The Psychological Processing Checklist: relationship to the Cognitive Assessment System

Shelly L. Lucas
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THE PSYCHOLOGICAL PROCESSING CHECKLIST:
RELATIONSHIP TO THE COGNITIVE
ASSESSMENT SYSTEM

by
Shelly L. Lucas

A Thesis
Submitted in partial fulfillment of the requirements of the
Master of Arts Degree
of
The Graduate School
at
Rowan University
May 1, 2001

Approved by ____________________________
Professor

Date Approved 5/4/01
Abstract

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The Psychological Processing Checklist:
Relationship to the Cognitive Assessment System
2001
Dr. Klanderman and Dr. Dihoff
School Psychology

The purpose of this research was to test the validity of the Psychological Processing Checklist (PPC) against the Cognitive Assessment System (CAS). The participants of this study consisted of 30 first grade students, 11 girls and 19 boys whose ages ranged from 6 years 6 months to 7 years 11 months and their teachers from Monroe Township, New Jersey. Each child was evaluated with the Psychological Processing Checklist by their teacher and the Cognitive Assessment System by the researcher. The full scale raw scores, the full scale percentile ranks and the subscales of the two tests were then compared using the Pearson r. The results of the analysis of data showed significant negative relationships between the full scale raw scores, the full scale percentile ranks and the subscale raw scores of the Cognitive Assessment System and the Psychological Processing Checklist with one exception, the attention subscale raw scores, indicating that the Psychological Processing Checklist is a valid test of psychological (cognitive) processing.
The current research tests the validity of the Psychological Processing Checklist (PPC) against the Cognitive Assessment System (CAS). The results of the Pearson $r$ indicated significant and negative relationships between the full scale raw scores, full scale percentile ranks and the subscales of the two tests, with the exception of attention subscales of the PPC and the CAS.
Acknowledgements

First, I would like to thank Dr. Mark Swerdlik from Illinois State University for creating the Psychological Processing Checklist (PPC) and giving me the opportunity to work on the validation of the PPC.

Second, I would like to thank my family and friends for their continued support and understanding throughout this project. Without their patience and encouragement I do not think that I would have been able to complete my thesis.

Third, I would like to thank Dr. Frank Epifanio of the Monroe Township School District in Williamstown, New Jersey for his help in obtaining the approval to conduct my research in the Monroe District. Without his help I would not have been able to conduct my research at all.

Fourth, I would like to thank all the teachers and students of Oak Knoll School in Williamstown, New Jersey for participating in my study. Again without their help I would not have been able to complete my study.

And finally, I would like to thank my advisors Dr. John Klanderman and Dr. Roberta Dihoff of Rowan University. Without Dr. Klanderman’s help I would have never learned about Dr. Swerdlik’s work and I would have never been introduced to Dr. Epifanio. Also, without Dr. Klanderman’s and Dr. Dihoff’s wonderful instruction and advice I would never have completed my thesis.
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Chapter One

The Problem

Need

A student whose learning disability goes unrecognized is a student who is deprived of an appropriate education. Sometimes a learning disability is hard to recognize; they may be mistaken for immaturity in young children or as delayed development in older children. Learning disabilities can affect a student’s ability to interpret what they hear or see, or their ability to transmit information properly to the correct areas of the brain (NIMH). The confusion felt by a child with an undiagnosed learning disability can not only cause serious difficulties in schooling but will almost certainly undermine the child’s self-esteem and confidence.

Learning disabilities may reveal themselves as distinct complications with written or spoken language, coordination, self-control, or attention (NIMH). They need to be recognized at a young age, so that proper steps can be taken to not only help the child learn, but to also help the child understand and work with their disability. It is possible for a teacher to detect a learning disability in the first year of schooling through day to day observations of a child (Lansdown, 1978). And there have been preschool screening programs for learning disabilities for over thirty years (Hirsch, Jansky & Langford, 1966). However, the predictive validity of these test has been called into question (Kochanek & Hennen, 1988). Therefore there is a constant need to improve the availability of the assessments teachers use to explore if a child has a learning disability.
Purpose

The Psychological Processing Checklist (PPC) is a new learning disability assessment instrument developed by a team of educational professionals at Illinois State University. The PPC was created to assist in the assessment of the cognitive processes necessary to distinguish children with learning disabilities from children that are underachievers or have other disabling conditions (Swerdik, 1999). The purpose of conducting this research is to test the validity of this new teacher assessment instrument for learning disabilities against an established cognitive processing ability test, specifically the Cognitive Assessment System. The Cognitive Assessment System is a validated individually administered cognitive abilities test that is based on A. R. Luria’s Planning, Attention, Simultaneous and Successive (PASS) processes theory.

Hypothesis

The current study is testing the validity of the Psychological Processing Checklist (PPC) against the Cognitive Assessment System (CAS). The hypothesis is that the PPC will be a valid checklist for the assessment of learning disabilities when it is compared to a valid standardized test of cognitive processing such as the Cognitive Assessment System.

Theory

In 1988, the National Joint Committee on Learning Disabilities (NJCLD) revised the definition of a learning disability. A learning disability is currently described as “…a general term that refers to a heterogeneous group of disorders manifested as significant
difficulties in the acquisition and use of listening, speaking, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to a central nervous system disorder, and may occur across the life span.”

Since the accepted definition of a learning disability requires that the disorder be due to a central nervous system disorder and the disorder be intrinsic to the individual, an appropriate theory or model to utilize in exploring a learning disability must include not only a information processing approach, but also a neuropsychological approach and a cognitive psychological approach. The PASS (Planning, Attention, Simultaneous, and Successive) approach of intelligence incorporates all of these approaches.

The PASS theory is based on A. R Luria’s neuropsychological, information processing and cognitive psychological research. Luria described the basic building blocks of intelligence as functional systems. These functional systems are basic cognitive processes that allow for the ability to perform acts that are unique in character. Each of the basic cognitive functions are associated with distinct areas of the brain (Naglieri, 1999).

The first functional unit is Attention. This unit is associated with the brain stem, diencephalon, and medial regions of the hemispheres, which are responsible for controlling the regulation of cortical tone and maintenance of attention. In order for an individual to receive and process information correctly, a proper state of arousal that allows for the focus of attention must be achieved. Too little arousal or too much arousal interferes with proper information coding and planning (Das, Naglieri, Kirby, 1994). Evidence in support of this aspect of the model is found in the behavioral/cognitive profile of children with attentional deficits. It appears that these children have a problem
with the information-processing component of attention, speed of cognitive processing and mental preoccupation. Environmental distracters complicate these functions even more so since children with attentional problems are more vulnerable to environmental distractions then children without attentional deficiencies (Tetter and Sermund-Clikeman, 1997).

Research on tasks that require active processing and focused attention found that children with learning disabilities show a difference in cognitive processing of intensional knowledge of category members. LD children tend to not have a problem in recognizing similarities among category members however, LD children’s intensional knowledge of differences is markedly deficient (Scott, Greenfield & Sterental, 1986).

The second functional unit is simultaneous-successive. This unit is associated with the lateral regions of the neo-cortex, posterior regions of the hemispheres including the occipital (visual), temporal (auditory), and parietal (general sensory) lobes (Das, Kar, Parrila, 1998). To correctly process simultaneous-successive information the preceding regions must be working optimally.

Simultaneous processing involves the integration of separate elements into a single whole or group. An individual must see how separate stimuli are interrelated in a conceptual whole. This involves strong spatial and logical dimensions in both verbal and nonverbal content. When an individual reads a sentence simultaneous processing is involved (Naglieri, 1999). Simultaneous processing deficits may also affect spatial planning, visualization of words, organization and spelling (Tetter & Semrud-Clikeman, 1997).
Successive processing involves the integration of stimuli into a specific sequence where the elements form a chainlike progression. In successive processing stimuli are not interrelated, they are only linearly related (Das, Kar, Parrila, 1998). To perform skilled movements such as, writing (Das, Naglieri, Kirby, 1994) and narrative sequencing (Tetter & Sermund-Clikeman, 1997) successive processing is needed. Without properly functioning successive processing writing may be decreased and/or illegible and an individual may have an awkward pen/pencil grip (Tetter & Sermund-Clikeman, 1997).

The third functional unit is planning. This unit is associated with the prefrontal areas of the frontal lobes of the brain. Planning is involved in any activities where there is intentionality and a need to solve any type of problem. Self-monitoring and impulse control are also involved in this process (Naglieri, 1999). A lack of functioning in this process may result in children having trouble writing a narrative text (Nodine, Barenbaum, & Newcomber, 1985) or expository prose (Thomas, Englert & Gregg, 1987) and may also result in a child having trouble finding a topic to write about (MacArthur & Graham, 1987).

All of these functional units are interrelated. The third functional unit depends on both the first and second functional units. The first functional unit has to provide a proper attentional status, so that the information can be acquired through the appropriate senses. The second functional unit has to process the stimuli in the accurate manner, either simultaneously or successively. Once these two units have properly completed their functions the third functional unit can create a plan of action, execute it, monitor it for mistakes and modify it as necessary. The third functional unit will also control inappropriate impulses and voluntary actions.
Definitions

PASS: A. R. Luria's theory of cognitive functioning.

Phonemic: One of the elementary units of speech that distinguish one utterance from another.

Extensional Knowledge: Refers to the exemplars that considered appropriate members of category.

Intensional knowledge: Refers to the properties that define category membership.

Simultaneous: a mental process by which the individual integrates separate stimuli into a single whole or group.

Successive: a mental process by which the individual integrates stimuli into a specific serial order that forms a chain-like progression.

Assumptions

There are several assumptions being made in this research study. The first assumption is that the Cognitive Assessment System is a valid assessment of learning disabilities. The second assumption is that the teachers that complete the Psychological Processing Checklist will be able to complete this checklist in an objective manner. The final assumption is that all participants in this study will be treated exactly the same by the researcher when they are being assessed with the Cognitive Assessment System.
Limitations:

This study is limited to thirty 1st grade students from the same socioeconomic class in Monroe Township Elementary School in Williamstown, NJ. Due to the small sample and the limited testing area the findings can only be applied to children in this age range and socioeconomic class and cannot be applied to children of other ages and other socioeconomic classes. This study is also limited by the assumptions that the teachers will be able to assess the students objectively and that the students will be treated the same by the researcher during the assessment.
Chapter Two
Review of Literature

Overview

In chapter 2, literature relevant to this research study will be examined, as well as recent research findings. In chapter 3, the design of the study will be explained. Included will be a description of the sample, the assessments that will be used and the type of research design. In chapter 4, the results will be presented, as will an interpretation of these results and their significance. Finally, in Chapter 5, there will be a discussion of the relevance of the findings and implications for future research.

Review of Literature

In the following chapter, research will be reviewed relevant to this study. In the first section, research will be reviewed about the need for early intervention. In the second section, research will be reviewed concerning the judgments of teachers and their ability to detect children with learning problems. In the third section, research will be reviewed concerning the need to move towards a cognitive functioning assessment of intelligence. Finally, in the fourth section research will be reviewed relevant to Luria’s Planning, Attention, Simultaneous and Successive (PASS) theory and the Cognitive Assessment System (CAS).

Early Intervention

Many researchers have found that the early detection of learning disabilities
greatly improves the academic achievements of students. In 1972, Strag conducted
survey which revealed that when children with dyslexia are diagnosed in first or second
grade, approximately 82 percent of those children were remediated, while only 46 percent
of the children diagnosed in the third grade were helped and only 10 percent of children
diagnosed in grades five through seven were brought up to normal classroom
expectations. His findings suggest that the longer a learning disability goes undetected,
the less likely it is that the child will be helped.

In a 5-year follow up study of 43 children in elementary and junior high school
with reading disabilities Muehl and Forell (1973) found that children who received early
intervention for their reading disability were later found to have having stronger reading
skills in high school, regardless of the type of clinical instruction. The findings of both of
these studies support Fletcher & Foorman's (1994) conclusion that the most effective
means for reducing the incidence of learning disabilities may be early detection with
appropriate early intervention. The findings also support the contention that learning
disabilities do not disappear, they persist and are associated with behavior problems and
risk for dropping out of school (Tramontana, Hooper, & Selzer, 1988).

Judgement of Teachers

It has long been the goal of many educational researchers to find a way to detect
learning disabilities that is easy to use, accurate and cost efficient. Since the goal of
screening students for learning disabilities is to identify students eligible for further in-
depth diagnostic testing who may be candidates for preventive or remedial intervention
programs (Carran & Scott, 1992), it makes sense that “the classroom teacher is naturally
the key person in the detection of pupil behavior” and that “the child with learning
problems is usually first identifiable in the classroom (Novack, Bonaventura, & Merenda, 1973)."

Several studies have found that the utility of the judgement of the classroom teacher is accurate (Novack, Bonaventura, & Merenda, 1973). A study of 48 kindergarten classes was conducted by Haring and Ridgeway (1967). It was found that when teachers' observations were compared with test profiles, that teachers' individual analysis of children's behavior may be more effective than group testing in identification of possible learning disorders.

In a follow up study (Taylor, Anselmo, Foreman, Schatschneider, & Angelopoulos, 2000) of students with learning disabilities it was found that when children who were first identified by their kindergarten teachers as having learning difficulties were group tested one year later, that there persisted to be a difference in achievement scores between the identified learning difficult group and the nonidentified group. Furthermore, in a follow-up of these students two years later, it was found that a greater number of identified students were receiving special learning assistance by the third grade when compared to students that were in the nonidentified group.

Cognitive Functioning Model of Intelligence

Many researchers have expressed the need move towards a cognitive functioning based assessment for learning disabilities. It has been suggested that current IQ testing instruments such as, the Binet Intelligence Test and the Wechsler Intelligence Scale for Children (WISC-R) "reflect static general ability" and "if intelligence is a static unitary concept, successful remediation might be severely limited" (Das & Abbott, 1995). Das
and Abbott (1995) also propose that a cognitive functioning test would better assess “intelligence” or cognitive ability. They recommend that when an assessment technician is able to identify a weakness in processing capacity, the student should be assigned to a program of remediation congruent with the problem area.

Nagleri, Das & Jarman (1990) agree with this position and add that the current instruments used for assessment of learning disabilities are irrelevant to the diagnosis of learning disabilities because

The major emphasis in the development of intelligence tests has been on achieving a high degree of criterion related validity and as both a consequence of and a cause of the relatively reduced emphasis on discriminant validity, intelligence tests have tended to employ too narrow a concept of intelligence, or what we prefer to call cognitive functioning (Naglieri, Das & Jarman, 1990 p. 423).

In a study on cognitive processes, Greenfield and Scott (1985) tested preschool children using the Peabody Picture Vocabulary Test (PPVT). The results showed that only knowledge of differences was related with the child’s current level of intellectual functioning. The researchers determined that similarities of category members are taught, while differences of category members are not. Which suggests that intensional knowledge of how category members are different is an active cognitive process. In a later study of intensional knowledge, Scott, Greenfield, and Sterental (1986), found that children with learning disabilities were able to determine similarities in category members but, they were unable to determine differences among category members which may suggest that they lack the active processing that may not have been recognized in a
standard IQ test. This study also lends support for the need to move towards a cognitive functioning model of assessment.

PASS and CAS

As stated in the theory section, Luria’s Planning, Attention, and Simultaneous and Successive theory is based upon four functional units and their interactions. The Cognitive Assessment System is an individually administered, cognitive abilities tested that is based on the PASS theory of cognitive functioning.

Numerous studies have been done on the four functional units of the Planning, Attention, Simultaneous and Successive model of cognitive functioning. More studies have been done on the simultaneous and successive functions, then the planning and attentional functions. However, since all of the functional units interact, it is difficult to separate literature. The researcher will first review literature relevant to the planning and attentional units and then review literature examining the simultaneous and successive functions.

It has been found that task used to measure the third functional unit, planning, are task that are as easy as trail making, which is connecting numbers on a page, to more complicated tasks such as writing a story or playing a strategic game such as Chess. Das & Heemsbergen, (1983) investigated the relationship between visual search and a strategy game and found that those who did well on the visual search, a task used to test planning, also did well in the strategy game. Indicating that whether a person is playing a game such as tic-tac-toe or writing a research paper, planning appears to be involved in just about every cognitive function.
In a study conducted by Reardon & Nagleri (1989) it was found that the functional units of planning, attention, and successive processing of students ranging in age from 7 to 22 with attention deficit/hyperactivity disorder were deficient when compared with students in the same age range without attention deficit/hyperactivity disorder. Suggesting that children with attention deficit/ hyperactivity disorder do not just have attentional problems. Nagleri also reports that in a study of delinquent children (Hurt & Nagleri, 1992) it was found that there is a deficiency with their attentional processes but their planning, simultaneous and successive functions were average.

In a study of the operationalization of PASS, Nagleri and Das (1987), administered both a cognitive processing and an academic achievement test to 434 students in 2nd, 6th and 10th grades. They found that planning, simultaneous and successive functioning were related to academic achievement in all 3 grades. Planning and simultaneous processes were more correlated with mathematics at younger ages, than were successive process. Simultaneous and successive processes correlated with reading in the younger ages and also with reading in the older ages. However, in the older ages planning was also related to reading. Part of this study supports the findings of Das and Heemsbergen (1983) that also found that planning is related to mathematical computation and written composition. All these studies suggest that planning and attention are important cognitive functions that need to be working properly in order for the individual to perform various academic and leisure activities.

While some studies have focused on planning and attention other studies have focused on simultaneous and successive functions. In a study of reading disabled children (Brailsford, Snart & Das, 1984) it was found that training reading disabled
children in successive and simultaneous strategies greatly improves reading and coding of successive and simultaneous information when compared to a group of individuals who received remedial reading training. In another study of successive and simultaneous process it was found that students who were better at reading relied more on simultaneous processing (Das, Manos, & Kanunga, 1975).

Kirby and Das (1977) found that high scores in both simultaneous and successive processing were required for high achievement in reading and if the student scored low in either of the processes than achievement would be less. Hunt and Randhawa (1983) obtained similar results when studying the effect of simultaneous and successive processing factors and mathematical abilities however, they also factored in sustained attention. Regardless of the measure of sustained attention those who scored high in both simultaneous and successive processing or low in both successive and simultaneous processing scored respectively high or low in mathematical achievement. However, when Hunt and Randhawa (1983) used reading and spelling as the dependent variable and factored in sustained attention along with simultaneous and successive processing the results revealed that scoring on simultaneous or sustained factors had an impact on achievement in reading and spelling. As before if the student scored high in both simultaneous and successive processes and this was paired with high sustained attention the student would score high in either reading or spelling. But, if the student scored low in either of the two processing categories then the determining factor in a high or low score in reading or spelling would be a high or low score in sustained attention.

Simultaneous processing was also found to be an important factor in processing incidental information (Hunt, 1980). Cummins and Das (1978) studied simultaneous and
successive processes and their relationship to ambiguous sentences. The researchers used Kessler’s Ambiguities test. Their study revealed that when children hear an ambiguous sentence, simultaneous processes relate to lexical ambiguities and successive processes relate to surface and underlying structure ambiguities. Cummins and Das (1978) also found that when given the Piagetian Class Inclusion test, which is a test of subordinate and superordinate categories, the children’s performance depended on simultaneous and successive processes.

Summary

The previous section has reviewed the need for early detection and intervention. It was found that the earlier a learning disability is detected, the better the chance for remediation for the child. This section also reviewed the judgments of teachers in detecting learning disabilities. The findings of these studies suggest that the best person to first detect a learning disability is the teacher and the judgments of teachers tend to be accurate. Literature relevant to the need to move towards a cognitive functioning assessment as opposed to an intelligence test for assessment of learning disabilities was also reviewed. These studies provide evidence that a cognitive function assessment does assess functions that are unable to be assessed in standard intelligence tests. Lastly, support for the functional units of the Planning, Attention, Simultaneous and Successive (PASS) model of cognitive functioning that the Cognitive Assessment System (CAS) is based upon was reviewed. The literature reveals that the PASS theory is operational and that the functions in the CAS can be tested and are valid.

The Psychological Processing Checklist (PPC) is a checklist that is to be used in
grades K – 5, by the teacher, to evaluate the cognitive functioning of the students. The results of the PPC will be compared to the Cognitive Assessment System (CAS), which is an assessment of cognitive functioning based on the Planning, Attention, Simultaneous, and Successive theory of intelligence. Therefore, since the PPC is to be utilized in grades K – 5, it is relevant to review literature that expresses the need for early detection. It is also relevant to review literature that recognizes the abilities of the teacher to assist in assessing children’s cognitive functions because the PPC is a teacher’s checklist. Furthermore, a large proportion of the questions on the PPC are relevant to the PASS theory and are assessed by the Cognitive Assessment System.
Participants

The participants of this study consisted of teachers and students in the Monroe Township School district in southern New Jersey. The participants were thirty 1st grade students (11 girls and 19 boys) from 4 different classes. The ages of the student participants ranged from 6 years 6 months to 7 years 11 months. The socioeconomic status for this area ranges from low SES to middle SES. Of the students 18 were Caucasian and 12 were African-American. All participants being evaluated were on a volunteer basis however, the parents of the participants were offered a “Learning Styles Workshop” following the conclusion of this study.

The teacher participants were four 1st grade teachers of the students being evaluated. The teachers received a $50.00 gift certificate to a local school supply store for participating in this study.

Measures

The present study is testing the concurrent validity of a new teacher checklist for the assessment of learning disabilities. Specifically, the Psychological Processing checklist is being compared to the Cognitive Assessment System (CAS).

The Psychological Processing Checklist (PPC) was developed by Mark Swerdlik,
Ph.D., Peggy Swerdlik, Ph.D. and Jef Kahn, Ph.D. at the University of Illinois. At the present time the literature available on the Psychological Processing Checklist is limited. However, internal consistency reliability was reported as being significantly high, the coefficient alpha was reported at .98 and the split-half reliability (odd-even split) was reported at .99 (Swerdlik, 2000).

In another study conducted by Kahn, Swerdlik, & Swerdlik (2000) the criterion-related validity of the PPC was measured against the Iowa Test of Basic Skills (ITBS) and the Cognitive Abilities Test (CogAT). The results of this study indicated that there were strong negative correlations between the PPC and both the ITBS and the CogAT. The correlations reported for the ITBS and PPC were reading, -.48 (p < .001); language, -.46 (p < .01); and mathematics, -.51 (p < .001). The correlations reported for the CogAT and the PPC were verbal, -.55 (p < .01) and composite (general cognitive ability), (p < .05).

The Cognitive assessment System was developed by Nagleri & Das (1997). Several studies have been conducted to test the reliability and validity of the Cognitive Assessment System. Noted here are two studies one of which examines validity and the other examines reliability. For a review of research on CAS please see the “Cognitive assessment System Interpretive Handbook” (Nagleri & Das, 1997). Nagleri and Das (1997, p. 46.) studied the test-retest reliability and stability across age groups over time. Their findings indicated that the “CAS demonstrates good stability across age groups overtime.” They also examined the validity of CAS. Their findings indicated that the correlations (ranging from .66 to .73) between the CAS Full Scale and the Woodcock Johnson-revised (WJ-R) Test of Achievement were significant and they concluded that
CAS is a valid predictor of achievement.

Procedure

The PPC assess fundamental psychological processes including attention, social perception, organization, visual motor skills, visual processing and auditory processing. The 35 item checklist scores range from 0 – 105. The higher a child scores on the checklist the better the probability that there is some type of deficiency in one or more of the processing areas listed above.

Letters of informed consent were sent home to the parents of the students of each of the four 1st grade classrooms. After consent was received and the students were assigned identification numbers, the PPC was distributed to four teachers. The teachers were instructed to complete the demographics on the first page and then to rate the child on the items of the checklist on the second page. Each of the items on the checklist were rated from 0 to 3 (0 = never; Does not engage in the behavior; 1 = Seldom; Exhibits behavior one to several times per month; 2 = Sometimes; Exhibits behavior one to several times per week; 3 = Often; Exhibits behavior one to several times per day).

Each child was then individually assessed by this researcher with the Cognitive Assessment System. For the purposes of this research only 8 of the 12 subtests were administered. These subtests were the matching numbers, planned codes, nonverbal matrices, verbal-spatial relations, expressive attention, number detection, word series and sentence repetition.
Testable Hypothesis

Null hypothesis #1: There is no relationship between the Cognitive Assessment System (CAS) full scale raw scores and the Psychological Processing Checklist (PPC) full scale raw scores.

Alternative Hypothesis #1: There is a relationship between the Cognitive Assessment System (CAS) full scale raw scores and the Psychological Processing Checklist (PPC) full scale raw scores.

Null Hypothesis #2: There is no relationship between the Cognitive Assessment System (CAS) full scale percentile rank and the Psychological Processing Checklist (PPC) full scale percentile rank.

Alternative Hypothesis #2: There is a relationship between the Cognitive Assessment System (CAS) full scale percentile rank and the Psychological Processing Checklist (PPC) full scale percentile rank.

Null Hypothesis #3: There is no relationship between the Cognitive Assessment System (CAS) Successive Subscale raw score and the Psychological Processing Checklist (PPC) Audio Processing Subscale raw score.

Alternative Hypothesis #3: There is a relationship between the Cognitive Assessment System (CAS) Successive Subscale raw score and the Psychological Processing Checklist (PPC) Audio Processing Subscale raw score.

Null Hypothesis #4: There is no relationship between the Cognitive Assessment
System (CAS) Simultaneous Subscale raw score and the Psychological Processing Checklist (PPC) Visual Processing Subscale raw score.

Alternative Hypothesis #4: There is a relationship between the Cognitive Assessment System (CAS) Simultaneous Subscale raw score and the Psychological Processing Checklist (PPC) Visual Processing Subscale raw score.

Null Hypothesis #5: There is no relationship between the Cognitive Assessment System (CAS) Planning Subscale raw score and the Psychological Processing Checklist (PPC) Organization Subscale raw score.

Alternative Hypothesis #5: There is a relationship between the Cognitive Assessment System (CAS) Planning Subscale raw score and the Psychological Processing Checklist (PPC) Organization Subscale raw score.

Null Hypothesis #6: There is no relationship between the Cognitive Assessment System (CAS) Planning Subscale raw score and the Psychological Processing Checklist (PPC) Attention Subscale raw score.

Alternative Hypothesis #6: There is a relationship between the Cognitive Assessment System (CAS) Planning Subscale raw score and the Psychological Processing Checklist (PPC) Attention Subscale raw score.

Null Hypothesis #7: There is no relationship between the Cognitive Assessment System (CAS) Attention Subscale raw score and the Psychological Processing Checklist (PPC) Attention Subscale raw score.
Alternative Hypothesis #7: There is a relationship between the Cognitive Assessment System (CAS) Attention Subscale raw score and the Psychological Processing Checklist (PPC) Attention Subscale raw score.

Analysis

The data was collected from both the PPC and the CAS. Each PPC received a total raw score and a percentile rank. Additionally, items that measured the different psychological processing abilities were grouped and each received a raw score. Each CAS also received both a total score and a percentile rank and each subsection received a raw score. This was done so that both the total scores and the processing areas for both the PPC and CAS could be compared. The results were then correlated using the Pearson $r$.

Summary

The present study's participants consisted of thirty 1st grade students and their teachers. The instrumentation compared in this study was the Psychological Processing Checklist and the Cognitive Assessment System. There has been minimal research done on the validity and reliability of the PPC however, the research that has been done has shown the PPC to be a promising instrument in the detection of learning disabilities. Studies testing the validity and reliability of the CAS have suggested that the CAS is a useful instrument for assessing cognitive functioning. The researcher hypothesized that this study will show that there is a significant relationship between the scores on the PPC and the CAS.
Chapter Four

Analysis of Results

Null Hypothesis #1

There is no relationship between the Cognitive Assessment System (CAS) full scale raw scores and the Psychological Processing Checklist (PPC) full scale raw scores.

The results of the Pearson r correlation showed that there is a relationship between the CAS full scale raw scores and the PPC full scale raw scores. Therefore, the null hypothesis has been rejected. See Table 4.1 and Graph 4.1.

Table 4.1:

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<tr>
<th></th>
<th>CAS Full Scale Raw Score</th>
<th>PPC Full Scale Raw Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS Full Scale Raw Score Pearson Correlation</td>
<td>1.000</td>
<td>-.413*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.023</td>
<td>.023</td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>PPC Full Scale Raw Score Pearson Correlation</td>
<td>-.413*</td>
<td>1.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.023</td>
<td>.</td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).
Graph 4.1:
Scatterplot Graph of the Relationship Between the Cognitive Assessment System Full Scale Raw Score and the Psychological Processing Checklist Full Scale Raw Score

Null Hypothesis #2
There is no relationship between the Cognitive Assessment System (CAS) full scale percentile rank and the Psychological Processing Checklist (PPC) full scale percentile rank.

The results of the Pearson r correlation showed that there is a relationship between the CAS full scale percentile rank and the PPC full scale percentile rank. Therefore, again the null hypothesis has been rejected. See Table 4.2 and Graph 4.2.

Table 4.2:
Relationship Between the Cognitive Assessment Full Scale Percentile Rank and the Psychological Processing Checklist Full Scale Percentile Rank

<table>
<thead>
<tr>
<th></th>
<th>CAS Full Scale Percentile Rank</th>
<th>PPC Full Scale Percentile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS Full Scale Percentile Rank Pearson Correlation</td>
<td>1.000</td>
<td>-.395*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
<td>.031</td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>PPC Full Scale Percentile Rank Pearson Correlation</td>
<td>-.395*</td>
<td>1.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.031</td>
<td>.</td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

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

Graph 4.2:
Scatterplot Graph of the Relationship Between the Cognitive Assessment System Full Scale Raw Score and the Psychological Processing Checklist Full Scale Raw Score
Null Hypothesis #3

There is no relationship between the Cognitive Assessment System (CAS) Successive Subscale raw score and the Psychological Processing Checklist (PPC) Audio Processing Subscale raw score.

The results of the Pearson r correlation showed that there is a relationship between the CAS Successive Subscale raw score and the PPC Audio Processing Subscale raw score. The null hypothesis has been rejected. See Table 4.3.

Table 4.3:

Relationship Between the Cognitive Assessment System Successive Subscale Raw Score and the Psychological Processing Checklist Audio Processing Subscale Raw Score.

<table>
<thead>
<tr>
<th></th>
<th>CAS Successive Subscale Raw Score</th>
<th>PPC Audio Processing Raw Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAS Successive Subscale Raw Score</strong></td>
<td>1.000</td>
<td>-.380*</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td>.038</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.038</td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td><strong>PPC Audio Processing Subscale Raw Score</strong></td>
<td>-.380*</td>
<td>1.000</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td>.038</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.038</td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).
Null Hypothesis #4

There is no relationship between the Cognitive Assessment System (CAS) Simultaneous Subscale raw score and the Psychological Processing Checklist (PPC) Visual Processing Subscale raw score.

The results of the Pearson r correlation showed that there is a relationship between the CAS Successive Subscale raw score and the PPC Visual Processing Subscale raw score. Therefore, again the null hypothesis has been rejected. See Table 4.4.

Table 4.4:
Relationship Between the Cognitive Assessment System Simultaneous Subscale Raw Score and the Psychological Processing Checklist Visual Processing Subscale Raw Score.

<table>
<thead>
<tr>
<th>CAS Simultaneous Subscale Raw Score</th>
<th>PPC Visual Processing Subscale Raw Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
</tr>
<tr>
<td>N</td>
<td>30</td>
</tr>
<tr>
<td>PPC Visual Processing Subscale Raw Score.</td>
<td>-.438*</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.016</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>30</td>
</tr>
<tr>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).
Null Hypothesis #5

There is no relationship between the Cognitive Assessment System (CAS) Planning Subscale raw score and the Psychological Processing Checklist (PPC) Organization Processing Subscale raw score.

The results of the Pearson r correlation showed that there is a relationship between the CAS Planning Subscale raw score and the PPC Organization Subscale raw score. As a result, again the null hypothesis has been rejected. See Table 4.5.

Table 4.5:

Relationship Between the Cognitive Assessment System Planning Subscale Raw Score and the Psychological Processing Checklist Organization Subscale Raw Score.

<table>
<thead>
<tr>
<th></th>
<th>CAS Planning Subscale Raw Score</th>
<th>PPC Organization Subscale Raw Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pearson Correlation</strong></td>
<td>1.000</td>
<td>-.484**</td>
</tr>
<tr>
<td><strong>Sig. (2-tailed)</strong></td>
<td>.</td>
<td>.007</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.01 level (2-tailed).
Null Hypothesis #6

There is no relationship between the Cognitive Assessment System (CAS) Planning Subscale raw score and the Psychological Processing Checklist (PPC) Attention Subscale raw score.

The results of the Pearson r correlation showed that there is a relationship between the CAS Planning Subscale raw score and the PPC Attention Subscale raw score. Once again the null hypothesis has been rejected. See Table 4.6.

Table 4.6:

<table>
<thead>
<tr>
<th></th>
<th>CAS Planning Subscale Raw Score</th>
<th>PPC Attention Subscale Raw Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pearson Correlation 1.000</td>
<td>-.511**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .007</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>N 30</td>
<td>30</td>
</tr>
<tr>
<td>PPC Attention Subscale Raw Score</td>
<td>-.511**</td>
<td>1.000</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1.000</td>
<td>.007</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.007</td>
<td>.007</td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.01 level (2-tailed).
Null Hypothesis #7

There is no relationship between the Cognitive Assessment System (CAS) Attention Subscale raw score and the Psychological Processing Checklist (PPC) Attention Subscale raw score.

The results of the Pearson r correlation showed that there is no relationship between the CAS Attention Subscale raw score and the PPC Attention Subscale raw score. Therefore, the null hypothesis has been accepted. See Table 4.7.

Table 4.7:
Relationship Between the Cognitive Assessment System Attention Subscale Raw Score and the Psychological Processing Checklist Attention Subscale Raw Score.

<table>
<thead>
<tr>
<th></th>
<th>CAS Attention Subscale Raw Score</th>
<th>PPC Attention Subscale Raw Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAS Attention Subscale Raw Score</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1.000</td>
<td>-.294</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.115</td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td><strong>PPC Attention Subscale Raw Score</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-.294</td>
<td>1.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.115</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

Summary

The results of the analysis of data showed several relationships between the Cognitive Assessment System and the Psychological Processing Checklist. All data were
analyzed using the Pearson r correlation. The full scale raw scores of the two test are negative and significant. The full scale percentile ranks of the two tests are also negative and significant. The subscales of both tests were also analyzed and the results showed that all of the subscales except for the attention subscales were negative and significant.
Chapter Five  
Summary and Conclusions

Summary

The purpose of this research was to test the validity of the Psychological Processing Checklist (PPC) against the Cognitive Assessment System (CAS). The researcher hypothesized that there is a significant relationship between the PPC and the CAS. The participants of this study consisted of 30 first grade students and their teachers. Each child was evaluated with the Psychological Processing Checklist by their teacher and the Cognitive Assessment System by the researcher. The full scale raw scores, the full scale percentile ranks and the subscales of the two tests were then compared using the Pearson r. The results of the analysis of data showed several significant negative relationships between the Cognitive Assessment System and the Psychological Processing Checklist.

Conclusions

The current research found the Psychological Processing Checklist to be a valid test of psychological processing when compared to the Cognitive Assessment System. This suggests that the PPC maybe a promising instrument for the early assessment of possible learning problems.

The results of the analysis of data showed that several relationships exist between the Psychological Processing Checklist and the Cognitive Assessment System. The first two relationships that were analyzed were the relationship between the full scale raw
scores of the PPC and the CAS and the relationship between the full scale percentile ranks of the PPC and the CAS. The results of both of the analysis support the hypotheses that significant relationships exist between the full scale raw scores of the two tests and the full scale percentile ranks of the two tests, respectively. In both cases the two tests correlated negatively meaning, students who were rated as having more psychological processing problems on the PPC scored significantly lower on the Cognitive Assessment System than those students who were rated as having fewer processing problems and when the scores of the students were converted into percentile ranks the same results were obtained.

The next relationships that were analyzed were the relationships between the PPC subscale raw scores and the CAS subscale raw scores. Each subscale of the PPC was matched with the corresponding subscales of the CAS and then compared. Again the results of the analysis supported the hypotheses that significant relationships exist between the subscale scale raw scores of the two tests with the exception of one case. In all cases the tests correlated negatively meaning, students who were rated as having more psychological processing problems in a specific area by the PPC scored significantly lower on the corresponding subscale of the CAS, than those who were rated as having fewer processing problems. The one exception was the attention subscales. In this case the correlations between the PPC attention subscale and the CAS attention subscale were not significant. This might be due to the small sample size.

Discussion

The current research study supports previous research findings that the
Psychological Processing Checklist appears to be a valid test of the assessment of psychological (cognitive) functioning and early assessment of learning disabilities (Kahn, Swerdik, & Swerdik, 2000). Since the PPC is based on psychological (cognitive) functioning, the findings also support previous research for the need to move toward a cognitive functioning model of intelligence as opposed to the current standard model of intelligence.

Also, previous research has found the early detection and intervention of learning disabilities greatly improves the academic achievement of the students (Strag, 1972; Muehl & Forell, 1973). The Psychological Processing Checklist has the potential to be a useful instrument in the early detection and intervention of learning disabilities because it can be administered as early as kindergarten and the way in which the checklist is written provides a basis for specific intervention techniques.

Finally, the Psychological Processing Checklist is based on teacher’s judgments therefore, it is important that previous research not only supports teacher’s judgments of students learning to be accurate (Novack, Bonaventura, & Merenda, 1973), but also follow-up studies support the judgments of teacher’s in identifying children with learn
disabilities (Taylor, et.al., 2000).

Implications for future research

The current research is limited by the assumption that the Cognitive Assessment System is a valid test of cognitive functioning. Future research studies may want to explore the validity of the Psychological Processing Checklist using other various tests of cognitive functioning. Also, the current research is limited to the population that it was
conducted on. Future researchers may want to expand the research to cover different age ranges, races and socio economic classes.
References


predictor of learning disability classification. *Intelligence, 10*, 337-387.


Dear Parent,

Williamstown Elementary schools will be participating in a research study being conducted by Rowan University. Your child may be chosen to participate. If so, your child will be assessed by his or her teacher with a new psychological processing checklist developed by Illinois State University called the Psychological Processing Checklist. Your child will also be assessed with a cognitive abilities test, called the Cognitive Assessment System, by a psychology intern from Rowan University.

These assessments will be used for research purposes only. All participants' identities and the results of the assessments will be kept confidential. Since this study is for research purposes only, the individual results of these assessments will not be revealed to anyone in the school district or otherwise. However, the overall results of the study may be published at a later date.

The psychology intern from Rowan University will be offering a workshop for those parents who are willing to allow their children to participate. The workshop will inform parents about the different learning styles of children and will also include a brief explanation of the research.

If you give your permission and your child is chosen to participate in the study you will be notified. If you have any questions please contact Dr. Frank Epifanio at Oak Knoll School, 856-728-3944.

Please fill out the appropriate statement below and return this form to your child's teacher as soon as possible.

I __________, the parent/guardian of _______________ do not give my permission for my child to be considered to participate in this study.

I __________, the parent/guardian of _______________ do give my permission for my child to be considered to participate in this study. I understand that all information will be kept confidential.

Child's Name __________________________________________

Child's Homeroom #/ Teacher __________________________________

Parent's Signature __________________________________________