2.1 INTRODUCTION

The review of related literature is an important process in the realm of research. “The review of the literature provides the background and context for the research problem. It should establish the need for the research and indicate that the writer is knowledgeable about the area” (Wiersma, 1995). It shares with the reader the results of other studies that are closely related to the study being reported (Fraenkel and Wallen, 1990). It relates a study to the larger ongoing dialogue in the literature about a topic, filling in gaps and extending prior studies (Marshall and Rossman, 1989). Review is helpful to find out the real progress of research in a particular discipline or area of study. Sometimes it may be used as data for research. In the initial stages of the research it helps to establish the theoretical roots of the study at hand, clarify our ideas and develop our methodology, but later on it helps to integrate our findings with existing knowledge i.e. either support or contradict earlier research. So review helps to avoid duplication, helps us to design our own methodology and keeps us abreast with the empirical or theoretical controversies in a particular area. 90% of the research literatures are available in the libraries; the remaining literatures are available in organizations and government offices. At present, the internet which is called a global network and emerging technology is made possible to access the literature or information, sources available in an electronic form called e-resources. Review helps to bring clarity and focus to the research problem, improve the methodology, broaden the knowledge base in the research area, and contextualize the findings.

This chapter contains the review of related studies with regard to studies on cognitive processing and self-perception of disability and achievement, such a review helped the researcher to possess indepth knowledge on the nature of the problem, the methodology to be adopted for the present study and the types of variables the researcher has to deal with. Many studies have been conducted on cognitive processing in foreign context. But in the Indian context fewer studies have been found. The available studies in foreign and Indian context have been presented under studies related to cognitive processing and studies related to cognitive processing and achievement. Further studies on self-perception and achievement of children are described following it.
2.2 STUDIES RELATED TO COGNITIVE PROCESSING

Studies related to Cognitive Processing i.e., Planning, Attention and Simultaneous and Successive processes are reviewed and quoted under this heading.

Decker (1989) in his study ‘Cognitive processing rates among disabled and normal reading young adults: A nine year follow-up study’ examined forty adults who had been diagnosed as reading disabled when they were children and 40 adults from a matched control group of normal readers were tested to assess the diagnostic utility of a newly developed set of tests as well as to ascertain whether or not reading disability persists into early adulthood. The new measures, designed to examine cognitive processing rates in disabled and normal adult readers, included expressive verbal fluency, confrontation naming, and perceptual speed. Evidence for significantly slower cognitive processing rates and persistent problems in reading and spelling was apparent among the young disabled adult readers. Spatial and mathematical ability levels were well within the normal range.

Robins and Hinkley (1989) assessed aspects of the reliability and validity of three measures of social cognitive processing in children that have been developed to investigate the relations of such processes to childhood depression: the Children's Attributional Style Questionnaire (CASQ), the Children's Negative Cognitive Error Questionnaire (CNCEQ), and the Common Beliefs Inventory for Students (CBIS). In an unselected sample of 61 children, aged 8 to 12, the internal consistencies of the total scores on the CNCEQ and the CBIS were good; for the CASQ, it was only moderate. Internal consistencies of all subscale scores were inadequate. Despite this, several subscale and total scores were significantly associated with depressive symptoms, and the measures were generally correlated with each other. Although these data are encouraging concerning the role of social-cognitive processing in childhood depression, the field needs to develop psychometrically stronger measures and to test the role of social cognition in prospective studies of depression.

Naglieri et al. (1989) conducted a study titled ‘An Exploratory study of Planning, Attention, Simultaneous and Successive cognitive processes’, examined factorial validity of tasks designed to measure cognitive processing in each of Luria’s three functional
units. Fourth and fifth graders (N=112) were administered nine experimental tasks chosen or developed according to theoretical components of Planning, Attention, Simultaneous and Successive cognitive processes. Results obtained were in general support for feasibility of measurement of Luria’s cognitive processing model.

Naglieri et al. (1990) in an article published in School Psychology Review discusses current intelligence tests in relation to a theory of cognitive processing that can serve as a model for reconceptualizing cognitive functioning. An analysis is provided of what is measured using the Wechsler Intelligence Scale for Children Revised (WISCR), Kaufman Assessment Battery for Children, McCarthy Scales of Children's Abilities, and the Stanford-Binet Intelligence Scale. The authors reflect on the effectiveness of these tests and suggest that the Planning, Attention, Simultaneous, and Successive model originally conceived by A. R. Luria (1966, 1973, and 1980) should be used as a broad conceptualization and framework for cognitive processing. In presenting this model, as well as a summary of some relevant research, the authors hope to initiate a reexamination of the concept of intelligence or ability as it has been represented in past intelligence tests and encourage professionals to consider this alternative view.

Bardos et al. (1992) in their study examined gender differences on the Das-Naglieri planning, attention, simultaneous and successive processing tasks developed the following. Planning, Attention, Simultaneous and Successive model of cognitive processing. The study had two samples of 434 (Grades 2, 6, and 10) and 110 (combined Grades 4 and 5) children included pupils from several schools in a large Midwestern suburban school district. The results indicated that boys and girls performed similarly on simultaneous, successive, and attention measures but girls outperformed boys on measures of planning processes. These differences were significant for the sixth graders in the first sample and for the combined sample of fourth and fifth graders. These results suggest that a broader definition of intelligence, one that includes measures of planning and attention in addition to simultaneous and successive processes, might provide useful information when cognitive differences and similarities of the genders are examined.

Naglieri et al. (1993) carried out a study on ‘confirmatory Factor Analysis of the Planning, Attention, Simultaneous Successive (PASS) cognitive Processing Model for a
Kindergarten sample’ examined the relationships among experimental tasks developed by Das and Naglieri (1997) to measure Planning, Attention, Simultaneous and Successive (PASS) cognitive processing and other tests that theoretically fit within the model of intelligence. Luria’s theoretical model was examined by Lisrel confirmatory factor analysis to examine the congruence between the variables and the PASS model for kindergarten-aged normal male and females. The results demonstrated that the PASS model is a sound conceptualization of the relationships that underlie the tasks in this study. These results support other confirmatory factorial studies that have found the PASS model to be a viable alternative model of cognitive functioning.

Kirby et al. (1996) made a study on ‘Cognitive Processes and IQ in Reading Disability’. Here four groups of children were compared with respect to their performance on a number of cognitive process measures, selected on the basis of the PASS cognitive processing Model. The groups included two groups of children with reading disabilities, one of the group with average nonverbal IQ and another group with above-average nonverbal IQ, were compared to a chronological age control group and a reading age control group. Results confirmed the hypotheses that (a) the average IQ children with reading disabilities differed from their chronological age control group mainly in the area of successive processing and (b) the average-IQ children with reading disabilities did not differ consistently from their reading age control group on variables theoretically related to reading disability. The status of the third hypothesis, (c) that the high-IQ children with reading disabilities would not differ consistently from the average IQ children with reading disabilities on variables theoretically related to reading disability was less clear. The results point to the critical role of successive processing in reading achievement and to the need for remediation to address successive processing.

Daley et al. (1997) studied ‘PASS Model processes of children with emotional disability’, examined the cognitive styles of 40 children (ages 8-17) with serious emotional disturbances (SED) were investigated via their performance on PASS model tasks as represented by the Das-Naglieri Cognitive Assessment System (CAS). In this study children with SED and 40 typical children were administered the 14 subtests of the CAS standardized edition. The two groups were matched according to age, race, and sex. Findings revealed significant differences between the two groups. In favour of control
group, across the four PASS model scales and 12 of the 14 CAS subtests, this demonstrated that the children with SED have consistent cognitive weakness relative to the control group. Cluster analysis of the performance of children with SED yielded a two profile solution which suggested the presence of a subgroup that was higher functioning and attention disorders, and a lower functioning, more disturbed subgroup. Overall results from the study indicate that the CAS appears to provide alternative to the traditional assessment measure in acquiring a better understanding of the cognitive characteristics of children with SED, the nature of their abilities and disabilities and appropriate strategies for the students’ academic remediation.

Diana and Mervyn (1999) attempted a study to compare the performance of 19 children with nonverbal learning disabilities to a comparison group of 16 children with language learning disabilities on measures of simultaneous and successive/sequential processing on the Kaufman Assessment Battery for Children (K-ABC). As hypothesized, children with nonverbal learning disabilities were found to have significantly higher Successive than Simultaneous Processing scores on the K-ABC, while children with language learning disabilities were found to have an inverse pattern of significantly higher Simultaneous than Successive Processing scores. The results suggest that different subtypes of learning disabilities can be defined through differences in cognitive processing. Further, the simultaneous-sequential/Successive processing model may offer a valuable basis for conceptualizing learning disabilities in general, and nonverbal learning disabilities in particular. These findings had implications for the assessment and remediation of such learning disabilities.

Kranzler et al. (2000) study on ‘Independent Examination of the Factor structure of Cognitive Assessment System (CAS): Further Evidence Challenging the Construct Validity of the CAS’ examined independently the factor structure of the CAS (Naglieri and Das, 1997) with a primary dataset not collected by its authors. Participants were 155 students aged 8 to 11 in grades 3 to 6. Confirmatory Factor Analysis was used to compare the fit provided by the PASS model, the theoretical model underlying the CAS, with alternative models of cognitive ability suggested by previous research. Results of this study indicated that the PASS model did not provide a better fit to the data than did alternative hierarchical and non-hierarchical models. Not only were the Planning and
Attention factors of the PASS model virtually indistinguishable, but they demonstrated inadequate specificity for meaningful interpretation. The model reflecting the actual hierarchical structure of the CAS was found to fit the data no better than alternative models based on different theoretical orientations. Of the hierarchical models examined in this study, the best fitting was a hierarchical (PA) SS model with one second-order general factor, psychometric g, and three first-order factors reflecting fluid intelligence/visual Processing (Simultaneous), Memory Span (Successive) and Processing Speed (Planning/Attention). In sum, results of this study support Kranzler and Keith’s (1999) conclusion that the CAS lacks structural fidelity, which means that the CAS does not measure what its authors intended it to measure. Results of this study, therefore, provide further evidence challenging the construct validity of the CAS.

Naglieri and Johannes (2001) focused on Gender differences in ability and achievement, have been studied for some time and have been conceptualized along verbal, quantitative, and visual–spatial dimensions. Researchers recently have called for a theory-based approach to studying these differences. This study examined 1,100 boys and 1,100 girls who matched the U.S. population using the Planning, Attention, and Simultaneous, Successive (PASS) cognitive-processing theory, built on the neuropsychological work of Luria (1973). Girls outperformed boys on the Planning and Attention scales of the Cognitive Assessment System by about 5 points (d = 0.30 and 0.35, respectively). Gender differences were also found for a subsample of 1,266 children on the Woodcock-Johnson Revised Tests of Achievement Proofing (d = 0.33), Letter-Word Identification (d = 0.22), and Dictation (d = 0.22). The results illustrate that the PASS theory offers a useful way to examine gender differences in cognitive performance.

Johnson et al. (2003) investigated on ‘Discriminant validity of the Cognitive Assessment System for students with written Expression Disabilities’ explored the PASS cognitive processing theory in Junior high school students (aged 11-15 years) with and without written expression disabilities. Ninety six students with (n=48) and without (n=48) written expression disabilities were administered the Das-Naglieri Cognitive Assessment system (Das and Naglieri, 1997) and the writing subtests of the Wechsler individual Achievement Test (WIAT; 1992). Discriminant analysis were utilised to identify the Das Naglieri CAS subtests and composites that contributed to group
differentiation. The Planning composite was found to be the most significant contributor among the four composite scores. Subsequent efficiency of classification analysis provided strong support for the validity of the obtained discriminant functions in that the four Das Naglieri Cognitive Assessment System composite scale scores correctly identified 83% of the students as members of their respective groups.

Naglieri et al. (2003) in a study mentioned as an example of evidential validity. The part of study that is relevant here concerns the comparison between a sample of 25 children with Attention Deficit Hyperactivity Disorder (ADHD) and normative groups on two tests the Cognitive Assessment System (CAS) and WISC-III. The purpose was to examine the assumption that the PASS theory and its derivative, the CAS, may be particularly sensitive to the cognitive difficulties of children with ADHD, whereas the general intelligence test, the WISC-III is inadequate for diagnosis of ADHD. Specifically low planning score was expected for the ADHD sample. The results showed a large effect size for planning between the ADHD and the standardisation sample. With regard to Attention a small effect size was observed. Differences between two samples in simultaneous and successive processing scales were not significant.

Mackey et al. (2003) study focused on planning deficit predominant in foetal alcohol syndrome. The difference between planning and attention is again found to be meaningful in research on foetal alcohol syndrome (FAS) as suggested in the study by Mackey et al. (2003). Its purpose was to determine whether planning was a relative weakness in the FAS population. The participants included 7 children diagnosed with FAS and 11 with confirmed prenatal exposure to alcohol who did not have physical characteristics required for FAS. Findings revealed that children with FAS and children with other alcohol related effects performed equally poor on the planning component. In contrast, both the groups performed normatively in simultaneous processing.

Joseph et al. (2003) study on “PASS cognitive processes, phonological processes, and basic reading performance for a sample of referred primary-grade children” explored the relationships among cognitive processing, phonological processing and basic reading skill performance. Cognitive theorists propose that Planning, Attention, Simultaneous and Successive (PASS) processes are related to various phonological skills. A sample of
62 Primary Grade children referred for reading problems were administered measures of cognitive processes (Cognitive Assessment System), phonological processes (Comprehensive Test of Phonological Processing) and basic reading achievement (Woodcock-Johnson Tests of Academic Achievement-III). Findings indicated that some cognitive processes were significantly related to phonological processes as well as basic reading skills. The strongest relationships were found between phonological memory and successive processes and between phonological awareness and basic reading performance.

Pape (2004) studied “Middle School Children's Problem-Solving Behaviour: A Cognitive Analysis from a Reading Comprehension Perspective”, reported that many children read mathematics word problems and directly translate them to arithmetic operations. More sophisticated problem solvers transform word problems into object-based or mental models. Subsequent solutions are often qualitatively different because these models differentially support cognitive processing. Based on a conception of problem solving that integrates mathematical problem solving and reading comprehension theories and using constant comparative methodology (Strauss and Corbin, 1994), 98 sixth and seventh grade students' problem-solving behaviours were described and classified into five categories. Nearly 90% of problem solvers used one behaviour on a majority of problems. Use of context such as units and relationships, recording information given in the problem, and provision of explanations and justifications were associated with higher reading and mathematics achievement tests, greater success rates, fewer errors, and the ability to preserve the structure of problems during recall. These results were supported by item-level analysis.

Naglieri et al. (2005) study examined Black (n=298) and White (n=1,691) children on Planning, Attention, Simultaneous, and Successive cognitive processes (PASS theory of intelligence) as operationalized by the Cognitive Assessment System (CAS). Regression analyses, controlling for key demographic variables, showed an estimated CAS Full Scale mean score difference of 4.8, which is smaller than that found with traditional IQ. Correlations between the PASS scores and achievement were similar for Blacks (median of 0.70) and Whites (median of 0.64). Moderated regression analyses showed no interaction effect for race by CAS Full Scale with achievement, suggesting that there are similar relationships between the CAS and achievement for Black (n=298)
and White (n=1,691) groups. No significant interactions resulted when the Black and White child groups were analysed with smaller matched samples (n=298; n=298). These results add to the growing body of literature supporting the validity of the PASS theory as measured by the CAS and the utility of the theory for assessment of minority students.

James and Lyn (2006) reported in an article that a study was undertaken to obtain a better understanding of problem solving and scientific reasoning in 10 year old children. The study involved measuring children's competence at syllogistic reasoning and in solving a series of problems requiring inductive reasoning. Children were also categorized on the basis of levels of simultaneous and successive synthesis. Simultaneous and successive synthesis represents two dimensions of information processing identified by Luria in a program of neuropsychological research. Simultaneous synthesis involves integration of information in a holistic or spatial fashion, whereas successive synthesis involves processing information sequentially with temporal links between stimuli. Analysis of the data generated in the study indicated that syllogistic reasoning and inductive reasoning were significantly correlated with both simultaneous and successive synthesis. However, the strongest correlation was found between simultaneous synthesis and inductive reasoning. These findings provide a basis for understanding the roles of spatial and verbal-logical ability as defined by Luria's neuropsychological theory in scientific problem solving. The results also highlight the need for teachers to provide experiences which are compatible with individual students' information processing styles.

Das et al. (2008) reviewed on “comparing the effectiveness of two reading intervention programs for children with reading disabilities”. The effectiveness of two reading intervention programs was investigated with 63 First Nation children identified as poor readers in grades 3 and 4. The major dependent variables were pre-test to post-test changes following intervention on reading tests for word reading and word decoding. Other dependent variables comprised tests of phonological awareness, rapid naming speed, and cognitive tests of Planning, Attention, Successive and simultaneous (PASS) processing. Results showed a significant improvement on both reading tasks, following inductive learning intervention, among children below the median in comparison with those above the median. The phonics based program resulted in similar improvement only in word decoding.
Sins et al. (2008) study focused on to test a conceptual model of relations among achievement goal orientation, self-efficacy, cognitive processing, and achievement of students working within a particular collaborative task context. The task involved a collaborative computer-based modeling task. In order to test the model, group measures of mastery-approach goal orientation, performance-avoidance goal orientation, self-efficacy, and achievement were employed. Students’ cognitive processing was assessed using an online log-file measure. As predicted, mastery-approach goal orientation had a significant positive effect on achievement, which was mediated through students’ use of deep processes. No significant relationships could be found between performance-avoidance goal orientation and surface processing and between surface processing and achievement. Results were discussed with respect to general theoretical implications and lead to suggestions for the design of appropriate scaffolds.

Benson (2008) in his study Structural equation modelling procedures are applied to the standardization sample of the Woodcock—Johnson III to simultaneously estimate the effects of a psychometric general factor (g), specific cognitive abilities, and reading skills on reading achievement. The results of this study indicate that ‘g’ has a strong direct relationship with basic reading skills until about sixth grade. Also, ‘g’ is found to have a strong indirect effect on reading fluency and comprehension across grade levels. Basic reading skills have a strong direct effect on reading fluency across grade levels. The effect of cognitive processing speed (Gs) on reading fluency increase with age. Reading fluency initially has a strong direct effect on reading comprehension, but this effect is reduced with age. Conversely, the direct effect of crystallized intelligence or knowledge (Gc) on reading comprehension increase with age.

Das et al. (2008) made a different approach in assessing the “Influence of distal and proximal cognitive processes on word reading”. The main objectives of the study were (a) to explore the inter-relationship among distal, proximal cognitive skills, and word reading, (b) to identify those cognitive processes that predict phonological awareness and rapid naming. Seventy, first nation Canadian children attending grade 3 and 4 were examined on phonological awareness, rapid naming, word identification, word attack, and the cognitive measures of PASS. Results indicated that phonological awareness and rapid naming uniquely predicted reading while PASS variables did not,
when the effects of phonological awareness and rapid naming were controlled. Finally, both phonological awareness and rapid naming were controlled. Finally both phonological awareness and rapid naming were predicted by Planning. Implications for diagnosis of children at risk for reading difficulties and remediation were discussed.

Lehman et al. (2009) in a national study on the Development of visual attention using the cognitive assessment system tried to find out the developmental changes in the performance of children and adolescents using the Cognitive Assessment system (CAS) which is an individually administered test of four basic cognitive processes. The test measured the Planning, Attention, Simultaneous and Successive (PASS) processes as a theory of intelligence that can provide the framework for an alternative to traditional IQ tests. The CAS, which includes a scale of attention comprising 3 subtests, each of which is presented visually, provides an opportunity to study the development of visual attention for 2,200 children and adolescents aged 5 to 17 years old who participated in the national standardization sample. A sub sample (n=1395) was also administered the Woodcock-Johnson Tests of Achievement- Revised (WJ-R). Results indicated that on all three CAS attention subtests, the mean scores improve with age, and the rate of change between adjacent age groups is moderately large upto 15 years old. At all ages the CAS Attention standard score is moderately related to WJ-R achievement Cluster scores. The results are discussed in light of conclusions about the development of attention based on the standardization sample of the NEPSY- A Development Neuropsychological Assessment.

To summarize from the above Decker (1989) study provided evidence for significantly slower cognitive processing rates and persistent problems in reading and spelling was apparent among the young disabled adult readers. Naglieri et al. (1989) and Naglieri et al. (1990) suggest PASS as an alternative model of intelligence. Bardos et al. (1992) study findings revealed that boys and girls performed similarly on simultaneous, successive, and attention measures girls outperformed boys on measures of planning processes. Naglieri et al. (1993) suggests PASS as alternative viable model in cognitive processing. Kirby et al. (1996) study results point to the critical role of successive processing in reading achievement and the need for remediation to address successive processing.
Daley et al. (1997) Cognitive Assessment System provides an alternative to the traditional assessment measure in acquiring a better understanding of cognitive characteristic of children with SED. Kranzler et al. (2000) Cognitive Assessment System (CAS) based on PASS model lacks structural fidelity. Naglieri and Johannes (2001) study results illustrate that the PASS theory offers a useful way to examine gender differences in cognitive performance. Mackey et al. (2003) study focused on planning deficit predominant in foetal alcohol syndrome. Joseph et al. (2003) study found that the strongest relationships were found between phonological memory and successive processes and between phonological awareness and basic reading performance. Naglieri et al. (2005) study supports the validity of the PASS theory as measured by the CAS and the utility of the theory for assessment of minority students.

2.3 STUDIES RELATED TO COGNITIVE PROCESSING AND ACHIEVEMENT

Few studies have examined the relationship between the PASS (Planning, Attention, Simultaneous and successive processes) and writing achievement, and most of them took place at the early stages of the development of the PASS theory with exploratory tasks. Ashman (1978) study revealed that planned composition loaded highly on a factor with other planning tasks; forming the initial hypothesis that planning as described in PASS theory is important for writing.

Wachs and Harris (1986) found a significant relationship between written composition and successive processing in college students, but they do not use any planning processing tasks.

Later Flanagan (1992) expressed that planning tasks were the best predictor of punctuation, capitalization, and written composition achievement in 78 elementary-aged children referred for learning problems.

Naglieri and Das (1997), in their first study on PASS theory and written expression achievement, 1,600 youths were administered the DN: CAS and the Dictation and Proofing subtests of the Woodcock-Johnson-Revised tests of Achievement (WJ-R, Woodcock and Johnson 1989). Significant correlations were found between the WJ-R achievement measures and the DN: CAS, with analysis demonstrating that weaknesses on the planning scale were related to scores on the Dictation and Basic writing subscales.
Naglieri and Das (1997), in their second study on PASS theory and written achievement, 80 students identified and placed in special education classes for LD were administered the DN: CAS, WJ-R tests of achievement, and another cognitive measure. The students were classified with LD prior to the study and ranged in age from 6 to 16 years. The highest correlation was with the planning scale, and all correlations were significant at the 0.05 level. When compared with their scores on other achievement subtests of the WJ-R, those with LD achieved their lowest scores on the Basic writing skills composite.

Naglieri and Das (1997) in their third study on PASS theory and written achievement, the DN: CAS was administered to 105 regular education students in grade 6 and grade 8. In addition, each student wrote a story about a picture. The students were instructed to write a story that had a purpose, a starting point, an action, and an ending. The resulting stories were scored on a seven-point scale in expression; organization; wording; mechanics and individuality. The DN: CAS planning scale correlated significantly with the Planned Composition total and each rating category.

Naglieri (1999) reported that the CAS based on PASS theory offers a useful alternative to traditional IQ batteries. He summarized 5 research studies involving more than 8000 children aged 5-17 years who were administered nearly all the major intelligence tests. Findings show that median correlations between CAS global score and achievement were higher (0.70) than all other IQ tests studied (range between 0.59 and 0.63).

Naglieri and Bornstein (2003), study was to summarize the correlations between individually administered tests of intelligence and achievement reported in various test manuals and published journal articles. An exhaustive review of published findings yielded data that were organized into two groups: studies involving correlations between (a) IQ and achievement test composites and (b) IQ and achievement subtests. Within these two areas, data were further divided into studies involving small (n= 200) samples. For the large studies, the ability/achievement composite correlations for the K-ABC (0.74) followed by the CAS and WJ-III (both 0.70) were the top ranked. Results for the large-scale ability and achievement subtest studies demonstrated that the CAS (Standard and Basic Batteries, respectively) had the highest correlations with achievement subtests (0.65 and 0.64),
followed by the K-ABC (0.63). Thus, the two measures of cognitive processing consistently had the highest correlations with achievement despite the fact that they do not contain achievement-like subtests found in all the other ability measures. These and other findings are discussed and contribute to the conclusion that measures of basic psychological processes offer a viable alternative to traditional IQ for the correlation with achievement.

Bruinsma (2004) investigated the question of whether a student's expectancy, values and negative affect influenced their deep information processing approach and achievement at the end of the first and second academic year. Five hundred and sixty five first year students completed a self-report questionnaire on three different occasions. The departmental administrations provided data on the students' achievement. Covariance analysis indicated that student's expectancy and values positively affected the total number of credits. However, the expected relationship through the deep information processing approach was not found. Even though the analysis showed a relationship between students' expectancy, values and the deep information processing approach, this approach did not affect academic achievement.

Srmiento and Deano (2011) study on Cognitive Processing and Mathematical Achievement: A Study with Schoolchildren between Fourth and Sixth Grade of Primary Education. This investigation analysed the relation between cognitive functioning and mathematical achievement in 114 students in fourth, fifth, and sixth grades. Differences in cognitive performance were studied concurrently in three selected achievement groups: mathematical learning disability group (MLD), low achieving group (LA), and typically achieving group (TA). For this purpose, performance in verbal memory and in the PASS cognitive processes of planning, attention, and simultaneous and successive processing was assessed at the end of the academic course. Correlational analyses showed that phonological loop and successive and simultaneous processing were related to mathematical achievement at all three grades. Regression analysis revealed simultaneous processing as a cognitive predictor of mathematical performance, although phonological loop was also associated with higher achievement. Simultaneous and successive processing were the elements that differentiated the MLD group from the LA group. These results show that, of all the variables analyzed in this study, simultaneous processing was the best predictor of mathematical performance.
To summarize from the above studies there are only fewer studies on the aspect of cognitive processing and achievement. Ashman (1978) study revealed that planning is important for writing. Later Flanagan (1992) expressed that planning tasks were the best predictor of punctuation, capitalization, and written composition achievement. The results of these studies of Naglieri and Das (1997) suggest that when children have the basic writing skills, their planning scale standard scores and individual planning subtest scores were significantly correlated with their written compositions achievement (Naglieri and Das, 1997). The studies with experimental tasks of the DN:CAS has shown that a relationship exists between the planning scales of the DN:CAS and writing in both students with and without learning disabilities. Naglieri and Bornstein (2003) found that cognitive processing consistently had the highest correlations with achievement.

2.4 STUDIES RELATED TO SELF PERCEPTION AND ACHIEVEMENT

The following studies focus mainly on self-perception and how it is related to the academic achievement of special children as well as the normal groups. How the normal and special children perceive their disabilities and how the severity in disability is related with their achievement. Studies related to self-perception and achievement are as follows

Heyman (1990) carried out a study on ‘The Self-Perception of a Learning Disability and Its Relationship to Academic Self-Concept and Self-Esteem’ where eighty seven children with learning disabilities, aged 9 through 11 years 11 months, completed measures of self-esteem, academic self-concept, and self-perception of their learning disability. The Self-Perception of Learning Disability (SPLD) instrument measures the extent to which children with learning disabilities perceive their disability as (a) delimited rather than global, (b) modifiable rather than permanently limiting, and (c) not stigmatizing. It was hypothesized that self-perception of one's learning disability would be related positively to both academic self-concept and self-esteem, and that each of these relationships would remain significant when controlling for sex, ethnicity, age, reading and math achievement, self-contained versus mainstreamed classroom setting, and age at diagnosis. Correlations and multiple regression analysis confirmed these hypotheses. Results were discussed in terms of helping children to develop less negative self perceptions of their disabilities.
Priel and Leshem (1990) examined in their study ‘Self-Perceptions of First and Second Grade Children with Learning Disabilities’, the question of the effects of developmental positive bias and repeated experiences of failure on the self-perception of mainstreamed first and second grade Israeli children with learning disabilities. The self-perceptions of 44 children with learning disabilities and their 36 nondisabled classmates were assessed. In addition, teachers' evaluations and objective measures of cognitive performance and social acceptance were gathered. The children with learning disabilities were found to have a greater positive bias and lower self-perception in the cognitive competence domain than their normally achieving peers. Self-perceptions of peer acceptance among children with learning disabilities are similar to their normally achieving peers' self-perceptions, in spite of their significantly lower sociometric ratings and teacher evaluations in the social domain. These findings are analysed in the context of the globality-specificity dimension of self-perceptions at the age level studied. The obtained pattern of self-perceptions is discussed in the light of the interrelationships between cognitive deficit and experiential factors among mainstreamed first and second grade children.

Bear et al. (1991), studied ‘Self-Perceptions Of Nonhandicapped Children And Children With Learning Disabilities In Integrated Classes’, Based largely on social comparison theory, it was hypothesized that self-perceptions of scholastic competence, behavioural conduct, and global self-worth are (a) lower among children with learning disabilities (LD) in integrated classes than among nonhandicapped (NH) children in the same classes, and (b) higher among NH children in integrated classes than among NH children in nonintegrated classes. Scores of 341 third graders (52 LD Integrated, 164 NH Integrated, and 125 NH Nonintegrated) on the Self-Perception Profile for Children (Harter, 1985) provided general support for the first hypothesis, but limited support for the second hypothesis. Sex differences were found, as were Placement Group x Sex interactions. Results also indicated that measures of self-perceptions of scholastic competence, behavioural conduct, and global self-worth provided redundant information in the discrimination between LD Integrated and NH Integrated groups. Findings suggest that integration is unlikely to have a positive effect on the self perceptions of children with learning disabilities, but may well enhance the self-perceptions of NH children, particularly NH boys.
Clever et al. (1992) in another study on Self-perceptions of specific domains of competence, judgments of the importance of these domains, and perceptions of global self-worth were examined among children with learning disabilities (LD), low achievement (LA), and normal achievement (NA) in a full-time integrated classroom setting. Results showed that children with LD and LA held lower self-perceptions of scholastic competence than children with NA, and children with LD had lower self-perceptions of behavioural conduct than children with LA and NA. Both children with LD and children with LA had significantly larger discrepancies between perceived competence and importance in the scholastic domain than did children with NA. We found little evidence that children with LD employ a discounting mechanism to protect their self-worth. Overall, results offer little support for the use of importance ratings or discrepancy scores in understanding the relation between children's self-perceptions of competence and global self-worth.

Smith and Nagle (1995) explored ‘Self-Perceptions and Social Comparisons among Children with LD’, the self-perceptions of third and fourth grade children with learning disabilities (n=59) and nondisabled students (n=57) were compared using the Self Perception Profile for Learning Disabled Students. Results suggested that the children with Learning Disability perceived themselves as less competent than did the controls in the areas of intelligence, academic skills, behaviour, and social acceptance. These differences were not related to the length of time subjects with Learning Disability had received special education services. Contrary to expectations, subjects' self perceptions were not affected by whether they chose LD or general education class peers as a reference group.

Rothman and Cosden (1995) investigated the relationship between self-perception of a learning disability (SPLD) and self-concept and social support. Fifty-six, third through Sixth grade children with learning disabilities were administered Heyman's SPLD scale. This instrument measures the degree to which children view their disability as circumscribed, modifiable and nonstigmatizing rather than global, unchangeable and stigmatizing. Students were also administered two scales developed by Harter to measure general and domain specific self-concept and social support. Results revealed that children with less negative perceptions of their learning disability had higher mathematics achievement scores. Also, they perceived more positive global self-concept,
more intellectual and behavioural competence, and more social acceptance. These children also felt more support from their parents and classmates. The relationship of SPLD to self-concept and social support was maintained after partialing out the influences of actual academic achievement. The importance of helping students and the nature of their learning disability is discussed.

Meltzer et al. (1998) reported in their study on ‘Perceptions of Academic Strategies and Competence in Students with Learning Disabilities’, that research findings regarding general self-concept, academic self-concept, and self-awareness in students with learning disabilities have varied, and results are still inconclusive regarding the consistency between students' and teachers' judgments of academic performance. The current study focused on students' and teachers' perceptions of the students' strategy use and performance in nine different academic and organizational domains. Six hundred and sixty-three students and their 57 teachers were involved in the study. Findings indicated that the students with learning disabilities considered themselves appropriately strategic and competent in the five domains of reading, writing, spelling, mathematics, and organization. These students also rated their academic performance and organization as average to above average in seven of nine domains, with the exception of checking and planning their work. Nevertheless, the self-ratings of the students with learning disabilities were still significantly lower than the self-ratings of average achievers in virtually all domains. The second major set of findings revealed a sharp discrepancy between the self-assessments of the students with learning disabilities and their teachers' judgments. Teachers rated the students with learning disabilities as weak in their strategy use and below average in their performance in all nine academic and organizational domains. Finally, gender differences were not evident in eight of the nine domains. These results have added to the increasing body of literature indicating that students with learning disabilities frequently perceive themselves as capable and effective and often rate themselves as academically stronger than their teachers judge them to be.

Bear et al. (1998) conducted a study on ‘Achievement-Related Perceptions of Children with Learning Disabilities and Normal Achievement Group and Developmental Differences’. Self-perceptions of teacher feedback, social comparison of reading competence, reading satisfaction, and general self-worth were assessed among third and
sixth graders with learning disabilities and normal achievement (n=247). Relations among these variables and mean differences were examined within and across grades. As predicted, in both grades teacher feedback was the most common criterion children used to judge their academic performance. In both achievement groups, perceived teacher feedback and reading satisfaction were less favourable among sixth than third graders. Hierarchical regression analyses showed that perceived teacher feedback was the best predictor of reading satisfaction; however, in sixth grade, social comparison also contributed significantly to the prediction. The importance of perceived feedback also was demonstrated in the relation to self-worth, which was generally positive among both achievement groups and within each grade. Through its relation to reading satisfaction, perceived teacher feedback contributed significantly to prediction of self-worth. Developmental differences and classroom factors that may explain these findings were discussed.

Montague and Garderen (2003) study focused on students' mathematics achievement, estimation ability, use of estimation strategies, and academic self-perception. Students with learning disabilities (LD), average achievers, and intellectually gifted students (N=135) in fourth, sixth, and eighth grade participated in the study. They were assessed to determine their mathematics achievement, ability to estimate discrete quantities, knowledge and use of estimation strategies, and perception of academic competence. The results indicated that the students with LD performed significantly lower than their peers on the mathematics achievement measures, as expected, but viewed themselves to be as academically competent as the average achievers did. Students with LD and average achievers scored significantly lower than gifted students on all estimation measures, but they differed significantly from one another only on the estimation strategy use measure. Interestingly, even gifted students did not seem to have a well-developed understanding of estimation and, like the other students, did poorly on the first estimation measure. The accuracy of their estimates seemed to improve, however, when students were asked open-ended questions about the strategies they used to arrive at their estimates. Although students with LD did not differ from average achievers in their estimation accuracy, they used significantly fewer effective estimation strategies.

Silverthorn et al. (2005) study on ‘Self-Perceptions of Ability and Achievement across the High School Transition: Investigation of a State-Trait Model’, investigated the
relationship between self-perceptions of ability and achievement in maths, science, and English from Grades 8 to 11 (N=342). A state-trait model that included an association between stable (i.e., trait-like) components of self-perceptions and achievement as well as time-specific (i.e., state-like) effects during the transition to high school (i.e., Grade 8 to Grade 9) demonstrated superior fit to alternative models that did not incorporate these features. Stable components of self-perceptions of ability and achievement exhibited a substantial association in this model. In most instances, however, there also was evidence of a positive effect of self-perceptions in Grade 8 on achievement in Grade 9.

Lackaye and Margalit (2006), in their article ‘Comparisons of Achievement, Effort, and Self-Perceptions Among Students With Learning Disabilities and Their Peers From Different Achievement Groups’, compared the social emotional implications of academic achievement for students with and without learning disabilities (LD) and identified predictors of effort investment. Students with LD showed lower levels of achievement, effort investment, academic self-efficacy, sense of coherence, positive mood, and hope, and higher levels of loneliness and negative mood. When compared to peers without LD (n=447) at four different academic achievement levels, students with LD showed higher achievement than the low-average group, but their social-emotional profiles were similar to the low and low-average groups. Hierarchical multiple regression analysis showed that achievement, academic self-efficacy, negative mood, and hope predicted effort investment for students with LD. These results demonstrated the importance of hope in understanding the functioning of students with LD.

Stringer and Heath (2008) studied ‘Academic self-perception and its relationship to academic performance’. One hundred and fifty-five students (average age, 10 years 7 months) were initially tested on reading, arithmetic, and academic self-perception. One year later they were tested again. Initial academic scores accounted for a large proportion of the variance in later academic scores. The children's self-perceptions of academic competence accounted for significant variance in academic performance one year later. However, neither the academic self-perceptions at the beginning of the study nor changes in self-perceptions over time predicted changes in academic performance. Self-perception of academic competence cannot play a simple, causal role in academic achievement.
Dickson (2008) experimented on ‘Self-Perception of Learning Disabled Children within Mainstream Classrooms’, within the classroom, self-perception of learning disabled students is commonly found to be negative. Mainstreaming students with learning disabilities is thought to increase academic and social functioning, in part, through allowing interaction with a greater number of students. This study examined the potential effects of mainstream classrooms on learning disabled (LD) student self-perception. Student self-perception may affect mental stability. Mainstreamed LD students were compared to LD students who were not mainstreamed to explore group differences of self perception. The results showed no significant differences between the two groups except for the dimension of self-perception of physical appearance. Specific ideas for further study were discussed.

Fareo (2011) reported in his article on ‘A study of self-perception and academic performance of students with special needs into mainstreamed public secondary schools in Nigeria’ investigated the influence of types of exceptionality on the self-perception of students with special needs. It examined the influence of sex of students with special needs on their self-perception. It also compared the academic performance of male and female students with special needs. One instrument named Self-Perception of Students with Special Needs (SPSSN) and the Examination Records (ER) were used for the collection of data. The results showed exceptionality types of students with special needs had influence on their self-perception. However, the result revealed that sex of students with special needs had no significant influence on their self-perception. Also, there was no significant difference between academic performance of male and female students with special needs. The study concluded that students with special needs were yet to be integrated into public secondary schools, and this could affect their self-perception and academic performance.

It can be summarized from the above studies that Heyman (1990) study discussed in terms of helping children to develop less negative self-perceptions of their disabilities. Priel and Leshem (1990) found that the children with learning disabilities were found to have a greater positive bias and lower self-perception in the cognitive competence domain than their normally achieving peers. Bear et al. (1991), Findings suggest that integration is unlikely to have a positive effect on the self-perceptions of children with
learning disabilities, but may well enhance the self-perceptions of Non Handicapped children, particularly Non Handicapped boys. Clever et al. (1992) Results showed that children with Learning Disabled and Low Achievement held lower self-perceptions of scholastic competence than children with Normal Achievement. Smith and Nagle (1995) suggested that the children with LD perceived themselves as less competent than did the controls in the areas of intelligence, academic skills, behaviour, and social acceptance. Meltzer et al. (1998) reported that students with learning disabilities frequently perceive themselves as capable and effective and often rate themselves as academically stronger than their teachers judge them to be.

2.5 OVERVIEW OF RESEARCHES REVIEWED

The above reviews on cognitive processing and achievement clearly indicate that the researches conducted are more in western countries than in India. Further from these studies it can be summarized that

- Disabled readers possess slower cognitive processing rates.
- PASS cognitive processing tasks has Factorial and discriminant validity.
- Most of the studies stressed the importance of PASS model as viable alternative model of cognitive processing.
- When gender differences in cognitive processing were examined, girls and boys performed similarly on simultaneous, successive processing and attention measures, but girls’ outperformed boys on measures of planning process.
- Successive processing plays a vital role in reading achievement. High frequency language impairment is related to cognitive processing problems in children. Cognitive processing were related to phonological processes as well as basic reading skills.
- Different subtypes of learning disability can be defined through difference in cognitive processing; also PASS theory is useful to examine gender differences in cognitive processing.
- Studies on cognitive processing and achievement provided an insight that cognitive processing has highest correlations with achievement and individual planning subtests scores were significantly correlated with written composition achievement.
From the studies on self-perception and achievement it can be summarized that

- Children with learning disabilities were found to have a greater positive bias and lower self-perception in the cognitive competence domain than their normally achieving peers.

- Integration is unlikely to have a positive effect on the self-perceptions of children with learning disabilities, but may well enhance the self-perceptions of normal children.

- Children with LD and children with Low Achievement had significantly larger discrepancies between perceived competence and importance in the scholastic domain than did children with Normal Achievement.

- The children with LD perceived themselves as less competent than did the control groups in the areas of intelligence, academic skills, behavior, and social acceptance.

- Children with less negative perceptions of their learning disability had higher math achievement scores. Also, they perceived more positive global self-concept, more intellectual and behavioral competence, and more social acceptance.

- Students with learning disabilities frequently perceived themselves as capable and effective and often rate themselves as academically stronger than their teachers judge them to be.

- Students with LD performed significantly lower than their peers on the math achievement measures, as expected, but viewed themselves to be as academically competent as the average achievers did.

- No significant differences were found in school completers and noncompleters with Learning Disabilities similarities in Academic Achievement and Perceptions of Self and Teachers.

- No significant differences in self-perception were found between mainstreamed LD students and LD students who were not mainstreamed, except for the dimension of self-perception of physical appearance.
2.6 SUMMARY

Studies on cognitive processing and achievement put light on the fact that cognitive processing is related to achievement and self-perception in the learning disabled group is negative when compared to the normal achieving group. Children with learning disabilities were found to have a greater positive bias and lower self-perception in the cognitive competence domain than their normally achieving peers. The self perception of learning disability is related with achievement. With these reviews in mind the investigator penned down the conceptualization of the present study and designed the methodology for the present study.