removed from the barrel and the child was to put them back in. Latency to complete cleanup was recorded in seconds. The maximum time period to complete this task was 60 seconds. The final task was the *Toy Return,* in which the child was given a toy guitar by the assessor to play with for a brief period and then asked by the assessor to return the toy. The latency to give the toy back was recorded.

According to Smith-Donald et al. (2007), four of the tasks from the PSRA were classified as delay tasks to measure children's control: *Toy Wrap, Toy Wait, Snack Delay,* and *Tongue Task*. Two tasks aimed to measure the executive control of children because the tasks required them to process opposing stimuli: *Balance Beam* and *Tower Task*. Three tasks were aimed at measuring compliance when given directions: *Tower Cleanup, Toy Sort,* and *Toy Return*. With the combination of different measurement assessments involved in each task, the results yielded data related to self-regulation.

2.2.3 Comprehensive Test of Phonological Processing (CTOPP)

The third assessment was the phonological awareness subtest called *Phoneme Elision* of the Comprehensive Test of Phonological Processing (CTOPP). This is a one-on-one assessment used to test the ability of children ages 4 - 24 to remove phonological segments from spoken words to form other new words. The goal for the test is to assess a person's phonological awareness, phonological memory, and rapid naming skills (Dickens et al., 2015). More recently, CTOPP-2 came out for the principle uses of identifying children who are below others in phonological ability, determining strengths and weaknesses in phonological ability, documenting a child's progress throughout their education to see if there has been improvement, and for research to test phonological processing (Dickens et al., 2015). The CTOPP-2 differs from the original CTOPP because the ceilings of the test have increased to make it more challenging. Since the ceiling for the test was increased, the developers also wanted to lower the level of the floor. In the first CTOPP the youngest children that could take the test were five to 6-year-olds. For the second edition, easier items were added so children at the age of four could also take the test. Within the CTOPP-2 age range, there are different subtests (Dickens et al., 2015).

In the CTOPP-2, the test recommended for four to 6-year-olds is called the *Elision*, in which a child listens to a word, repeats that word, and then is asked to say the word without a designated sound. For example, say cat without the /c/ (Dickens et al., 2015). The administration of this test was designed to be given by an examiner who has received formal training on the test. Feedback is given to the child during the first six questions for them to understand how the test works. The children then receive one point for each correct answer and 0 points for each incorrect answer until the ceiling of three consecutive incorrect responses has been reached.

A possible variable that may affect the results is if the children tested are at the floor of the recommended sample of ages providing the chance of inaccurate results. Reliability for CTOPP-2 subtests and composites are .85 or higher, and the validity of CTOPP-2 subtests and composites are demonstrated by correlations that directly measured constructs in the CTOPP-2 (Dickens et al., 2015). The average coefficients ranged from .49 (moderate) to .84 (very large), while composites ranged from .65 (large) to .76 (very large) in magnitude. It was hypothesized that those children with higher scores on the SBC and PSRA would achieve better outcomes on the CTOPP and PPVT-5, thus making them better prepared for Voluntary Pre-kindergarten (VPK) and kindergarten.

2.2.4 Peabody Picture Vocabulary Test, Fifth Edition (PPVT-5)

The final assessment administered was the PPVT-5, a norm-referenced instrument to evaluate receptive vocabulary. The purpose was to measure the correlation between cognitive and social development, especially vocabulary, and age. Specifically, the PPVT-5 uses pictures and minimal instruction to measure the vocabulary range of children (Dunn, 2019). The PPVT-5 booklet has a corresponding answer sheet, which provides the number for the correct picture answer for each exercise and a score section. The score section is numbered with 0 and 1. A score of 0 indicates the child did not choose the correct answer, while a score of 1 indicates that the correct answer was chosen. It should be noted that a correct answer was defined as a time where the child pointed to the correct picture within 10 seconds and on their first try (Dunn, 2019). An answer was labelled as incorrect when the child hesitated, first chose an incorrect picture, or took longer than 10 seconds to indicate their response.

Children were presented with four pictures to choose from when instructed to point to a verb or noun (Mulhern et al., 2017). Each child was tested independently and with two members of the research team, one to record the data and another to instruct the student. This was a modification from the original instructions, as Dunn (2019) intended the PPVT-5 to be administered one-on-one. Verbal cues were given in the form of "Point to the [noun or verb]." Children then chose the picture that best fit the instruction given (Mulhern et al., 2017). Researchers made eye contact with the children and gave positive reinforcement to encourage them to continue attempting each exercise, regardless if they knew the correct answer. If a child attempted to engage in conversation, the response was considered to be incorrect, consequently scored as 0 (Dunn, 2018).

Holding a conversation, crawling under the table, or distracting from the test, is an attempt by the child to look to researchers for clues when they find the task to be too difficult.

The PPVT-5 has section headings indicating expectations of what age group will respond correctly, ranging from 2 years and 6 months to late adulthood (Mulhern et al., 2017). The first page of the PPVT-5 booklet is used for two practice questions allowing the student to understand the kinds of questions the test will ask and how to correctly respond (U.S. Bureau of Labor Statistics, 2015). The accuracy of these responses was recorded but not included in any further calculations or scoring practices. Researchers began with the first card in the PPVT-5, and testing was completed when the participant incorrectly answered six consecutive times (Dunn, 2019). When calculating the raw score of the child, the incorrect answers were subtracted from the question number the child reached (U.S. Bureau of Labor Statistics, 2015). This value indicated the age predictor for vocabulary and hearing comprehension when matched up with the question number on the answer sheet.

III. Results and Discussion

An adaptation of Bandura's Social Learning Theory (1971) suggests that early literacy is a relatively unitary construct with reciprocal determinism among its components. In the present study, the components of SEL as measured by the SBC correlated well with vocabulary (PPVT-5) and phonological awareness (CTOPP). Bivariate correlation results show that self-regulation as measured by the PSRA is reliably predicted by age and the SBC (see Table 2). In fact, cognitive and social development by all measures are predicted by age, especially vocabulary. Older children are more likely to be less disruptive in class, have better self-regulation strategies, have more phonological awareness, and higher receptive vocabulary than younger children. That age is so powerful is dramatic because the sample is small, and the children only vary in age by months.

A Confirmatory Factor Analysis (CFA) confirmed that the five measures form one factor called Cognitive and Social Development at 4. Fifty-two percent of the variance in children's scores are accounted for by knowing age, PSRA, SBC, CTOPP, and PPVT-5. Only the one component has an Eigen value greater than 1.

Factor analysis reduces the data down to the smallest number of predicting factors. Although these five measures do not correlate perfectly with each other, factor analysis shows that they stay together statistically; by taking the sum, one could use them to predict how well an individual child will do in the future. The sample is small and the variance explained is only half of the total possible, but the data do give a clear picture of the importance of social learning, which is hard to measure, with known early predictors of kindergarten readiness like phonological awareness and picture vocabulary. Future studies should expand the idea of the importance of SEL to knowing what to expect of any 4-year old child. The present results suggest that a core SEL competency program should be provided for children even younger than kindergarten age, as it contributes to overall academic success.

References

Bandura, A. (1971). Social learning theory. *General Learning Press.*

Brooks, P.J., & Kempe, V. (2014). Encylopedia of language development. *Sage Publications.* http://dx.doi.org/10.4135/9781483346441

CASEL. (2019). Core SEL competencies. https://casel.org/core-competencies/

Dickens, R. H., Meisinger, E. B., & Tarar, J. M. (2015). Comprehensive test of phonological processing-2nd ed. (CTOPP-2). *Canadian Journal of School Psychology, 30*(2), 155-162. doi: 10.1177/0829573514563280

Dunn, D. M. (2019). PPVT-5, Peabody Picture Vocabulary Test. *Pearson.* https://www.pearsonassessments.com/content/dam/school/global/clinical/us/assets/ppvt-5/ppvt-5-sample-score-summary-report.pdf

Gresham, F.M., & Elliot, S.N. (2017). SSIS-SEL teacher edition rating form. https://www.pearsonassessments.com/content/dam/school/global/clinical/us/assets/ssis-sel/ssis-sel-edition-teacher-score-summary-report-sample.pdf

Lin, B., Liew, J., & Perez, M. (2019). Measurement of self-regulation in early childhood: Relations between laboratory and performance-based measures of effortful control and executive functioning, *Early Childhood Research Quarterly*, *47*, 1-8, https://doi.org/10.1016/j.ecresq.2018.10.004

Mensah, F. (2011). Investigating whether children's transition from pre-operational stage to concrete operational stage can be accelerated using an intervention strategy. *Ife Psychologia, 19*(2), 462-482.

Mulhern, T., Stewart, I., & Elwee, J. M. (2017). Investigating relational framing of categorization in young children. *The Psychological Record, 67*(4), 519-536.
https://doi.org/10.1007/s40732-017-0255-y

Ransdell, S., & Borror, J. (2019). Helping teachers decide. An early behavior checklist predicts Peabody Picture Vocabulary test scores over and above age or classroom. *International Journal of Education and Social Science, 6*(6), 11-14. http://www.ijessnet.com/uploades/volumes/1575190313.pdf

Reyes, M. R., Brackett, M. A., Rivers, S. E., Elbertson, N. A., & Salovey, P. (2012). The interaction effects of program training, dosage, and implementation quality on targeted student outcomes for the RULER approach to social and emotional learning. *School Psychology Review*, *41*(1), 82-99. http://ei.yale.edu/wp-content/uploads/2013/08/pub318_Reyesetal2012_SPR.pdf

Sapra, R. (2019). Social and emotional skills as scaffold for mental well-being of children and adolescents: A construct. *Indian Journal of Health and Well-being, 10*(10-12), 334-336.

Smith-Donald, R., Raver, C. C., Hayes, T., & Richardson, B. (2007). Preliminary construct and concurrent validity of the Preschool Self-regulation Assessment (PSRA) for field-based research. *Early Childhood Research Quarterly*, *22*(2), 173-187. https://doi.org/10.1016/j.ecresq.2007.01.002

Taylor, J.J., Buckley, K., Hamilton, L.S., Stecher, B.M., Read, L. & Shweig, J. (2018). Choosing and Using SEL Competency Assessments: What Schools and Districts Need to Know.
https://measuringsel.casel.org/pdf/Choosing-and-Using-SEL-Competency-Assessments_What-Schools-and-Districts-Need-to-Know.pdf

Tominey, S.L., O'Bryon, E.C., Rivers, S.E., & Shapses, S. (2017). Teaching Emotional Intelligence in Early Childhood. *National Association for the Education of Young Children, 72*(1), 1-12.

Ulutas, J. & Omeroglu, E. (2007). The Effects of an Emotional Intelligence Education

Program on the Emotional Intelligence of Children. *Social Behavior and Personality, 35*(10), 1365-1372. https://doi.org/10.2224/sbp.2007.35.10.1365

U.S. Bureau of Labor Statistics. (2015). *Peabody Picture Vocabulary Test - Revised (PPVT-R)*. https://www.nlsinfo.org/content/cohorts/nlsy79-children/topical-guide/assessments/peabody-picture-vocabulary-test-revised

Table 1: Descriptive Statistics

	N	Mean	Std. Deviation
Age in years and months	24	4.1083	.34631
Social Behavior Checklist (positive number is more disruptive)	22	10.7273	16.75647
Preschool self-regulation assessment	22	58.6818	63.55529
Phonoaware subtest elision	22	.6136	1.01103
PPVT-5 Receptive vocabulary	22	60.9545	21.28151
Valid N (listwise)	22		

Table 2: Bivariate correlations among Age, SBC, PSRA, CTOPP, and PPVT-5 in 4-year old class

		Age in years and months	Social Behavior Checklist	PSRA Self-regulation	Phonoaware subtest elision	Receptive vocabulary
Age in years and months From start date of study	Pearson Correlation	1	-.381	.478*	.436*	.644**
	Sig. (2-tailed)		.088	.028	.048	.002
	N	23	21	21	21	21
Social Behavior Checklist positive number is more disruptive	Pearson Correlation	-.381	1	-.540**	-.330	-.347
	Sig. (2-tailed)	.088		.009	.134	.113
	N	21	22	22	22	22
PSRA Preschool self-regulation assessment	Pearson Correlation	.478*	-.540**	1	.264	.311
	Sig. (2-tailed)	.028	.009		.234	.159
	N	21	22	22	22	22
Phonoaware subtest elision from CTOPP	Pearson Correlation	.436*	-.330	.264	1	.393
	Sig. (2-tailed)	.048	.134	.234		.070
	N	21	22	22	22	22
Receptive vocabulary From PPVT5	Pearson Correlation	.644**	-.347	.311	.393	1
	Sig. (2-tailed)	.002	.113	.159	.070	
	N	21	22	22	22	22

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Appendix A: Social Behavior Checklist (SBC)

OBSERVER:_____   OBSERVATION DATE(S):_____

INSTRUCTIONS: Observer says to the students: *Hello class, My name is _____ and I'm going to observe your class activities today and write down some things I see. Is that ok?*
Mark each instance of a student (with subject number only) who exhibits one of these behaviors in a large group setting (N=20) during library reading/circle time.

SOCIAL BEHAVIORS	TUESDAY	THURSDAY	NOTES
Pays attention to the story or lesson			
Follows classroom rules/completes tasks			
Makes eye contact when talking			
Speaks in appropriate tone of voice			
Says please and/or thank you			
Respects property of others			
Comforts others			
Asks for help from adults when necessary			
Says nice things about self without bragging			
Says bad things about self			
Easily distracted			
Plays with lanyard			
Crowds others' personal space			
Does not follow directions / Disobeys			
Talks out of turn			
Pouts			
Cries			
Hits			
Tattles			
Has temper tantrums			
Offends others (verbally)			
Takes or destroys property of others			
Acts anxious or depressed			
Teases			
Stays calm when teased			