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A clinical-developmental analysis of interpersonal problem solving

Feldgaier, Steven, Ph.D.
The Ohio State University, 1987

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A CLINICAL-DEVELOPMENTAL ANALYSIS OF INTERPERSONAL PROBLEM SOLVING

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of the Ohio State University

By

Steven Feldgaier, B.A., M.A.

****

The Ohio State University

1987

Dissertation Committee:
F.C. Serafica
C. Wenar
G. Winer

Approved by

[Signature]

Advisor
Department of Psychology
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To My Mother
ACKNOWLEDGEMENTS

I would like to thank my advisor, Dr. F.C. Serafica, for her guidance and support throughout this study. Her ideas and critical comments were most helpful and her patience, given the "long distance" nature of this project, much appreciated. I would also like to thank Drs. C. Wenar and G. Winer for their constructive suggestions and comments.

I would like to acknowledge the support of the Manitoba Mental Health Research Foundation in providing a research grant to conduct this investigation. I would also like to gratefully acknowledge the generous assistance provided by my colleagues at the Child Guidance Clinic of Greater Winnipeg. In particular, I would like to thank the members of the Elmwood unit for their continuing support and encouragement. I would also like to acknowledge the participation of the Winnipeg School Division No. 1, the St. Vital School Division No. 6, the St. Boniface School Division No. 4, the River East School Division No. 9, and the Fort Garry School Division No. 5; the cooperation of administrators, teachers, parents and children has been greatly appreciated.

Many thanks also go to Linda Delaney, Marilyn Davidson, Carole Boyce, Chris Hackett, Don Salmon, Dan Brodsky, and Lois Peters for their assistance in data collection and to Linda Neden for her expert
statistical assistance. A special thank you must be given to Sharon Shaydak, both for her help in data scoring and her invaluable secretarial assistance. The many long hours that she put in on this study are deeply appreciated. Thanks must also go to Carole Ewach, my secretary at the Child Guidance Clinic, for her patience and willingness to put up with the many phone calls, messages and letters related to this study on top of her regular office duties.

I would also like to thank my family for their ongoing encouragement and support over these many years. Knowing that I could always count on them for guidance and inspiration made completion of this project so much more attainable. To Jamie goes a special thank you for his patience and good humor, especially during the latter stages of this task. Despite his young age, his understanding of the importance of my completing this project and his tolerance of its many associated inconveniences for him, are greatly appreciated. To Sharon goes my deepest love and appreciation for her steadfast support and belief in my ability to complete this study. Her devotion and love continue to be sources of great comfort and encouragement to me.

Finally, I would like to acknowledge the contribution made by my late mother. Although it was her hope to see this project through to its completion, her untimely death prevented that from happening. Nevertheless, her courage and unflagging optimism throughout her life, and especially during her illness, ultimately provided me with the inspiration and tenacity to make her dream finally come true.
VITA

July 25, 1952..........................Born - Montreal, Quebec

1974....................................B.A., McGill University,
Montreal, Quebec

1976-1980..............................Graduate Research Associate,
Department of Pediatrics,
The Ohio State University,
Columbus, Ohio

1979 ....................................M.A., The Ohio State
University, Columbus, Ohio

1980-1981..............................Clinical Psychology Interne,
Section of Behavioural Science,
Department of Psychiatry,
Faculty of Medicine,
University of Manitoba,
Winnipeg, Manitoba

1981-1982..............................Clinical Psychology Interne,
Specialty Year in Child and
Family Therapy,
Section of Behavioural Science,
Department of Psychiatry,
Faculty of Medicine,
University of Manitoba,
Winnipeg, Manitoba

1982-Present............................School Psychologist,
The Child Guidance Clinic
of Greater Winnipeg
Winnipeg, Manitoba

PUBLICATIONS

thinking and classroom behavior of learning impaired children.
Psychological Reports, 50, 415-420.
FIELDS OF STUDY

Major Field: Clinical Child Psychology
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INTRODUCTION

Many investigators (e.g., Anderson & Messick, 1974; Christoff, Scott, Kelley, Schlundt, Baer, & Kelly, 1985; Elias, Gara, Ubriaco, Rothbaum, Clabby, & Schuyler, 1986; Gesten, Flores de Apodaca, Rains, Weissberg, & Cowen, 1978; Hamburg & Adams, 1967; Hansen, St. Lawrence, & Christoff, 1985; Jahoda, 1953; Nezu, 1986; Pellegrini & Urbain, 1985; Ridley & Vaughn, 1982; Shure & Spivack, 1982; Spivack & Shure, 1974; Vaughn, Ridley, & Bullock, 1984) have argued that successful resolution of interpersonal problems is an important mediator of behavior adjustment. They have all pointed out that, because people differ markedly in their attitudes for dealing with others, it is only natural to expect that problems are going to arise and require satisfactory resolution if positive relationships are to be maintained. These conflicts may be simple in nature or quite complex. On occasion, everyone will encounter such interpersonal difficulties in their everyday life. Whenever individuals with differing goals, temperaments and experiences interact, there will be a need for effective problem solving.

Many researchers have contended (e.g., Allen, Chinsky, Larcen, Lochman, & Selinger, 1976; Krasner, 1982; Spivack & Shure, 1974) that problem solving is a general process activated in conflict situations. D'Zurilla and Goldfried (1971) have defined problem solving as:
"...a behavioral process, whether overt or covert in nature, which (a) makes available a variety of potentially effective response alternatives for dealing with the problematic situations and (b) increases the probability of selecting the most effective response from among these various alternatives." (p.108)

This process encompasses a basic method in the confrontation and resolution of conflict situations and includes a variety of specific stages and skills (D'Zurilla & Goldfried, 1971; Spivack & Shure, 1974). It is, thus, a multidimensional process.

To date, there is a growing body of research indicating that interpersonal problem solving is an important mediator of adjustment (Gesten et al., 1978; Pellegrini, 1985; Ridley & Vaughn, 1982; Shure & Spivack, 1978; Spivack & Shure, 1974; Spivack, Platt & Shure, 1976; Tisdelle & St. Lawrence, 1986). These studies have also delineated specific problem solving skills and have shown their relative significance in determining behavioral adjustment at various ages, particularly the early childhood years.

Most studies have concentrated on either demonstrating that training significantly enhances interpersonal problem solving or in establishing the link between interpersonal problem solving and behavioral adjustment. Relatively few studies (e.g., Feldgaier 1979; Marsh, 1982), however, have outlined normative age-related changes in interpersonal problem solving skills.

While links to adjustment have been delineated at various ages, it is difficult to discern common threads among the various studies
(Spivack, Platt & Shure, 1976) due to the multiplicity of problem solving measures used and differences in the manner in which adjustment has been defined. Moreover, several recent studies (e.g., Kendall & Fischler, 1984; Mullins, Siegel, & Hodges, 1985) have questioned the links between problem solving ability and adjustment and have downplayed their role in mediating adjustment. In addition, few studies have attempted to place these links within a developmental context.

The present investigation was designed to address both issues; that is, adjustment and development, by utilizing the same problem solving measures and behavior adjustment taxonomy for the two age groups studied. This design permitted a clearer delineation of both the relationship between interpersonal problem solving and adjustment of age-related changes in the problem solving process.
 CHAPTER I
 LITERATURE REVIEW

Impersonal Problem Solving

Over the years most research on the problem solving process has concerned itself with the investigation of so-called 'impersonal' problem solving tasks (that is, the solution of such problems as anagrams, puzzles, concept identification tasks, etc.) rather than 'interpersonal' ones (e.g., Davis, 1966; Duncan, 1959; Simon & Newell, 1971; Wason & Johnson-Laird, 1968). The reason for this is largely historical in nature, for research on impersonal problem solving has always occupied an important place in basic experimental studies of thinking processes.

Within this impersonal domain, most theorists have perceived problem situations and the associated problem solving process in similar fashions. Duncker (1945), for example, stated that a problem arises when an individual has a goal but does not know how the goal is to be achieved. Thus, whenever a person cannot go from the given situation to the desired one, he or she is faced with the task of devising some plan of action which must mediate between the existing and the desired situations. Similarly, Newell and Simon (1972) and Greeno (1973) saw this process as one in which the subject's task is
to find a way of transforming the initial problem situation into the desired one. Furthermore, this path to the desired situation relies more upon higher thinking processes than upon simple conditioning or rote learning (Duncan, 1959; Duncker, 1945).

Research in the impersonal problem solving field has generally followed one of three different schools of thought: associative, cognitive-Gestalt, and informational-processing (Dominowski, 1977). The traditional learning theory or associative approach (e.g., Maltzman, 1955) basically advocates a position in which problem solving is related to trial and error and simple learning as directly as possible. Although dominant for many years, this approach is now seen to be in decline due to its rather limited value in explaining tasks other than the simple ones (Dominowski, 1977).

Unlike the associative approach, the cognitive-Gestalt position (e.g., Asher, 1963; Duncker, 1945; Scheerer, 1963) has stressed the re-organization of the problem situation as the fundamental means by which the solution is attained. Great emphasis is initially placed upon the perceptual analysis of the problem and then upon the occurrence of 'insight'; that is, to the understanding of the essential relationships involved in the task. This approach, like the associative one, possesses certain limitations. Its heavy reliance upon the occurrence of insight, a term which frequently lacks a satisfactory operational definition, does not allow for a more detailed description of the processes at work in solving the task.
The third approach, that of information-processing, serves as an intermediary between the two others in that it shares characteristics with each. As Newell, Shaw and Simon (1958) have pointed out, information processing theories resemble associative ones in their acceptance of mechanisms and the production of associations. However, unlike the associative approach which holds that a stimulus elicits mediating or overt responses, the information processing paradigm contends that a stimulus represents information to be acted upon through the use of specific processes which are called forth to deal with the incoming information. This approach can be accurately described as a mechanistic cognitive theory because it postulates the use of such processes as comparing, transforming and deciding (Dominowski, 1977).

Fundamentally, then, this approach identifies those processes that occur between the presentation of stimulus information and the performance of some response. The assumption is also made that there are certain basic principles in the problem solving process that are applicable to most any type of problem (Newell & Simon, 1972). The use of heuristics, plans and means-ends analysis are all basic to the solution of any given problem. As heuristic problem solvers, individuals utilize devices or rules of thumb which drastically limit the search for solutions and thus reduce the number of response alternatives to be considered. The specific heuristics used will differ with the particular subject matter of the problem situation but they will be used nevertheless (Newell & Simon, 1972). The use of an executive plan or process which serves to simplify the original
problem by eliminating some of the detail is also of great importance (Miller, Galanter, & Pribram, 1960). This general plan serves to guide the problem solver towards the solution of the original problem in those instances where the individual may be straying off course. Thus, while the person may be working on the solution of a somewhat tangential subproblem, the plan serves to relate this subproblem situation back to the originally desired goal. Finally, means-ends analysis is a process by which differences between the given situation and the desired one are detected and operators are then activated which serve to reduce this difference until none is perceived and attainment of the desired situation is realized (Simon & Newell, 1971). This process would appear to be at the heart of the solution procedure. While Miller et al. (1960) have proposed a specific unit (i.e. TOTE) which tests for such differences, it is the more general concept of means-ends analysis which is of importance here.

Numerous researchers have also attempted to delineate specific stages or levels through which one passes on the road to task solution (e.g., Dewey, 1910; D'Zurilla & Goldfried, 1971; Ellis, 1972; Merrifield, Guilford, Christenson, & Frick, 1962; Posner, 1973; Wallas, 1926). They have all adopted the view that problem solving is a multifaceted process which requires satisfactory passage through all stages in order to maximize successful solution.

Dewey (1910), for example, outlined five logical steps to problem solution: (a) sensing a difficulty, (b) locating or defining the difficulty, (c) suggesting possible solutions, (d) considering their consequences, (e) and accepting a solution. Wallas (1926) suggested
somewhat more general stages such as information-gathering, incubation, illumination, and verification; while Merrifield et al. (1962) expanded upon these frameworks by adding a 'reapplication' stage by which the problem solver frequently returned to a previous point in the process until an effective solution was obtained.

More recently, Ellis (1972) has suggested the following stage approach: (a) understanding the problem, (b) remembering the problems as initially conceived, (c) identifying alternative hypotheses, (d) acquiring coping strategies to deal with difficulties and frustrations possibly encountered during the problem solving procedure, and (e) evaluating the final hypothesis.

Finally, D'Zurilla and Goldfried (1971) have proposed the following stages: (a) general orientation (i.e. recognition that problems can occur and identification of them when they do happen); (b) problem definition and formulation (i.e. definition of all aspects of the situation in operational terms and formulation of elements of the situation appropriately so as to separate relevant from irrelevant information, identify major goals and specify major subproblems, issues or conflicts); (c) generation of alternatives; d) decision-making (i.e. evaluation and selection of the most suitable alternative); and (e) verification (i.e. assessment of the final outcome in order to provide feedback for possible later use in similar problem situations).

Although these approaches appear to take on a sequential ordering, there is likely an overlap between the stages with the problem solver returning, at times, to earlier stages when required to
do so or combining several of them when necessary (D'Zurilla & Goldfried, 1971).

The similarity between approaches points to considerable agreement regarding the steps necessary to solve most any problem. It should be emphasized, once again, that these stages are seen as basic to the solution of most any type of task. Whether it be an anagram, concept identification task, or an interpersonal problem, as will be argued later, each of these stages must be worked through in order to maximize the potential for successfully solving the problem.

Information on age-related performance changes on impersonal problem solving tasks is sparse. Several studies, however, have indicated some important developmental changes in problem solving strategies. Weir (1964) reported a curvilinear relationship between efficiency of performance in a probability learning situation and age. Young (3-4 years) and older (19 years) children performed better on a three-choice probability task than did those at several intermediate ages. The behaviour of the young children was accounted for by simple conditioning principles while that of the older ones was explained by their increased use and efficiency of hypothesis selection and testing. During the middle years, performance was not as good since the child tries hypotheses but lacks the information processing skills necessary for the most efficient and accurate hypothesis selection and testing. Only with increasing age does the child achieve these skills, allowing for quick testing and confirming of the hypotheses proposed. The Weir study also demonstrated that while adults reached a high level of performance on the problem, their performance curve
rose more slowly to this level than did the performance curve of the youngest subjects. This is consistent with the idea that the adults tried out a variety of other possibilities before adopting a final strategy.

Odom and Coon (1966) investigated some of the implications of Weir's study and also found that performance improved as age increased from six to nineteen years. Further, Neimark and Lewis (1967) examined the development of problem solving strategies and found that more logical information-gathering procedures were exhibited as age increased above age nine. Finally, Beilin (1967) reported developmental differences in solution time for word and nonsense anagrams for children eight through fourteen. Overall, then, these studies indicate that efficiency and effectiveness do improve with age, particularly as a result of increased hypothesis selection and testing ability.

Implications of Impersonal Problem Solving for the Interpersonal Domain

This review has previously argued that the basic processes and stages of problem solving are applicable to most any type of problem. As such, one may assume that such processes and stages may extend to interpersonal problems as well. For example, it was mentioned previously that most definitions of problem solving point to the need for the individual to devise some plan of action which permits progress from the given situation to the desired result (e.g., Duncker, 1945; Greeno, 1973). Though this definition was construed
with impersonal tasks in mind, it certainly appears general enough to encompass interpersonal problems as well. Here, too, the aim is to transform an initial problem situation (in this instance, some form of conflict involving another individual) into the desired goal. Thus, the child who wishes to obtain a toy from another who is unwilling to surrender it is faced, in a very generic sense, with a situation similar to that of a child encountering an impersonal problem. Both must devise a plan of action and proceed through various stages which will permit the resolution of this dilemma.

This generalization to the interpersonal domain does not imply, however, that the two types of problems are identical nor that the individual adept at solving impersonal tasks will be equally so skilled at interpersonal problems (Spivack & Shure, 1974). Rather, interpersonal problem solving should be considered to potentially involve the same set of skills, in a very generic sense, that impersonal problem solving does. Thus, such mechanisms as means-ends analysis, plans and heuristics should all be studied in order to determine their role in the interpersonal realm. More importantly, the generalization of the sequentially ordered stage approaches described earlier (e.g., D'Zurilla & Goldfried, 1971; Ellis, 1973) to the interpersonal domain requires attention. There does not appear to be any sound reason for precluding this generalization. On the contrary, D'Zurilla & Goldfried (1971) have argued quite forcefully that their stage approach provides a basic framework which can encompass both impersonal and interpersonal problems. They have contended that problem solving in each domain requires attention to
such tasks as the identification and definition of the problem, generation of alternatives, decision making and verification. Further, this delineation of stages underscores the belief that interpersonal problem solving, like the impersonal type, is a complete process with numerous skills being called into play at each juncture in order to most effectively resolve the conflict at hand.

Contrasts Between Impersonal and Interpersonal Problem Solving

It is also important to recognize that there are quite readily apparent differences between the two forms of problem solving.

Since interpersonal problem solving involves other individuals aside from the problem solver himself, this suggests consequences which are not generally associated with the impersonal problem solving of inanimate, physical objects. The fact that one is interacting with other individuals (rather than simply acting on impersonal stimuli) requires the recognition that the others involved will, in turn, be reacting to the problem solver's own actions. As a result, one must take into account not only the other's overt behavioral responses but also their covert feelings, intentions and responses. Ultimately, then, one must focus not only on one's own plan of attack but also on that of the others involved. This recognition that the others involved in the situation are also reacting suggests, furthermore, that the interpersonal situation is a rather dynamic one in which much restructuring frequently occurs. This is not to imply that restructuring does not also occur during the solution of impersonal tasks as well. However, the fact that one is dealing with concrete,
physical objects in the impersonal realm would suggest that changes occurring in these objects during the solution process may be more easily monitored than the covert feelings and thoughts of people in the interpersonal realm.

Unlike many impersonal tasks where there are specific and limited correct solutions to the problem presented, solutions to interpersonal problems are much more open-ended. A solution that may prove effective and appropriate for one person may not necessarily be so for another. In certain instances, moreover, a compromise solution must be reached if both parties are to be satisfied.

Spivack and Shure (1974) have also strongly asserted that the process of solving impersonal problems

"...does not allow one to become personally involved except to the extent that he is ego-involved in the task. The substance of the task is unrelated to the individual as a person. The problem is not designed to tap one's interpersonal hopes and aspirations. It has no intimate relationship to him." (p. 3)

This statement clearly denotes the high degree of emotional investment that is associated with this type of problem solving. While strong feelings may be aroused, at times, during the impersonal solution procedure, Spivack and Shure contend that there is a greater likelihood for such strong emotion to be brought forth during the interpersonal process where one's deep-rooted concerns and motivations appear to be so much more a part of the given conflict situation. This affect arousal, furthermore, may have either positive or negative consequences which can ultimately impinge upon one's effectiveness in
resolving the problem.

These, then, are some of the differences between the two problem solving domains. These differences do not, in any fashion, detract from the earlier assertion that there are also many similarities between the two. They merely suggest that there are also certain skills unique to each domain which are utilized in effective problem solving.

Interpersonal Problem Solving

The literature on interpersonal problem solving continues to grow ever steadily. Studies by Shure and her colleagues (e.g., Shure & Spivack, 1975, 1978, 1979, 1980, 1982; Spivack, Platt & Shure, 1976; Spivack & Shure, 1974), along with the work of others (e.g., Allen et al., 1976; Asarnow & Callan, 1985; Elardo & Bradley, 1977; Gesti et al., 1978; Pellegrini, 1985; Weissberg et al., 1981), have now begun to provide further insights into several specific problem solving abilities and their relationship to behavioral adjustment.

To date, the Spivack group has identified at least five interpersonal problem solving skills: (a) sensitivity to interpersonal problems, (b) generation of alternative solutions, (c) means-ends analysis, (d) consequential thinking, and (e) understanding of cause and effect relationships in interpersonal situations (Spivack & Shure, 1974). That these skills are at the core of the problem solving process is supported by the work of several others (e.g., Allen et al., 1976; Elardo, 1974; Elias et al., 1986; Gesti et al., 1978), all of whom have developed extensive training programs based
upon this framework.

The following pages will examine each of these problem solving skills more closely, giving attention to: (a) its definition, (b) method of assessment, (c) age at which it was studied, (d) relationship to behavioral adjustment, and (e) attempts to modify it through specific training.

**Sensitivity to Interpersonal Problems**

Sensitivity to interpersonal problems is primarily an ability to perceive a problem when it exists as well as a basic awareness of the variety of possible problems that may arise during interpersonal interactions (Spivack & Shure, 1974). Shure and Spivack (1975) first examined this skill in a group of kindergarten children in order to determine its relationship to behavioral adjustment. A total of 113 black five year olds attending 'inner-city' regular public schools in Philadelphia served as subjects. Sensitivity was measured by showing the child pictures depicting a situation which could elicit responses of either an interpersonal, impersonal or personal nature (e.g. a boy walking a dog and a girl angrily looking on). Children's scores consisted only of statements classifying the problem in the picture as an interpersonal one. Behavioral adjustment was assessed by teacher ratings on the Hahnemann Pre-School Behavior Rating Scale. This scale assesses classroom behavior with respect to impatience, emotionality and aggressiveness. The score is the basis for assigning a subject to one of three behavioral groups: inhibited, impulsive or adjusted.

Results indicated that inhibited children proved to be the least sensitive in classifying problems as interpersonal in nature.
However, these results were not highly significant. Further analyses showed that the predictive power of 'sensitivity' when combined with 'alternative thinking' scores significantly distinguished between behavior groups. Furthermore, correlational analysis demonstrated a significant correlation between sensitivity and alternative thinking, causal thinking and consequential thinking.

Instruction in interpersonal problem solving produced no significant improvement in sensitivity, although there was a positive trend in the direction of the trained group improving more in their sensitivity than the control group.

The study concluded that at least in the manner that it was measured, sensitivity did not have a strong relationship to behavior and did not improve greatly following problem solving training.

The results of two other studies (Shure & Spivack, 1975) further support this conclusion. In the first of these, subjects were 48 male and 48 female 4 year old black 'inner-city' children enrolled in the Philadelphia Get Set Day Care program. Sensitivity was measured as before and the Hahnemann Pre-School Behavior Rating Scale was again used. Although there were no significant differences between behavior groups on the sensitivity measure, there was a definite tendency for the inhibited children to obtain low scores. There was also no significant sex difference.

Problem solving training also produced no significant effect. Training, this time, was carried out by the child's mother at home and involved 20 of the 94 children in the day care program. Although training was not effective in significantly increasing sensitivity
scores in any of the three behavior groups, there was still a positive trend towards higher scores on post-testing for all children trained.

The second study (Shure & Spivack, 1975), involving an entirely new sample of 40 male and 40 female black 'inner-city' four year olds, utilized the same assessment measures as before. Once again there was no overall behavior main effect regarding a child's tendency to perceive interpersonal problems, although inhibited youngsters performed the poorest. Analyses did reveal, however, a sex X behavior group interaction which was borderline, with 'adjusted' girls being the most sensitive and 'inhibited' boys the least.

The effect of problem solving training on sensitivity was examined through comparisons of 20 trained children and 20 matched controls, all of whom had been part of the initial sample of 80 children and had been found to be deficient in problem solving skills. Pre-post comparisons between groups found no significant training effect nor any significant differences in behavioral improvement for either sex.

The authors (Shure & Spivack, 1975; Spivack et al., 1976) have put forward several reasons to account for these findings: (a) the measurement technique was not sensitive enough to detect differences, (b) the problem solving training program did not focus directly enough on the sensitivity skill, and (c) this skill may have served only a minor role in mediating adjustment in this particular age group. However, the fact that this ability did relate to both alternative and consequential thinking suggests that it probably
"...plays a significant role in the child's total pattern of problem solving thinking. Whether such sensitivity is an antecedent of or result of ability to conceptualize solutions to a problem and consequences of an act is not known. It is possible to assume that the child's sensitivity may lead him to think about how to go about solving a problem, but is not in itself sufficient to determine behavioral adaptation." (Shure & Spivack, 1975, p. 547)

The relationship of sensitivity to behavior has received little direct attention in other age groups. Platt, Altman, Altman, and Peizer (1974) examined a host of problem solving skills in a group of adolescent psychiatric patients (33 teens recently hospitalized with diagnoses of adjustment reaction or schizophrenia, latent type) and a group of nonpatient controls (53 high school sophomores) and found no significant differences in sensitivity scores between the two groups nor any significant sex or interaction effects. Sensitivity to problems was assessed by directly asking the subject: "What kinds of problems do you think people have in life?". Responses were scored with regard to the number of distinct problem areas the subject could conceptualize.

In a study of adult problem recognition ability, Platt and Spivack (1973) reported a similar finding for a group of 106 acute inpatients and 47 hospital staff members.

The studies just reviewed demonstrate that sensitivity to interpersonal problem situations is not a powerful mediator of adjustment. However, as it does maintain a strong relationship to
other problem solving abilities, it may still play a role in the overall problem solving process.

**Alternative Thinking**

Alternative thinking, is by far, the problem solving skill which has received the greatest amount of attention. While initial studies (e.g., Shure & Spivack, 1974) appeared impressive in their ability to link this skill to adjustment, more recent ones (e.g., Kendall & Fischler, 1984) have begun to question these earlier results.

Alternative thinking denotes an ability to generate various options or, alternative solutions, to a given problem situation (Shure & Spivack, 1970). The more solutions one can come up with the more one is likely to successfully resolve the conflict at hand.

In young children, alternative thinking has been measured through the development of the Preschool Interpersonal Problem Solving Test (i.e. PIPS, Shure & Spivack, 1974). This test assesses the child's ability to generate alternative solutions to two real life problems presented in story and picture form: (a) peer problem - ways for one child to get a toy from another, and (b) authority problem - ways to avoid mother's anger which might result from damage to property. Extensive use of this test has yielded an inter-rater reliability of 97% and a test-retest reliability coefficient of .72 (one week interval) and a coefficient of .59 for a three to five month period (Shure & Spivack, 1974).

Shure and Spivack (1970) first investigated alternative thinking in a group of 35 lower class 'inner-city' and 25 middle class four-year olds, finding both social class and adjustment group effects.
Middle class children typically produced more options both in absolute number and in the span of types of solutions proffered. More importantly, regardless of social class, adjusted children were able to generate more solutions than their more poorly adjusted counterparts. This finding was particularly true for inhibited middle class children and impulsive lower class youngsters.

A follow-up study (Shure, Spivack & Jaeger, 1971) of 62 black 'inner-city' four year olds (32 boys and 30 girls) attending Philadelphia Get Set Day Care classes found similar trends. Once again, there was a significant adjustment effect, with adjusted children (based on ratings of the Devereux Child Behavior Rating Scales) able to give more relevant solutions than poorly adjusted ones. Though both 'acting-out' and 'inhibited' children performed far below the adjusted group, there was no significant difference in ability between these two aberrant groups themselves. There was neither a sex nor IQ effect evident, although a low but significant correlation was found between problem solving and Peabody IQ. When the sample was divided into groups of high and low problem solvers, they found that: (a) the former group had a significantly higher ratio of relevant solutions to total solutions than did the latter, and (b) low problem solvers gave a higher ratio of forceful solutions (e.g., hit, grab) to the peer problem than did the high problem solvers.

A second phase of this study (Shure, Spivack, & Gordon, 1972) examined the effects of problem solving training. Of 54 children remaining from the initial 62, 22 received problem solving training.
received 'special attention' but no training and the remaining served as 'no treatment' controls. Training did, indeed, produce substantial gains in alternative thinking ability, irrespective of IQ. Further, many more of the trained youngsters showed a trend towards an increased capacity to delay gratification, although this did not reach significance. Finally, trained subjects who improved the most in alternative thinking scores also improved on significantly more behaviors measured by the Devereux Child Behavior Rating Scale, especially those with the poorest initial adjustment. Although these behavioral changes were, in general, not extremely marked, they point to the relative importance of alternative thinking in mediating behavioral adjustment.

Similar findings have been reported by Shure and Spivack (1975, year 1; see also Shure, Newman & Silver, 1973) who looked at alternative thinking ability (PIPS test) and adjustment (Hahnemann Preschool Behavior Rating Scale) in a group of 257 'inner-city' black four year olds and found that adjusted children, regardless of sex, gave significantly more solutions than did either impulsive or inhibited youngsters. They also found differences in relevancy ratios, with the adjusted group obtaining the highest and the inhibited the lowest. Similarly, high problem solvers gave a lower percentage of forceful responses, although this was not related to adjustment group. Finally, though positively correlated with Binet IQ, alternative thinking was still significantly related to adjustment status when IQ was partialled out.
Further analyses showed that while alternative thinking was related to other problem solving skills (e.g., consequential and causal thinking), the degree of overlap was not extreme. Moreover, the power of alternative thinking scores in discriminating between adjusted and non-adjusted children was pre-eminent over that of the other problem solving scores. Finally, a strong association also appeared between alternative thinking and such overt behaviors as concern for others, initiative, autonomy and liking by peers as assessed by teacher ratings.

In summary, regardless of sex or IQ, adjusted children (i.e. those who were able to wait their turn, who did not nag or display over-emotionality or excessive verbal and/or physical aggression) were those who could most readily produce a wide range of solutions to typical interpersonal conflicts. Armed with this large repertoire of options, they were more likely to successfully resolve their conflicts than either impulsive or inhibited children who were both more restricted in the number of solutions available to them.

Shure & Spivack (1975, year 3) found similar results in a study of 94 black 'inner-city' four year olds (48 boys and 46 girls). Here, too, PIPS scores were strongly related to adjustment group with adjusted children, regardless of sex, producing the most relevant solutions and inhibited the least.

The last of these preschool studies (Shure & Spivack, 1975; year 4) involved another completely new sample of 80 black 'inner-city' preschoolers. Adjusted children continued to generate the most solutions and inhibited the least, although the difference in ability
between the impulsive and inhibited groups did not reach statistical significance. Relationships between relevancy ratio and adjustment and between force ratio and PIPS scores also appeared. As in a study cited previously (Shure & Spivack, 1975, year 1), alternative thinking continued to maintain the strongest relationship to adjustment of the various problem solving skills measured.

In summary, these studies clearly show that children, rated by their teachers or teacher-aides as being behaviorally adjusted, are able to conceptualize more relevant options to specific interpersonal conflicts than less adequately adjusted youngsters can. This ability, moreover, is maintained regardless of sex or IQ and is more strongly related to adjustment status than other problem solving skills. Further, children highly proficient at generating alternative solutions are also seen as having more concern for others, greater initiative and autonomy and as being more liked by peers.

Shure and Spivack (1975, year 1; 1980) have demonstrated the effectiveness of interpersonal problem solving instruction. In a study where 113 youngsters received such training from their teachers and 106 served as controls, results revealed that each of the three adjustment groups undergoing training gained significantly more in their alternative thinking scores than their corresponding controls. These gains were equally evident for both inhibited and impulsive children.

Training produced behavioral change as well, with inhibited youngsters becoming more outgoing and impulsive ones becoming more patient, less nagging and less emotional. While 50 % of trained
children demonstrating impulsive behaviors at pretest were judged to be well adjusted at posttest, only 21% of the impulsive controls made similar adjustment changes. For inhibited youngsters, 75% of the trained children were judged at posttest to have progressed to the adjusted category in comparison to only 35% of the inhibited controls. When a comparison was made of alternative thinking scores for those children initially judged as poorly adjusted and subsequently as adjusted and those who continued to be poorly adjusted, there was evidence that a direct link between improved alternative solution scores and change in behavioral status existed. Those children who improved the most in alternative thinking ability were the same ones who changed the most in adjustment ratings.

These findings continued to hold up in later preschool studies as well. Shure and Spivack (1975; year 3) had 20 mothers individually conduct this training at home with their child. This group consisted of 12 adjusted, 6 impulsive and 2 inhibited children. Once again, substantial gains (pre-post) were made in all three adjustment groups for boys and girls.

As before, behavioral change also occurred and was linked to improved alternative thinking ability. These results, though persuasive, must be considered in the light of the fact that a comparable control group was not included in this study and that the number of poorly adjusted children that received training was relatively small. Comparisons were made, however, between the results obtained here and those previously secured in the teacher trained study. These comparisons continued to point to the effectiveness of
the mother-trained program.

Shure and Spivack (1975, year 4) obtained similar results in a final training study involving 20 mothers who carried out the training and a comparable control group. Almost all children, this time, were either impulsive or inhibited. Training produced significant gains in both alternative thinking skill and adjustment in comparison to that of the control group. The direct link between the two was also evident.

In summary, Shure and Spivack (1980, 1982) in reviewing these earlier studies, have concluded even more vigorously that alternative thinking is a prime mediator of adjustment.

Several other studies have also pointed to the beneficial effects of problem solving training. For example, Ridley and Vaughn (1982), utilizing a more comprehensive training program than the Shure and Spivack group, demonstrated that the training group, compared to the control group, showed a significant increase on both the PIPS test and on the Behavioral Preschool Interpersonal Problem Solving (BPIS) test (a modification of the PIPS which attempts to determine the actual ability of a child to generate alternatives in real-life situations). These gains continued to be maintained at a three month follow-up. Their program centered not only on instruction in generating alternatives and evaluating consequences, but also trained children in perspective taking, empathy and sensitivity to verbal, nonverbal and environmental signals. While the effectiveness of this training was clear, its role in mediating adjustment remained unanswered as no behavioral measures were employed nor any attempt made to identify
poorly adjusted children. In a later follow-up study, however, Vaughn and Ridley (1983) did report that in comparison to a contact control group, preschoolers who received the previously described comprehensive training program, demonstrated a significant increase in positive verbal and nonverbal peer interactions. Positive verbal interactions included such behaviors as praise, greetings, and positive regard of another, while positive nonverbal ones included offering help to another child, smiling, giving guidance and sharing. As Vaughn and Ridley have pointed out: "children are not just verbally better able to solve problems within the confines of the training program, but are applying these skills in a way which positively affects their interactions with others" (p. 9).

In a later study, Vaughn, Ridley and Bullock (1984) extended their previous results by examining the effectiveness of training on aggressive preschool children. One hundred and sixty-five children were screened by teachers using the Hahnemann Pre-School Behavior Rating Scale in order to identify aggressive children. Twenty-five children were thus identified of which 13 were randomly assigned to the training program and 11 to the contact control group. Training was conducted for 20 minutes per day, 5 days per week for 10 weeks and followed the guidelines described in the previous Vaughn studies. Results indicated that both at posttesting and at followup, children in the training group were able to generate a greater number of alternative solutions (as measured by the BPIPS) than their control counterparts. Additionally, the trained youngsters were less likely to engage in irrelevant talk and more likely to respond to the problem
solving task with relevant responses, requests for more information about the problem, or requests for additional time to think about the problem than the control children. These results were further maintained at a three month follow-up. As Vaughn et al. (1984) have concluded: "the results presented here demonstrate that the training procedures being taught have positively affected the interpersonal problem solving behavior of children in a laboratory setting" (p. 222). However, as they further point out, the results do not answer the question of whether this training also impacted on these youngsters' behavior in more naturalistic settings. As no attempt was made to assess behavior change, these results can only suggest that training has the potential for mediating behavior. They do not, however, conclusively demonstrate such a link.

Recent studies have also begun to question these findings. Sharp (1978), in a study of 107 black preschool children (mean age 4.5 years) found no significant difference between the three adjustment groups (ratings on the Hahnemann Preschool Behavior Rating Scale) on alternative thinking scores (i.e. PIPS test). Furthermore, her examination of the relationship between PIPS score and actual in-class behavioral observations for a randomly selected subsample of 56 children revealed a low but positive correlation between alternative thinking and negative behavior for both boys and girls, a finding contrary to that of the various Shure and Spivack studies. Sharp has seriously questioned the existence of the strong relationship between cognition and behavior as proposed by Spivack and Shure. As she has concluded: "while such a child may well have learned to verbalize
ways in which he or she can solve a problem, it is another issue as to whether that same child acts in congruence with what is verbalized" (Sharp, 1978, p. 5).

In a second study, Sharp (1981) reported on results of a training program implemented with this same sample of preschool black youngsters. Following the Shure and Spivack program and utilizing identical measures (i.e. PIPS, Hahnemann Preschool Rating Scale), Sharp found that although children's ability to generate alternative solutions increased significantly following training, this increase did not have a direct beneficial effect on behavioral adjustment as judged by the teacher rating scale. In fact, there proved to be no significant difference between the number of trained children who made a positive change in behavior and the number who made a negative change. This lack of direct effect was further confirmed through behavioral observations which demonstrated no significant effects for changes in aggressive or dominant behavior. As Sharp has concluded:

"the present data strongly suggest that at this very young age there is no consistent relationship between the child's ability to think about solutions and consequences and his/her overall level of behavioral adjustment, as operationally defined by Shure and Spivack." (p.142). Sharp, has, therefore urged caution in wholeheartedly adopting the Shure and Spivack position of alternative thinking mediating behavioral adjustment.

Finally, in a follow-up of the children trained in the earlier Sharp (1981) study, Rickel, Eshelman and Loigman (1983) reported that at a six month follow-up the gains in alternative thinking that had
been evident in the aberrant group at posttest were no longer sustained. Moreover, blind teacher ratings of adjustment as well as naturalistic observations of independent scores continued to show no significant behavior training effects. These results, they conclude, suggest that behavior change in preschoolers may not be directly mediated by interpersonal problem solving training.

Alternative thinking in kindergarten age children has been examined in one study (Shure & Spivack, 1975; year 2) comprising a total of 113 black five year olds attending regular public schools. Results, here, were almost identical to those found with the preschoolers. Significant differences appeared for all three adjustment groups on PIPS scores. Though still maintaining a relationship to other problem solving skills, alternative thinking scores still continued to be the best discriminator of adjustment among them.

Problem solving training in this age group also proved to be quite effective and the direct link to adjustment change continued to emerge. For example, in the Shure and Spivack (1980) study, 69% of pretest impulsive kindergarten children who received training were later judged to be adjusted in comparison to only 8% of the controls. Moreover, 75% of the inhibited children were judged to be adjusted following training in contrast to none of the control youngsters. Although these results are impressive, it must be noted that an extremely small sample size was used (i.e. 4 inhibited children receiving training and 3 inhibited controls). As in the nursery school studies, those children who improved in behavior adjustment
were the same ones to have improved in alternative solution thinking.

Comparisons were also made between training received in nursery, kindergarten or in both years (Shure & Spivack, 1975; 1979; 1982). Results suggested that training received in kindergarten yielded equal benefits to those obtained from training in nursery school. However, children receiving two years of training (i.e. in both nursery and kindergarten) were most proficient in generating solutions. Nevertheless, the behavioral gains made by this two year training group (as measured by the percentage of children initially rated as non-adjusted and now seen as adjusted) were not significantly greater than for those children receiving only one year of training, suggesting that "perhaps the cognitive skills obtained after one year of training, whether that year be nursery or kindergarten, are sufficient to guide adjusted overt behavior as demonstrated in the classroom" (Shure & Spivack, 1975, p. 350).

Shure and Spivack (1970) have also investigated alternative thinking in 28 lower and 33 middle class fifth graders attending regular public schools. As with the younger children, they examined both the number and type of solutions generated by these youngsters. Here, too, stories involved peer and authority problems although they were modified to suit this older age group. Adjustment was based upon teacher ratings on the Devereux Elementary School Behavior Rating Scale, a measure consisting of 47 items of observable classroom behavior divided into 11 factors (e.g., Classroom Disturbance, Disrespect-Defiance, Impatience, Closeness to Teacher). Assignment to the category of poor adjustment occurred when a child's total scores
on three or more factors fell outside a statistically defined normal range.

Results showed middle class children to perform better than their lower class counterparts, a finding similar to that found with preschoolers. However, irrespective of social class and Lorge-Thorndike IQ, adjusted children generated a greater number of solutions as well as more types of solutions than the poorly adjusted youngsters.

Few other studies have attempted to simply investigate the relationship of alternative thinking to adjustment. Asarnow and Callan (1985) examined alternative thinking ability in 30 fourth grade and 30 sixth grade boys. These youngsters were initially identified as having or not having peer adjustment problems through the use of the Class Play peer evaluation measure. This measure rates children as having either positive or negative peer status, with negative status being linked to several indicators of maladjustment, including low likeability and high aggression. Results of the study demonstrated clearly that the negative peer status group generated fewer alternative solutions, and suggested fewer mature and assertive solutions while giving more intense aggressive solutions than their positive peer status counterparts. They also tended to judge aggressive solutions more positively than the positive peer status boys. These results support the previous Shure and Spivack findings as well as those of Richard and Dodge (1982) and point to an association between alternative thinking ability and social adjustment.
While these studies have generally been supportive of a link between problem solving and adjustment, several others have been less so. For example, in an examination of fourth, fifth and sixth grade students, Mullins, Siegel and Hodges (1985) found no consistent relationship between the ability to generate alternative solutions and depressive symptoms. Youngsters in this study were initially asked to complete the Children's Depression Inventory, a self-report questionnaire that assesses the cognitive, affective and somatic symptoms of depression. Based on their scores they were then placed in either nondepressed or depressed groups. All subjects then were administered a number of measures assessing locus of control, alternative thinking and means-ends thinking. No significant difference was found between the depressed and nondepressed groups in their ability to generate alternative solutions. Mullins et al. have suggested that this finding may be due to a deficit lying in the domain of performance of the required problem solving behaviors as opposed to a cognitive deficit. They also have suggested that the instruments used to assess problem solving are poorly developed and may not adequately measure this construct. Another possible explanation may be that while children were grouped into depressed and nondepressed categories, all youngsters in the study were nonreferred children. No other ratings, by parents or teachers, were undertaken nor were clinical assessments made. Hence, the degree of depression between the two groups may have not been extreme enough to allow for problem solving deficits to emerge. Regardless of possible explanations, however, these results appear contradictory to those
described previously.

Kendall and Fischler (1984) have also reported contradictory results in their study of a wide range of problem solving skills (e.g., alternative thinking, means-ends and consequential thinking) in 150 children, ages 6-11. The results showed no systematic relationship between any of these problem solving abilities and either ratings of behavioral adjustment made by parents (Child Behavior Checklist) or those made by teachers (Devereux Elementary School Behavior Scale). Nor was any systematic link established between these written problem solving abilities and observations which attempted to assess problem solving behaviors through an interactional problem-solving task.

While the authors have pointed out that their results fail to replicate the previous findings of the Spivack and Shure group, they also have suggested an explanation which might account for the discrepancy. They note that their sample had higher mean IQ and adjustment scores, were of higher social class, were almost entirely white and had higher means-ends thinking scores than those reported by Spivack and Shure. They, then, propose that these differences "suggest that interpersonal problem solving skills are a necessary condition to attain a certain level of adjustment, above which other factors such as IQ become more important. Thus, these skills may be conceptualized as necessary but not sufficient components of higher levels of child adjustment" (p. 889).

Aside from these studies, most others have examined the effectiveness of problem solving training in modifying both problem solving ability and behavior. One such intervention is 'Project
Aware' (Elardo & Caldwell, 1979), a social development program focusing on the strengthening of both problem solving and role-taking skills. Subjects in this study were 68 nine and ten year old children (34 matched pairs); the 34 experimental children were matched on the basis of sex, race, age and group IQ scores with students in the control group. Alternative thinking was measured, once more, through the use of problem situation stories (different from those of the Spivack group) and concentrated on the number of solutions a child could generate. The Devereux Elementary School Behavior Rating Scale served as the measure of classroom adjustment.

Results of training did, indeed, demonstrate significant improvement in alternative thinking ability for the experimental group in comparison to that of the controls. Behavioral gains were made in respect for others, creative initiative, patience and self-reliance. These were not 'blind' ratings, however, and experimental teachers were aware that the children rated were part of a special program.

Despite these improvements in both alternative thinking and behavior, one cannot draw a direct link between the two as this issue was not addressed in their analysis. However, Spivack et al. (1976) have argued that since gains in alternative thinking were stronger than those in social role-taking, one might assume that the behavioral improvement was due more to the former than the latter.

In a problem solving program for third to fifth graders, Stone, Hinds, and Schmidt (1975) have reported significant gains for their trained fifth grade youngsters in alternative thinking but not for their third graders. Effects on behavior are unknown, however, as no
adjustment measures were included. In a later study, Poitras-Martin and Stone (1976) were also able to effect significant gains in alternative thinking for a group of sixth grade youngsters following problem solving training. As in the earlier study, no measures of behavioral adjustment were obtained.

The Rochester group (Gesten et al., 1978; Weissberg et al., 1981) has conducted one of the more comprehensive training programs encompassing 243 third graders divided into training and control groups and comparable in age, sex, race and socioeconomic level. Compared to the control group, trained youngsters improved significantly in alternative thinking skill as well as problem identification and consequential thinking ability. Means-ends problem solving skill, however, yielded little change. Training also served to significantly alter classroom behavior as rated by teachers utilizing the Devereux Elementary School Behavior Rating Scale. This occurred for both a factor representing 'acting out' behavior and one encompassing 'inattentive-withdrawn' behavior. It is important to note, however, that these effects were only significant for the suburban school children and not for the urban ones.

Finally, in contrast to the various Spivack and Shure training studies, the Rochester group was unable to find any direct links between the gains in problem solving ability and those in adjustment. The reasons for this are not entirely clear, although Weissberg et al. (1981) have suggested that perhaps their sample group may have been more cognitively advanced or better adjusted than the Spivack and Shure youngsters.
The Connecticut group (Allen et al., 1976) have carried out a training program for third and fourth graders based both upon the D'Zurilla and Goldfried (1971) and the Spivack models. As in the other studies reviewed, alternative thinking was assessed on tasks similar to those of the Spivack group.

Findings, here, also demonstrated the effectiveness of training. The experimental group improved significantly more than the controls on alternative solutions. They also demonstrated greater improvement on the number of steps (i.e. means-ends) generated for each solution, although this result did not reach significance. Training proved equally effective for both boys and girls as well as equally so for both third and fourth graders. Furthermore, despite evidence of a relationship between alternative thinking and verbosity and Peabody IQ, these were not strong enough to account for the improvement of the experimental over the control group.

The training also proved effective in allowing for some generalization of problem solving ability to an 'in vivo' real life situation. Significantly more experimental than control children generated more than one solution to the problem presented.

The effect of this training upon behavior change, however, was not as encouraging. There proved to be no significant changes on any of the component or total scores of the Modified Walker Problem Behavior Checklist or on peer sociometric ratings. Allen et al. (1976) have suggested three possible explanations for this finding: (a) these behaviors were not functionally related to those in the training program, (b) the interval between pre and posttesting was too
brief for change to occur, or (c) rater bias persisted in the school setting as a function of a labelling process that was resistant to change even when there were observable changes in behavior. Although Allen favored this latter explanation, Spivack et al. (1976), in a review of these findings, supported the second one: that of resistance to change in behavior over short time intervals.

In a follow-up study, McClure, Chinsky and Larcen (1978) replicated many of the findings cited in the initial Connecticut study with regard to improvement in problem solving thinking. Unlike the previous study, no measures of behavioral adjustment were included.

In a training program for 87 second and third grade learning impaired children, Helper, Farber, and Feldgaier (1982) reported somewhat disappointing results. Students participated in either a combined problem solving and tutoring program or in tutoring alone. Results showed that training in problem solving had no measurable effect either on the number of alternative solutions generated or on classroom behavior. Moreover, like Sharp (1978) in her study of preschool children, they found that at pretest, the number of alternative solutions generated correlated positively not negatively to teachers' ratings (Devereux Elementary School Behavior Rating Scale) of acting-out behavior for boys. However, for girls, there was a positive correlation to "good student" behavior, a finding more in line with the majority of problem solving studies. Finally, contrary to almost all previous studies, they found that increases in alternative thinking from pretest to posttest were actually associated with increases, not decreases, in acting out behavior for both boys.
and girls.

Gesten et al. (1982) reported inconclusive results in their examination of the effects of a comprehensive classroom-based training program for over 200 second and third-grade suburban children. Although there was a significant increase in the generation of alternatives following training which was also maintained at a one year follow-up, improvement in teacher behavior ratings was not immediately evident at posttesting. However, at the one year follow-up, significant adjustment gains were noted. Although the authors have put forth a number of possible explanations for this result, no definitive conclusions can be drawn.

Stiefvater, Kurdek, and Allik (1986) have also reported disappointing results in their evaluation of the effects of a classroom-based training program on popular, rejected, neglected and average fourth-grade children. One hundred and forty-four boys and girls took part in the study and were randomly assigned to either the social solving training program or an attention placebo control group. Prior to placement in either of these groups all children completed social status peer nominations which allowed for each child to then be categorized as either popular, rejected, neglected or average. While the results indicated a clear training effect on the generation of alternative solutions, no significant differences were found between the four social status groups in this ability. If anything, rejected children gave more irrelevant solutions than the others following training. Stiefvater et al. have argued that this may have been due to the short duration of the training which may have not been
sufficiently intense to markedly affect the deficits in these children.

In an attempt to compare the effectiveness of an 8 week Spivack and Shure type training program with that of a response cost program (i.e. where children had points deducted for misbehavior), combined social problem solving and response cost program and a no treatment control group, Olexa and Forman (1984) found a significant improvement in alternative thinking (modified PIPS test) for those children involved in the problem solving training. These gains were not only evident immediately at posttest but also were maintained at a five week follow-up. Despite these improvements in problem solving ability, no significant changes in teacher ratings (Devereux Elementary School Behavior Rating Scale) were apparent as a result of this training. Neither were significant changes demonstrated in observations of classroom behavior (Schedule for Classroom Activity Norms) carried out by trained observers. Again, there is little substantiation for a direct link between problem-solving training and positive behavior changes. However, the authors have pointed out that this lack of behavior change may have been due to the short duration of the training program. As they have concluded: "It is possible that a larger number of treatment sessions may have allowed more time for rehearsal of techniques and increased the probability of their use in classroom situations" (p. 174).

Finally, in a much more promising study, Elias, Gara, Ubriaco, Rothbaum, Clabby, and Schuyler (1986) have reported on the effect of a comprehensive social problem solving program upon children entering
middle school. One hundred and fifty-eight fifth-grade students took part in the study and either received: (a) one year of social problem solving training with a focus both on instruction and application, (b) six months of training but lacking any attempt at application (i.e. no integration of these problem solving skills in the children's daily actions), or (c) no training at all. The results clearly indicated the presence of a positive relationship between the level of training received and the children's subsequent reports of coping with stressors and adjusting to entry into middle school approximately four months after the conclusion of any formal training. Children who lacked these social problem solving skills tended to experience many intense stressors during this middle school period, while good problem solvers experienced a high or low intensity of stressors. As the authors have concluded: "differences in social problem solving skills seem to be associated with coping difficulties. For children with adequate social problem solving skills, other unmeasured factors apparently mediate the extent to which they experience intense stressors" (p. 270). They go on to argue that there is now strong evidence to demonstrate that social problem solving skills are "a consistent mediating factor in children's responding to stressors" (p. 272). As a final comment, they conclude that these results provided "one of the strongest findings to date of the potential preventive value of social problem solving programs" (p. 273).

In summary, the studies, just reviewed, clearly point to the effectiveness of training in improving problem solving skills; however, associated behavioral improvement is less clearly
demonstrated. In some instances, outcomes are ambiguous due to measurement or design flaws. Studies vary considerably in their design, format, as well as duration. As Elias et al. (1986) have pointed out, it is this variance in implementation procedures which may account for the disparities seen between various studies. They argue that this hypothesis receives support from "...the findings that interventions in ICPS or SPS that are conducted simultaneously in large numbers of settings seem to produce results that are most ambiguous or contradictory within the sample." (p. 261)

Studies of alternative thinking in adolescence and adults are extremely limited in number. Platt et al. (1974) examined a variety of problem solving skills in a group of 33 adolescent psychiatric patients (adjustment reaction and schizophrenia, latent type) and 53 normal controls (high school sophomores) and found that controls generated significantly more solutions than did patients, regardless of IQ.

Hains (1984) investigated the use of a problem solving training program with four delinquent adolescent boys. Using a multiple baseline design, results indicated that all four boys improved in their problem solving ability of hypothetical dilemmas following training. However, the results were quite mixed when generalization of these skills was examined. Although several explanations are offered, the role of training in mediating behavior change remains unclear.

In the adult years, results are also ambiguous. Although Platt and Spivack (1973) initially found significant differences in
alternative thinking ability in a comparison of 106 acute adult inpatients and 47 hospital staff members, this difference was eliminated when IQ was controlled for. Spivack et al. (1976) have suggested that this result may be indicative of a diminution in the role of this skill and the ascension of other problem solving skills (particularly means-ends thinking) in mediating adjustment.

In a recent series of studies investigating problem solving in depressed adults, results are somewhat more promising. Nezu (1985) reported that ineffective problem solvers reported significantly higher levels of depressive symptoms than effective problem solvers. In a second study, Nezu and Ronan (1985) pointed out that one's problem solving ability is linked to one's effectiveness in coping with daily problems and in one's likelihood of experiencing depressive symptoms. Finally, Nezu (1986) demonstrated that subjects receiving social problem solving training reported a significant decrease in their depression as measured by the Beck Depression Inventory and the MMPI - Depression scale. Moreover, this decrease was maintained at a 6 month follow-up. More importantly, these results proved significant when compared to subjects receiving no intervention (i.e. wait-list control) or a form of group therapy. These reductions in depressive symptoms were also linked to increases in the subjects self-appraised problem solving effectiveness.

Finally, in an interpersonal problem solving training program with seven chronic psychiatric patients, Hansen, St. Lawrence and Christoff (1985) reported that following training, problem solving ability significantly increased. This was further maintained at one
and four month follow-ups. When problem solving ability after training was compared to a sample of nonpsychiatric volunteers recruited from the community, no differences were found in solution effectiveness. However, as no measures of adjustment were included, it is difficult to ascertain whether this training also brought about significant behavioral changes.

In summary, studies of alternative thinking have demonstrated that in the early years, the evidence, save for several studies, is fairly consistent in showing that alternative thinking is closely associated with adjustment. Children rated as adjusted by their teachers are better able to generate a variety of optional solutions in comparison to both impulsive and inhibited youngsters. This holds true irrespective of IQ or sex. Moreover, these adjusted good problem solvers are better liked by their peers, show greater concern for others and more creative initiative and autonomy. Several studies have demonstrated a direct link between problem solving training and improved behavioral status. Alternative thinking ability proves to be the most prominent and important of the various problem solving skills.

During middle childhood, alternative thinking continues to play a role as evidenced by both correlational and training studies. However, contradictory studies have appeared resulting in less consistent findings, especially when training studies are examined for direct links to behavior change. In both adolescence and adulthood, where there have been fewer studies, the findings are again somewhat tentative.
Studies, however, are still somewhat limited in number and, hence, do not allow for clear conclusions to be drawn. The variations in measures used and training programs employed contribute greatly to these ambiguities in results. Thus, the assertion that alternative thinking conclusively mediates behavioral adjustment is, at best, tentative and requires further substantiation.

Means-Ends Thinking

Platt and Spivack (1975) have defined means-ends thinking as an individual's ability to orient himself to and conceptualize means of moving towards a goal. Of particular interest is the degree to which a person can plan, in a careful fashion, the discrete steps required to reach a given endpoint. It is a skill clearly predicated upon the same type of means-ends thinking that was discussed in the earlier section on impersonal problem solving.

The Means-Ends Problem Solving Test (Platt & Spivack, 1975) is most commonly used to assess this skill. This is an open-middle story format type of test in which the subject is told the beginning and ending of an interpersonal story and is then required to fill in the middle. The subject's responses are then scored for (a) the number of individual steps, or means, delineated; (b) awareness of potential obstacles that may arise in this path; and (c) the awareness of the passage of time.

To date, means-ends thinking has generally received close attention in studies of middle childhood and above. Spivack and Shure (1974) have suggested that younger children may not possess this ability in the manner defined. Consequently they may have difficulty
Shure and Spivack (1972) first studied means-ends thinking in a sample of 108 children, aged 10 to 12 years. The total group consisted of 74 normal and 34 disturbed youngsters (diagnoses were predominately personality disorder and psychoneurosis). A subdivision by socioeconomic level was also made. They reported that, irrespective of social class and intellectual functioning, the disturbed children gave significantly fewer means, recognized fewer obstacles, and were less aware of the passage of time than their normal counterparts. Furthermore, content analysis of the children's stories revealed the percentage of disturbed youngsters who gave physically aggressive, impulsive and pragmatic responses was significantly greater than the percentage of normal children who did so. Although this study points to an association between means-ends thinking and adjustment, no causal link was established.

Higgins and Thies (1981) examined means-ends thinking in 38 boys, eight to thirteen years of age, living in residential treatment for serious learning and behavior problems. They found a high relation between social position (i.e. sociometric ratings) and problem solving skill. The most popular boys saw a wider range and number of means for reaching goals than did the group of least popular youngsters.

Doerfler, Mullins, Griffin, Siegel, and Richards (1984) investigated means-ends thinking in 134 children enrolled in grades four through six. Initially all children were administered the Children's Depression Inventory followed by both the Social Means-Ends Problem Solving Test, as well as the Emotional Means-Ends Test (a
variant of the former which involves the ability to deal with one's own negative emotional states). Results demonstrated that the correlation between depression and the total number of means on either the Social or the Emotional MEPS was not significant. The only significant correlation that did appear was between depression and the total number of irrelevant means on the Social MEPS. Children who had higher depression scores tended to give more irrelevant means. Given these results, Doerfler et al. have suggested that perhaps the measure used to assess problem solving ability does not tap into the real nature of such deficits in depressed youngsters. As they have pointed out, what may need evaluation is the performance of depressed subjects rather than assessment of paper and pencil ability. "Although depressed and nondepressed individuals may possess comparable problem solving ability, performance of requisite actions may be hampered by motivational factors. Considering that lethargy and pessimism are characteristic features of depression, the distinction between skill deficits and performance deficits may be particularly important" (p. 496).

Kendall and Fischler (1984) in their comprehensive study of various problem solving skills found no significant relationship between means-ends thinking and adjustment as measured by the Child Behavior Checklist. As noted earlier, Kendall and Fischler have provided several explanations for their results which, nevertheless, remain contrary to those findings of Shure and Spivack.

The previously cited Weissberg et al. (1981) training program found that training did not significantly increase means-ends thinking
when compared to a comparable control group. Stiefvater et al. (1986) obtained similar results in a training study which was described previously in the section on alternative thinking.

Means-ends thinking has received somewhat closer attention in research with adolescents. Platt et al. (1974) examined means-ends ability in groups of 33 adolescent psychiatric patients, (adjustment reaction or schizophrenia, latent type) and 53 normal high school sophomores. Two measures of means-ends skill were utilized: (a) the standard test (i.e. social MEPS), and (b) a modified version (i.e. emotional MEPS) focussing on problems relating to the ability to cope with one's own negative emotional states, rather than problems in the social realm. On the social MEPS, they found a significant group effect with the normal controls scoring much higher than their hospitalized counterparts. Not only did the patient group give fewer relevant means but they also gave significantly more ineffective and irrelevant responses. The authors have interpreted this result as indicating that the difference between groups was not caused by motivational level or the ability to verbalize. The Platt study also reported no sex effect nor any difference between groups on the emotional means-ends task.

To further support the view that means-ends thinking distinguishes between adolescent adjustment groups, Platt et al. (1973) looked at differences in problem solving ability in a group of 28 heroin addicts and a group of non-addict controls (aged 19-21) admitted to a state reformatory. The controls not only scored higher in terms of the total number of relevant means generated, but also
produced a better ratio of relevant to irrelevant responses than did the addict group.

Doerfler et al. (1984), however, examined means-ends thinking in 99 high school students, grades 8-12, and found no significant correlations between level of depression as measured by the Beck Depression Inventory and the total number of means on either the Social or Emotional MEPS.

Gotlib and Asarnow (1979) examined means-ends thinking in mildly and clinically depressive university students. Subjects were four groups of undergraduate students: two groups (depressed and nondepressed) who were enrolled in an introductory psychology course and two groups (depressed and nondepressed) who were being treated for emotional problems at the university counselling services. Degree of depression was based upon the subject's score on the Beck Depression Inventory. Results showed that the depressed students generated significantly fewer relevant means and significantly more irrelevant means, no means and non-response answers. Similar findings were uncovered for the depressed and nondepressed students receiving counselling. Furthermore, an analysis based upon a pooling of all subjects revealed a significant correlation between depression scores and means-ends ability.

They also found that: (a) there was no significant correlation between IQ and means-ends thinking, and (b) no significant correlation between means-ends ability and performance on an anagram task. The first of these findings support Platt and Spivack's (1975) view that IQ is unrelated to interpersonal problem solving performance while the
second strengthens Spivack et al.'s (1976) contention that a distinction must be made between the cognitive processes involved in impersonal and interpersonal problem solving.

Doerfler et al. (1984), however, evaluated 28 depressed and non-depressed college women and found no significant difference on any of the MEPS scores. Given the discrepancy between these results and those of Gotlib and Asarnow (1979), Doerfler et al. have contended that an explanation may lie in the differing sample characteristics in the two studies. While subjects in their study felt that they could cope with their problems without receiving professional help, some of those in the Gotlib study had sought help at a college counselling center. Doerfler et al. have suggested that this "raises the interesting possibility that problem solving deficits are present in depressed persons who feel that they cannot cope with their problems but not in those who feel they can cope" (p. 495).

Means-ends thinking has also received some attention in studies of adults. In a study of short term psychiatric inpatients and hospital employees, Platt and Spivack (1972) have reported that the inpatient group gave significantly fewer relevant means than did the employee control group. This finding was strongly supported by a later study of Platt and Spivack (1973). Subjects were, once again, acute inpatients (n = 106 rather than the 53 in the previous study) and hospital employees (n = 47). Here, too, the inpatients generated significantly fewer relevant means as well as maintaining a much higher ratio of irrelevant to relevant means. This held true for both males and females in the study. Intellectual functioning did not
seriously affect the group differences.

Platt and Spivack (1972b) have also examined means-ends thinking on a within group basis to determine whether or not performance on this skill not only distinguished between extreme levels of adjustment (i.e. normals and inpatient psychiatric subjects) but also within a given psychiatric group. To accomplish this, Platt and Spivack examined the relationship of means-ends thinking to premorbid social competence in a group of 103 acutely ill psychiatric patients. Relative social competence for each of the patients was determined on the basis of the Zigler and Phillips scale; a scale which is an index of premorbid adaptation based upon biographical data. The authors did, indeed, find that patients with higher social competence scores had both significantly greater numbers of effective means and higher proportions of relevant means than did patients with low social competence scores.

Drawing from these results, Platt and Spivack (1972, p. 4) concluded that "...the present results extend the validity of the construct of problem solving thinking by indicating that even within the relatively restricted range of adjustment found among psychiatric patients, the capacity to problem solve is associated with higher levels of premorbid social competence".

To further corroborate this within group approach, Platt and Siegel (1976) looked at the relationship between means-ends thinking and MMPI scores in another sample of psychiatric patients (83 males and 107 females) and found that poor problem solvers (i.e patients with low MEPS scores) among males, but not females, were more clearly
schizophrenic, socially inadequate and more psychotic than their high problem solving counterparts. To explain the absence of such differences in females, the authors have suggested that the extent of psychopathology may not be as directly related to real-life problem solving thinking for this group as it apparently is for males.

Aside from studies examining the quantitative aspects of means-ends thinking, Platt and Spivack (1974) have looked at the content of such responses in order to ascertain whether differences also exist here for psychiatric and normal control groups. The patient group consisted of 122 (66 male and 56 female) psychiatric patients while the contrast group was made up of 23 male and 46 female hospital employees. Analysis of means-ends responses showed that the two groups did differ significantly in the ways used to reach the stated goals of the MEPS stories. Whereas controls were more likely to include an element of introspection before any other action on the part of the story's protagonist, the patients tended to rely more heavily on means based upon immediate and concrete action. This finding lends further support to the existence of a cognitive deficit in problem solving thinking in psychiatric patients. Not only do such patients generate fewer means but they also differ in the quality of the relevant means that they produce when compared with normal subjects.

Appel and Kaestner (1979) have reported differences in means-ends thinking in groups of narcotic drug abusers who have been judged to be in "good" standing and those deemed to be in "poor" standing. Those in "good" standing produced more relevant means and were better able
to recognize relevant means than were their "poor" counterparts.

In summary, the various studies of adult means-ends thinking just reviewed clearly point to the conclusion that "...a group of individuals demonstrating poorer behavioral adjustment, as defined by requiring psychiatric hospitalization, are less able than normals to address themselves to hypothetical real-life problem situations and are less able to provide problem solving responses effective in reaching specified goals in such situations (Platt & Spivack, 1972, p. 150).

Reports of efforts to modify means-ends thinking through specific training programs are somewhat limited in number. Intagliata (1978), in a study of 64 alcoholics at a V.A. hospital, found a significant increase in means-ends scores for the instructional group following training; whereas such increases were not event for the control group. The trained group was also able to generalize this problem solving thinking into real-life situations both within the hospital and at a post discharge follow-up one month later.

Coche and Flick (1975) have reported on a group problem solving training program developed for a sample of 41 hospitalized psychiatric patients. Forty other patients served as controls while another group of 23 took part in play-reading groups without problem solving training (placebo condition). They found that, in comparison to the control and placebo groups, patient who participated in the problem solving training produced both a significant gain in the number of relevant means-end generated and a reduction in irrelevant responses given.
This study also found that the more disturbed patients (based upon scores on the schizophrenia scale of MMPI) made only slightly greater gains than the less disturbed ones. Further, the hospital stays of the problem solving and ready group members were shorter than those of the control patients. However, this result cannot be attributed solely to the problem solving training since the placebo group was, in fact, the group which had the shortest hospital stay of all.

Although this study supports the effectiveness of problem solving training in modifying means-ends thinking, it does not demonstrate that this ability directly mediates adjustment. The only measure that might be interpreted as assessing adjustment is that of length of hospital stay. However, as the placebo group actually had the shortest stay, one may question the role played by the problem solving training in changing behavior.

It is evident from most of the studies just reviewed that performance on the Means-Ends Problem Solving Test served to distinguish between well adjusted and more poorly adjusted groups. Although contradictory studies have appeared, they are still limited in number. From middle childhood through the adult years this skill emerges as pre-eminent among the various problem solving skills in its relationship to adjustment. Evidence for its functioning in early childhood, however, is still limited. Means-ends performance also discriminates between various levels of social competency within certain pathological populations. Further, the effects of problem solving training on means-ends ability is still unclear due to limited
data. Hence its direct role in mediating adjustment has not yet been fully delineated.

**Consequential Thinking**

Consequential thinking has received considerable attention in studies with preschoolers but significantly less investigation with other age groups. It is, furthermore, a construct which has undergone accompanying transformations in definition in the various studies undertaken.

Shure and Spivack (1975) have defined consequential thinking in preschoolers as an ability to conceptualize potential consequences to a given interpersonal act. Similar in procedure to the Preschool Interpersonal Problem Solving Test (PIPS), the 'What Happens Next Game' examines the child's ability to generate alternative consequences by providing him with the solution to a problem and then asking him to tell what might happen next. Like the PIPS, this test consists of both a peer related (e.g., grabbing a toy) and an adult related (e.g., taking an object without asking) problem situation. A child's score consists of responses independently judged as a reaction by one person in direct relationship to the other person's act.

The first investigation of consequential thinking in preschoolers (Shure & Spivack, 1975) involved a sample of 257 'inner-city' four-year olds from twenty different classes within Philadelphia Get Set Day Care preschool program. All children were black and were divided into groups of 110 boys and 147 girls. In addition to the consequential thinking test, several other problem solving measures were given. Behavioral adjustment was assessed by the Hahnemann
Pre-School Behavior Rating Scale.

Analyses of the data revealed a significant behavior main effect and no sex or behavior X sex interaction for the number of different, relevant consequences generated. Children, rated as being within the adjusted behavior group, gave the greatest number of consequences whereas the impulsive group gave significantly less and the inhibited group the least, by far.

The study also found a low but significant correlation between Binet IQ and the number of consequences given. However, upon controlling for this factor, there still remained a significant behavioral group main effect. Thus, irrespective of IQ as well as the number of verbalizations, adjusted children still gave the most consequences and inhibited children the least.

Further analyses of these results revealed a significant correlation between this consequential thinking measure and several other problem solving tests (i.e. with PIPS; with Causality; IQ partialled out in both instances). Though there is some overlap between them, Shure and Spivack (1975) have argued that it is really not sufficient to suggest that all three tests are measuring the same unidimensional trait.

Finally, discriminant analyses revealed that consequential thinking scores added significant predictive power in distinguishing inhibited from impulsive children. Thus, while alternative thinking scores were still the best predictor of overall behavioral group, the combination of alternative and consequential thinking scores clearly
ailed in distinguishing between the impulsive and inhibited groups such that a child scoring poorly in both alternative thinking and consequential thinking was most likely to be placed within the inhibited adjustment group.

To more adequately ascertain the role of consequential thinking in mediating adjustment, the second phase of this preschool study (Shure & Spivack, 1973, 1975, 1980) focused on the training of interpersonal problem solving skills in a subgroup of the initial sample (113 in training group and 106 in the control group). Classroom teachers carried out the training which consisted of the basic training program devised by the Spivack group (see earlier section for description). Training in problem solving did, indeed, prove effective as the experimental group improved significantly more than the control group in their ability to generate consequences. This increase was found, furthermore, in each of the three adjustment groups within the experimental sample, with the greatest effects seen for the two nonadjusted groups.

Although the 43 trained children rated as either impulsive or inhibited (pre) and adjusted (post) increased more in the number of consequences they generated than did the 29 children who remained aberrant, this difference reached only borderline significance. These results demonstrate that although there is a link between the ability to generate consequential responses and adjustment group, the strength and directness of this link is by no means overwhelming and certainly not as strong as the link between alternative thinking and adjustment.
In a new sample of 94 black 'inner-city' four year olds, Shure and Spivack (1975) found, once again, a significant behavior main effect on consequential thinking scores. Adjusted children still performed the best while inhibited youngsters continued to be the poorest. As before, no sex differences were found.

The intervention phase of this study (Shure & Spivack, 1975: 1975b) differed from the previous one in that youngsters, this time, received problem solving training from their mothers at home rather than from their teachers in school. Twenty children (12 adjusted, 6 impulsive and 2 inhibited) received such training and it proved highly effective in significantly increasing the group's consequential thinking scores from pre to post-testing. Although a comparable control group was not available, the results, when compared with those obtained by the large control group of the previously cited study, demonstrated the continued effectiveness of this training. As in the earlier study of teacher trained children, both adjusted and nonadjusted children benefited from training and improved their consequential thinking scores.

The direct link between improved consequential thinking ability and change in behavioral status (by comparison of consequential scores of children who improved behaviorally and those who did not) could not be determined due to the relatively small sample size.

The final investigation of consequential thinking in four year olds (Shure & Spivack, 1975) involved another new sample of 80 black 'inner-city' children. Here too, adjusted preschoolers generated the most consequences and inhibited youngsters the least.
Twenty mothers carried out the training (Shure & Spivack, 1975, 1977a, 1977b, 1978) this time and, unlike the previous study, there was a comparable control group available. Pre-post analyses along with a comparison of group scores demonstrated, once more, that the training was highly effective in increasing consequential thinking in both boys and girls. The direct link between improved consequential ability and behavioral change still remained quite modest, however, and was clearly overshadowed by the strength of the link between improved alternative thinking and shift in adjustment status.

Finally, Sharp (1981, previously described) assessed the impact of training on preschoolers and found no consistent relationship between alternative thinking and consequential thinking ability and adjustment.

Shure and Spivack (1975) reported on a group of 113 'inner-city' black five year olds attending regular public schools and found there was no significant difference between behavior adjustment groups on the consequential thinking measure (i.e. What Happens Next Game). However, the trend was similar to that in their preschool studies with the adjusted group scoring the highest and the inhibited group the lowest. As an explanation they have simply suggested (Shure & Spivack, 1975, p. 247) that, perhaps, a new measure of this skill in kindergarten children be considered or that a replication of the study be undertaken. They argue, further, that since this ability still retains a high correlation with other problem solving skills, its role in interpersonal problem solving should not be dismissed for this age group.
Results of problem solving training revealed that those children who had received two years of training benefited the most in improved consequential thinking. However, children trained in kindergarten only, also made significant gains in this area. Both of these groups, along with children trained only in nursery school, all made greater gains than any of the control groups. A direct link between improved consequential skill and change in behavioral status also appeared, although this relationship was still not as strong as the one linking alternative thinking to behavioral change. This finding is interesting in light of the fact that prior to the training of these kindergarten children, there was no significant relationship between consequential thinking and adjustment group. Shure and Spivack (1975) have argued that this link is further support for their previously cited contention that the initial absence of association might be due to unexplained chance factors. Thus, consequential thinking may still play an important role in mediating adjustment in this particular age group.

Consequential thinking in later childhood years is viewed by the Spivack group (e.g., Spivack & Shure, 1974; Spivack et al., 1976) as encompassing more than the simple ability to specify what might happen after a certain action is undertaken. Rather, they envision the construct as signaling a process by which a person comes to consider the pros and cons of an action before actually carrying through with it. They see this skill as one founded upon the child's "ability to consider how his actions may affect other people and himself and how they must react" (Spivack et al., 1976, p. 72). What is implied,
then, is a certain decetration in the child's thinking such that he may view the merits of particular actions from various perspectives.

Studies of consequential thinking in mid-childhood are quite limited. Spivack et al. (1975) have reported on one such attempt carried out by Larcen, Spivack, and Shure (1972) who found no significant relationship between this ability and behavior among dependent and neglected children. In this study, they defined consequential thinking as the child's spontaneous ability to conceptualize pros and cons when faced with a situation in which there is a potential temptation to transgress. Kendall and Fischler (1984) have also reported finding no significant relationship between an awareness of consequences and ratings of behavior adjustment.

The paucity of published research with this particular age group leaves unanswered its role in mediating adjustment. Weissberg et al. (1981), cited earlier, have reported significant improvements in consequential thinking following training for third grade youngsters. However, they found no direct links to behavioral adjustment gains. Similarly, Olexa and Forman (1984, previously reviewed) found that exposure to problem solving training resulted in an improvement in consequential thinking but did not result in changes in teacher ratings of classroom behaviour.

Investigations of consequential thinking in adolescents have continued to follow this tack of measuring the subject's spontaneous inclination to weigh the pros and cons in the face of the temptation to transgress. Spivack and Levine (1963; reported in Spivack et al., 1976) examined this skill in impulsive and normal adolescents and
found that the normal youngsters were significantly more likely to consider the pros and cons of transgressing before deciding upon which particular course of action to follow.

However, Platt et al. (1974) have found somewhat contradictory evidence. In their investigation of problem solving thinking in 33 adolescent psychiatric patients (adjustment reaction and schizophrenia, latent type) and 53 normal controls, they have reported finding no difference between the two groups.

Spivack et al. (1976) have suggested that this discrepancy may suggest that this particular form of consequential thinking may be most directly related to behavioral impulsivity than to other types of behavioral adjustment. There appears to be some merit for this contention. It seems reasonable to argue that a certain degree of reflection, rather than impulsivity, is required in order for one to assess the pros and cons of a course of action before actually embarking upon it. Ultimately, one must stop, think and consider before jumping impulsively into action.

Platt and Spivack (1973) examined consequential thinking in adults in their comparison of acute inpatients and hospital employees. Looking, once again, at a subject's consideration of consequences when exposed to transgression, they found a significant difference in ability between the groups with the patient group performing the more poorly of the two. Normal adults were more likely to conceptualize the pros and cons of a particular action before carrying through with it.
Although this finding supports a relationship between consequential thinking and adjustment, the absence of additional studies, particularly training ones, within this age group leaves unanswered the role of this skill in mediating behavior.

In review, there is some evidence to demonstrate the importance of consequential thinking, especially in preschool children. In this age group, irrespective of IQ, adjusted children (both boys and girls) are typically those who generate more consequential statements than their impulsive or inhibited counterparts. Further, when combined with alternative thinking performance, it can further distinguish the impulsive from the inhibited group. These studies have also shown that consequential thinking ability directly mediates adjustment, although its effect is somewhat overshadowed by that of alternative thinking.

In kindergarten age children, there was no initial significant relationship to behavior. However, several training studies demonstrated that gains in consequential thinking ability are strongly associated with improved behavior.

In older age groups, several studies have redefined consequential thinking to include not only the ability to generate multiple consequences but also the ability to weigh the pros and cons of an action before carrying through with it. The function of this skill in mid-childhood and adolescence is still not clear, with contradictory evidence available and a general paucity of data to confirm any particular suspicions. In adults, however, consequential ability re-establishes its association with adjustment, but this is based on
Causal Thinking

The role of causal thinking in interpersonal problem solving is still unclear as most studies have produced inconsistent results.

In preschoolers, investigators have assessed causal thinking through the development of a measure aimed at evaluating the child's spontaneous inclination to think of cause and effect relationships when presented with hypothetical events that might lead one to consider such links. For example: "Billy's knee is bleeding. He is talking to his mother. What is he saying to her?" (Shure, Spivack, & Jaeger, 1971) Any response of the child indicating a possible cause of this event (i.e. bleeding knee) would receive credit.

Shure et al. (1971) administered this measure to 36 black 'inner-city' four year olds and found that it was not related to behavioral adjustment group. However, they did find that causality scores were significantly correlated with alternative thinking and consequential thinking scores. Shure and Spivack (1972) have reported similar findings for another group of 100 four year old day care children.

Shure and Spivack (1975) in their third preschool study of 257 four year olds, found that despite an initially significant adjustment effect for the number of causal statements, this effect was drastically reduced to only borderline significance when Binet IQ scores were controlled for.

It is apparent that the ability to spontaneously think in cause and effect terms is not strongly related to adjustment status in this
particular age group. However, the finding of a significant relationship between this skill and other problem solving abilities, suggests that causal thinking may play some role in problem solving, though not independently of other more pre-eminent skills.

In a large scale training study, Shure and Spivack (1975, 1980) found that although training did significantly increase causality scores for the experimental group, this was only in effect for the inhibited children within this sample. They have suggested that this result may be due more to fluctuations in statistical chance than anything else. They argue, further, that the meaning of this overall training effect is unclear due to the initial relationship of causality scores to other problem solving skills and to IQ.

In this study, they also found no direct links between improvement in causal statements and change in behavioral status. Although problem solving training resulted in marked shifts in adjustment for a large number of children, these youngsters were not the same ones who also markedly improved in their ability to think in cause and effect terms. Shure, Spivack, and Powell (1972) reported similar results in an earlier pilot training program of 52 children.

In summary, it appears that causal thinking, at least in the manner defined and assessed, does not play a key role in the mediation of behavioral adjustment in four year old black 'inner-city' children.

Results of research with kindergarten children have also been rather discouraging. Utilizing a revised causality test (what was assessed here was the ability of the child to conceptualize alternative causes given that he knew specifically, this time, that
causal statements were being sought), Shure and Spivack (1975) found that in a sample of 113 black 'inner-city' kindergarten children, the number of relevant causal statements was significantly related to behavior adjustment group, with adjusted children generating the most and inhibited children the least. Unlike the preschool studies, as well, this relationship still held up when IQ was controlled for. However, the measure's predictive power in relation to adjustment still did not add anything above that produced by alternative thinking and sensitivity scores. Thus, it is clear that the relationship of even this new measure of causal thinking to adjustment is relatively weak. This result is further underscored when the training phase of this study failed to produce any significant increases in causal ability despite the behavioral improvement of most of these children.

In summary, there is little evidence to show that causal thinking plays any direct role in determining behavioral adjustment in the early school years.

Studies of causal thinking in mid-childhood are rather limited and many date back some 20 or more years.

Ojemann et al. (1955) reported on the effects of a 'causal' program on elementary school aged children. In their view, a causal orientation "...recognizes that human behavior is produced by many factors and that one can distinguish between an approach to a given behavior incident which recognizes and takes into account the variety of factors that may have produced it as compared with an approach that considers mainly the overt form of the behavior" (Ojemann, 1955, p.95). On a more basic level, the contrast in approaches is one
between a 'deep structure' and a 'surface' analysis of the causes of behavioral responses.

Working from this conceptual viewpoint, they introduced a training program into several fourth through sixth grade classes. Results of this procedure were that children who received this training demonstrated greater 'causality' than control children. Causality was measured through the development of a test aimed at tapping "the child's awareness of the dynamic, complex, variable nature of human motivation, though it does not require that he have any specific knowledge of the behavior themselves" (Ojemann, p. 101).

Although this study showed that a child's level of awareness of the complex multiple causative nature of behavior might be raised, no attempt was made to directly assess concurrent changes in behavior that might have accompanied such a 'causal' orientation. However, such a link is suggested from a theoretical standpoint. As Bruce (1958, p. 230) has explained: "the program was based on the assumption that a child who is provided with the opportunity for understanding some of the many causes underlying his own behavior and the behavior of people about him will be able to make more effective adjustments".

This question of effects on adjustment have been answered, in part, by Bruce (1958) who found that 'causal training' (as just defined) permitted children to feel more comfortable about discrepancies which they felt existed between their self-concepts and ideal self-concepts. Lengthy training (two years in duration), moreover, resulted in children demonstrating less manifest anxiety and less observed insecurity than did children who had received only one
year of training or no training at all.

Muuss (1960a) obtained similar results by demonstrating that fifth and sixth graders who were high causally oriented showed less anxiety on the Children's Anxiety Scale and were more secure on the observational Insecurity-Security Scale.

Based upon these findings and others, Muuss (1960b) concluded that: (a) "a high causally oriented subject is less punitive, less anxious, more tolerant, more democratic, more responsible, more secure, has fewer conflicts and shows better school adjustment; and (b) "a more lasting effect involving behavioral changes should not be expected until at least two years after the beginning of training in causality" (p. 155).

Muuss also points out, regarding paper and pencil tests, that "a child might operate causally in his thinking processes and thus be able to give the kind of answer that is considered as indicative of mental health while still unable to emotionally apply causal thinking to actual situations such a conflict. He also might be rationalizing by giving the kind of answers he thinks the teacher wants" (Muuss, 1960b, p. 155).

Larcen, Spivack and Shure (1972) found a significant relationship between causal thinking and behavior among children of mid-childhood age. Despite this finding, no direct link has been solidly established due to the lack of appropriate training studies.

Investigations of causal thinking in adolescents and adults are also very limited in number. The Platt et al. (1974) study of adolescent problem solving thinking is the primary source of
information here. As with young children, they looked at causal thinking with regard to the subject's ability to spontaneously focus on the possible causes of four different problem situations. When a comparison was made of this skill in a psychiatric population and normal controls, they found no difference. Although this result suggests little role for this ability in mediating adjustment, this conclusion is based upon one study in which causal thinking was assessed in one particular fashion (i.e. a spontaneous inclination to relate cause and effect events). It may be that defined and assessed differently (e.g., ability to recognize specific causes or ability to generate multiple causes), causal thinking may proved to be related to adjustment status.

Platt and Spivack (1973), in comparing acute adult psychiatric inpatients and hospital employees, found that the spontaneous tendency to think in cause and effect terms clearly differentiated the poorly adjusted patients from the controls, irrespective of IQ. This finding, in contrast to that of the adolescent group, may indicate the re-emergence of this skill in later years.

In summary, efforts to link causal thinking to adjustment have not proven very fruitful. Studies, however, are very few in number, with the construct having been defined in a very limited and specific fashion. Redefinition may prove useful. For example, simple generation of causes has not been extensively investigated despite the fact that studies of other problem solving skills defined in this fashion (e.g., number of alternatives or consequences) have proven more successful.
Summary of Interpersonal Problem Solving and Its Relationship to Adjustment

Although not always well established, some trends have begun to emerge between interpersonal problem solving and adjustment.

During the preschool years, alternative thinking seems to play the most prominent role in mediating adjustment. Of the various problem solving skills identified, it is the one most able to discriminate between adjustment groups and, in training studies, the most closely linked to changes in behavioral status. These findings have appeared consistently in a number of investigations, although there have been several studies refuting them.

Coupled with alternative thinking skill, the ability to generate consequences is important, especially in further distinguishing between inhibited and impulsive preschool children. Increased consequential thinking ability following training produces some behavioral change, although less than that resulting from increased alternative thinking ability.

Research on causal thinking and problem sensitivity has provided rather inconsistent results in this young age group and their role in mediating adjustment is not well established.

Although there is some evidence of a relationship between alternative thinking skill and adjustment in middle childhood, training studies have proven inconclusive in establishing the directness of this link. During this age period, means-ends thinking has begun to emerge as an important skill. Generally, adjusted youngsters are much better able to produce a well thought-out,
step-by-step, plan in the attainment of a goal than are their disturbed counterparts. However, the limited number of training studies and their rather inconsistent results have left unanswered the exact role of this skill in mediating adjustment.

The role played by consequential thinking is also unclear. Defined in a fashion different from that of the preschool years, the construct has received little support in the few studies that have been conducted.

In adolescence, there is some shift in emphasis related to the various problem solving skills. Problem sensitivity still continues to be rather unimportant; but the unique way in which it has been defined may have contributed to this result. Alternative thinking maintains its relationship to adjustment but investigations of this skill are somewhat limited and not totally conclusive. Means-ends thinking now emerges as a prime skill. A number of studies has recently appeared demonstrating a relationship between this ability and various clinical groups; although, even here, some contradictory evidence has emerged.

As in middle childhood, the role of consequential thinking is unclear, with contradictory evidence found in the few studies published.

Finally, support for causal thinking as a correlate of adjustment is lacking; although, for this age group, few studies are available and, once again, the construct has been defined in a very limiting fashion.
In adulthood, there remains little evidence of a relationship between problem sensitivity and adjustment. In addition, alternative thinking seems to decline in importance as there is little support for a link to adjustment. A variety of studies, however, has linked means-ends thinking with adjustment and, although limited in number, several training studies have produced positive results.

Although consequential thinking also maintains some relationship to adjustment, this is based upon a limited survey and must, therefore, be looked upon with some reservation. Similarly, the role of causal thinking is unclear. Whereas it appears unrelated to adjustment in adolescence, it re-emerges during this adult period.

Overall, then, some links between interpersonal problem solving and adjustment have emerged. However, these links are far from clear and, in some instances, still quite tentative.

**Age Related Changes in Interpersonal Problem Solving**

As is evident from the literature just reviewed, the majority of studies have concentrated on either establishing a link between interpersonal problem solving and adjustment or in demonstrating the effectiveness of training in both improving problem solving ability and modifying behavior. Relatively little attention, however, has been paid to age-related changes in interpersonal problem solving.

Thus far, only Feldgaier (1979) and Marsh (1982) have examined the development of interpersonal problem solving skills. Marsh's study showed that with increasing grade, significant changes occur in the number and types of problem definitions, alternative solutions and
anticipated consequences.

In his study of kindergarten, fourth and eighth graders, Feldgaier (1979) found similar age-related changes in a number of problem solving skills, except alternative thinking. In contrast to their younger peers, older children were better able to recognize the existence of a problem, to consider pieces of information pertinent to subsequent conflict resolution, to foresee possible consequences of alternative solutions, to plan steps to achieve a goal, and to select solutions reflecting the consideration of various other viewpoints.

Feldgaier (1979) also found age-related changes in problem solving response types. Kindergarten children defined conflict situations in concrete, simplistic terms whereas older children provided more concise, abstract definitions which encapsulated the basic issues rather than simply retold the story events. Kindergarten boys also generated more forceful solutions than did the others. They also anticipated consequences which more frequently dealt with behavior while the two older groups more equitably divided their attention between behavioral, psychological and general conceptual issues. However, all three groups preferred solutions other than force to finally resolve the conflicts.

These results suggest a tentative description of the developmental sequence for the interpersonal problem solving process. Even at kindergarten age, boys already exhibit rudiments of the skill required at each step of the interpersonal problem solving process. However, these skills are present in a significantly lesser degree than among eighth graders. During this period, a problem is defined in
terms of its specific and concrete aspects; definitions tend to be
simplistic and vague. The relevant factors considered are mainly
behavioral. Proposed solutions are apt to be action oriented and more
likely to involve the use of force. The possible consequences of
alternative solutions are conceptualized significantly in behavioral
terms.

At fourth grade, increments in all abilities occur but the
significant shifts are in problem recognition and solution adequacy.
More problems are recognized and more solutions which take into
account various perspectives are preferred. Significant qualitative
changes characterize problem recognition and consequential thinking.
At this period, the scope of the problem is defined more broadly.
Drawing upon knowledge and experience, the child includes
ramifications beyond what is actually presented in the story. There
is a definite improvement in the ability to define the problem in more
abstract terms but some boys still tend to give long definitions which
simply retell the story. Potential consequences are significantly
less likely to be behavioral; psychological ones are anticipated
almost as frequently.

By eighth grade, further consolidation of age-related changes
takes place. The child is significantly more able than the
kindergartener to recognize problems and to conceptualize them as more
general social issues, (e.g., friendship and fairness). There is also
a much greater capacity to anticipate possible consequences, in
psychological as well as behavioral terms. Attention is now given to
the thoughts and feelings of others as well as to their actions.
There is very little reliance upon force as an effective means of conflict resolution. Instead there is a concerted effort to arrive at solutions equitable to all parties involved.

These results clearly point to interpersonal problem solving being a developmental process, characterized by sequential changes in number and type.

**Perspective Taking, Adjustment and Interpersonal Problem Solving**

Whereas this review has focused primarily on the link between interpersonal problem solving and adjustment, it is not the only social-cognitive skill which has received attention recently. The ability to recognize and infer the feelings, intentions, thoughts and perceptions of another person (i.e., perspective taking) has received increasing attention during the past few years (e.g., Burka & Glenwick, 1975, Hoffman, 1977, Shantz, 1975) as investigators explore its role as a potential mediator of behavioral adjustment.

While research on perspective taking is fraught with contradictory evidence, there does appear, however, to be some consensus that it is a multi-dimensional construct (e.g., Kurdek & Rodgon, 1975; Shantz, 1975) encompassing at least three forms: (a) perceptual perspective taking; that is, the skill to take another's perceptual view; (b) affective perspective taking; that is, the skill to infer the other's feelings and emotions; and (c) cognitive perspective taking; the skill to determine the other's thoughts and intentions. As a variety of studies (e.g., Kurdek & Rodgon, 1975; Zahn-Waxler, Radke-Yarrow, & Brady-Smith, 1977) all have reported
either non-significant or low but significant correlations among scores on tests of perceptual, cognitive and affective perspective taking, there appears to be adequate support for asserting its multi-dimensional nature.

Kurdek (1978) has pointed out, however, that within each of these dimensions, one may further discern separate component skills which are assessed by qualitatively different tasks. For example, within the cognitive perspective taking sphere, he refers to evidence (Kurdek, 1977; Piche, Michlin, Rubin & Johnson, 1975; Urberg & Docherty, 1976) supporting the identification of four separate processes: (a) successive decentering, (b) simultaneous decentering, (c) recursive perspective taking, and (d) referential communication.

Concerns have also been raised about the psychometric qualities of various perspective taking tasks. In many instances, little regard has been given to issues of test-retest reliability and internal consistency, particularly for tasks of perceptual and affective perspective taking (Kurdek, 1978). Where such issues have been examined, the results have been somewhat disappointing. For example, a task which is frequently used to assess affective perspective taking is that of Rothenberg (1970). Rubin (1978) has reported average inter-item correlations of .18, .20, and .39 for use of this task in grades 1, 3, and 5. Overall, the inter-item correlations was .50. Rothenberg (1970), herself, has reported inter-correlations among item scores ranging from .28 to .47; scores which can be seen as indicative of a relatively low degree of internal consistency.
Within the cognitive perspective taking sphere, somewhat more attention has been given to such psychometric issues, although, once again, with somewhat disappointing results. For example, one of the more popular cognitive role-taking tasks is that of Feffer and Gourevich (1960). Feffer and Gourevich (1960) reported a correlation between scores of .42 while Kurdek (1977) found a correlation of .40 as did Turnure (1975). However, Keller (1976) reported a disappointingly low correlation between item scores of .27.

Findings have been somewhat more promising with regard to the Chandler (1973) perspective taking task. Chandler (1971) found correlations among item scores ranging from .38 to .87 while Kurdek (1977) reported correlations of .56 to .68. Rubin (1978) obtained an overall inter-item correlation of .52, though somewhat lower correlations were found when internal consistency was examined within each grade level of subjects tested in the study.

In summary, it appears that perspective taking is a multi-dimensional construct incorporating a variety of component skills which are measured by a variety of different tasks having varying degrees of psychometric acceptability.

As in the interpersonal problem solving domain, studies of perspective taking have concentrated on either establishing a link between perspective taking and adjustment or in showing that training significantly enhanced perspective taking skill.

In the former domain, Chandler (1973) found sharp differences in cognitive role taking skills in a group of 45 chronically delinquent and 45 nondelinquent boys, ages 11 through 13. Whereas the
nondelinquent boys had little trouble adopting the role of others, the delinquent boys "...by contrast, typically demonstrated marked deficits in their ability to differentiate their own point of view from that of others and regularly attributed to others information available only to themselves" (Chandler, 1973, p. 329).

Platt et al. (1974) in their examination of adolescent psychiatric patients and high school controls found that the latter group was clearly better able to see situations from the perspective of other individuals. Platt and Spivack (1973) obtained similar results in their study of adult psychiatric patients and normal controls.

Chandler, Greenspan, and Barenboim (1974) in a study of 125 emotionally disturbed institutionalized youngsters, ages 8-15, found that they exhibited a relatively high level of egocentric thinking. In contrast to normal non-institutionalized children, their cognitive perspective taking ability was clearly inferior with most of the them frequently confusing their own points of view with those of others.

Selman (1976) found similar results for a measure of social perspective taking among children ages 7-12 identified as having learning and interpersonal problems requiring special school placement. When contrasted with matched normal controls from public schools, the group with interpersonal difficulties possessed significantly poorer perspective taking skills.

However, Shure (1978) and Shure and Spivack (1978) report that in one of their investigations of nursery school aged children, they found only a minimal relationship between affective perspective taking
and measures of behavioral adjustment.

Kurdek (1978) examined the relationship between cognitive perspective taking and teacher ratings of classroom behavior for 96 children in grades one through four. He found that those children rated as most aggressive by their teachers had better perspective taking abilities as measured by the Chandler Bystander Cartoon Test than did their nonaggressive counterparts. Kurdek has suggested that such a result should lead one to "avoid the simplistic expectation that just because children have good cognitive perspective taking skills they should ipso facto be altruistic, cooperative, etc." (p. 26). He goes on to point out that clearly the motivational system underlying behavior is worthy of attention, as both "prosocial and antisocial behaviors can be performed for various reasons, only some of which involve an ability to consider the other person's point of view" (p. 26).

In a similar study, however, Burka and Glenwick (1978) found somewhat contradictory results. Subjects were 53 white fourth grade children who were rated by their teachers on two measures of classroom adjustment. All children then completed the Chandler Bystander Cartoon Test as well as a measure of peer sociometric status. Results demonstrated that the boys who performed poorly on the perspective taking measure (i.e. were highly egocentric), were also those who were rated by their teachers as aggressive, acting out, having learning difficulties and unpopular with their peers. For girls, however, high egocentrism was related to a tendency towards shy, anxious behavior. No significant relations were found between egocentrism and
sociometric status. The authors have proposed that both types of behavior (i.e. acting out in boys and shy, anxious behavior in girls) hamper the development of close, interactive relationships with peers. Consequently, both boys and girls lacking these close contacts with peers, are thereby limited in their opportunity to be exposed to differing viewpoints. Hence, they continue to remain highly egocentric.

In a more recent study, Waterman, Sobesky, Silvern, Aoki, and McCaulay (1981), examining perspective taking in fifth and sixth grade groups of emotionally disturbed, learning disabled and normal boys, found that the emotionally disturbed boys were significantly inferior to the normal boys in their cognitive perspective taking ability. However, within group analyses pointed to a significant positive correlation between affective perspective taking and antisocial behavior among the emotionally disturbed group. This was in clear contrast, though, with the nonsignificant but negative correlation between anti-social behavior and perspective taking in the normal group.

The study also found a strong correlation between both affective and cognitive perspective taking and teacher ratings of withdrawn-gregarious behavior across the sample. When the three groups were considered separately, it was only among the emotionally disturbed group that the correlations either reached (i.e. for cognitive perspective taking) or approached significance (i.e. for affective perspective taking).
The results of the Waterman et al. (1981) study are not as clearcut as those of the other studies previously reviewed. Although there is evidence to show differences in perspective taking ability based upon adjustment group in this study as in the others, the more refined analyses undertaken here (i.e., examining the relationship between types of perspective taking and specific behavioral dimensions within adjustment groups) suggest that the relationships implied by studies which utilize relatively heterogeneous groups of emotionally disturbed subjects (e.g., Platt et al., 1974) and simply contrast them with normal controls, may not be as straightforward as initially depicted.

To further confuse the picture, Rubin (1982) found that preschoolers who were judged to be more withdrawn than their peers did not differ significantly from their peers on a measure of perspective taking.

While most of the above studies have suggested a link between perspective taking and adjustment, it is not clear whether this skill is, in itself, a direct mediator of adjustment. As with some of the interpersonal problem solving training studies, not all perspective taking training studies have included behavior ratings as part of their research design. For example, VanLieshout, Leckie and VanSonsbeek (1976) compared a group receiving social perspective taking training to a no treatment control group. Although the results showed a significant improvement for the treated youngsters (3 & 4 year olds but not 5 year olds) in comparison to the controls on a variety of affective and cognitive perspective taking tests, there was
no attempt made to assess behavioral change. The authors, themselves, recognized this point and stated that "...it is also important to know whether the intervention program exclusively influenced internal behavior structures or at the same time influenced the concrete social behavior, e.g., the amount of aggressive behavior, cooperation, altruism, etc." (p. 600).

Silvern, Waterman, Sobesky and Ryan (1979), in a study of 34 middle class fourth and fifth graders, were also successful in improving cognitive and affective perspective taking skills following training. Self-esteem also improved and there was a significant decrease on a measure of defensiveness as well. However, like the previous study, no behavioral measures were included.

In a study of institutionalized delinquent females aged 13 through 16, Little (1979) found little evidence for the effectiveness of perspective taking training when contrasted with an attention control group. Although there were improvements in cognitive perspective taking following training, differences between groups at posttest were not significant.

Iannotti (1978), in a study of 40 six and nine year olds used both a role taking and a variant role switching intervention. Both treatments resulted in increases on measures of cooperation and altruism in comparison to a control group. However, there was no change on measures of empathy and aggression.

O'Connor (1977) also found no behavioral change in a training study with pre-schoolers. Although there was improvement on a measure of perceptual perspective taking, no significant change occurred on a
cognitive perspective taking test or on observational measures of free play.

Enright and McMullin (1977), working with sixth graders, obtained rather mixed results in their training program. Although successful in improving results on a measure of interpersonal understanding, less success was achieved on tests of referential communication, cognitive role taking or means-ends thinking. As in previous studies, no behavioral measures were employed.

Murray and Ahammer (1977, cited in Urbain and Kendall, 1980) also obtained inconsistent results with four and five year olds. Perspective taking training brought increases in cognitive perspective taking, altruism and empathy but not in cooperation.

Chandler, Greenspan, and Barenboim (1974), working with 48 institutionalized, emotionally disturbed children aged 9-14, were successful in improving cognitive role taking skill by either training in perspective taking or referential communication. A follow-up conducted one year after training, although showing only a trend towards significant adjustment change in the experimental groups, did reveal, however, significant relationships between the degree of behavioral change and the degree of change in cognitive perspective taking skill.

Finally, in one of the most successful training studies, Chandler (1973) has reported on a cognitive role taking program for chronically delinquent boys. Here, 45 delinquent boys aged 11-13 were divided into role taking, placebo and no treatment control groups. Following treatment, only the youngsters in the role taking training group
improved significantly in their perspective taking skill. Even more promising was the finding that 18 months after training, the role taking group had a significantly lower recidivism rate than the other groups. However, Chandler (1973) has pointed out that "... it must be stressed that demonstrating a relationship between persistent social egocentrism and anti-social behavior does not, in itself, provide a sufficient basis for inferring a causal relationship between these variables. The possibility remains, however, that the experimental training program differed from the training received by the placebo group along dimensions other than the role taking and perspective taking training specified and that the observed differences in test performance and delinquent behavior are traceable to these effects" (p. 331).

In summary, most of these studies point to the successful implementation of perspective taking training. However, less clear is their impact on behavioral change. While effective in some instances, they are less so in others. Thus, the role of perspective taking as a direct mediator of behavioral adjustment is still left unanswered.

Results of the previously reviewed social skills training program of Elardo and Caldwell (1979) would also suggest that perspective taking may not be, in itself, enough to promote behavioral change. Concentrating upon both the training of perspective taking and social problem solving, they obtained results which pointed to a more direct link between alternative thinking skill and behavior than between perspective taking and behavior.
Given the mixed results of the various perspective taking training programs, several studies have, instead, attempted to delineate the relationship between perspective taking and interpersonal problem solving. Shure and Spivack (1978) have suggested that perspective taking ability should enhance problem solving thinking by "enriching the nature and range of solutions from which to choose and should also enrich one's appreciation of consequences" (p. 15). Moreover, they see this perspective taking skill as ultimately influencing the decision making process for "...such a perspective taking child also should be better able to select the one solution that might best work, considering the individual he is facing and how the latter is likely to react" (Shure & Spivack, 1978, p. 16).

Along these lines, Hudson, Peyton, and Brian-Maisels (1976) found significant positive correlations between perspective taking and interpersonal problem solving among second graders while Affleck (1975) obtained similar results among retarded young adults. Platt and Spivack (1973), in their study of adult psychiatric patients and normal controls, factor analyzed scores on a perspective taking measure and a variety of problem solving tasks and found that perspective taking loaded highly on the same factor as means-ends thinking for the normal control group. Results were quite similar for the patient group except that perspective taking was now coupled with causal thinking along with means-ends thinking on the same factor.

Marsh, Serafica, and Barenboim (1981), in a study of both male and female eighth grade students, found a strong relationship between
measures of both social and affective perspective taking and means-ends thinking as well as analytical thinking (i.e. total problem solving). This study also pointed to a more consistent relationship between interpersonal problem solving and interpersonal functioning than between perspective taking and the latter.

In a developmental study of a variety of interpersonal problem solving skills, Feldgaier (1979) found, within a fourth grade sample, that a measure of cognitive perspective taking (i.e. Chandler’s Bystander Cartoons) was negatively related to solution adequacy scores. Hence, the more egocentric the child, the less his final preferred solution plan reflected the consideration of various other viewpoints relevant to the problem.

These studies all seem to point to a link between role taking ability and interpersonal problem solving. Although perspective taking may have more influence on certain specific problem solving skills than others, it is difficult to identify consistent patterns. This may be partly due to the variety of perspective taking measures used and the various problem solving skills examined. There is also some evidence to link perspective taking to behavioral change; although, again, results are inconsistent. How these three variables (i.e. perspective taking, adjustment, and problem solving) inter-relate is still, however, open to some speculation.

Statement of the Problem and Elaboration of Hypotheses

From the interpersonal problem solving literature just reviewed, it is clear that many issues have yet to be directly addressed.
Although one can detect some emerging links between interpersonal problem solving and adjustment, they are tentative and even disputed by some (e.g., Kendall & Fischler, 1984). Even where these ties are more strongly supported, the link is generally made to very broad definitions of adjustment. Little research has attempted to delineate more clearly the relationship between problem solving ability and either traditional diagnostic nomenclature or other forms of classification, such as empirically based factor analytic approaches. Thus, there is little information that links specific problem solving deficits to either specific diagnostic groups or to broader behavioral dimensions.

Although Spivack et al. (1976) acknowledged this lack of information some years ago, the intervening years have resulted in only modest gains being made (e.g., Tisdelle & St. Lawrence, 1986) in establishing a link between the two. Still lacking is a comprehensive and clear picture of the relationship of interpersonal problem solving to various clinical groups.

As was noted earlier, the strongest links seen are those in preschool and kindergarten youngsters exhibiting inhibited-withdrawn, impulsive-impatient and normal behavior. While the relationships, here, are generally clear, one must remember that essentially all children in these studies were 'normal' in that none were clinically diagnosed as having excessive behavioral difficulties.

In the middle childhood years, the links are even less straightforward. Few studies have attempted to extend the findings of the preschool groups to similar behavioral dimensions (i.e.,
inhibited-withdrawn, impulsive-impatient) in this period. Shure and Spivack (1970) dealt with fifth graders where adjustment was based upon ratings on the Devereux Elementary School Behavior Rating Scale. As was pointed out previously, assignment to the category of poor adjustment occurred when a child's total score on three or more of the scale's eleven factors fell outside a statistically defined normal range. Though we see, for example, a significant difference in alternative thinking skill between the adjusted and nonadjusted groups, the most one can say in describing this nonadjusted sample is that it is rather heterogeneous in its composition. One cannot even make the simple delineation here between impulsive and inhibited youngers. One can make a similar argument regarding another study (Shure & Spivack, 1972) pertaining to this age group. Although this investigation merits approval for its use of a clinical population along with a 'normal' contrast group, the clinical sample is rather heterogeneous in make-up, comprising youngsters diagnosed as either personality disorder or psychoneurosis. Here, again, despite the evidence of clear cut differences in problem solving skill between the 'normal' and clinical groups, one cannot more clearly define the clinical group and attempt to draw any parallels between these results and those obtained in the preschool studies.

For studies in the adolescent and adult years, the picture is not much better although there is, at least, an attempt to utilize clinical groups more frequently. Once more, however, the clinical groups are rather heterogeneous and ill-defined. For example, Platt et al. (1974) examined a group of adolescents diagnosed as either
adjustment reaction or schizophrenia, latent type. Such diagnoses are clearly broad and loosely defined.

One of the few studies attempting to be more specific and limiting in its scope is that of Gotlib and Asarnow (1979) who found significant differences in means-end thinking in mildly and clinically depressed university students in contrast to non-depressed students. The use of clearly defined clinical groups in this study makes it all the more valuable in our understanding of the relationship between interpersonal problem solving and adjustment.

The use of rather heterogeneous and poorly defined clinical groups raises several problems. On the one hand, where significant differences in problem solving skill are obtained between adjusted and broadly defined nonadjusted groups, it does not allow one to delineate more accurately whether there are also significant differences within the nonadjusted group itself based upon some form of clinical classification. On the other hand, in some instances where significant differences in problem solving skill are not seen between adjusted and nonadjusted groups, it may be that such differences are masked by the heterogeneity of the nonadjusted group. Thus, if one were to subdivide this group into more homogeneous groupings, one might observe differences in problem solving skill which are less clearly seen when the entire group is lumped together and then simply contrasted with an adjusted sample.

Finally, the use of loosely defined, widely disparate clinical samples, along with attempts to assess different problem solving skills with a wide variety of measures for each of these studies,
makes it all the more difficult to generalize results from one study to another and to pinpoint the stage at which certain problem solving skills emerge as more potent discriminators of adjustment status. This is particularly true in the mid-childhood period where there is a rather incomplete picture of the relationship of the various problem solving skills to adjustment. This is, in part, due to the loosely defined manner in which nonadjustment is defined in many of these studies; and, in part, due to a less than comprehensive attempt to examine a variety of problem solving skills rather than simply one or two. The use of differing measures also makes it difficult to generalize from study to study. One need only contrast this with the research conducted in the preschool and kindergarten age periods to support such a contention. Here nonadjustment is more clearly defined and further subdivided into distinct groups. Moreover, this method of classification is carried through for all studies, thus allowing for greater generalization of results and for a clearer understanding of the relationship between a variety of interpersonal problem solving skills and behavior adjustment group.

The question then arises as to which would be the most appropriate and productive classification scheme to be utilized in attempting to more clearly discern differences in problem solving ability among adjusted and nonadjusted youngsters. In a broad sense, one may divide these approaches to classification into those that rely heavily on traditional clinically based diagnostic nomenclature and those which depend more directly upon statistically based empirical methods. Whereas the former approaches (e.g., Diagnostic and
Statistical Manual of Mental Disorders of the American Psychiatric Association, i.e. DSM-III, 1977; Committee on Child Psychiatry of the Group for the Advancement of Psychiatry, GAP Report No. 62, 1966) are largely based on a variety of competing and conflicting principles such as presenting symptoms, etiologic considerations, and theoretical orientation (Eysenck, 1986), the latter approaches focus primarily on observable behaviors which are analyzed through factor analytic or cluster analysis techniques in order to identify patterns of behavior which are interrelated. Such an approach avoids many of the difficulties and criticisms which have been directed at the clinically derived classification schemes (Achenbach, 1982; Achenbach & Edelbrock, 1978; Quay, 1979, 1986). These empirical approaches are viewed as being potentially more objective, reliable and readily quantifiable than the diagnostic categories designated by the traditional methods (Achenbach, 1979; Quay, 1986).

The clinically derived approaches have received numerous criticisms on a variety of issues. The DSM classifications of the American Psychiatric Association, in particular, have received many of these complaints. Many of these criticisms center on the reliability of these particular traditional schemes. For example, Rosen, Bahn, and Kramer (1964) reported that even though a variety of categories were provided for the classification of child pathology in DSM-I, over 70% of children assessed in clinics were diagnosed as having adjustment reaction or no diagnosis.

Carreto and Tuma (1977) in their investigation of DSM-11 category usage, found that 37.8% of the children diagnosed fell into the
transient situational disorders category while another 30.3% fell into the behavior disorders category. The remaining cases fell across a wide variety of categories including those designed primarily for adults. Although the study pointed to an increased usage of categories over that of DSM-I, it also noted that some categories (e.g., transient situational reaction) were overused and that overall, the results "...must be tempered by the unknown reliability of the assigned diagnostic labels" (p. 154). In a study comparing DSM-II and DSM-III childhood diagnoses, Mattison, Cantwell, Russell, and Will (1979) found that average inter-rater agreement was 57% for DSM-II and 54% for Axis I of DSM-III; hardly a significant improvement in agreement for the latter classification scheme. To highlight this further, Cantwell, Russell, Mattison, and Will (1979) reported that average rater agreement was less that 50% when compared to the expected diagnosis. This hardly bodes well for a system attempting to be both comprehensive and well defined. Although Werry, Methven, Fitzpatrick, and Dixon (1983) and Strober, Green, and Carlson (1981) report slightly higher inter-rater reliabilities, Quay (1986) has pointed out that "despite the efforts of various researchers to date, the reliability of many of the major Axis I diagnostic categories remains insufficiently examined, either because there are no data or because the data came from a single study where sample sizes in many categories were very small" (p. 161).

Studies of reliability for adult diagnostic categories are not exceedingly more promising. For example, although Kreitman, Sainsbury, Morrissey, Towers, and Schriver (1961) found an inter-rater
reliability of about 80% for broad classes of psychiatric disturbance, this reliability dropped to about 65% when more specific categories were utilized. Beck, Ward, Mendelson, Mock, and Erbaugh (1962) reported that inter-rater reliability was only about 54% in their investigation of specific diagnostic category classification.

Similar criticisms have been leveled against the classification scheme proposed by the Committee on Child Psychiatry of the Group for the Advancement of Psychiatry (1966). Freeman (1971) reported on one such reliability study in which he had 20 psychiatrists classify 44 case histories. Agreement was moderate, at best, with all 20 psychiatrists only demonstrating perfect agreement on two of the 44 cases. On eight other cases there was agreement by 16 to 19 psychiatrists; in eleven others, 13 to 15 raters agreed. Overall, there were 70% of the cases in which eleven or more of the raters agreed. Reliability proved even lower when attention was given to levels of agreement on subcategories rather than on the broader general categories. A follow-up three months later, in which 6 of the 44 cases were reassessed, yielded a test-retest reliability of 72%.

Beitchman, Dielman, Landis, Benson, and Kemp (1978) and Tartar, Templer, and Hardy (1975) have also reported finding low to moderate reliabilities.

Aside from these reliability results, Edelbrock and Achenbach (1980) have argued that the GAP system consists of descriptions of disorders that are not operationally defined and thus further lends itself to high degrees of inference and poor reliability. Moreover, both Rutter (1965) and Achenbach (1974) have pointed out that the
varied theoretical leanings of the system lead to contradictions and conflicts in the definition of certain categories.

Other clinically derived classification schemes do not seem to provide significantly better results. With regard to the World Health Organization system, Rutter, Schaffer, and Shepherd (1975) reported an average inter-rater agreement of 67% for a series of case histories.

Aside from concerns over poor to moderate reliabilities associated with these approaches, Quay (1979) and others (e.g., Achenbach, 1974; Edelbrock & Achenbach, 1980) have raised concerns over the lack of studies examining the validity of these schemes. Edelbrock and Achenbach (1980, p. 442) have pointed out that: "it is also questionable whether these systems are useful in differentiating among disturbed children with respect to etiology, prognosis and differential response to treatment". Finally, in a review exceedingly critical of the DSM-III scheme, Eysenck, Wakefield, and Friedman (1983) have written:

"Our survey of the available evidence on the DSM-III leaves us with the impression that while an improvement on previous schedules, the new scheme is based on foundations so insecure, so lacking in scientific support, and so contrary to well established fact that its use can only be justified in terms of social need. Psychologists may have to use the system because of social pressures of various kinds, but this should not blind them to the fundamental weaknesses of any such scheme based on democratic voting procedures rather than on scientific evidence." (p. 183)

From this brief review, it is clear that important questions and serious concerns have been raised over the diagnostic utility of
these clinically derived systems; and, far from being universally accepted, various other attempts have been made to provide taxonomies which are more reliable, useful and better defined.

Alternative approaches to these traditional taxonomies are systems which are statistically derived and attempt to be more firmly based in empirical data (Achenbach, 1979). Hence, they strive whenever possible to deal with operationally defined, observable behaviors which through multivariate statistical procedures are deemed to be inter-related. In this manner, they attempt to avoid the problems and concerns which have been raised over the traditional taxonomies (Achenbach, 1982; Quay, 1979).

Although some concerns have been voiced with regard to these approaches (e.g., method of data selection, selection of which behaviors to analyze), Quay (1979) has observed that "...multivariate statistical approaches, although not without some associated difficulties, are currently the methods of choice for classification-system construction" (p. 13). Achenbach (1982), Achenbach and Edelbrock (1978), and Martin, Hooper, and Snow (1986) have all echoed similar feelings.

In comprehensive reviews of studies employing such approaches to classification, both Achenbach and Edelbrock (1978) and Quay (1979) have concluded that these investigations point to the consistent appearance of two broad band behavioral factors, regardless of the source from which the data was collected or the specific group of children examined. Although these studies may have revealed less consistency among narrow band factors, the two broad band syndromes
repeatedly surfaced. The first of these encompasses problems primarily within the self whereas the second encompasses problems with the outside world (Achenbach, 1979). These two syndromes have taken on various names throughout the years depending upon the study in question. For example, Hewitt and Jenkins (1946) in an examination of clinical case histories labelled these syndromes overinhibited and undersocialized aggressive. Peterson (1961), in a factor analysis of behaviors culled from clinic case histories, found two similar groupings which he titled Personality Problem and Conduct Problem. Miller (1967), likewise, produced two broad band categories, Inhibition and Aggression. Finally, in an extremely comprehensive and thorough examination of clinic case histories (600 cases of children aged 4 through 16), Achenbach (1966) proposed two broad syndromes labelled Internalizing and Externalizing which accounted for an exceedingly large portion of the observable problem behaviours reported.

As suggested earlier, these studies all point to the consistent appearance of these two behavioral dimensions; that is, one in which overcontrol (i.e. inhibited, shy-anxious) and another in which undercontrol (i.e. aggressive, acting out) characterized the behaviors clustering in each group (Achenbach & Edelbrock, 1978). Kohn and Rosman (1972), Quay and Quay (1965), Schectman (1970) have all reported similar dimensions.

The comprehensive reviews by both Achenbach and Edelbrock (1978) and Quay (1979) have also provided support for the validity of these multivariate statistical approaches and, in particular, the two broad
band groupings of Internalizing and Externalizing. These reviews have reported clear differences between these two syndromes in such areas as locus of control, impulsivity, physiological responsiveness, school performance, and family and parental characteristics.

Drawing from his initial comprehensive study (Achenbach, 1966) which examined clinic case histories, Achenbach has recently devised a 118 item checklist to be completed by parents in rating the severity of child behavior problems (Achenbach, 1978; Achenbach & Edelbrock, 1979, 1981, 1983). Factor analyses of these ratings have produced two broad band groupings quite similar to those Achenbach (1966) obtained in his original analyses of clinical case histories. Due to this similarity, Achenbach (1979) has also given these new groups the labels Internalizing and Externalizing. Additional analyses have produced nine reliable narrow band problem factors for boys, aged 6-11, boys, aged 12-16 and girls, aged 6-11 (Achenbach, 1978; Achenbach & Edelbrock, 1979). Normalized T scores have been computed for both the narrow band scales and broad band groupings and are based on the checklists filled out by 1300 randomly selected parents of normal children.

Extensive studies (Achenbach, 1978, 1979; Achenbach & Edelbrock, 1979, 1981, 1983) have shown the Profile Scales to have quite adequate test-retest reliability (intraclass correlation coefficient of .952 at a 1 week interval and .838 at 3 months) and inter-parent agreement (intraclass correlation coefficient of .985). In a comparison of clinical and nonclinical sample, Achenbach and Edelbrock (1981) found that clinical status had more numerous and larger effects than race,
SES, or age on the various behavior problem items. The main effect of clinical status was significant for almost every item.

Given the extensive research into these multivariate taxonomies and the growing evidence supporting their reliability and validity, one can see the merits in Quay's (1979) contention that such approaches are presently the methods of choice for classification. Moreover, the comprehensive investigations conducted by Achenbach suggest that his particular method of classification is certainly one of the more valuable and useful systems currently available.

Aside from the arguments just put forward which point to the utility of using an empirically-derived system like that of Achenbach, one need only look to the interpersonal problem solving literature, itself, for further support of this approach in future studies in the problem solving domain. As previously reviewed, the clearest differences in problem solving ability have appeared in preschool studies in which youngsters have been classified as either well adjusted, inhibited or impulsive, based upon classroom behavior ratings. An examination of the items making up both the inhibited and impulsive factors show themselves to be quite similar to items subsumed under the broad band factors of Internalizing and Externalizing as delineated by Achenbach in his taxonomy. Thus, it appears likely that one could extend the results obtained by the Shure and Spivack group to youngsters classified according to the Achenbach system. Moreover, as the Achenbach system has extensive reliability and validity data, it appears of greater utility than the teacher rating scale used by Shure. Finally, as the Achenbach system has
proven to be sensitive to differentiating clinic children from normals and has also had extensive use in further categorizing these clinic youngsters into Externalizers and Internalizers, it would seem to be the taxonomy of choice to be used in extending the Shure and Spivack research to an investigation of interpersonal problem solving in well adjusted and clinic identified children with behavioral difficulties.

Given the consistent results obtained by Shure and Spivack in this young age group, it would seem appropriate and quite valuable to attempt to extend these findings to other age groups as well, particularly the middle and late childhood years where the relationships between problem solving ability and adjustment are the least clear. Until now, there has been little attempt to determine whether the differences found between adjusted, inhibited and impulsive youngsters in the preschool years also apply to this later age period.

Additionally, it has already been pointed out that these results obtained for the preschool youngsters essentially comprised groups of children who had never been clinically identified as disturbed. Although there was a distinction made between impulsive, inhibited and well adjusted youngsters, there is little to suggest how many of these 'nonadjusted' children would have been clinically identified as disturbed or nonadjusted. It, thus, seems appropriate to examine whether the difference in problem solving skill already found can be extended to children clinically identified as poorly adjusted and subdivided along this dimension of acting out versus inhibition.
As previously indicated, the utilization of Achenbach's Child Behavior Checklist and the two broad band groupings of Externalizing and Internalizing appears most useful as the inhibited and impulsive factors designated by Shure and Spivack are readily subsumed under Achenbach's taxonomy.

Using this approach, one might expect to obtain results similar to those previously suggested by the Shure and Spivack group in their preschool studies with inhibited youngsters being the most deficient in such problem solving skills as alternative and consequential thinking. Thus, Internalizing youngsters, at the age groups to be examined in this study, would be expected to be more deficient in these skills than would their Externalizing or well adjusted counterparts.

Similar differences would also be expected on other problem solving skills such as problem recognition and means-ends thinking. Whereas Internalizers might be the most deficient in these skills, Externalizers might prove to be the ones most deficient in others. Such differences might prove most evident in problem consideration and solution adequacy skills. The former of these skills is concerned with one's ability to consider all pieces of information pertinent to subsequent conflict resolution. The latter pertains to one's ability to select a final preferred solution which reflects the consideration of various other viewpoints. Inherent in both of these skills is the ability to suspend judgment and think reflectively rather than impulsively in considering all the pertinent information available. Weintraub (1973) has already pointed to Externalizers being the most
impulsive and the ones with the least amount of foresight in comparison to Internalizers and normals. One might, thus, expect them to show similar deficits with regard to interpersonal problem solving skills which require foresight and reflection. As both the problem consideration and solution adequacy skills are ones not previously examined by the Shure and Spivack group, it is important to determine whether adjustment differences in these abilities do exist.

Finally, one would expect to find differences in the types of solutions generated by the three groups. As Externalizers are typically characterized by their 'acting out' behavior and both verbal and physical aggression, one might assume that the alternative solutions that they generate would typically be composed of a higher percentage of forceful solutions than those provided by either Internalizing or well adjusted youngsters.

These, then, are just a few of the issues that need to be addressed with regard to extending the Shure and Spivack preschool findings to other age groups, as well as to clinical populations.

An issue which, until now, has received little attention is that concerned with interactions between age-related changes in problem solving skills and adjustment status. As previously noted, both Feldgaier (1979) and Marsh (1982) have demonstrated that interpersonal problem solving ability is a developmental phenomenon characterized by sequential changes in number and type. By early adolescence, youngsters are significantly more able to recognize and conceptualize problems, to anticipate consequences and conceive of them in both psychological and behavioral terms and to rely less heavily upon force
as an effective means of conflict resolution. Instead there is a concerted effort to arrive at solutions equitable to all parties involved.

Given that there are these age-related changes and that there are also differences in problem solving ability which are associated with adjustment status, how do these factors interact? Is it possible that older, nonadjusted children (both Externalizers and Internalizers) lag further behind their well adjusted counterparts in problem solving ability than do younger nonadjusted boys lag behind their counterparts? If so, then, one might contend that these behaviorally nonadjusted boys exhibit a slower rate of development within the problem solving sphere. Such a finding would be important in pointing to the need for the early identification of youngsters with problem solving deficits in order to begin intervention at a time when these deficits have not grown exceedingly large or have become well entrenched and ingrained.

The lack of information in this regard may be partly explained by the scant attention that has been paid to the simple development of interpersonal problem solving ability. Until the recent appearance of evidence delineating its developmental nature, there was little reason to suggest that examination of adjustment related problem solving deficits need be considered within a developmental framework. Moreover, as almost all previous studies in the problem solving realm have looked at individual age groups and have utilized different measures at each age, it has been extremely difficult to discern common threads throughout the studies and to draw comparative
conclusions across age levels.

At present, it would be difficult to propose which of the problem solving skills would show the greatest effects of such age by adjustment interactions, since there is little information examining this issue. It is, nevertheless, an important issue to explore.

Finally, attention needs to be given to examining patterns of problem solving performance within the two nonadjusted groups themselves. Even if there are significant adjustment group effects for the various problem solving skills, is it still possible that within either or both of the disturbed groups there are youngsters who demonstrate problem solving ability comparable to or above that displayed by the average well adjusted child? This question has received little attention until now, although there is related evidence to suggest that there may, indeed, be poorly adjusted youngsters who fit this category. For example, Selman (1976), in his study of interpersonal reasoning in disturbed and well adjusted children, found that there were some clinic children who performed as well or better than their matched adjustment peers. Selman interpreted this finding to suggest that youngsters who manifest average interpersonal reasoning skills for their age may either function adequately or in an immature fashion but that it is difficult to reliably predict which. The results did, however, suggest that it was far more likely that a child experiencing significant deficits in interpersonal reasoning would come from the clinic group. Selman has suggested that these results point to the fact that
"normative or average interpersonal conception stage may be necessary but not sufficient for adequate or normal interpersonal relating. Low stage of interpersonal conception does not cause immature behavior, but it puts a constraint on the ability to act maturely. Unfortunately, high stage interpersonal conception does not guarantee the maturity of relating that is constrained by low stage interpersonal reasoning; we have just noted that a number of the children with interpersonal difficulties in our sample did very well on the social cognitive measures. Mature interpersonal conceptions are not sufficient for mature interpersonal relations" (p. 192).

Based upon Selman's findings, one might contend that similar results might also appear within the interpersonal problem solving domain such that there would be some Externalizing and Internalizing youngsters who demonstrate adequate problem solving ability. If so, then one might rightly argue that adequate problem solving skill is, in itself, not sufficient to ensure good behavioral adjustment. This view is further supported by the results of the Helper et al. (1982) study which found that good alternative thinking skill was actually associated with excessive acting out behavior in boys. If adequate problem solving ability had been sufficient to ensure adjustment, then this finding would not have been obtained. Thus, it could be argued that other factors must be coupled with adequate problem solving ability in order to ensure satisfactory adjustment status.

The literature review has previously demonstrated a link between perspective taking and adjustment status. As well, previous research (eg., Kurdek, 1977) has demonstrated age-related changes in this skill. As with the problem solving domain, similar questions may be
raised with regard to perspective taking. Thus, attention must be given to examining differences in cognitive perspective taking skill which are based on adjustment status, age and age by adjustment interactions. From the research just reviewed and, in particular, the Waterman et al. (1981) study, it would be expected that Internalizing youngsters would show the greatest deficits in cognitive perspective taking ability followed by Externalizing children.

In addition, the relationship of perspective taking to the various problem solving skills requires closer examination. Although there is evidence to argue for such a relationship, previous studies have proven contradictory in highlighting which specific problem solving skills are not closely related to perspective taking. Some of these contradictory findings have appeared as a result of studies utilizing different groups of youngsters at different ages. As Feldgaier (1979) has shown, cognitive perspective taking exhibits different ties to problem solving skills at different age levels. This finding, however, must be replicated and also examined within the light of adjustment status.

Finally, the relationship of IQ to problem solving must be examined due to previous studies which have provided evidence of a low but significant positive correlation between various IQ measures and both alternative and consequential thinking. While this relationship has never been strong enough to detract from the link between problem solving and adjustment, it must be taken into consideration.

These, then, were some of the clinical developmental issues that were of immediate concern in this study.
Aims of the Study: A Summary

This study was designed as an investigation into the above-mentioned clinical and developmental issues pertaining to the area of interpersonal problem solving and attempted to discern differences in problem solving skills that were based upon clearly defined behavior adjustment categories. Moreover, it attempted to place these differences within a developmental framework by determining whether age interacted with adjustment status to significantly affect problem solving ability.

This was done by examining interpersonal problem solving ability in two age levels (i.e. 6-7 years olds and 10-11 year olds) of boys which had been subdivided into groups of well adjusted, Externalizing and Internalizing youngsters based upon parent ratings of behavior. All children were presented with the identical problem solving tasks, thereby allowing for clearer examination of both developmental and adjustment group effects.

This study was thus designed as a straightforward clinical-developmental investigation.

Specific Hypotheses: A Summary

Hypothesis I (Adjustment Effects)

It was expected that interpersonal problem solving ability would vary significantly as a function of behavioral adjustment status. More specifically, it was expected that for:

1. Problem Recognition - Adjusted boys would identify more conflict situations than either Externalizers or Internalizers.
2. **Problem Consideration** - Adjusted boys would produce a greater number of specific statements pertinent to the problem situation than either Externalizers or Internalizers.

3. **Alternative Thinking** - Adjusted boys would produce more alternative solutions than either Externalizers or Internalizers.

4. **Consequential Thinking** - Adjusted boys would produce more consequential statements than either Externalizers or Internalizers.

5. **Solution Adequacy** - Adjusted boys would select solution plans reflecting greater consideration of the views of the various story characters in the problem situation than either Externalizers or Internalizers.

6. **Total Problem Solving** - Adjusted boys would have higher total problem solving scores as measured by a combined score of all preceding problem solving skills than either Internalizers or Externalizers.

7. **Problem Recognition - Response Type** - Adjusted boys would define problem situations in a more clear and concise manner than either Externalizers or Internalizers.

8. **Alternative Thinking - Use of Force** - Externalizers would have a higher percentage of forceful solutions than either Adjusted boys or Internalizers.

9. **Consequential Thinking - Response Type** - Adjusted youngsters would more equitably divide their concern amongst consequences reflecting behavioral, psychological and
general conceptual issues than either Externalizers or Internalizers.

10. **Solution Adequacy - Use of Force** - A larger percentage of Externalizers would select a forceful solution as their final preferred solution than either Adjusted boys or Internalizers.

11. **Means-Ends Thinking** - Adjusted boys would produce more relevant means than either Externalizers or Internalizers.

12. **Perspective Taking** - Adjusted boys would obtain scores reflecting greater decentration in their thinking than either Externalizers or Internalizers.

**Hypothesis II (Age Effects)**

It was expected that interpersonal problem solving ability would vary significantly as a function of age. More specifically, it was expected that for:

1. **Problem Recognition** - Older boys would identify more conflict situations than younger ones.

2. **Problem Consideration** - Older boys would produce a greater number of specific statements pertinent to the problem situation than younger ones.

3. **Alternative Thinking** - Older boys would produce more alternative solutions than younger ones.

4. **Consequential Thinking** - Older boys would produce more consequential statements than younger ones.
5. **Solution Adequacy** - Older boys would select solution plans reflecting greater consideration of the views of the various problem story characters in the problem situation than younger ones.

6. **Total Problem Solving** - Older boys would have higher total problem solving scores than younger ones.

7. **Problem Recognition - Response Type** - Older boys would define problem situations in a more clear and concise manner than younger ones.

8. **Alternative Thinking - Use of Force** - Older boys would have a lower percentage of forceful solutions than younger ones.

9. **Consequential Thinking - Response Type** - Older boys would more equitably divide their concern amongst consequences reflecting behavioral, psychological and general conceptual issues than younger ones.

10. **Solution Adequacy - Use of Force** - A smaller percentage of older boys would select a forceful solution as their final preferred solution than younger ones.

11. **Means-Ends Thinking** - Older boys would produce more relevant means than younger ones.

12. **Perspective Taking** - Older boys would obtain scores reflecting greater decentration in their thinking than younger ones.
Hypothesis III (Adjustment X Age Effect)

It was expected that there would be a significant adjustment by age interaction effect most evident for older, nonadjusted boys.

Hypothesis IV (Within Group Performance)

It was expected that at each age level, there would be a significant number of Externalizers or Internalizers who would obtain total problem solving scores at or above the median score for Adjusted boys.

In addition to these specific hypotheses, the study explored the relationship between perspective taking and the various problem solving skills. It also identified those problem solving skills serving as the best predictors of adjustment status.
Sample

Subjects for this study were 148 white, middle-class boys drawn from regular first, second, fifth and sixth grade classrooms in a number of public school divisions in a midwestern Canadian city of 600,000 people. Seventy-four boys made up the younger combined grade one and two group (mean age - 86.77 months) while 74 others comprised the older combined grade five and six group (mean age - 133.92 months).

Youngsters in both age groups were subsequently classified into one of four categories: (a) Behaviorally well adjusted (20 boys in each of the two age groups), (b) Externalizers (20 boys in each of the two age groups), (c) Internalizers (16 boys in each of the two age groups), and (d) Mixed (18 boys in each of the two age groups). This Mixed group was added when it was found that a substantial number of children fit neither the Externalizer nor Internalizer categories but rather displayed marked behavioral characteristics from both.

While the intent had been initially to obtain identical subgroup sizes throughout, it proved to be extremely difficult to identify Internalizing males at either age level. Similarly, as the Mixed subgroup came to light only after data collection had begun, this group also ended up somewhat fewer in number.
Table 1 presents the mean ages for each of the adjustment groups at each age level.

Placement into the adjusted and nonadjusted behavior groups was based upon a child's total behavior problem score on the Child Behavior Checklist. Achenbach and Edelbrock (1981) have reported using the 90th percentile as an adequate cutoff point in separating referral and nonreferred youngsters. For males, aged 6-11, a total problem behavior raw score of 40 corresponding to a T score of 63 was used in this study as this score corresponds to the 90th percentile. Where nonreferred (i.e. adjusted) boys obtained total behavior problem T scores above 63, they were excluded from the study. This led to the elimination of eight boys whose teachers had indicated they functioned well in class but whose parents rated their behavior as above the cutoff of 63. For the remaining 40 boys included in the adjusted groups, the mean total behavior problem T scores were 46.65 for the younger 6-7 year old group and 45.80 for the older 10-11 year old group. Both of these scores are clearly well below the cutoff score of 63 and well within the normal range.

Similarly, clinic referred boys who obtained total behavior problem T scores below 63 were also excluded from the study. This led to the elimination of four youngsters. For the remaining 108 boys in the clinic referred group, the mean total behavior problem T scores were 68.19 for the younger 6-7 year old group and 69.44 for the older 10-11 year old group. Both scores are again, clearly well above the cutoff score of 63 and well within the clinical range.
TABLE 1

MEANS AND STANDARD DEVIATIONS OF AGES (IN MONTHS) FOR ADJUSTMENT GROUPS

<table>
<thead>
<tr>
<th></th>
<th>INTERNALIZERS</th>
<th>EXTERNALIZERS</th>
<th>MIXED</th>
<th>ADJUSTED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
</tr>
<tr>
<td>6-7 YRS.</td>
<td>87.81 6.41</td>
<td>88.45 6.27</td>
<td>85.33 6.90</td>
<td>85.55 6.78</td>
</tr>
<tr>
<td>10-11 YRS.</td>
<td>135.50 7.07</td>
<td>134.20 7.66</td>
<td>132.39 9.00</td>
<td>133.35 5.93</td>
</tr>
</tbody>
</table>
Finally, clinic referred boys were then classified as Internalizers or Externalizers according to the criterion established by Achenbach and Edelbrock (1983); that is, that there be a difference of at least 10 points between their Internalizing and Externalizing T scores. As there also proved to be a substantial number of youngsters whose difference between T scores was less than 10 points, these boys were deemed to be members of a third group; that is, the Mixed group.

Table 2 summarizes the mean total behavior T scores for each of the adjustment groups at each age level.

Subject Recruitment

Boys included in the three behaviorally disturbed categories (i.e. Externalizing, Internalizing and Mixed) were all initially identified through referral to a local child guidance clinic. The clinic, a publicly-funded agency operated by the city's central school division and neighboring suburban divisions, provides multi-disciplinary services free of charge to all children enrolled in school. Comprehensive mental health services are provided by psychologists, psychiatrists and social workers. Additional services are provided by speech and hearing clinicians, audiologists and reading specialists. All services are largely school based with clinic staff assigned to service specific schools within the various divisions.

Following authorization from the appropriate sources, both psychologists and social workers serving the schools participating in the study were requested to provide the investigator with the names of
<table>
<thead>
<tr>
<th>Age Group</th>
<th>Internalizers</th>
<th>Externalizers</th>
<th>Mixed</th>
<th>Adjusted</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>6-7 yrs.</td>
<td>66.88</td>
<td>3.95</td>
<td>68.40</td>
<td>4.01</td>
</tr>
<tr>
<td>10-11 yrs.</td>
<td>70.56</td>
<td>7.21</td>
<td>70.10</td>
<td>7.10</td>
</tr>
</tbody>
</table>
all boys in the first, second, fifth and sixth grades who were being seen for behavioral adjustment problems. This included youngsters identified as being aggressive, hyperactive, and delinquent, as well as those seen as withdrawn, inhibited, fearful, overly anxious and depressed. Children who were mentally retarded or of borderline intellectual capacity were excluded. Also excluded were boys who were psychotic or neurologically impaired. Before releasing these names to the investigator, all clinicians were requested to obtain permission from parents or legal guardians to submit the child's name. This process resulted in 132 names being submitted of which 108 boys were included in the final sample. The remaining youngsters were excluded either because: (a) parents subsequently changed their mind about participation (4 boys), (b) they did not meet the more stringent selection criteria regarding intellectual level or severity of behavior problems (9 boys), or (c) data were incomplete, most often through parents not filling out the Child Behavior Checklist (11 boys).

To obtain a suitable contrast group (i.e. well adjusted boys), teachers of those boys referred by the clinic were asked to nominate boys in their classrooms whom they judged to be socially and behaviorally well adjusted. These teachers were requested to provide the names of 4-5 boys whom they perceived to be socially well adjusted, academically proficient and of at least average intellectual ability. This process led to 118 boys being nominated. Of this number, 85 parents gave consent for their child's participation. Fourteen children were then excluded from the study due to incomplete
data or to the child not meeting the behavioral criteria. Of the remaining 71 youngsters, 40 were randomly selected for inclusion in the final sample.

All children thus nominated (i.e. by both clinic staff and teachers), were then solicited for participation in the study through letters (Appendix A) sent home to their parents detailing the purpose and nature of the research and requesting their written consent (Appendix B) authorizing their child's participation. Consent forms were signed both by the child's legal guardian and, where feasible, by the child himself.

All responses were kept strictly confidential. In situations where the child's school or the clinic requested information regarding a child's performance, such a release was only made following notification of parents and their signing of an additional release of information form authorizing this specific release. Following their child's participation, parents were provided with information regarding their son's performance either by letter or by direct contact with the investigator.

General Testing Conditions

All children in the study were seen individually by either the principal investigator or one of seven trained assistants. Four of the assistants were graduate students (3 males and 1 female) in the Department of Psychology at a local university while two other female assistants were professional social workers and the third female, a school psychologist. These latter three women all had many years of
clinical experience and at the time of the investigation were on sabbaticals from their clinical work. All seven assistants were blind to the adjustment status of the boys they were testing. The nature of the study was such that no experimental manipulations of conditions were involved. All testing was, therefore, strictly of an interview nature. Testing took place in the student's own school in a quiet, empty room provided by the principal and took approximately 90-120 minutes to complete. Interviews were divided into several short sessions in order to ensure that each child did not miss any substantial periods of classroom instruction.

During the first session, the examiner told the child that he would be seen several times and would, primarily, be listening to a number of stories. This information was conveyed to the child in the following fashion:

(E) "I am interested in the way children like you think about different things. What I'd like to do today is have you listen to some stories and look at some pictures about kids your age who have different things happening to them. Then I'd like you to answer some questions about these stories for me. What we are going to do is not a test. There are no right or wrong answers so you can just tell me anything that comes into your mind."

Following this introduction, the examiner spent 5-10 minutes in general conversation with the child in order to establish some degree of rapport before proceeding with the actual testing. Throughout each interview, the examiner judiciously dispensed verbal encouragement and praise in order to obtain optimal performance by the child.

All of the child's answers were transcribed verbatim during the interview session itself. In addition, many of the sessions were tape
recorded in order to provide an additional record of the child's responses.

Test Instruments

Each subject was tested individually on the following 6 tasks:

1. Test of Interpersonal Problem Solving
2. Means-Ends Problem Solving Test
3. Chandler's Bystander Cartoons
4. Peabody Picture Vocabulary Test
5. Alternative Thinking Test
6. Measure of Interpersonal Problem-Solving.

The order of task presentation was randomly varied for subjects in both age groups.

Test of Interpersonal Problem Solving (TIPS - Appendix C)

Description. This measure (Feldgaier, 1979) is designed to assess the overall problem solving process as well as a number of the individual problem solving skills inherent in the process: that is, problem recognition, problem consideration, alternative thinking, consequential thinking and solution adequacy. The measure requires analysis on several levels in that attention must be given, both on a sequential and simultaneous basis, to a host of relevant details pertinent to the effective resolution of the interpersonal conflict depicted. Previous research (Feldgaier, 1979) has shown this measure to be sensitive to age-related changes in interpersonal problem solving.
The measure consists of four primary stories that typify the types of interpersonal problems that frequently arise between children and their peer group. Story dilemmas were selected on the basis of their possible relevance to a wide age span and included such conflict situations as: a) the selection of a team assistant captain, b) the persuasion of friends to attend a show, c) the acquisition of a toy from another child, and d) the selection of which of two friends to play with.

Feldgaier (1979) has shown this measure to have inter-rater reliabilities ranging from 90 to 97% for the different problem solving skills examined and an internal consistency for the total problem solving score of .80 (Kuder-Richardson 20).

Administration. As the four primary stories had all been placed on audio tape, each was played individually for the child. Following the playing of each taped story, the examiner then reviewed the story plot with the child to ascertain that he had grasped the basic outline. All stories were accompanied by simple laminated posterboard drawings depicting the various characters described in each story.

The subject was then asked the following series of questions about each conflict: 1) Do you think (E supplied name) may have some type of problem? What do you think his problem is?; 2) What are all the things you would be thinking about if you had to solve this problem?; 3) How many ways can you solve this problem?; 4) What might happen for each of these solutions?; and 5) What do you think is the best way to solve this problem? Why?. 
Scoring. Responses were scored according to the following criteria as adapted from Feldgaier (1979) and Marsh (1978, 1982):

Question 1 - (Problem Recognition): a score of one or zero was accorded depending upon the child's indication that he sensed the existence of a problem.

Question 2 - (Problem Consideration): one point assigned for each separate, relevant aspect of the problem that is considered and recognized.

Question 3 - (Alternative Thinking): one point assigned for each relevant solution suggested. Repetitious and enumerations of a given solution not given credit.

Question 4 - (Consequential Thinking): one point assigned for each separate, relevant consequence provided in response to the third question.

Question 5 - (Solution Adequacy): scores reflected the degree to which subjects selected a solution that reflected all individuals involved in the problem situation. One point assigned for each relevant representation of a person's point of view.

For each story, individual scores were computed for each problem solving level (i.e. for each question asked). In addition, a total score (i.e. sum of all problem solving levels) was obtained. Total scores were also obtained for each question across stories as well as for a grand total problem solving score.

In addition to this assessment of interpersonal problem solving performance, attention was given to the content of the child's responses to several of the questions.

Question 1 (Problem Recognition - Response Type)

Scoring criteria based upon previous research (Feldgaier, 1979) was used.
<table>
<thead>
<tr>
<th>Score</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No indication or recognition that a problem exists.</td>
</tr>
<tr>
<td>1</td>
<td>Slight recognition that some form of problem exists without being able to delineate even its most basic points clearly. (e.g. &quot;he has a mean problem...about him...go to circus&quot;).</td>
</tr>
<tr>
<td>2</td>
<td>Response which defines problem primarily by the simple re-telling or re-stating of story events (e.g. &quot;cause one is the best player and one is his best friend&quot;).</td>
</tr>
<tr>
<td>3</td>
<td>Definition of problem in relation to its basic underlying concept-concise definition. (e.g. &quot;must try to decide which of friends to choose&quot; or &quot;think of ways to get friends to go with him to the circus&quot;.</td>
</tr>
</tbody>
</table>

Scores were computed for each story as well as a total score across all four stories.

Question 3 (Alternative Thinking - Use of Force)

Here, attention was initially given to the classification of the type of solution produced. This assessment was completed only for Story C, as this story is the one that most closely resembles the problem story used by the Spivack group and, thus, lends itself most readily to the use of their categorical classification system.

Each solution provided by the child was classified into one of the following categories (adapted from Shure & Spivack, 1974):

1. Ask: e.g., "ask him", "can I have it?", etc.
2. Please: e.g., "say please", "pretty please"
3. Loan: e.g., "can I have it for awhile?" "I'll give it right back"
4. Share, turns: e.g., "they can take turns"
   "they can share it"
   "they can play together"

5. Fair: e.g., "You've had it a long time and now I want a chance"
   - any use of the word "fair"

6. Trade, bribe: Group A: "give him candy, give him ice cream, give him money"
   Group B: "You can come to my house"
            "You can't come to my house"
            "I'll invite you to my birthday party"
   Group C: "You can play with my toy"
            "You can't play with my toy"
   Group D: "I'll walk you to school"
            - trade of service

7. Authority
   Intervention: Group A: Family Intervention
                 "tell his mother, father, sister, etc." 
   Group B: Peer Intervention:
            "get friends, older boy, etc."

8. Trick:
    "trick him"
    "tell him his mother's calling"
    - this category receives an indefinite amount of solutions provided each thought is different.

9. Finagle:
    "you don't know how to play with the toy"
    "you can have more fun if you play with me"
    - each different finagle scored individually

10. Manipulative
    Affect: Group A: "scare him away"
             "put a sheet on and he'll go away"
Group B: "I won't like you"
   "I'll be your friend"

Group C: "I really like that toy"
   "I don't like that toy"

Group D: "Cry so he'll feel bad"
   "Look real sad"

11. Get mad: any use of the word "mad"

12. Force, grab: "he takes it"
   "he snatches it, grabs it"

13. Physical Attack on Person: Group A: "hit him"
   "kick him"
   "bite him"

   Group B: "get his dog after him"

   Group C: "throw sand in his face so that he can't see and then take it"

14. Damage to Property: "I'll smash your car"
   "I'll break your toys"

15. Command: "give it to me"
   "gimme"
   "that's mine"
   "I want it now"

16. Plan for future: "take it when he's not looking"
   "when he gets a drink of water, take it"

Upon completion of this initial categorization, attention was given to the forceful content of the child's problem solving solutions. Forceful categories included:

Force-grab, Physical Attack, Damage to Property, and Command.

To compute the force ratio, the following formula was used (Shure & Spivack, 1974):
Question 4 (Consequential Thinking - Response Type)

Responses were examined in order to assess the proportions of different kinds of answers given and was adapted from Marsh (1978, 1982).

A. Specific Psychological - number of statements consisting of references to specific persons in story and their internal processes such as thoughts, feelings, intentions, etc. (e.g. understand, happy, hurt, angry, upset, unlucky, mad, feels left out, jealous)

B. Specific Behavioral - number of statements consisting of reference to specific story characters and their observable behaviors or actions. (e.g. best friend, fight, explain, lose a friend, have fun, won't play anymore, runs home)

C. General Concepts - number of statements referring either to general issues (e.g. friendship, responsibility, fairness, trouble, punishment) or to inclusive statements about the group, that is, individuals not mentioned by name or specific reference (e.g. Thinking about everyone's feelings, avoiding a fight, would lose friends, everyone would be satisfied, nobody would get hurt, they would all feel good, mad at each other).

Ratios were computed for each category for each story as well as a mean ratio per category across all four stories.

Question 5 (Solution Adequacy - Use of Force)

Like Question 3, responses were categorized as being forceful or nonforceful solutions. Of interest here was the number of boys in each adjustment and age group who provided forceful responses as their final preferred solution.
Means-Ends Problem Solving Test (MEPS - Appendix D)

Description. This measure (Platt & Spivack, 1975) assesses the child's ability to orient himself to and conceptualize means of moving towards a goal. Required here is an ability to plan ahead in a sequential fashion in addition to recognizing potential obstacles in one's way which must be taken into consideration when developing this plan.

Although the measure consists of six stories in its complete form for children, only three of these stories were used for this investigation. Each story depicts real life interpersonal problem situations and has a beginning in which a need is aroused in the protagonist and an ending in which the story's main character succeeds in satisfying his need. The stories, however, have no middle part. The child is required to provide this part; thus joining the beginning and ending together by means of a step-by-step plan.

Previous use of the MEPS (Children's Form, Shure & Spivack, 1972) has yielded an inter-rater reliability of 91%. Feldgaier (1979) has reported an inter-rater reliability of 90% and internal consistency of .51 (Kuder-Richardson 20) for the three stories.

Administration. This task was presented in the following fashion to each child:

(E) "What you are going to do now is make up some stories and I'm going to help you. For each story, I will give you the beginning and the end. You will make up the middle part. In other words, you make up what happens in between the beginning of the story that I will give you and the end of the story that I will also give you. Be sure and tell me everything that comes into your head about the story".
Other than these instructions, the examiner provided no other prompting or aid to the child.

Scoring. All stories were scored for the number of relevant means, the number of obstacles recognized, as well as for the number of time references as suggested in the MEPS manual (Platt and Spivack, 1975) and its supplement (Spivack, Shure and Platt, 1981).

Relevant Means: Each relevant step that was effective in reaching towards the goal was scored. The MEPS manual criteria were used here to determine relevant means for each story.

Obstacles: This was scored for a response which delineated an event which interfered with, or could potentially interfere with, reaching the stated goal.

Time: This was scored for any reference made to an amount of time elapsing between the beginning and the end of the story.

A total MEPS score thus consisted of the sum of all relevant means, obstacles and time references. Scores were obtained for each story as well as a total score across all stories.

Chandler's Bystander Cartoons (CBC)

Description. This measure, in a cartoon sequence format, is aimed at determining whether a child attributes to another person information that, in fact, only the child himself has. In each of the six stories (i.e. Sandcastle, Postman, Bakery, Kite, Broken Window, Coin), the central character is depicted as occupied by some antecedent event the circumstances of which produce in him a strong affective response. Following this antecedent event some major change is effected and at this time a second character is introduced who, as
a late arrival, is witness to the subsequent activities of the hero but has no knowledge of the antecedent events to which they relate. After the introduction of the bystander, the central character is shown to act and feel in ways which follow directly from the circumstances of the antecedent event but which appear unreasonable or nonsensical without specific knowledge of these events.

The task requires that the child tell two stories to each of the cartoon sequences. The first, designated as the 'spontaneous story' includes a complete account of the child's understanding of the actions and events of the entire cartoon sequence. The second, designated as the 'bystander's report' includes that account which the child ascribes to the only partially informed witness or bystander, and concerns only that part of the cartoon sequence which follows the introduction of the second character.

Kurdek (1977) has reported previous studies that found inter-rater reliabilities ranging from .78 to .95, correlations among cartoon scores ranging from .38 to .87, a two week parallel form test-retest correlation of .83, and a five week test-retest correlation of .68 for this perspective taking measure. Kurdek (1977) in his own study reported inter-rater reliability of 92% and correlation co-efficients between scores of .56 and .68. Rubin (1978) found inter-rater agreement of 84% and inter-item correlations of .26, .33, and .32 for grades 1, 3 and 5 respectively. Despite these low values, the average inter-item correlation across grades was .52. Feldgaier (1979) found high inter-rater reliability and an internal consistency co-efficient of .94 (Kuder Richardson 20).
Administration. The administration of this task followed the instructions provided for in the test manual (Chandler, undated) and included four of the original six Chandler stories (Sandcastle, Postman, Broken Window and Bakery).

1. Spontaneous Story: "I am going to show you some cartoons - like the comics in the newspaper - which I will ask you to describe to me. The cartoons are about a boy and girl. To make it easier to tell the stories, I want you to decide what they should be called.

I will show you the cartoons one at a time and ask you to describe what is going on. You will have all the time you need, so go slowly and look at every picture in the cartoon before you decide what the whole thing is about. I am particularly interested in what the people in the cartoons are thinking and feeling, so pay special attention to those parts of the story. When you finish studying each cartoon and know what it is about, I will ask you to describe what is happening in each picture.

Do you understand what you are supposed to do? Good. Here is the first cartoon. Study it carefully. Look at each picture and remember to pay special attention to what the people in the pictures are thinking and feeling....What is happening here?

2. Bystander’s Report: After the initial description by the child, the examiner begins with the cartoon frame that introduces the bystander: "Now I want you to begin again with this card (pointing to the first frame in which the bystander is introduced) and re-describe what’s happening, but this time I want you to tell me the story that X (i.e. Bystander) would tell. Try to pay special attention to what X would believe the other people in the cartoon are thinking and feeling. Begin here and tell me that X would say is happening in this picture. He would say..."

Scoring. All scoring was done in accordance with the criteria outlined in the scoring manual (Chandler, undated) and supplemented by an updated guide (Barenboim, 1978).
<table>
<thead>
<tr>
<th>Score</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>A score of &quot;4&quot; is assigned to those stories in which no recognition is given to the fact that the S and the bystander have access to different amounts of information and where the S explicitly attributes to the only partially informed bystander knowledge of details which could only be known to himself. The S, thus, ascribes all three pieces of pertinent information to the bystander.</td>
</tr>
<tr>
<td>3</td>
<td>A score of &quot;3&quot; is assigned to stories in which unwarranted attributions of privileged information are made; but where these egocentric intrusions are couched in probabilistic or conditional language suggestive of some uncertainty regarding the comparability of the two perspectives which the S is required to adopt. Thus, the S attributes the full set of privileged information to the bystander but in a conditional fashion (e.g. bystander thinks &quot;maybe&quot; or &quot;probably&quot;).</td>
</tr>
<tr>
<td>2</td>
<td>A score of &quot;2&quot; is assigned whenever the S offers, as descriptive of the bystander's point of view, a field of alternative explanations, one of which explicitly includes elements of privileged information available to the S but not to the partially informed witness. A score of &quot;2&quot; may also be given in those instances where the S ascribes only two out of the three pieces of privileged information to the bystander.</td>
</tr>
<tr>
<td>1</td>
<td>Stories assigned a score of &quot;1&quot; are those which, while essentially free of gross egocentric intrusions, include peripheral or incidental elements of privileged information available only</td>
</tr>
</tbody>
</table>
to the S, which "contaminate" the bystander's report. A score of "1" is also given when the S ascribes only one piece of privileged information to the bystander.

A score of "0" is assigned to those stories which reflect the S's awareness that the bystander exposed to less information than himself, would be led to sharply different conclusions regarding the chains of events depicted. Stories coded in this category contain no evidence of direct or indirect intrusion of unavailable or privileged information.

Based upon this scoring system, a score of "4" represents a highly egocentric mode of thought while a score of "0" indicates a contrasting differentiation or decentration of thinking.

Each story was assigned a score. A total score, across all stories, was also obtained.

**Alternative Thinking Test (Appendix E)**

**Description.** This test (Shure and Spivack, 1978) requires the subject to come up with as many different solutions as possible to a common interpersonal problem.

**Administration.** The examiner read the story to the youngster and then simply asked him to state all the ways possible that he could think of to resolve the problem.

**Scoring.** One point given for each relevant solution produced and followed the guidelines set out by Shure and Spivack (1981).
Measure of Interpersonal Problem Solving (IPS - Appendix F)

Description. This test (Marsh, 1978, 1982) is similar in format to the TIPS and requires the subject to respond to an identical series of questions as previously delineated for the TIPS.

Administration. The examiner read the story to the child and proceeded to follow the same series of questions as outlined for the TIPS.

Scoring. Scoring followed the identical criteria as described previously for the TIPS.

Peabody Picture Vocabulary Test (PPVT)

Description. This task (Dunn, 1965) provides a measure of general verbal intelligence by requiring the child to select the correct picture from among a series, in response to a list of words read to him by the examiner.

Administration. As this is a standardized test, the administration followed the guidelines outlined in the PPVT manual. Scoring followed the manual guidelines and yielded an intelligence quotient (I.Q.) score for each child.

Child Behavior Checklist (CBCL)

The Child Behavior Checklist (Achenbach, 1981) is a rating scale which comprises 118 behavior problem items, plus items for reporting a child's school performance and the amount and quality of his participation in sports, games, hobbies, chores, organizations and social relationships. The CBCL is designed to be filled out by
parents and typically requires about twenty minutes to be completed. Behavior problem items are rated on 3 point response scales, with 0 indicating that the item is not true of the child, 1 indicating that the item is somewhat or sometimes true of the child, and 2 indicating that the item is very true or often true of the child.

The Child Behavior Profile consists of scales for scoring the social-competence and behavior problem items of the CBCL. Separate editions of the Behavior Profile have been developed and standardized for each sex at ages 4-5, 6-11, and 12-16 (Achenbach, 1978, 1979, 1983).

Factor analysis of the 118 behavior problem items of the Checklist filled out by parents of children referred for mental health services reveals nine reliable behavior problem factors for boys aged 6-11, boys aged 12-16 and girls aged 6-11 (Achenbach, 1978; Achenbach & Edelbrock, 1979). For example, among boys aged 6-11, factors labelled schizoid, depressed, uncommunicative, obsessive-compulsive, somatic complaints, social withdrawal, hyperactive, aggressive and delinquent have been obtained (Achenbach, 1978). The performance of second-order factor analyses of the narrow-band behavior problem scales has revealed that these narrow-band scales form two broad-band groupings, one of which has been labelled Internalizing and comprises problems primarily with the self and a second labelled Externalizing comprising problems of conflict with the outside world (Achenbach, 1979; Achenbach & Edelbrock, 1978, 1983).

Normalized T scores have been computed for both the narrow-band scales and broad-band groupings and are based on the checklists filled
out by 1300 randomly selected parents of normal children.

Extensive studies (Achenbach, 1978, 1979; Achenbach and 
Edelbrock, 1979, 1981, 1983) show the Profile Scales to have quite 
adequate test-retest reliability (range of .65 to .97) and interparent 
agreement (mean correlation of .74 for 6-11 year old boys). In a 
comparison of clinical and nonclinical samples, Achenbach & Edelbrock 
(1981) found that clinical status had more numerous and larger effects 
than race, SES, or age for both behavior problem and social competence 
items. The main effect of clinical status was seen as being 
significant for almost every item.

Achenbach and Edelbrock (1981, 1983) also have reported that the 
use of the ninetieth percentile for the total behavior problem score 
serves as an adequate cutoff point in separating referred and 
nonreferred youngsters. In their extensive research, use of this 
cutoff resulted in 9.3% of the nonreferred children being classified 
as outside the normal range and 26% of the referred youngsters being 
placed within the normal range. This behavior problem cutoff also 
proved to be superior to the social competence score cutoff in 
producing fewer misclassifications (17.6% vs. 25.9%).

Administration. While interparent agreement has been shown to 
be quite high in scoring the checklist (Achenbach & Edelbrock, 1983), 
the present study requested that only the mothers of the youngsters 
participating fill out the rating scale. Checklists were only sent 
home to parents once informed consent had been obtained. Mothers were 
also then asked to complete and return the checklist as soon as 
possible.
Scoring. The checklist was scored according to the standard procedures set out by Achenbach and Edelbrock (1983). T scores were obtained for each of the narrow-band behavior problem factors as well as for the broad-band Externalizing and Internalizing groupings.

Analyses of the Data

In order to investigate adjustment, age, and age by adjustment effects for the various TIPS scores, a series of separate multivariate analyses of variance were undertaken. In order to investigate adjustment, age, and adjustment by age effects on PPVT, MEPS and CBC scores, a series of separate 2 x 4 univariate analyses of variance were performed.

To assess possible relationships between problem solving skills, separate correlational analyses were undertaken both for the total sample, as well as for each age level. To assess possible relationships between problem solving and adjustment, separate correlational analyses were performed both for the total sample, as well as for each age level.

In order to determine the best predictors of both adjustment and total problem solving ability, separate stepwise regression analyses were performed.

Finally, in order to determine whether there were youngsters in the nonadjusted groups who obtained total TIPS scores equal to or better than their adjusted counterparts, median splits were performed at each age level with a subsequent determination of how many youngsters in each adjustment group fell at or above these median scores.
CHAPTER III
RESULTS

This study was designed to investigate adjustment and age effects on the interpersonal problem solving abilities of elementary school aged boys. Visual inspection of the raw scores indicated that they did not appear to vary significantly between the various examiners who assisted in data collection.

Preliminary Analyses

Reliabilities. Inter-rater reliabilities were calculated on a random sample of 45 subjects (i.e. 30 % of the total sample) for the TIPS, MEPS and CBC measures. These subjects were almost equally divided amongst the four adjustment groups at each age level. Scoring was done independently by the author and a trained assistant with reliability scores reflecting the percentage of perfect agreement between the two for the various measures. For each measure, this score was obtained by dividing the number of responses where there was exact agreement by the total number of responses given. Table 3 presents these results which show a range from 87% - 98%.

Internal Consistency. To determine internal consistency, Cronbach alpha coefficients were obtained for the various TIPS scores as well as the MEPS and CBC scores. Table 4 summarizes these results which range from .23 to .96.
<table>
<thead>
<tr>
<th></th>
<th>TIPS</th>
<th>MEPS</th>
<th>CBC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Problem Recognition</td>
<td>98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Problem Consideration</td>
<td>91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Alternative Thinking</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Consequential Thinking</td>
<td>93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Solution Adequacy</td>
<td>93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Problem Recognition-Response Type</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Alternative Thinking-Use of Force</td>
<td>95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Consequential Thinking-Response Type</td>
<td>91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Solution Adequacy-Use of Force</td>
<td>97</td>
<td></td>
<td></td>
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</tbody>
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$\%$ Agreement
<table>
<thead>
<tr>
<th>Cronbach alpha</th>
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<tbody>
<tr>
<td><strong>TIPS</strong></td>
</tr>
<tr>
<td>1. Problem Recognition</td>
</tr>
<tr>
<td>2. Problem Consideration</td>
</tr>
<tr>
<td>3. Alternative Thinking</td>
</tr>
<tr>
<td>4. Consequential Thinking</td>
</tr>
<tr>
<td>5. Solution Adequacy</td>
</tr>
<tr>
<td>6. Total Problem Solving</td>
</tr>
</tbody>
</table>

| **MEPS**       | .78 |
| **CBC**        | .96 |
Test-Retest. In order to determine its relative stability, the TIPS measure was re-administered to a random sample of 46 youngsters (i.e. 31% of the total sample) seven to ten days after its initial presentation. Table 5 describes the composition of this retest sample while Table 6 summarizes the test-retest correlations (Pearson r's) for each of the TIPS stories with correlations ranging from .59 to 1.00.

Construct Validity of the TIPS. Analyses were undertaken to determine the relationship of the TIPS measure to other well-established measures of interpersonal problem solving. The first of these analyses examined the relationship of the TIPS measure to that of Marsh (1982). This latter measure is similar in format to that of the TIPS and has shown itself to be quite sensitive to age related changes in interpersonal problem solving (Marsh, 1982). Table 7 presents the results of the correlational analysis between the TIPS and IPS measures for the entire sample of 148 boys.

The relationship of TIPS alternative thinking to Shure and Spivack's (1978) measure of alternative thinking was also undertaken. Table 8 summarizes the correlations for the entire sample for each of the four TIPS stories and the Shure measure.

The results of these two analyses are clearly significant and point to a relatively strong relationship between the TIPS and other well established measures of interpersonal problem solving.

The Influence of IQ. In order to examine the influence of IQ, a univariate analysis of variance (age X adjustment) was performed on PPVT scores. Table 9 presents the means and standard deviations for
TABLE 5

COMPOSITION OF SAMPLE FOR TEST-RETEST ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th>INTERNALIZERS</th>
<th>EXTERNALIZERS</th>
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<th>ADJUSTED</th>
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<tr>
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<td>n</td>
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<td>10-11 YRS.</td>
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<td>8</td>
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<tr>
<td></td>
<td>4</td>
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### TABLE 6

**TEST-RETEST CORRELATIONS FOR THE TIPS**

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<tr>
<th>TIPS</th>
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<th>STORY C</th>
<th>STORY D</th>
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</thead>
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<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
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<td>.73^</td>
<td>.77^</td>
<td>.77^</td>
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<tr>
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<td>.77^</td>
<td>.59^</td>
<td>.69^</td>
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<tr>
<td>Consequential Thinking</td>
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<td>.87^</td>
<td>.80^</td>
<td>.85^</td>
</tr>
<tr>
<td>Solution Adequacy</td>
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<td>.96^</td>
<td>.73^</td>
<td>.93^</td>
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<tr>
<td>Total Problem Solving</td>
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<td>.91^</td>
<td>.74^</td>
<td>.87^</td>
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^p < .0001
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<th>Problem Consideration</th>
<th>Altern. Thinking</th>
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<td>.16 (Story B)</td>
<td>.20 (Story C)</td>
<td>.17 (Story D)</td>
<td>.23 (Total)***</td>
<td></td>
</tr>
<tr>
<td>2. Problem Consideration</td>
<td></td>
<td>.49 (Story A)***</td>
<td>.32 (Story B)***</td>
<td>.41 (Story C)***</td>
<td>.41 (Story D)***</td>
<td>.55 (Total)***</td>
</tr>
<tr>
<td>3. Alternative Thinking</td>
<td>.30 (Story A)***</td>
<td>.47 (Story B)***</td>
<td>.33 (Story C)***</td>
<td>.52 (Story D)***</td>
<td>.58 (Total)***</td>
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</tr>
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<td>4. Consequential Thinking</td>
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<td>.50 (Story B)***</td>
<td>.31 (Story C)***</td>
<td>.50 (Story D)***</td>
<td>.58 (Total)***</td>
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<tr>
<td>5. Solution Adequacy</td>
<td>.28 (Story A)**</td>
<td>.34 (Story B)***</td>
<td>.16 (Story C)</td>
<td>.31 (Story D)***</td>
<td>.31 (Total)***</td>
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<tr>
<td>6. Total Problem Solving</td>
<td>.30 (Story A)***</td>
<td>.34 (Story B)***</td>
<td>.16 (Story C)</td>
<td>.31 (Story D)***</td>
<td>.31 (Total)***</td>
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* p < .05  ** p < .001
*** p < .0005  **** p < .0001
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<th>TIPS: ALTERNATIVE THINKING</th>
<th>ALTERNATIVE THINKING (SHURE)</th>
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<td>STORY A</td>
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<tr>
<td>STORY B</td>
<td>.31**</td>
</tr>
<tr>
<td>STORY C</td>
<td>.35**</td>
</tr>
<tr>
<td>STORY D</td>
<td>.25*</td>
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<tr>
<td>TOTAL (A-D)</td>
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* $p < .005$
** $p < .0001$
TABLE 9

MEANS AND STANDARD DEVIATIONS OF PPVT IQ FOR AGE AND ADJUSTMENT GROUPS

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<th>MIXED</th>
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<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<tr>
<td>6-7 YRS.</td>
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<td>100.25</td>
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<td>109.39</td>
<td>10.96</td>
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<td>10.29</td>
</tr>
<tr>
<td>10-11 YRS.</td>
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<td>17.16</td>
<td>105.65</td>
<td>12.28</td>
<td>111.00</td>
<td>15.64</td>
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</table>
the various adjustment groups while Table 10 summarizes the ANOVA results. While neither a significant age nor interaction effect appeared, a significant adjustment effect was found, $F(3, 140) = 6.25$, $p < .0005$. Post hoc Scheffe comparisons between means revealed significant differences between both Adjusted boys and Externalizers ($p < .05$) and Internalizers and Externalizers ($p < .05$).

Given this significant adjustment effect, all subsequent analyses included PPVT scores as a covariate.

### Adjustment Effects

#### TIPS

A multivariate analysis of covariance (adjustment $\times$ age) with PPVT IQ as a covariate was performed on all primary levels of the TIPS measure except for Total Problem Solving. Analysis was based upon total scores obtained by combining individual story scores for each level on the TIPS. Table 11 presents the means and standard deviations for these various TIPS scores by adjustment group and Table 12 summarizes them by age and adjustment group. A significant overall multivariate adjustment effect (Wilks' criterion), $F(15, 373) = 2.54$, $p < .005$ was found. No significant overall interaction effect was found. In light of the significant adjustment effect, univariate analyses of covariance (adjustment $\times$ age) with PPVT IQ as a covariate were performed on these various TIPS scores, as well as TIPS Total Problem Solving.

Table 13 summarizes the results of these various ANCOVAs. Significant adjustment effects were found for Problem Recognitio,
TABLE 10

SUMMARY OF ANOVA RESULTS OF PPVT SCORES

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<th>P</th>
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</tr>
<tr>
<td></td>
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<td>SD</td>
<td>M</td>
</tr>
<tr>
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<td>3.85</td>
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### TABLE 12
MEANS AND STANDARD DEVIATIONS FOR TOTAL TIPS SCORES FOR ADJUSTMENT AND AGE GROUPS

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<th>INTERNALIZERS</th>
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<th>ADJUSTED</th>
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<td>M</td>
<td>SD</td>
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<td>2.69</td>
<td>6.15</td>
<td>3.12</td>
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<td>.0011</td>
</tr>
</tbody>
</table>
(3,130) = 3.10, \( p < .05 \); Problem Consideration, \( F (3,130) = 8.92, p < .001 \); Consequential Thinking, \( F (3,130) = 3.16, p < .05 \); Solution Adequacy, \( F (3,130) = 3.06, p < .05 \); and Total Problem Solving, \( F (3,130) = 5.66, p < .005 \). No significant adjustment effect was found for Alternative Thinking.

Post hoc Scheffe comparisons were then undertaken to identify specific adjustment differences. For Problem Recognition, Adjusted boys recognized more problem situations than their Externalizing counterparts \( (p < .05) \). No other comparisons proved significant.

For Problem Consideration, post hoc comparisons revealed that Adjusted boys considered more relevant aspects of the problem than did their Externalizing peers \( (p < .05) \). They also considered more aspects than either Internalizers \( (p < .05) \) or their Mixed group counterparts \( (p < .05) \). No other comparisons proved significant.

For Consequential Thinking, Adjusted boys generated significantly more consequences than did either their Externalizing \( (p < .05) \) or Mixed group \( (p < .10) \) peers. No other comparisons proved significant.

For Solution Adequacy, post hoc comparisons found that Adjusted boys gave solutions reflecting significantly more story character perspectives than did Externalizers \( (p < .05) \). As well, Internalizers gave solutions reflecting more story characters than this latter group \( (p < .05) \).

Finally, for Total Problem Solving, Adjusted boys had significantly higher total problem solving scores than did either Externalizers \( (p < .05) \) or the Mixed group \( (p < .05) \) boys. As well,
Internalizers had higher total scores than the Externalizers ($p < .05$) but not significantly different from those of the Adjusted boys.

In addition to the multivariate analysis undertaken for the primary TIPS scores, a second separate multivariate analysis of covariance (adjustment X age) with PPVT as a covariate was performed for the different kinds of answers given for several of the TIPS scores. Table 14 summarizes the means and standards deviations for these various TIPS scores by adjustment group while Table 15 summarizes them by age and adjustment. A significant overall multivariate adjustment effect (Wilks' criterion), $F (15,373) = 2.06$, $p < .05$ was also found here. No significant overall multivariate interaction effect was found.

In view of the significant adjustment effect, univariate analyses of covariance (adjustment X age) with PPVT IQ as a covariate were performed on these TIPS scores. Table 16 presents the results of these ANCOVAs. Significant adjustment effects were found for Problem Recognition-Response type, $F (3,139) = 5.20$, $p < .001$; and Alternative Thinking-Use of Force, $F (3,139) = 3.65$, $p < .05$. No significant adjustment effects were found for Consequential Thinking-Behavior ratio, Consequential Thinking-Psychological ratio, or Consequential Thinking-Concept ratio.

Post hoc Scheffe comparisons were subsequently undertaken to identify specific adjustment differences. For Problem Recognition-Response type, significant differences appeared between both Adjusted boys and Externalizers ($p < .05$) and Internalizers and Externalizers ($p < .05$). No significant differences were seen,
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<td><strong>Behavior Ratio</strong></td>
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</tr>
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<td>0.70</td>
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<td>0.16</td>
<td>0.18</td>
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<tr>
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<td>0.29</td>
<td>0.14</td>
<td>0.28</td>
<td>0.16</td>
</tr>
<tr>
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<td><strong>Concept Ratio</strong></td>
<td></td>
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</tr>
<tr>
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<td>0.25</td>
</tr>
<tr>
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</tr>
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<td>F</td>
<td>p</td>
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</tr>
<tr>
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<td>.0020</td>
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<td>Consequential Thinking - Psychological Ratio</td>
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<td>0.63</td>
<td>.5958</td>
</tr>
</tbody>
</table>
however, between Internalizers and Adjusted youngsters nor between any other comparisons. Thus, both Adjusted boys and Internalizers are much more capable of defining initial problems in a clear, concise manner which incorporates the basic story dilemma in an abstract fashion.

For Alternative Thinking—Use of Force, post hoc comparisons revealed that Adjusted boys had a significantly lower proportion of forceful solutions than did Externalizers (p < .05) or Internalizers (p < .05). No other comparisons proved significant.

Finally, attention was given to the degree to which force was used as a final preferred solution (Solution Adequacy). Tables 17 and 18 summarize the number of boys in each adjustment group at each age level who selected a forceful response as his final preferred solution. For the younger boys, a significant adjustment effect was found, $\chi^2 (3, n=74) = 9.29$, $p < .05$. For the older boys this effect almost reached significance, $\chi^2 (3, n=74) = 7.50$, $p < .06$.

**MEPS**

A separate univariate analysis of covariance (adjustment X age) with PPVT IQ as a covariate was also performed on total MEPS scores. Table 19 summarizes the means and standard deviations for each adjustment group while Table 20 summarizes them for each group at each age level. No significant adjustment effect nor interaction effect was found for the MEPS.

**CBC**

A separate univariate analysis of covariance with PPVT IQ as a covariate was also performed on total CBC scores. Table 21 summarizes
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<thead>
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<th>Category</th>
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<th>Force</th>
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</thead>
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<tr>
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<tr>
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<td>10</td>
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<tr>
<td>Mixed</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Adjusted</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Nonforce</td>
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<td>----------------------</td>
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<td>-------</td>
</tr>
<tr>
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<td>5</td>
</tr>
<tr>
<td>Externalizing</td>
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<td>4</td>
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<td>EXTERNALIZERS</td>
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<td>---------------</td>
<td>---------------</td>
</tr>
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<tr>
<td>SD</td>
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<td>INTERNALIZERS</td>
<td>EXTERNALIZERS</td>
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<td>---------------</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>6-7 YRS</td>
<td>3.88</td>
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</tr>
<tr>
<td>10-11 YRS</td>
<td>6.69</td>
<td>4.71</td>
</tr>
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</table>
### Table 21

**Means and Standard Deviations for Total CBC Scores for Adjustment Groups**  
(*Age Levels Combined*)

<table>
<thead>
<tr>
<th></th>
<th>Internalizers</th>
<th>Externalizers</th>
<th>Mixed</th>
<th>Adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M</strong></td>
<td>4.91</td>
<td>6.83</td>
<td>5.58</td>
<td>2.65</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>5.78</td>
<td>5.87</td>
<td>5.81</td>
<td>4.26</td>
</tr>
</tbody>
</table>
the means and standard deviations for adjustment groups while Table 22 summarizes them for each adjustment group at each age level. A significant adjustment effect was found, $F(3,139) = 3.37, p < .05$.

Post hoc Scheffe comparisons found that Adjusted boys were significantly more decentered in their thinking than either their Externalizing ($p < .05$) or Mixed group ($p < .10$) counterparts. No significant interaction effect was found.

**Age Effects**

**TIPS**

Results of the previously described multivariate analysis of covariance performed on the primary levels of the TIPS measure also revealed a significant overall multivariate age effect (Wilks' criterion), $F(5,135) = 18.67, p < .0001$. Table 23 summarizes the means and standard deviations for each age level.

Univariate analyses of covariance were subsequently performed on these TIPS scores as well as TIPS Total Problem Solving. Table 24 summarizes the results of these ANCOVAs. Significant age effects were found for Problem Consideration, $F(1,139) = 62.42, p < .0001$; Alternative Thinking, $F(1,139) = 52.62, p < .0001$; Consequential Thinking, $F(1,139) = 53.35, p < .0001$; Solution Adequacy, $F(1,139) = 46.61, p < .0001$; and Total Problem Solving, $F(1,139) = 86.04, p < .0001$. No significant age effect was found for Problem Recognition. In all instances where there was a significant age effect, older boys performed better than their younger aged counterparts; that is, they considered more aspects of the problem.
<table>
<thead>
<tr>
<th></th>
<th>INTERNALIZERS</th>
<th></th>
<th>EXTERNALIZERS</th>
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<th></th>
<th>ADJUSTED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
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<td>5.34</td>
<td>7.44</td>
<td>6.31</td>
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<td>3.72</td>
<td>4.74</td>
<td>1.05</td>
<td>2.14</td>
</tr>
<tr>
<td></td>
<td>6-7 YRS</td>
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<td>10-11 YRS</td>
<td></td>
<td></td>
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<td>--------------------------------------</td>
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</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<td>8.19</td>
<td>2.58</td>
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<td></td>
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<tr>
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<td>2.41</td>
<td>9.39</td>
<td>2.22</td>
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<td>10.72</td>
<td>2.84</td>
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<td></td>
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</tr>
<tr>
<td>Total Problem Solving</td>
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<td>10.40</td>
<td>45.14</td>
<td>9.12</td>
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<tr>
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<td>F</td>
<td>p</td>
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</table>
generated more alternative solutions and consequences, and provided final solutions which reflected the perspectives of more story characters. Finally, older boys had significantly higher overall problem solving scores.

Results of the previously described multivariate analysis of covariance for the different kinds of TIPS answers also revealed a significant overall multivariate age effect (Wilks' criterion), $F(5,135) = 6.16$, $p < .0001$. Table 25 summarizes the means and standard deviations for each age level. Univariate analyses of covariance were subsequently performed on these various TIPS scores. Table 26 summarizes the results of these ANCOVAs. Significant age effects were found for Problem Recognition-Response Type, $F(1,139) = 12.06$, $p < .001$; Alternative Thinking-Use of Force, $F(1,139) = 6.18$, $p < .05$; Consequential Thinking-Behavior ratio, $F(1,139) = 14.15$, $p < .0005$; and Consequential Thinking-Psychological ratio, $F(1,139) = 13.67$, $p < .0005$. No significant age effect was found, however, for Consequential Thinking-Concept ratio. A significant interaction effect was found, however, for this latter score, $F(3,139) = 2.94$, $p < .05$.

Older boys, in comparison to their younger counterparts, are more capable of defining initial problems in a clear, concise manner. They also maintain a significantly lower proportion of forceful solutions as well as generating consequences which reflect a lower proportion of responses of a behavioral nature while providing more of a psychological one.
<table>
<thead>
<tr>
<th>Problem Recognition-Response Type</th>
<th>6-7 YRS</th>
<th>10-11 YRS</th>
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<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Alternative Thinking-Proportions of Forceful Solutions</td>
<td>8.39</td>
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<tr>
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<td>0.38</td>
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<tr>
<td>Consequential Thinking-Psychological Ratio</td>
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</tr>
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<td>Consequential Thinking-Concept Ratio</td>
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<td>0.19</td>
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<tr>
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<td>0.22</td>
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<th>F</th>
<th>P</th>
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<th>F</th>
<th>P</th>
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</thead>
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<th>P</th>
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</thead>
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<td>0.0097</td>
<td>0.31</td>
<td>.5788</td>
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</table>
MEPS

A significant age effect also appeared for the univariate analysis of covariance performed on the total MEPS scores, $F(1,139) = 42.00$, $p < .0001$. Older boys generated significantly more means than younger boys. Table 27 summarizes the means and standard deviations at each age level.

CBC

A significant age effect also appeared for the univariate analysis of covariance performed on the total CBC scores, $F(1,139) = 26.38$, $p < .0001$. Older boys were significantly more decentered in their thinking than younger boys. Table 28 summarizes the means and standard deviations at each age level.

Relationships Between TIPS, MEPS, and CBC Measures

In order to investigate the potential relationship amongst problem solving skills, correlational analyses were performed on the five primary total scores of the TIPS, total MEPS scores and total CBC scores. Table 29 summarizes the results for the total sample of 148 boys. Except for Problem Recognition, all other TIPS skills appeared to be significantly inter-related. As well, these problem solving abilities also maintained strong relationships to both means-ends thinking and perspective taking.

To determine the influence of PPVT IQ on these relationships, a second partial correlational analysis controlling for this factor was undertaken (Table 30). Results revealed that while the correlational coefficients tended to drop slightly, they remained highly significant.
### Table 27

**Means and Standard Deviations for Total MEPS Scores for Each Age Level**

<table>
<thead>
<tr>
<th>Age Level</th>
<th>Mean (M)</th>
<th>Standard Deviation (SD)</th>
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</thead>
<tbody>
<tr>
<td>6-7 YRS</td>
<td>2.91</td>
<td>2.63</td>
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<tr>
<td>10-11 YRS</td>
<td>6.53</td>
<td>4.05</td>
</tr>
</tbody>
</table>

### Table 28

**Means and Standard Deviations for Total CBC Scores for Each Age Level**

<table>
<thead>
<tr>
<th>Age Level</th>
<th>Mean (M)</th>
<th>Standard Deviation (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-7 YRS</td>
<td>7.14</td>
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<td>10-11 YRS</td>
<td>2.82</td>
<td>4.49</td>
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</table>
### TABLE 29

**INTERCORRELATIONS OF INTERPERSONAL PROBLEM SOLVING MEASURES (TOTAL SAMPLE)**

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<th>TIPS</th>
<th>MEPS</th>
<th>CBC</th>
</tr>
</thead>
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</tr>
<tr>
<td>Recognition</td>
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<td>.14</td>
<td>.14</td>
</tr>
<tr>
<td>Problem</td>
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<tr>
<td>Thinking</td>
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<td>.34**</td>
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<td>.85**</td>
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<td>Solution</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Adequacy</td>
<td>.58**</td>
<td>.94**</td>
<td>.37**</td>
</tr>
<tr>
<td>Total Problem</td>
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<td>Solving</td>
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<td>.44**</td>
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<td></td>
<td>.46**</td>
<td>.46**</td>
<td>-.46**</td>
</tr>
<tr>
<td>CBC</td>
<td></td>
<td></td>
<td>.47**</td>
</tr>
</tbody>
</table>

* p < .05  ** p < .0001
TABLE 30
PARTIAL CORRELATIONS OF INTERPERSONAL PROBLEM SOLVING MEASURES CONTROLLING FOR PPVT IQ (TOTAL SAMPLE)

<table>
<thead>
<tr>
<th>TIPS</th>
<th>Problem Recognition</th>
<th>Problem Consideration</th>
<th>Alternative Thinking</th>
<th>Consequential Thinking</th>
<th>Solution Adequacy</th>
<th>Total Problem Solving</th>
<th>MEPS</th>
<th>GFC</th>
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<td>TIPS</td>
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<td></td>
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<td>.19*</td>
<td>.18*</td>
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<td>.85**</td>
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<td>-.31**</td>
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<td></td>
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<td>-.35**</td>
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* p < .05  ** p < .001
and maintain the basic pattern established in the previous analysis.

Analyses were also conducted to determine whether there might be differential patterns existent at each age level. Tables 31 and 32 summarize these results for 6-7 year old boys; the first including the influence of PPVT IQ and the second controlling for it. Both analyses maintained a similar pattern and revealed that while most relationships between problem solving abilities remained as in the total sample analyses, the number of significant relationships between both means-ends thinking and perspective taking to the various TIPS skills dropped.

Tables 33 and 34 present the results for the 10-11 year old boys, both with and controlling for PPVT IQ. Again, there was little difference in pattern between the two analyses, although for the first time several significant relationships involving Problem Recognition appeared in the latter analysis. In comparison to the patterns established for the total sample, there was little change apparent for this age group; although once again, the number of significant relationships to means-ends thinking dropped.

Relationships of TIPS, MEPS, and CBC to Adjustment

In order to investigate the relationship of the various problem solving measures to adjustment, correlational analyses were performed for the TIPS, MEPS and CBC measures along with both the broad and narrow band behavior scales as well as the social competence scales of the CBCL. Table 35 summarizes the results for the entire sample. Results revealed that several TIPS scores were significantly related
TABLE 31
INTERCORRELATIONS OF INTERPERSONAL PROBLEM SOLVING MEASURES (6-7 YEAR OLDS)

<table>
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<tr>
<th>TIPS</th>
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<th>Consequential Thinking</th>
<th>Solution Adequacy</th>
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</tr>
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*p < .05  **p < .01  ***p < .005  ****p < .0005  *****p < .0001
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<td>.87***</td>
<td>.13</td>
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<td>.93***</td>
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<td>-.22*</td>
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<td><strong>CBC</strong></td>
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TABLE 33
INTERCORRELATIONS OF INTERPERSONAL PROBLEM SOLVING MEASURES (10-11 YEAR OLDS)

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<th>Consequential Thinking</th>
<th>Solution Adequacy</th>
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<th>MFS</th>
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<td>.19</td>
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<td></td>
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<td>.24*</td>
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<tr>
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<td></td>
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<td>-.33</td>
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* p < .05  ** p < .01  *** p < .005  **** p < .0005  ***** p < .0001
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<th>Problem Consideration</th>
<th>Alternative Thinking</th>
<th>Consequential Thinking</th>
<th>Solution Adequacy</th>
<th>Total Problem Solving</th>
<th>MEPS</th>
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<td>.19</td>
<td>.70***</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Solution Adequacy</td>
<td>.38***</td>
<td>.90***</td>
<td></td>
<td></td>
<td>.14</td>
<td>-.20%</td>
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<td></td>
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<tr>
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<td>.22%</td>
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</table>

MEPS                     

CBC                      

* P < .05  ** P < .005  *** P < .001
# TABLE 35

INTERCORRELATIONS OF INTERPERSONAL PROBLEM SOLVING MEASURES AND CHILD BEHAVIOR CHECKLIST SCALES (TOTAL SAMPLE)

<table>
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<th>TIPS</th>
<th>MEPS</th>
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</thead>
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<td>-.37****</td>
<td>-.13</td>
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<td>-.34****</td>
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<td>-.23**</td>
<td>-.14</td>
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<td>-.08</td>
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<td>Somatic Complaints</td>
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<td>-.01</td>
<td>.04</td>
</tr>
<tr>
<td>Social Withdrawal</td>
<td>.08</td>
<td>-.20*</td>
<td>-.01</td>
</tr>
<tr>
<td>Hyperactive</td>
<td>-.14</td>
<td>-.37****</td>
<td>-.12</td>
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<tr>
<td>Aggressive</td>
<td>-.04</td>
<td>-.30****</td>
<td>-.09</td>
</tr>
<tr>
<td>Delinquent</td>
<td>-.04</td>
<td>-.30****</td>
<td>-.09</td>
</tr>
<tr>
<td>Total Social Competence</td>
<td>.06</td>
<td>.40*****</td>
<td>.14</td>
</tr>
<tr>
<td>Activity</td>
<td>.03</td>
<td>.33****</td>
<td>.10</td>
</tr>
<tr>
<td>Social</td>
<td>-.03</td>
<td>.28****</td>
<td>.09</td>
</tr>
<tr>
<td>School</td>
<td>.06</td>
<td>.29****</td>
<td>.08</td>
</tr>
</tbody>
</table>

* p < .05  
** p < .01  
*** p < .001  
**** p < .0005  
***** p < .00005
to a variety of CBCL scales. Most prominent among these was the negative relationship of Problem Consideration to Internalizing, Externalizing and Total Behavior scores. The greater the degree to which a youngster internalized or externalized his behavior, the fewer was the number of relevant aspects of the problem that he considered. Similar negative correlations also appeared between Problem Consideration and 2 of 5 narrow band Internalizing scales (i.e. Schizoid-Anxious, and Obsessive-Compulsive) and all 3 of the narrow band Externalizing scales (i.e. Hyperactive, Aggressive and Delinquent). In addition, Problem Consideration was negatively related to Social Withdrawal. Significant positive correlations were those with: (a) Total Social Competence, (b) Activities, (c) Social, and (d) School.

The next greatest number of significant correlations were those for Solution Adequacy and adjustment. Here, too, the correlations were all negative. Solution adequacy was linked to the following CBCL scales: (a) Externalizing, (b) Total Behavior, (c) Hyperactive, (d) Aggressive, and (e) Delinquent. Solution Adequacy was also positively related to: (a) Total Social Competence, and (b) School. Similar results appeared between Consequential Thinking and these same 5 behavior scales and 2 competence scales.

Means-ends problem solving was negatively related to the following CBCL scales: (a) Total Behavior, (b) Schizoid-Anxious, (c) Hyperactive, (d) Aggressive, and (e) Delinquent while perspective taking was positively correlated to these same scales save for the Delinquent one. Both measures were also significantly related
(positively for MEPS and negatively for CBC) to: (a) Total Social Competence, and 2) School.

No other correlations proved to be significant. Thus, neither Problem Recognition nor Alternative Thinking was significantly related to any of the CBCL scales.

In order to determine the influence of PPVT IQ on these correlations, a second analysis was undertaken with IQ partialled out. Table 36 presents these results. While this resulted in some lessening of the magnitude of the correlation coefficients, the pattern was similar although some relationships no longer were significant. Problem Consideration continued to maintain the largest number of significant correlations followed by Solution Adequacy. Of note was the drop in the number of significant correlations for both Consequential Thinking (from 8 to 3) and MEPS (from 7 to 1).

Analyses were also undertaken for each age level. Table 37 and 38 present the partial correlational analyses for 6-7 year old boys with and controlling for PPVT IQ. Once again, the basic pattern remained comparable for both, although the correlation coefficients did drop somewhat when IQ was partialled out. For the partial correlational analysis, Problem Consideration continued to maintain the greatest number of significant correlations; that is, negatively to: (a) Externalizing, (b) Total Behavior, (c) Hyperactive, (d) Aggressive, and (c) Delinquent and positively to: (a) Total Social Competence, (b) Social, and (c) School. For the first time, Alternative Thinking appeared as significantly negatively related to: (a) Hyperactive, (b) Aggressive, and (c) Delinquent and positively
### TABLE 36
PARTIAL CORRELATIONS OF INTERPERSONAL PROBLEM SOLVING MEASURES AND CHILD BEHAVIOR CHECKLIST SCALES
CONTROLLING FOR PPVT IQ (TOTAL SAMPLE)

<table>
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<th>Problem Consideration</th>
<th>Alternative Thinking</th>
<th>Consequential Thinking</th>
<th>Solution Adequacy</th>
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<td>-.19</td>
<td>-.04</td>
<td>-.06</td>
<td>-.03</td>
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<tr>
<td>Externalizing</td>
<td>-.10</td>
<td>-.20</td>
<td>-.08</td>
<td>-.15</td>
<td>-.18</td>
</tr>
<tr>
<td>Total Behavior</td>
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<td>-.27</td>
<td>-.07</td>
<td>-.13</td>
<td>-.11</td>
</tr>
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<td>-.13</td>
<td>-.10</td>
<td>-.15</td>
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<tr>
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<td>.06</td>
<td>.01</td>
<td>.01</td>
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<td>.04</td>
<td>.01</td>
<td>.01</td>
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<td>-.06</td>
<td>-.05</td>
<td>-.06</td>
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<td>.01</td>
<td>.05</td>
<td>.08</td>
<td>.07</td>
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<td>-.03</td>
<td>-.06</td>
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* $p < .05$  ** $p < .01$  *** $p < .005$  **** $p < .001$
### Table 37

**Intercorrelations of Interpersonal Problem Solving Measures and Child Behavior Checklist Scales (6-7 Year Olds)**

<table>
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<th>CBC</th>
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<td>Consequential Thinking</td>
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<td>-0.13</td>
</tr>
<tr>
<td>Externalizing</td>
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<td>-0.49***</td>
<td>-0.25*</td>
</tr>
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<td>-0.24*</td>
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<td>-0.05</td>
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<td>-0.04</td>
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<td>-0.09</td>
<td>-0.07</td>
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<tr>
<td>Somatic Complaints</td>
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<td>-0.11</td>
<td>-0.15</td>
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<tr>
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<td>-0.13</td>
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<td>Hyperactive</td>
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<td>-0.46***</td>
<td>-0.25*</td>
</tr>
<tr>
<td>Aggressive</td>
<td>-0.07</td>
<td>-0.49***</td>
<td>-0.28*</td>
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<td>0.40***</td>
<td>0.29*</td>
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<tr>
<td>School</td>
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<td>0.43***</td>
<td>0.30**</td>
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* p < .05  
** p < .01  
*** p < .001  
**** p < .0001
### Table 38

**Partial Correlations of Interpersonal Problem Solving Measures and Child Behavior Checklist Scales Controlling for PPVT IQ (6-7 Year Olds)**

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<tr>
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<td>Obsessive Compulsive</td>
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</tr>
<tr>
<td>Somatic Complaints</td>
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</tr>
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<td>Hyperactive</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delinquent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Social</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .05  **P < .01  ***P < .005  ****P < .0005*
related to: (a) Social, and (b) School. Finally, means-ends thinking is no longer significantly related to any CBCL scales.

Finally, Tables 39 and 40 present the results of the partial correlational analyses for the 10-11 year old boys. Again, Problem Consideration maintained the largest number of significant relationships. Significant correlations to Alternative Thinking were no longer evident. However, a number of significant negative relationships between perspective taking and various CBCL scales re-appear; that is, to: (a) Externalizing, (2) Total Behavior, (c) Hyperactive, (d) Aggressive, (e) Social Withdrawal, and (f) Social. As well, means-ends thinking re-appeared as negatively correlated to: (a) Externalizing, (b) Total Behavior, (c) Hyperactive, and (d) Aggressive, and positively related to School.

Predictors of Interpersonal Problem Solving

Stepwise multiple regression analyses were completed to determine the best predictors of interpersonal problem solving ability. The first of these analyses evaluated the contribution of age, PPVT IQ, MEPS and CBC scores to overall Total Problem Solving (TIPS) scores. Table 41 summarizes the results of this analysis. Age was the largest contributor accounting for nearly 33% of the variance. This was followed by PPVT IQ which contributed another 5% and the CBC which accounted for approximately 3%. While MEPS contributed 1% to the variance, this was not significant. Overall, these four variables accounted for approximately 42% of the variance in overall Total Problem Solving.
### Table 39

Intercorrelations of Interpersonal Problem Solving Measures and Child Behavior Checklist Scales (10-11 Year Olds)

<table>
<thead>
<tr>
<th></th>
<th>Problem Recognition</th>
<th>Problem Consideration</th>
<th>Alternative Thinking</th>
<th>Consequential Thinking</th>
<th>Solution Adequacy</th>
<th>Total Problem Solving</th>
<th>TPFS</th>
<th>CCB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CBCL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalizing</td>
<td>.05</td>
<td>-.36***</td>
<td>-.09</td>
<td>-.20</td>
<td>-.16</td>
<td>-.26***</td>
<td>-.14</td>
<td>.20</td>
</tr>
<tr>
<td>Externalizing</td>
<td>-.06</td>
<td>-.38***</td>
<td>.05</td>
<td>-.25*</td>
<td>-.23*</td>
<td>-.31**</td>
<td>-.29*</td>
<td>.32**</td>
</tr>
<tr>
<td>Total Behavior</td>
<td>.01</td>
<td>-.40***</td>
<td>-.06</td>
<td>-.25*</td>
<td>-.22</td>
<td>-.31**</td>
<td>-.25*</td>
<td>.28**</td>
</tr>
<tr>
<td>Schizoid-Anxious</td>
<td>.11</td>
<td>-.18</td>
<td>-.07</td>
<td>.03</td>
<td>.06</td>
<td>.06</td>
<td>.04</td>
<td>.11</td>
</tr>
<tr>
<td>Depressed</td>
<td>.11</td>
<td>-.28*</td>
<td>.01</td>
<td>.13</td>
<td>.16</td>
<td>.18</td>
<td>.09</td>
<td>.16</td>
</tr>
<tr>
<td>Uncommunicative</td>
<td>.08</td>
<td>-.32**</td>
<td>-.10</td>
<td>-.22</td>
<td>-.10</td>
<td>-.24**</td>
<td>-.19</td>
<td>.10</td>
</tr>
<tr>
<td>Obsessive Compulsive</td>
<td>.07</td>
<td>-.30**</td>
<td>-.10</td>
<td>-.17</td>
<td>-.09</td>
<td>-.21</td>
<td>-.09</td>
<td>.19</td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>-.02</td>
<td>-.10</td>
<td>.03</td>
<td>.01</td>
<td>-.08</td>
<td>-.05</td>
<td>-.05</td>
<td>-.01</td>
</tr>
<tr>
<td>Social Withdrawal</td>
<td>.06</td>
<td>-.31**</td>
<td>.08</td>
<td>-.17</td>
<td>-.21</td>
<td>-.24*</td>
<td>-.22</td>
<td>.24*</td>
</tr>
<tr>
<td>Hyperactive</td>
<td>-.05</td>
<td>-.43******</td>
<td>-.06</td>
<td>-.27*</td>
<td>-.28*</td>
<td>-.34**</td>
<td>-.24*</td>
<td>.27*</td>
</tr>
<tr>
<td>Aggressive</td>
<td>-.02</td>
<td>-.28*</td>
<td>-.02</td>
<td>-.21</td>
<td>-.22*</td>
<td>-.25**</td>
<td>-.26*</td>
<td>.30**</td>
</tr>
<tr>
<td>Delinquent</td>
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<td>-.19</td>
<td>.12</td>
<td>-.05</td>
<td>-.12</td>
<td>-.08</td>
<td>-.20</td>
<td>.14</td>
</tr>
<tr>
<td>Total Social</td>
<td>.03</td>
<td>.44******</td>
<td>.07</td>
<td>.14</td>
<td>.28*</td>
<td>.29**</td>
<td>.21</td>
<td>-.20</td>
</tr>
<tr>
<td>Competence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>.04</td>
<td>.33**</td>
<td>.04</td>
<td>.01</td>
<td>.05</td>
<td>.10</td>
<td>.07</td>
<td>.04</td>
</tr>
<tr>
<td>Social</td>
<td>-.03</td>
<td>.37******</td>
<td>.05</td>
<td>.13</td>
<td>.17</td>
<td>.23*</td>
<td>.15</td>
<td>-.25*</td>
</tr>
<tr>
<td>School</td>
<td>-.05</td>
<td>.45******</td>
<td>.12</td>
<td>.28*</td>
<td>.41***</td>
<td>.41***</td>
<td>.33**</td>
<td>-.19</td>
</tr>
</tbody>
</table>

* p < .05
** p < .01
*** p < .001
**** p < .0005
***** p < .00005

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### TABLE 40

**PARTIAL CORRELATIONS OF INTERPERSONAL PROBLEM SOLVING MEASURES AND CHILD BEHAVIOR CHECKLIST SCALES CONTROLLING FOR PPVT IQ (10-11 YEAR OLDS)**

<table>
<thead>
<tr>
<th></th>
<th>Problem Recognition</th>
<th>Problem Consideration</th>
<th>Alternative Thinking</th>
<th>Consequential Thinking</th>
<th>Solution Adequacy</th>
<th>Total Problem Solving</th>
<th>TIPS CBC</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBCL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalizing</td>
<td>.03</td>
<td>-.34***</td>
<td>-.08</td>
<td>-.18</td>
<td>-.15</td>
<td>-.25**</td>
<td>-.11</td>
</tr>
<tr>
<td>Externalizing</td>
<td>-.09</td>
<td>-.36***</td>
<td>-.04</td>
<td>-.23**</td>
<td>-.22**</td>
<td>-.28**</td>
<td>-.25**</td>
</tr>
<tr>
<td>Total Behavior</td>
<td>-.03</td>
<td>-.38***</td>
<td>-.04</td>
<td>-.23**</td>
<td>-.20**</td>
<td>-.28**</td>
<td>-.21**</td>
</tr>
<tr>
<td>Schizoid-Anxious</td>
<td>.10</td>
<td>-.18</td>
<td>-.07</td>
<td>-.02</td>
<td>.06</td>
<td>-.06</td>
<td>.03</td>
</tr>
<tr>
<td>Depressed</td>
<td>.09</td>
<td>-.27**</td>
<td>.01</td>
<td>-.11</td>
<td>-.15</td>
<td>-.17</td>
<td>-.06</td>
</tr>
<tr>
<td>Uncommunicative</td>
<td>.07</td>
<td>-.31***</td>
<td>-.09</td>
<td>-.20**</td>
<td>-.10</td>
<td>-.23**</td>
<td>-.18</td>
</tr>
<tr>
<td>Obsessive Compulsive</td>
<td>.06</td>
<td>-.28**</td>
<td>-.09</td>
<td>-.15</td>
<td>-.08</td>
<td>-.19**</td>
<td>-.06</td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>-.02</td>
<td>-.10</td>
<td>.02</td>
<td>-.01</td>
<td>-.08</td>
<td>-.05</td>
<td>-.06</td>
</tr>
<tr>
<td>Social Withdrawal</td>
<td>.06</td>
<td>-.30***</td>
<td>-.07</td>
<td>-.16</td>
<td>-.21**</td>
<td>-.24**</td>
<td>-.21**</td>
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<td>Hyperactive</td>
<td>.01</td>
<td>-.40***</td>
<td>-.04</td>
<td>-.24**</td>
<td>-.27**</td>
<td>-.32**</td>
<td>-.19**</td>
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<tr>
<td>Aggressive</td>
<td>-.07</td>
<td>-.25**</td>
<td>-.01</td>
<td>-.18</td>
<td>-.21**</td>
<td>-.22**</td>
<td>-.21**</td>
</tr>
<tr>
<td>Delinquent</td>
<td>.02</td>
<td>-.16</td>
<td>.14</td>
<td>-.02</td>
<td>-.10</td>
<td>-.05</td>
<td>-.15</td>
</tr>
<tr>
<td>Total Social</td>
<td>.05</td>
<td>.42***</td>
<td>.06</td>
<td>.12</td>
<td>.27**</td>
<td>.28**</td>
<td>.18</td>
</tr>
<tr>
<td>Competence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>.07</td>
<td>.30***</td>
<td>-.06</td>
<td>-.03</td>
<td>.03</td>
<td>.07</td>
<td>.03</td>
</tr>
<tr>
<td>Social</td>
<td>.01</td>
<td>.35***</td>
<td>.04</td>
<td>.11</td>
<td>.16</td>
<td>.21**</td>
<td>.12</td>
</tr>
<tr>
<td>School</td>
<td>-.02</td>
<td>.43***</td>
<td>.10</td>
<td>.26**</td>
<td>.40***</td>
<td>.39***</td>
<td>.30**</td>
</tr>
</tbody>
</table>

* P < .05  ** P < .01  *** P < .005  **** P < .001
### Table 41

**Summary of Stepwise Regression Analysis for Total Problem Solving (TIPS)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$</th>
<th>$R^2$ Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.3280</td>
<td>0.3280</td>
</tr>
<tr>
<td>PPVT IQ</td>
<td>0.3814</td>
<td>0.0534</td>
</tr>
<tr>
<td>CBC</td>
<td>0.4113</td>
<td>0.0299</td>
</tr>
<tr>
<td>MEPS</td>
<td>0.4213</td>
<td>0.0100</td>
</tr>
</tbody>
</table>
To evaluate whether adjustment would enhance the prediction of overall Total Problem Solving, the various CBCL scale scores were included with the previous four variables in a second stepwise analysis. Table 42 reveals that age continued to be the single largest contributor accounting for nearly 33% of the variance. This was, however, now followed by Total Social Competence of the CBCL which contributed approximately 9% and the CBC another 2%. Finally, although PPVT IQ accounted for another 1%, this was not a significant contribution. No other CBCL scales made significant contributions. Overall, then, these variables accounted for approximately 45% of the variance in Total Problem Solving.

Predictors of Adjustment

Separate stepwise multiple regression analyses were also undertaken to determine the best predictors of adjustment as measured by the CBC. The analyses were performed for the following four CBCL T scores: (a) Total Behavior, (b) Internalizing, (c) Externalizing, and (d) Total Social Competence and examined the relative contributions of age, PPVT IQ, the primary TIPS scores, MEPS and the CBC scores.

Table 43 summarizes the results for the Total Behavior score. Problem Consideration (TIPS) was the single largest contributor accounting for nearly 12% of the variance. This was followed by age which contributed approximately an additional 7%. PPVT IQ followed and accounted for another 3% while the CBC added another 2%, although this contribution was not significant. No other problem solving score
### TABLE 42

**SUMMARY OF STEPWISE REGRESSION ANALYSIS FOR TOTAL PROBLEM SOLVING (TIPS)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$</th>
<th>$R^2$ Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.3280</td>
<td>0.3280</td>
</tr>
<tr>
<td>Total Social Competence (CBCL)</td>
<td>0.4214</td>
<td>0.0934</td>
</tr>
<tr>
<td>CBC</td>
<td>0.4113</td>
<td>0.0199</td>
</tr>
<tr>
<td>PPVT IQ</td>
<td>0.4547</td>
<td>0.0134</td>
</tr>
</tbody>
</table>
TABLE 43

SUMMARY OF STEPWISE REGRESSION ANALYSIS FOR CBCL TOTAL BEHAVIOR SCORE

<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$</th>
<th>$R^2$ Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Consideration (TIPS)</td>
<td>0.1170</td>
<td>0.1170</td>
</tr>
<tr>
<td>Age</td>
<td>0.1846</td>
<td>0.0676</td>
</tr>
<tr>
<td>PPVT IQ</td>
<td>0.2160</td>
<td>0.0314</td>
</tr>
<tr>
<td>CBC</td>
<td>0.2333</td>
<td>0.0173</td>
</tr>
</tbody>
</table>
proved significant in its contribution to the overall variance. Overall, then, approximately 23% of the variance was accounted for by these variables.

Table 44 presents the results for the best predictors of the Externalizing score. PPVT IQ proved to be the largest contributor accounting for 14% of the variance in this score. This was followed by Problem Consideration (TIPS) which contributed an additional 7% to the explained variance. Age followed and accounted for approximately another 4% while the CBC contributed another 3%. While MEPS accounted for another 1%, this proved to be an insignificant contribution. All other scores provided negligible contributions, none of which were significant.

Table 45 summarizes the results for the Internalizing score. Only Problem Consideration (TIPS) and age provided significant contributions and accounted for approximately 6% and 5% of the explained variance respectively.

Finally, Table 46 presents the results for the Total Social Competence score. Here, Problem Consideration (TIPS) was the single largest contributor accounting for approximately 16% of the variance. This was followed by age contributing approximately 9% and PPVT IQ accounting for another 3%. Although MEPS contributed another 1%, this was not significant. All other scores were also negligible in their contribution. Overall, then, these variables accounted for approximately 29% of the variance in Total Social Competence.
<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$</th>
<th>$R^2$ Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPVT IQ</td>
<td>0.1424</td>
<td>0.1424</td>
</tr>
<tr>
<td>Problem Consideration (TIPS)</td>
<td>0.2125</td>
<td>0.0701</td>
</tr>
<tr>
<td>Age</td>
<td>0.2485</td>
<td>0.0360</td>
</tr>
<tr>
<td>CBC</td>
<td>0.2799</td>
<td>0.0314</td>
</tr>
<tr>
<td>MEPS</td>
<td>0.2928</td>
<td>0.0129</td>
</tr>
</tbody>
</table>
### TABLE 45

**SUMMARY OF STEPWISE REGRESSION ANALYSIS FOR CBCL INTERNALIZING SCORE**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$</th>
<th>$R^2$ Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Consideration (TIPS)</td>
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<td>0.0563</td>
</tr>
<tr>
<td>Age</td>
<td>0.1070</td>
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</table>

### TABLE 46

**SUMMARY OF STEPWISE REGRESSION ANALYSIS FOR CBCL TOTAL SOCIAL COMPETENCE SCORE**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$</th>
<th>$R^2$ Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Consideration (TIPS)</td>
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<td>0.1580</td>
</tr>
<tr>
<td>Age</td>
<td>0.2521</td>
<td>0.0941</td>
</tr>
<tr>
<td>PPVT IQ</td>
<td>0.2829</td>
<td>0.0308</td>
</tr>
<tr>
<td>MEPS</td>
<td>0.2933</td>
<td>0.0104</td>
</tr>
</tbody>
</table>
Within Group Performance

Median splits were performed to determine if there were significant differences in the numbers of nonadjusted boys compared to Adjusted ones who had obtained total TIPS problem solving scores at or above the median score of this latter group at each age level. Table 47 summarizes the number of 6-7 year old boys in each adjustment group who scored at or above this median. A nearly significant adjustment effect was found, \( \chi^2(3, n = 74) = 7.38, p < .06 \) for this age group.

Table 48 summarizes the number of 10-11 year old boys in each adjustment group who scored at or above the median. Results, here, pointed to a highly significant adjustment effect operating, \( \chi^2(3, n = 74) = 14.58, p < .005 \).
TABLE 47
MEDIAN SPLIT ON TIPS TOTAL PROBLEM SOLVING SCORES
FOR 6-7 YEAR OLDS

<table>
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<tr>
<th></th>
<th>Below Median n</th>
<th>At or Above Median n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internalizers</td>
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<td>7</td>
</tr>
<tr>
<td>Externalizers</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Mixed</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Adjusted</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Below Median</td>
<td>At or Above Median</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------</td>
<td>--------------------</td>
</tr>
<tr>
<td></td>
<td>(n)</td>
<td>(n)</td>
</tr>
<tr>
<td>Internalizers</td>
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<td>1</td>
</tr>
<tr>
<td>Externalizers</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Mixed</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Adjusted</td>
<td>9</td>
<td>11</td>
</tr>
</tbody>
</table>
CHAPTER IV
DISCUSSION

The following discussion will focus attention on an interpretation of each of the major findings just reported.

Adjustment Effects

TIPS

The overall results of this study provide evidence that interpersonal problem solving is linked to adjustment. As such, they also provide consistent support for the hypotheses stated previously. Significant adjustment effects were found for Problem Recognition, Problem Consideration, Consequential Thinking and Solution Adequacy. In all these instances, Adjusted boys demonstrated better problem solving ability than either one or more of the clinical groups. Thus, Adjusted boys were more adept at: (a) initially recognizing conflict situations, (b) considering relevant aspects of the problem, (c) generating consequences, and (d) selecting final solutions which reflected consideration of various perspectives.

Closer examination of these results also point to a consistent pattern developing amongst the four adjustment groups studied. In every instance, significant differences were found in problem solving ability between the Adjusted boys and their Externalizing counterparts. The problem solving ability of both Internalizers and
boys in the Mixed group seemed, however, to lie somewhere in between these two endpoints of the problem solving continuum. Whereas, in several instances, significant differences appeared between Internalizers and either Adjusted boys (e.g., Problem Consideration) or Externalizers (e.g., Solution Adequacy); in others, these differences were not significant (e.g., Problem Recognition and Consequential Thinking). A similar pattern also emerged for differences between the boys in the Mixed group and the other adjustment groups. Overall, then, there is a developing pattern in which: (a) Adjusted boys consistently appear to possess highly skillful problem solving abilities throughout; (b) Internalizers possess some relatively competent skills (e.g., Solution Adequacy), although they are weak in others (e.g., Problem Consideration); (c) the boys in the Mixed group are significantly weaker than Adjusted boys on a number of skills (e.g., Problem Consideration, Consequential Thinking, Total Problem Solving); and (d) Externalizers demonstrate significant deficits in almost all problem solving domains.

The significant adjustment effects found for the various TIPS-response type scores further support this pattern. Here, as well, Adjusted boys were significantly more competent than their Externalizing counterparts. They defined problems in a more precise fashion; they generated fewer solutions of a forceful nature, and fewer of them selected final preferred solutions which reflected forceful means of conflict resolution. Again, both Internalizers and boys in the Mixed group fell somewhere in between. Internalizers, for example, were significantly better than Externalizers in defining
problems but not significantly different from Adjusted boys. However, they relied more heavily on forceful solutions than Adjusted boys. Thus, again, Internalizers have certain relatively competent problem solving skills, although others remain weak. Similarly, the boys in the Mixed group appeared relatively competent in defining problems.

In summary, these results point to an emerging picture of interpersonal problem solving competence varying as a function of adjustment status where Adjusted boys are clearly the most capable, Internalizers are relatively capable, boys in the Mixed group demonstrate some weaknesses and Externalizers are deficient throughout.

These results tend to support the contention of the Shure and Spivack group that problem solving ability is linked to adjustment. However, in some ways, these results differ from the findings of the Shure and Spivack group. In their series of preschool and kindergarten studies (Shure and Spivack, 1975), the authors pointed to a pattern in which both inhibited and acting out youngsters were significantly less adept at problem solving than their adjusted peers, with inhibited children tending to be the weakest although their scores were not always significantly different from those of their acting out counterparts. In the present study, however, Externalizers (i.e. acting out boys) were the least adept with Internalizers (i.e. inhibited boys) somewhat more competent in certain skills (e.g., Solution Adequacy, Total Problem Solving). Several reasons may account for this difference. For one, it may have been due to
significant differences in the socio-economic status and race of the subjects in the two studies. While the Shure and Spivack group investigated problem solving in inner-city black youngsters, this investigation looked at middle class suburban youngsters. Secondly, children in this study appeared to have had higher mean IQ scores than those of the Shure and Spivack group. Thirdly, the use of different behavior rating scales (Hahnemann Pre-School Behavior Rating Scale versus the CBCL) may have produced differences in adjustment classification. Thus, the 'inhibited' child of the Shure and Spivack studies may have been somewhat different from that of the Internalizer in the present investigation. It should also be remembered that all children in the Shure studies were generally 'normal'. None had been clinically identified as 'nonadjusted' as was the case in the present investigation. Fourthly, differences in the problem solving measures used and the skills assessed may have produced the discrepancies that emerged. Indeed, Problem Consideration and Solution Adequacy are two skills not even addressed by the Shure group whereas Problem Recognition, Alternative Thinking and Consequential Thinking were all measured somewhat differently in the two studies. Finally, the two investigations used children of differing ages. Thus, it may be that the patterns that emerged vary as a function of age; at the preschool level it is 'inhibited' children who are the weakest in problem solving capacity whereas, at older ages, it is the 'acting out' children who are the least capable.

The consistent pattern of problem solving competence obtained in the present study is a new finding not previously seen. This finding
also supports the view that the link between adjustment and problem solving is not a simple one, but varies both as a function of adjustment status and the specific problem solving skill being studied. This would account, for example, for Internalizers being quite competent in certain problem solving abilities (e.g., Consequential Thinking) and markedly weaker in other (e.g., Problem Consideration).

Although a significant adjustment effect appeared for most problem solving abilities, this was not always the case. For example, no significant adjustment group difference emerged for Alternative Thinking, a finding in contrast to that of the Shure and Spivack group. One possible explanation for this may center on the use of forceful solutions. In the present study, Adjusted, as well as Internalizing youngsters, provided significantly lower proportions of forceful solutions than did Externalizers. It is possible that these two former groups were more frequently discarding their forceful alternatives as acceptable options when initially asked to provide the examiner with as many solutions as possible. If so, then it is conceivable that the number of solutions generated by either Adjusted and Internalizing boys does not reflect all possible alternatives available to them but rather the more limited number that they perceive as acceptable and appropriate. As they have already largely dismissed most forceful options as inappropriate, they do not include them in their repertoire of alternatives. However, if one were to then add these forceful options to those alternatives generated by either the Adjusted or Internalizing boys, one might, indeed, see that
these two groups are capable of producing more alternatives than Externalizers. The Shure and Spivack (1975) finding of no difference in force ratios between their groups of inhibited, impulsive and adjusted children supports this contention. In contrast to the present investigation, adjusted and inhibited youngsters, in their study, included forceful responses as frequently as did impulsive children. This clearly contributed to overall differences in alternative thinking between their three adjustment groups. That the adjusted and inhibited children in the Shure studies relied as heavily as they did upon forceful solutions in comparison to those in the present study, is of particular interest. One reason for this may be the difference in age between children in both studies. Youngsters in the Shure and Spivack (1975) studies were all of nursery or kindergarten age whereas those in the present study were all considerably older. As this study, as well as that of Feldgaier (1979), have demonstrated age related differences in the use of force, it may be that, to some degree, this factor accounts for some of the discrepancy found. Whereas young children, regardless of adjustment status, may rely heavily upon forceful solutions, older adjusted youngsters may be less likely to do so. If so, then one might expect few differences in the force ratio at the younger ages while seeing them emerge in later years, as was evident in the present study.

Finally, no significant adjustment effects were found for any of the Consequential Thinking response types. Thus, boys, in this study, generated proportions of consequences reflecting either behavioral, psychological or conceptual issues which did not vary as a function of
adjustment. This result proves to be contrary to that initially proposed and is further complicated by the finding of an interaction effect for conceptual issues. It is difficult to interpret this result relative to prior findings as no other study has examined its relationship to adjustment. It would appear, though, that both adjusted and nonadjusted boys rely primarily on behaviorally oriented consequences with some attention also given to psychologically or conceptually oriented ones. That over 50% of all consequences reflect this behavioral orientation may imply that such types of consequential thinking may vary more as a function of age and cognitive level than of adjustment status. Thus, despite some reference to thoughts, feelings and conceptual matters, boys, especially the younger ones, are guided in their consequential thinking primarily by the concrete operational level that they are functioning in. Hence, their frequent reliance upon behaviorally oriented consequences regardless of their adjustment status.

The appearance of significant adjustment group effects for these various TIPS skills is in contrast to results obtained by Kendall and Fischler (1984) in their study of interpersonal problem solving. They reported finding no significant difference between either Externalizers and average children or Internalizers and average youngsters on measures of alternative thinking, means-end thinking, or consequential thinking. As a result, they question the existence of any link between problem solving and adjustment. Children in both studies were quite similar in that they were both primarily white, middle class and relatively bright. Both studies seem to concur in
finding no differences in alternative or means-end thinking. Where the
two studies do differ, however, is in their finding pertaining to
consequential thinking. Whereas Kendall and Fischler reported no
significant adjustment effect, this investigation demonstrated
otherwise. Although this difference may be due to the use of somewhat
different tests, it may also be due to differences in the relative
adjustment status of the various groups examined. Kendall and
Fischler (1984) reported that their extreme group was composed of
youngsters with $T$ scores $\geq 60$ on the separate indices (e.g.,
Internalizing) of the CBCL while the 'average' group was made up of
the $10\% - 15\%$ of children in their sample whose scores were around the
mean. While no mean CBCL $T$ scores were provided for any of these
groups, it may be that the differences in adjustment between their
'average' and either Externalizing or Internalizing groups were not as
large as those in this study. In the present investigation Adjusted
youngsters were not simply 'average' boys but those who initially had
been identified by their teachers as possessing excellent
interpersonal skills and fine behavior which was later re-confirmed by
parent ratings on the CBCL which placed them clearly within the well
functioning domain. On the other hand, Internalizers and
Externalizers were not only rated as such by their parents but were
also clinically identified as poorly adjusted. This was not the case
in the Kendall and Fischler study. Hence, one has a picture of two
relative extremes, namely quite highly functioning Adjusted boys at
one end and very poorly functioning, clinically identified youngsters
at the other. It may, therefore, be that the gap in adjustment
between these two groups is larger than that seen between the 'average' and more poorly adjusted groups of the Kendall and Fischler study. If this is the case, then, this may account for the difference in results. It may only be when differences are large, that an adjustment effect seems to operate. For those boys, however, in the average to slightly maladjusted range, such effects would not be as readily apparent.

In summary, the present investigation found a significant adjustment effect for a variety of problem solving abilities. In all instances, Adjusted boys are significantly more adept than Externalizers at recognizing problems, in considering important details, in generating consequences, and in selecting final solutions reflecting a variety of perspectives. Adjusted boys are also more capable of defining problems in a concise fashion, in relying less frequently on forceful options, and in selecting final preferred solutions which were less forceful in nature. As such, these results are consistent with those of Asarnow and Callan (1985) and Richard and Dodge (1982) who also found differences in problem solving ability between adjusted youngsters and those with problems of an acting out, aggressive nature.

The problem solving capabilities of Internalizers, appear to lie somewhere in between those of Adjusted and Externalizing boys. Internalizers are significantly less capable than Externalizers at defining problems, at relying less frequently on forceful solutions and in selecting final solutions reflecting various perspectives. In other instances (e.g., consequential thinking), they fall somewhere in
the middle; that is, they are not significantly less capable than Adjusted boys but yet not significantly more capable than Externalizers. It is only with regard to Problem Consideration, that Internalizers are significantly less capable than Adjusted boys. Overall, then, Internalizers would appear to be fairly competent problem solvers. This result is consistent with those of Mullins et al. (1985) and Doerfler et al. (1984) who found little significant difference in problem solving ability between adjusted youngsters and those with some form of internalizing problem. Despite demonstrating some degree of problem solving competence on these tasks, Internalizers may, nevertheless, manifest performance difficulties when called upon to use their skills in real-life situations. Although generally competent in answering hypothesized story problems, Internalizers may perform much less skillfully when called upon to actually attempt such conflict resolutions. As Doerfler et al. (1984) have pointed out: ..."the distinction between skill deficits and performance deficits may be particularly important" (p. 496).

The problem solving capabilities of the Mixed group of boys seem, again, to also lie somewhere in between those of Adjusted and Externalizing boys. While, in some instances, they are significantly less adept than Adjusted boys (e.g., problem consideration, consequential thinking, and total problem solving); in others, they are not significantly different from either Adjusted, Internalizers or Externalizers.

What emerges, then, is a trend towards Adjusted youngsters being most capable at interpersonal problem solving; Internalizers almost as
adept, but possessing some weaknesses and generally tending to score lower; the Mixed group of boys somewhat weaker still; and finally, Externalizers, by far, the least adept at resolving interpersonal conflicts.

The consistency of this pattern for a variety of problem solving skills is quite clear; and, as such, is a finding not previously reported. The presence of such a problem solving continuum on which boys vary as a function of adjustment status is also important for it may serve to explain why previous studies have found such seemingly contradictory results. As this investigation is one of the very few to include a variety of different adjustment groups, it allows one to draw a more global picture of the relationship of problem solving to adjustment. Thus, it enlarges upon most other studies which simply contrast well functioning youngsters with one form of adjustment difficulty. As has been seen, when these studies focus on acting out forms of problem behavior, adjustment effects are evident. When, however, they center on more internalizing forms of problem behavior, adjustment effects are less readily apparent. Some investigators have then argued that these latter studies strongly negate the relationship between adjustment and problem solving. This, however, need not necessarily be so. Put in the broader context of the findings of the present study, the results of these latter studies would lie somewhere in between those of Adjusted and Externalizers on the problem solving continuum. Such results do not negate the link between problem solving and adjustment, but, rather, support the contention that the relationship between problem solving and adjustment is a complex one.
which varies as a function of the symptom pattern being examined.

**MEPS**

The present study found no significant adjustment effect for means-ends thinking. Although this finding is contradictory to that of Shure and Spivack (1972), it is in accordance with findings of Doerfler et al. (1984) and Kendall and Fischler (1984). The absence of any adjustment effect for this skill is somewhat puzzling given the significant adjustment effect demonstrated for so many of the other problem solving skills in this study. The inclusion of six and seven year old boys in this study may account partly for this finding. Spivack, Platt, and Shure (1976) have pointed out that means-ends thinking is a skill that does not clearly emerge until the 10-12 year old period. Younger children do not appear to have the requisite cognitive skills to respond in such a detailed sequential fashion. Thus, the inclusion of such young boys in this study, may have obscured the appearance of any overall adjustment effects. If this skill is generally beyond the capabilities of such young children, then it is likely that they will all produce very few means, regardless of their adjustment status.

**CBC**

This study also found a significant adjustment effect on perspective taking. Externalizers and the Mixed group of boys exhibited significantly greater egocentric thinking than Adjusted boys. The performance of Internalizers, again, fell somewhere in between. These results are quite consistent with those obtained for problem solving domain with Adjusted boys being the most adept:
Internalizers fairly competent; the Mixed group of boys demonstrating somewhat greater egocentric thinking; and finally, Externalizers exhibiting the most immature, egocentric thinking.

The results obtained would appear contrary to those obtained by Waterman et al. (1981) and Kurdek (1978) who both suggested that children with withdrawn, inhibited characteristics exhibited poorer perspective taking skills than those with aggressive, acting out tendencies. With respect to the Waterman study, these differing results may largely be due to the use of different perspective taking measures in the two studies. Waterman et al. (1981) primarily examined affective perspective taking whereas this study centered more upon the cognitive domain. Given that the relationships between perspective taking measures are not typically strong, it may be that these two studies were evaluating somewhat different abilities.

Although Kurdek (1978) employed the CBC, his evaluation of behavior was based upon teacher ratings and, thus, differed from the present study in the way in which adjustment was defined. The use of parent ratings, here, might indicate that children's behavior is, to some extent, situation specific and its assessment linked to the context in which it is observed. Teachers and parents do see children differently, and, thus, can evaluate their behavior in different ways. This is highlighted in an incidental way, from examination of the subject recruitment of the present study. Of 85 children nominated by their teachers as socially well adjusted, 11 were subsequently rated by parents as falling within the clinical range on the CBCL; thus, a clear example of how differing environments and raters may result in
differing views about a youngster's level of adjustment. In view of such a discrepancy, the contradictory results of this study in comparison to those of Kurdek might be better explained.

The present results do, however, support previous findings of Chandler (1973) and Burka and Glenwick (1978) who both used the CBC and uncovered links between high egocentrism and acting out, aggressive behavior. They also confirm, to some degree, the results of Cohen, Kershner and Wehrspann (1985) who found that Externalizers demonstrated significantly greater egocentric thinking (CBC) than did Internalizers. Although their study did not incorporate a well adjusted comparison group, one sees a pattern in both studies for Externalizers to be the most highly egocentric. Although perspective taking scores between Internalizers and Externalizers were not significantly different in the present study, the trend was certainly in the direction of Externalizers being the most egocentric, and in keeping with the results obtained by Cohen et al. (1985). An examination of mean perspective-taking scores for both Internalizers and Externalizers in the two studies suggests, moreover, that Internalizers in each are quite similar in their level of perspective taking ability. It is, however, for Externalizers that differences appear with Externalizers in the Cohen et al. (1985) study possessing more highly egocentric thinking than their Externalizing peers in the present investigation. This, then, would account for the significant adjustment effect seen between Internalizers and Externalizers in their study. Several reason may account for Externalizers being so egocentric in the Cohen study. Firstly, children in the Cohen study
seem to be of a somewhat lower socioeconomic level than those in the present investigation. Shure and Spivack (1975) have previously demonstrated differences in other problem solving skills based on SES. Secondly, while the majority of subjects in the Cohen study were English-speaking Canadians, a significant number came from the West Indies, Asia and Europe. This, too, may have contributed to the differences. Thirdly, the exceedingly small sample size in the Cohen study raises the question of the generalization of its results to larger groups.

In summary, the results of this study are consistent with many previous findings in demonstrating that perspective taking varies as a function of adjustment status. Moreover, these results are consistent with those obtained for problem solving in demonstrating a pattern in which Adjusted boys exhibit the most competent ability and Externalizers the least.

Age Effects

TIPS

The results clearly demonstrated a developmental trend in interpersonal problem solving ability. In contrast to younger boys, older boys are significantly more capable of considering relevant aspects of the problem, generating more alternative solutions, providing more consequences and providing final solutions which reflect the perspectives of more story characters. These results re-affirm the developmental course of these problem solving abilities which were first delineated in Feldgaier (1979) and Marsh (1982).
The absence of an age effect for Problem Recognition most likely reflects the relative ease with which boys in this study were able to discern the conflicts depicted in the TIPS stories. Although Feldgaier (1979) found an age related trend in this skill, the differences uncovered lay largely between 5 year old boys and their elder counterparts. That the youngest children in this study were somewhat older (i.e. 6-7 years) suggests that this ability to recognize problems, at least as depicted in the TIPS, is well within their grasp.

This study also demonstrated significant age effects for Problem Recognition-Response type, Alternative Thinking-Use of Force, Consequential Thinking-Behavior ratio and Consequential Thinking-Psychological ratio. Older boys are, in contrast to their younger aged peers, more capable of defining initial problems in a clear, concise manner. This result confirms the earlier findings of Feldgaier (1979) in demonstrating age related changes in this skill. As in the earlier study, younger boys tended to define most of the TIPS story conflicts by simply retelling the story rather than drawing out the relevant information. What appears to be operating here is an age related difference in analyzing information. Whereas younger children take in the story information on a rather global level, older children are capable of analyzing it more thoroughly and extracting the most pertinent details.

Older children also provide fewer alternative solutions of a forceful nature than do their younger counterparts. While nearly 37% of the younger boys' solutions reflected forceful means, this dropped
off to only 23% for the older boys. Clearly, older youngsters no longer perceive the use of force as a viable and socially appropriate means of resolving conflict and hence they rely far less on this method. This finding is also consistent with that of Feldgaier (1979) in demonstrating that the use of force to resolve conflicts varies as a function of age.

This study also revealed age related changes in consequential thinking. While younger boys typically provide consequences which are largely behavioral in nature (i.e. nearly 67% behavior and 22% psychological), older boys tend to think of consequences which are more reflective of both realms (i.e. 54% behavioral and 32% psychological). These results lend further support to the age related findings of both Feldgaier (1979) and Marsh (1982). This shift from a largely behavioral context to one which incorporates the increasing consideration of thoughts and feelings may reflect the broadening social perspective of older children as well as their increased ability in affective and cognitive perspective taking. The thoughts and feelings of others are now of greater concern to these older children as they become more adept at discerning others' perspectives. The transition from a concrete operational phase of cognitive development to one of formal operations may also account for this shift in older boys from behaviorally oriented consequences to ones of a psychological nature.

The absence of any age effect upon the Conceptual ratio for Consequential Thinking is somewhat puzzling, especially given the significant effects demonstrated for both the Behavioral and
Psychological ones. Although Marsh (1982) reported significant grade differences for this factor, there was no clear developmental trend evident in her study. Examination of her results, however, suggests that the largest differences were between her kindergarten children and her other older groups. As the present study did not include such a young age group, this may account for the differences seen in the two studies.

In summary, the overall results of this investigation have clearly demonstrated that interpersonal problem solving varies as a function of age. This was further highlighted by the regression analysis performed on Total Problem Solving scores. Age was, by far, the best predictor of this score, accounting for nearly 33% of the variance. Only limited contributions were made by PPVT IQ, CBC and MEPS scores. As such, these results confirm findings of Feldgaier (1979) and Marsh (1982) in supporting the developmental nature of the problem solving process.

**MEPS**

A significant age effect was also found for means-ends thinking. Older boys generated significantly more means than their younger aged counterparts. This finding is consistent with that of Feldgaier (1979) and reconfirms the developmental nature of this problem solving skill.

**CBC**

This study also demonstrated a significant age effect on perspective taking ability. Older children were more decentered in their thinking and more capable of differentiating various
perspectives than were younger boys. This finding is quite consistent with that of both Kurdek (1977) and Feldgaier (1979) in demonstrating that this skill varies as a function of age.

Relationships Among Problem Solving Skills

Correlational analyses were performed upon the total sample to determine relationships amongst problem solving skills. The partial correlational analysis controlling for PPVT IQ performed on the total sample resulted in the correlational coefficients dropping slightly but, nevertheless, generally remaining significant and maintaining the basic pattern of relationships established when IQ was included. This lack of systematic differences suggests that these relationships are relatively stable. Given the consistency in patterns, discussion will focus on those results obtained with IQ partialled out. As well, given the large number of correlations obtained, attention will center primarily on those correlations that were highly significant (i.e., $p < .01$).

The absence of significant relationships between Problem Recognition and other TIPS skills is not surprising. As was pointed out previously, the ability to recognize problems (at least as measured by the TIPS) is a relatively simple skill and one at which most youngsters in this study were quite successful. This lack of variation in their scores would account for the absence of significant correlations between this skill and other problem solving abilities. This finding is, moreover, quite consistent with that of Feldgaier (1979).
The pattern of significant relationships between the other TIPS abilities is also consistent with that reported by Feldgaier (1979). These results support the contention that the problem solving process is, indeed, a highly inter-dependent one in which proficiency in one skill tends to be associated with proficiency in others. The strong relationship of Total Problem Solving to all other TIPS abilities, except for Problem Recognition, (range of .76 to .94) also supports the contention that this overall total score may be used to represent a child's general problem solving ability.

Analyses were also conducted to determine whether the pattern of relationships at each age level differed from that of the total sample. As with the total sample analyses, the partial correlational analysis for the 6-7 year old boys resulted in similar patterns as those seen when IQ was left in. Results for this group were quite comparable to those for the total sample and hence further support the contention of relative stability in the relationships between the various TIPS skills even at this young age. Here, too, relationships between the various TIPS abilities were quite strong, reconfirming the highly inter-dependent nature of these skills. Here, as well, the absence of any significant relationships between Problem Recognition and other problem solving abilities is not unexpected as, even at this young age, most boys had already mastered this skill. Finally, Total Problem Solving serves as an excellent single representative of overall problem solving ability.

For the 10-11 year old group, the pattern of relationships again remained quite similar, both with and controlling for PPVT IQ. Here,
too, the relatively strong relationships between problem solving skills reflect the inter-dependence of these abilities. As well, the strong relationship between Total Problem Solving and the other problem solving skills reconfirm the potential of this score being used as a general indication of overall problem solving ability.

In summary, these correlational analyses highlight the highly interdependent nature of the various problem solving skills. The very limited influence of IQ upon these relationships also suggests that they are relatively stable ones. Finally, the similarity in relationship patterns at both age levels and with the total sample suggests a consistency in these relationships that does not vary significantly as a function of age.

Relationship of Means-Ends Thinking to Interpersonal Problem Solving

Like the previous analyses, those involving means-ends thinking and problem solving maintained similar patterns of relationships both with and controlling for PPVT IQ. For the total sample, the relationships that did appear are quite consistent with those obtained by Feldgaier (1979) with most coefficients in both studies ranging in the .30 to .45 range.

The fewer number of significant relationships between means-ends thinking and the various TIPS abilities in the 6-7 year old group is not unexpected. Means-ends thinking is a skill that is only beginning to emerge in this young age group and, thus, there was little variability in these scores for this age level.
The absence of many significant relationships for the 10-11 year old group is also consistent with the premise that means-ends thinking is still only at an emergent stage and most youngsters in this group have relatively comparable means-ends ability.

Relationship of Perspective Taking to Interpersonal Problem Solving

As in the other analyses, those involving perspective taking and problem solving generally maintained similar patterns of relationships both with and controlling for PPVT IQ. For the total sample, the appearance of significant relationships between perspective taking and several problem solving skills is consistent with previous findings (e.g., Feldgaier, 1979; Marsh et al., 1981). That good perspective taking ability should be closely associated with competence in considering problems, in generating solutions, in recognizing consequences and in selecting preferred solutions reflecting various views reconfirms the Shure and Spivack (1978) assertion that perspective taking ability should enhance problem solving thinking by enlarging the range of solutions to choose from and by heightening awareness of potential consequences. As they have also pointed out, "...such a perspective taking child also should be better able to select the one solution that might best work, considering the individual he is facing and how the latter is likely to react" (Shure & Spivack, 1978, p. 16). Clearly, the relationships demonstrated between perspective taking and the various problem solving skills in the present study, not only for the total sample but to some degree for each age group, re-affirm this statement.
Relationship Between Problem Solving and Adjustment

Correlational analyses were completed both with and controlling for PPVT IQ. As the pattern of relationships remained largely the same with IQ partialled out for the total sample, discussion will focus on these results. Problem Consideration proved to be the TIPS ability most frequently associated with CBCL scales. Its highly significant negative relationships to both the Internalizing and Externalizing scales further support the contention of a strong link between problem solving and adjustment. That Problem Consideration should be the skill most frequently related to the various CBCL scales is not a finding previously reported and points to this skill playing a role in determining adjustment status. The more capable one is of analyzing a problem and differentiating its vital aspects, the better should be one's chances of successfully resolving the conflict and enhancing one's interpersonal functioning. Deficits in this skill would most likely lead to difficulties in successful conflict resolution. Examination of the CBCL subscale correlations would support such a proposition. Problem Consideration is significantly negatively related to Schizoid-Anxious, Hyperactive, Aggressive and Delinquent. One would expect, for example, that highly anxious youngsters would be hampered in their processing of information and consideration of relevant details as a result of their symptomatology. Similarly, hyperactive children are typically impulsive and inattentive and as such would also be quite likely to find it difficult to elaborate the numerous details important to the conflict. Aggressive and delinquent boys also frequently manifest these
impulsive and inattentive characteristics and, thus, would also be expected to have similar difficulties. Consequently, this should then lead to less effective conflict resolution. Indeed, several of these same CBCL scales also are significantly negatively related to TIPS Solution Adequacy, an ability reflecting the number of varying perspectives accounted for in one's final preferred solution. One might argue that the more one attempts to resolve the conflict through consideration of all involved, the more likely one is to maintain successful interpersonal functioning. One, thus, sees the link between initial ability to consider problem details, eventual effective problem resolution and adjustment. Indeed, examination of the relationship between TIPS skills reveals Problem Consideration and Solution Adequacy to be quite strongly correlated.

Problem Consideration, thus, emerges as an important skill in relationship to adjustment. As previous studies have not focussed on this ability, this investigation has now demonstrated the need for its more intensive examination. Indeed, this study suggests that its role may be as vital as that played by either alternative thinking or means-end thinking in mediating adjustment.

That several TIPS abilities (i.e. Problem Consideration, Consequential Thinking and Solution Adequacy) are frequently negatively related to the Hyperactive, Aggressive and Delinquent CBCL subscales provides further support for the importance of these problem solving skills for youngsters with Externalizing behavioral difficulties. It further confirms the earlier contention that Externalizers are the least adept at problem solving. This is further
reinforced when one examines the absence of numerous relationships between TIPS abilities and the various narrow band Internalizing CBCL scales. As was argued previously, Internalizers generally are more capable problem solvers than Externalizers. These correlational results would support this view.

The very few significant relations between Internalizing subscales and TIPS abilities also support the contention that the link between adjustment and problem solving is more highly specific than previously thought (e.g., Spivack, Platt & Shure, 1976). This would account for those studies which have found little relationship between problem solving and adjustment. For example, Mullins et al. (1985) found no consistent relationship between depressive symptoms and either alternative thinking or means-ends thinking. The present study confirms this finding. This would suggest that the problem solving process may be differentially linked to various forms of behavioral symptomatology. What is now required are further studies examining very specific and well defined forms of behavioral disturbance and problem solving. The use of specific behavior profile types such as that developed by Achenbach and Edelbrock (1983) would be one such method.

As with the total sample, analyses for 6-7 year old boys with and controlling for PPVT IQ maintained similar patterns of relationships. Here, too, Problem Consideration was the TIPS ability most frequently related to CBCL subscales, thereby, further supporting the importance of this skill and its relatively stable and consistent link to adjustment across age levels. Like the total sample, its links to the
Hyperactive, Aggressive and Delinquent scales underscore the stability of these associations across age levels. It is also re-affirms the contention that the links between problem solving and adjustment vary as a function of symptomatology.

The results for the 10-11 year old boys further confirm the role of Problem Consideration. Here, too, this skill maintains the strongest and most numerous significant associations with CBCL scales. As before, the strongest links are those to acting out forms of behavior. Interestingly, however, several significant negative relations with both the Internalizing scale and its subscales (e.g., Depressed, Uncommunicative, Obsessive-Compulsive) now appear for the first time. This emergence suggests that not only might links between problem solving and adjustment be highly dependent on the form of behavioral disturbance but that age may also be a factor. Thus, for certain types of disturbance, links to problem solving may also be age dependent. For example, while in the 6-7 year old group, no significant association between the CBCL Depressed subscale and problem solving was evident, it does appear for the older group of boys.

In summary, these correlational analyses clearly point out the differing relationships of various problem solving skills to both behavioral adjustment and social competence. They further underscore the complexity of these associations and provide some explanation for the conflicting findings of previous studies. Finally, they highlight the emergence of Problem Consideration as an important problem solving skill and the one most consistently linked to adjustment.
The results of the regression analyses for the various CBCL scales further confirm the importance of Problem Consideration as a predictor of adjustment. In three of the four analyses (i.e., Total Behavior, Internalizing, and Total Social Competence) undertaken, this skill proved the single largest contributor to the variances examined. In the other instance (i.e., Externalizing), it was the second largest contributor following PPVT IQ. That no other TIPS abilities were significant contributors in any of the four analyses further highlights the strength of this particular skill.

Relationship Between Perspective Taking and Adjustment

Finally, a pattern similar to that seen between problem solving and adjustment was apparent between perspective taking and CBCL scales. Significant positive correlations appeared between perspective taking and the Externalizing, Total Behavior, Hyperactive, and Aggressive CBCL scales. No significant associations were evident for either the Internalizing scale or any of its narrow band subscales. These results are quite consistent with those of Cohen et al. (1985) and support the view that egocentrism is more closely related to acting out behavior than to inhibited, withdrawn forms.

Within Group Performance

Results of the median splits revealed a nearly significant adjustment effect at the 6-7 year old level and a highly significant adjustment effect at the 10-11 year old level. These results demonstrate that few nonadjusted youngsters obtained total problem
scores at or above the median score of Adjusted youngsters. This finding reinforces the results obtained in the major analyses of adjustment effects on interpersonal problem solving.

This finding is, in some ways, contradictory to that originally proposed. Whereas there are several children in the clinical groups who score above the median, there are not sufficient numbers to be significant. Thus, unlike Selman (1976) in his study of interpersonal reasoning, one can reliably predict from the present study that it is far more likely that a youngster exhibiting significant deficits in interpersonal problem solving would come from the clinical group.

Examination of these splits at each age level also reveals an interesting finding. Whereas almost 43% of 6-7 year old Internalizers scored at or above the median, only 7% of them did so in the older group. This precipitous drop may suggest a relative decline in Internalizers' problem solving competence with increased age. If so, then a subtle age effect may be operating, pointing to the importance of identifying Internalizers at an earlier age in order to intervene and halt subsequent decline in problem solving capability. This same decline in group percentages did not appear for either the Mixed group of boys or Externalizers. Given their relatively weak skills even at an early age, it may be that they have already reached their lowest level and, thus, remain relatively stable even at older age levels.

Implications of This Study for Future Research

The results of this study have implications on both theoretical and applied levels. First, these results have provided further
support for the use of the TIPS as a satisfactory measure of interpersonal problem solving. This study has demonstrated that it possesses adequate test-retest reliability as well as satisfactory internal consistency, not only for each problem solving skill (except for Problem Recognition), but also for its overall Total Problem Solving score. Its significant relationship to both the IPS and Shure's Alternative Thinking Test supports its construct validity as well. The results have also demonstrated its sensitivity to both age and adjustment effects and, as such, supports its use in investigations of a developmental nature as well as those of an applied, clinical one. Finally, the strong relationship seen between the Total Problem Solving score and each of the more specific problem solving skills (e.g. Problem Consideration) supports the contention that this former score may be used as a satisfactory single representative score of overall problem solving ability.

The TIPS, nevertheless, is still in its relatively early development and requires further use to refine it. For example, its long term stability needs closer examination as well as its use with girls. Its sensitivity in differentiating between other forms of behavioral disturbance, other than those investigated in this study, must be looked at. Finally, closer attention should be given to determining whether the four stories which presently make up the TIPS are all necessary or whether some other combination will provide even greater accuracy in assessing problem solving ability.

One other advantage of the TIPS should be pointed out. In contrast to so many other interpersonal problem solving measures
(e.g., PIPS, What Happens Next Game) which attempt to evaluate a single problem solving skill in isolation, the TIPS attempts to capture a feeling of the more global problem solving process by taking the child through a series of steps in the process. As was pointed out earlier in the literature review, problem solving is very much a comprehensive process involving a variety of skills needed to effectively resolve the conflict at hand. To single out one particular skill and evaluate it in isolation may result in one's losing the flavor of the overall process. In taking a child through a series of problem solving steps one may obtain a clearer picture of what is required to effectively resolve the conflict. The TIPS would seem to provide access to this more global process.

The results of this study also have direct implications for the future study of interpersonal problem solving. The emergence of Problem Consideration as a strong predictor of adjustment status is a finding not previously reported. Indeed, this particular skill has received relatively little examination in previous research. Its value, however, seems rather clear as this skill provides one with greater insight into the child's initial formulation of the problem given him. As such, it provides valuable clues as to the manner in which a child initially analyzes information and selects out those details which appear most important to him for subsequent problem resolution. Few previous studies have ever examined this skill or even suggested that it may be important. However, results of this study have demonstrated that it may play a key role and is deserving of further investigation. Given its strong relationship to other
problem solving skills, attention should be directed at determining how deficits in this particular ability might subsequently affect other skills and ultimately lead to ineffective conflict resolution.

The emergence of a significant adjustment effect on many of the problem solving skills supports the contention of a link between adjustment and problem solving. The use of several clinical groups with different behavioral symptomatology as well as an adjusted group has provided for a more detailed examination of these links. Unlike most previous studies which have simply contrasted one clinical group with an adjusted one, the use of several groups in this study has served to clarify many of the inconsistent findings previously reported. The results have clearly shown that the link between problem solving and adjustment is not a simple one. Rather, it is a more complex one in which problem solving ability varies as a function of adjustment status. As such, what has emerged is a continuum of problem solving competence based upon behavioral symptomatology. As the results have demonstrated, Adjusted boys are, by far, the most competent and capable problem solvers. They define problems more concisely, consider more relevant details of a problem, generate more consequences, rely less heavily on forceful solutions and select final solutions which reflect greater consideration of others. Internalizers possess some of these same capabilities, but, in some instances (e.g., Problem Consideration), they are somewhat weaker. The Mixed group of boys are somewhat weaker still, whereas Externalizers are clearly the least capable problem solvers. Whereas many previous studies have simply argued for or against the presence
of a link between problem solving and adjustment, the use of a problem solving continuum permits one to put these results in clearer context. Depending upon the clinical group being studied, its problem solving capabilities may fall: (a) close to those of Adjusted boys on the continuum, (b) close to those of Externalizers on the continuum, or (c) somewhere in between. From this perspective, it may be argued that previous findings which have questioned the links between adjustment and problem solving should not be viewed as definitive evidence against the existence of any such links. The present results have clearly shown that these links are there but that they are quite dependent upon the form of clinical disturbance being examined. Additional studies are now required to delineate even more clearly these links between problem solving and clinical type. Classifications such as Externalizing and Internalizing are still rather broad categories of adjustment. Finer distinctions are now needed to even more clearly differentiate these links. As was suggested previously, the use of Achenbach's behavior profile types may be a valuable route to go. The present study has taken the initial step in describing problem solving profiles for more global clinical groups. What is now required are problem solving profiles for even more specific adjustment groups.

Related to this issue is the role played by age. The study demonstrated clearly that problem solving ability varies as a function of age. Although the basic pattern of relationships between problem solving and Externalizers remained similar at both age levels, there was some indication for the emergence of a number of relationships
between problem solving and several Internalizing subscales in the 10-11 year old group. This may suggest that problem solving profiles vary both as a function of age and adjustment.

Finally, the relative decline in Internalizers' capabilities as demonstrated by the median splits suggests that early identification and intervention may be important for youngsters with this form of behavioral disturbance. Remediation at an early age may prevent further decline in problem solving competence in later childhood. Longitudinal follow-up studies of these youngsters would aid in confirming this contention of a decline in ability in later childhood.

The results of this study also have some implications for future training studies. As the present investigation has shown, interpersonal problem solving is a complex process of numerous inter-dependent skills. Training programs which focus solely on strengthening one or, at best, two problem solving skills diminish their chances of having an impact upon behavioral change. Many of the training studies previously reviewed contain this serious flaw. It is not unexpected, then, that they have been less than successful in bringing about significant changes in behavior. Comprehensive programs of problem solving instruction are required. Moreover, the inclusion of training in Problem Consideration appears warranted, given its emergence in this study as a key skill. Along with this comprehensive approach is a need to more adequately tailor the instructional program to the specific needs of the clinical group being worked with. As this study has shown that different adjustment
groups have somewhat different problem solving profiles, an attempt must be made to take this into account. For example, as Internalizers possess relatively weak Problem Consideration skill but relatively good Alternative Thinking ability, greater emphasis should be placed on training in the latter skill. Given the relatively weak capabilities of Externalizers overall, perhaps their instructional program would require a somewhat different emphasis. Results of this study also point to the value of including a perspective taking component in any training program. Its close relationship both to a variety of problem solving skills and to adjustment suggests that it has an important role to play in programs aimed at bringing about behavioral change.

Although this study has demonstrated that problem solving ability varies as a function of adjustment status, it is not without its limitations. Although links to adjustment have been shown, the study cannot definitively support the contention that these skills directly mediate adjustment. This can only come as a result of future studies which attempt to effect behavioral change through instruction in the problem solving skills delineated in this study.

Generalization of the results to other populations needs to be clarified. Firstly, this study involved only boys. Whether different patterns of problem solving skill apply to girls of varying adjustment type remains unanswered. Secondly, the sample in this study was white, middle class and relatively bright. Whether these results can be replicated in different samples needs further investigation.
Finally, like most other problem solving investigations, additional research is needed to demonstrate the generalization of these results to naturalistic, real life, everyday problem situations. The use of story interviews can, at best, reflect a child's problem solving performance relative to hypothetical situations. Whether the child will display similar competence, or lack of it, in everyday life needs further examination. Despite these limitations, the results of this study have clarified, to some degree, the relationship between problem solving and adjustment. Its findings have demonstrated the existence of problem solving profiles which vary as a function of adjustment status. Its examination of different age groups has pointed to the value of placing problem solving within a developmental framework. Its overall findings have answered several of the questions raised by previous studies which have produced differing results. Finally, this study has shown the need for further research in this area. Although there have been numerous studies in the past few years, many issues remain to be examined. The results of this study suggest that these future investigations may prove both promising for our better understanding of psychopathology and the role played by interpersonal problem solving and beneficial for the development of more effective intervention programs.
CHAPTER V
SUMMARY

Many investigators (e.g., Christoff et al., 1985; Elias et al., 1986; Gesten et al., 1978; Spivack, Platt & Shure, 1976) have promoted the view that effective resolution of interpersonal problems is an important mediator of behavioral adjustment. Most have agreed (e.g., Spivack & Shure, 1974) that problem solving is a general process activated in conflict situations which includes a variety of specific stages and skills (D'Zurilla & Goldfried, 1971; Spivack & Shure, 1974).

There is increasing evidence to show that interpersonal problem solving is an important mediator of adjustment (Pellegrini, 1985; Shure & Spivack, 1978; Spivack, Platt & Shure, 1976). These studies have identified a number of different problem solving skills and have pointed out their significance in mediating adjustment. Most studies have focussed on problem solving training rather than upon simply delineating the links between problem solving and adjustment. Even fewer studies (e.g., Feldgaier, 1979; Marsh, 1982) have identified normative age-related changes in interpersonal problem solving skills.

Although a variety of studies have delineated the links between problem solving and adjustment at various ages, it has been difficult
to detect common threads among them due to the numerous measures used and differences in the way in which adjustment has been defined. In recent years, several studies (e.g., Kendall & Fischler, 1984) have appeared raising doubts about the evidence of such direct links between problem solving and adjustment. As well, few studies have placed these findings within a developmental framework.

The present study was designed to investigate these two issues; that is, adjustment and development, by using the same problem solving measures and adjustment classification for the two age groups examined. This design provided a clearer delineation of both the relationship between interpersonal problem solving and adjustment and of age-related changes in the problem solving process.

The study involved boys both at the 6-7 year old level as well as the 10-11 year old one. All boys were categorized into one of four group based upon parent ratings on the Child Behavior Checklists: (a) Adjusted, (b) Internalizing, (c) Externalizing, and (d) Mixed. All children were presented with a series of stories depicting common interpersonal conflicts and then asked a series of questions pertaining to the resolution of the problem. All youngsters were also administered a perspective taking task.

The results of the study clearly demonstrated that problem solving capability varies as a function of adjustment status. Significant adjustment effects were found for Problem Recognition, Problem Consideration, Consequential Thinking, and Solution Adequacy. In all instances, Adjusted boys were more adept than one or more of the clinical groups at: (a) initially recognizing conflict
situations, (b) considering relevant aspects of the problem, (c) generating consequences, and (d) selecting final solutions which reflected consideration of various viewpoints.

The results also pointed to the emergence of a consistent pattern amongst the four adjustment groups. In every instance, significant differences were found in problem solving ability between the Adjusted boys and their Externalizing counterparts. The problem solving ability of both Internalizers and boys in the Mixed group seemed, however, to lie somewhere in between these two endpoints of the problem solving continuum. Whereas, in several instances, significant differences appeared between Internalizers and Adjusted boys (e.g., Problem Consideration) or Externalizers (e.g., Solution Adequacy); in others, these differences were not significant (e.g., Problem Recognition and Consequential Thinking). A similar pattern also emerged for differences between the boys in the Mixed group and the other adjustment groups. Overall, then, there is a developing pattern in which: (a) Adjusted boys consistently appear to possess highly skillful problem solving abilities throughout, (b) Internalizers possess some relatively competent skills (e.g., Solution Adequacy), although they are weak in others (e.g., Problem Consideration), (c) the boys in the Mixed group are significantly weaker than Adjusted boys on a number of skills (e.g., Problem Consideration, Consequential Thinking, Total Problem Solving), and (d) Externalizers demonstrate significant deficits in almost all problem solving domains.

The significant adjustment effects found for the various TIPS-response type scores further support this pattern. Here, as
well. Adjusted boys were significantly more competent than their Externalizing counterparts. They defined problems in a more precise fashion; they generated fewer solutions of a forceful nature; and fewer of them selected final preferred solutions which reflected forceful means of conflict resolution. Again, both Internalizers and boys in the Mixed group fell somewhere in between. Internalizers, for example, were significantly better than Externalizers in defining problems and not significantly different from Adjusted boys. However, they relied more heavily on forceful solutions than Adjusted boys. Thus, again, in some areas Internalizers are relatively competent problem solvers; although, in others, they remain weak. Similarly, the boys in the Mixed group appeared relatively competent in defining problems.

In summary, these results point to an emerging picture of interpersonal problem solving competence varying as a function of adjustment status where Adjusted boys are clearly the most capable, Internalizers are relatively capable, boys in the Mixed group demonstrate some weaknesses and Externalizers are deficient throughout.

The consistent pattern of problem solving competence obtained in the present study is a new finding not previously seen. This finding also supports the view that the link between adjustment and problem solving is not a simple one but varies both as a function of adjustment status and the specific problem solving skill being studied. This would account, for example, for Internalizers being quite competent in certain problem solving abilities (e.g., Problem
Consideration).

The results clearly demonstrated a developmental trend in interpersonal problem solving ability. In contrast to younger boys, older boys are significantly more capable of considering relevant aspects of the problem, generating more alternative solutions, providing more consequences and providing final solutions which reflect the perspectives of more story characters. These results re-affirm the developmental course of these problem solving abilities which were first delineated in Feldgaier (1979) and Marsh (1982).

The results of this study have implications both on a theoretical and applied level. The emergence of Problem Consideration as a strong predictor of adjustment status is a finding not previously reported. Results of this investigation suggest that it may play a key role in linking problem solving to adjustment. Given its strong relationship to other problem solving skills, attention should be given to examining this skill in more detail.

The emergence of a significant adjustment effect on many of the problem solving skills supports the contention of a link between adjustment and problem solving. The use of several clinical groups with different behavioral symptomatology, as well as an adjusted group, has provided for a more detailed examination of these links. Unlike most previous studies which have simply contrasted one clinical group with an adjusted one, the use of several groups in this study has served to clarify many of the inconsistent findings previously reported. The results have clearly shown that the link between problem solving and adjustment is not a simple one. Rather, it is a
more complex one in which problem solving ability varies as a function of adjustment status. As such, what has emerged is a continuum of problem solving competence based upon behavioral symptomatology. As the results have demonstrated, Adjusted boys are, by far, the most competent and capable problem solvers. They define problems more concisely, consider more relevant details of a problem, generate more consequences, rely less heavily on forceful solutions and select final solutions which reflect greater consideration of others. Internalizers possess some of these same capabilities, but, in some instances (e.g., Problem Consideration), they are somewhat weaker. The Mixed group of boys are somewhat weaker still, whereas Externalizers are clearly the least capable problem solvers. Whereas many previous studies have simply argued for or against the presence of a link between problem solving and adjustment, the use of a problem solving continuum permits one to put these results in clearer context. Depending upon the clinical group being studied, its problem solving capabilities may fall: (a) close to those of Adjusted boys on the continuum, (b) close to those of Externalizers on the continuum, or (c) somewhere in between. From this perspective, it may be argued that previous findings which have questioned the links between adjustment and problem solving should not be viewed as definitive evidence against the existence of any such links. The present results have clearly shown that these links are there but that they are quite dependent upon the form of clinical disturbance being examined. Additional studies are now required to delineate even more clearly those links between problem solving and clinical type. The use of
such groups as Externalizing and Internalizing are still rather broad categories of adjustment. Finer distinctions are now needed to even more clearly differentiate these links. The present study has taken the initial step in describing problem solving profiles for more global clinical groups. What is now required are problem solving profiles for even more specific adjustment groups.

Related to this issue is the role played by age. The study demonstrated clearly that problem solving ability varies as a function of age. Although the basic pattern of relationships between problem solving and Externalizers remained similar at both age levels, there was some indication for the emergence of a number of new relationships between problem solving and several Internalizing subscales in the 10-11 year old group. This may suggest that problem solving profiles vary both as a function of age and adjustment.

The results of this study also have some implications for future training studies. As the present investigation has shown, interpersonal problem solving is a complex process of numerous inter-dependent skills. Training programs which focus solely on strengthening one or, at best, two problem solving skills, diminish their chances of having an impact upon behavioral change. Many of the training studies previously reviewed contain this serious flaw. It is not unexpected, then, that they have been less than successful in bringing about significant changes in behavior. Comprehensive programs of problem solving instruction are required. Moreover, the inclusion of training in Problem Consideration appears warranted, given its emergence in this study as a key skill. Along with this
comprehensive approach is a need to more adequately tailor the instructional program to the specific needs of the clinical group being worked with. As this study has shown that different adjustment groups have somewhat different problem solving profiles, an attempt must be made to take this into account. For example, as Internalizers possess relatively weak Problem Consideration skills but relatively good Alternative Thinking ability, greater emphasis should be placed on training in the latter skill. Given the relatively weak capabilities of Externalizers overall, perhaps their instructional program would require a somewhat different emphasis. Results of this study also point to the value of including a perspective taking component in any training program. Its close relationship both to a variety of problem solving skills and to adjustment suggests that it has an important role to play in programs aimed at bringing about behavioral change.

The results of this study have clarified, to some degree, the relationship between problem solving and adjustment. Its findings have demonstrated the existence of problem solving profiles which vary as a function of adjustment status. Its examination of different age groups has pointed to the value of placing problem solving within a developmental framework. Its overall findings have answered several of the questions raised by previous studies which have produced differing results. Finally, this study has shown the need for further research in this area. Although there have been numerous studies in the past few years, many issues remain to be examined. The results of this study suggest that these future investigations may prove both
promising for our better understanding of psychopathology and the role played by interpersonal problem solving and beneficial for the development of more effective intervention programs.
APPENDIX A

LETTERS TO PARENTS
APPENDIX A

LETTER TO PARENTS OF CLINIC-REFERRED CHILDREN

With the cooperation of the Winnipeg School Division, the Child Guidance Clinic and your child's school, your child's participation in a study of interpersonal problem solving is being requested. This research is being conducted by Steven Feldgaier, M.A., a doctoral student in the Department of Psychology at the Ohio State University, under the direction of F.C. Serafica, Ph.D., a faculty member in the Department of Psychology, The Ohio State University. This research is being funded by a grant provided by the Manitoba Mental Health Research Foundation. Mr. Feldgaier is presently in Winnipeg working as a school psychologist at the Child Guidance Clinic of Greater Winnipeg.

Interpersonal problem solving involves the manner in which children go about solving the everyday type of problems that arise between themselves and others. Recent research has shown that a child's ability to effectively resolve such problems is closely linked to his level of social competence and behavioral adjustment. Children for this study will include both youngsters being seen at the Child Guidance Clinic, like your son, and other youngsters from your son's school.

Your child's participation in this study will only involve his being interviewed. He will simply be requested to listen to several stories involving typical problems encountered by children his age (e.g., sharing of toys, choosing a friend) and then asked questions to determine his ability to: (a) identify the problem, (b) consider important information pertinent to the problem, (c) plan the steps involved in the solution, and (d) think of consequences to each of the solutions. In order to ensure that your child's responses are not simply a reflection of general verbal ability but an accurate indication of his problem solving skill, the Peabody Picture Vocabulary Test will also be administered.

All interviews will be conducted by a research assistant trained and skilled in such interview techniques and will take place in your child's school at a time convenient for him. Interviews will take approximately 90 minutes to complete and will be scheduled so that your child does not miss substantial periods of classroom instruction. All interviews will be kept strictly confidential.
Should you agree to your son's participation in this study, please sign the consent form in the appropriate space and return it in the envelope provided. If you do not wish your child to participate, I would also request that you return the consent form signed in the appropriate space.

Should your son take part in this study, you will be requested to complete the Child Behavior Checklist, a rating scale which assesses a child's behavioral and social functioning.

Upon completion of the study, I would be more than happy to discuss your son's performance with you. Should you have any questions, please feel free to telephone me at the Child Guidance Clinic.

Thank you for your cooperation and assistance.
LETTER TO PARENTS OF ADJUSTED CHILDREN

With the cooperation of the Winnipeg School Division and your child's school, your child's participation in a study of interpersonal problem solving is being requested. This research is being conducted by Steven Feldgaier, M.A., a doctoral student in the Department of Psychology at the Ohio State University, under the direction of F.C. Serafica, Ph.D., a faculty member in the Department of Psychology, The Ohio State University. This research is being funded by a grant provided by the Manitoba Mental Health Research Foundation. Mr. Feldgaier is presently in Winnipeg working as a school psychologist at the Child Guidance Clinic of Greater Winnipeg.

Interpersonal problem solving involves the manner in which children age about solving the everyday type of problems that arise between themselves and others. Recent research has shown that a child's ability to effectively resolve such problems is closely linked to his level of social competence and behavioral adjustment. Children for this study will include both youngsters being seen at the Child Guidance Clinic as well as a contrast group of well adjusted boys, like your son, whose names have been submitted by their teacher as potential participants in this study.

Your child's participation in this study will only involve his being interviewed. He will simply be requested to listen to several stories involving typical problems encountered by children his age (e.g., sharing of toys, choosing a friend) and then asked questions to determine his ability to: (a) identify the problem, (b) consider important information pertinent to the problem, (c) plan the steps involved in the solution; and d) think of consequences to each of the solutions. In order to ensure that your child's responses are not simply a reflection of general verbal ability but an accurate indication of his problem solving skill, the Peabody Picture Vocabulary Test will also be administered.

All interviews will be conducted by a research assistant trained and skilled in such interview techniques and will take place in your child's school at a time convenient for him. Interviews will take approximately 90 minutes to complete and will be scheduled so that your child does not miss substantial periods of classroom instruction. All interviews will be kept strictly confidential.
Should you agree to your son's participation in this study, please sign the consent form in the appropriate space and return it in the envelope provided. If you do not wish your child to participate, I would also request that you return the consent form signed in the appropriate space.

Should your son take part in this study, you will be requested to complete the Child Behavior Checklist, a rating scale which assesses a child's behavioral and social functioning.

Upon completion of the study, I would be more than happy to discuss your son's performance with you. Should you have any questions, please feel free to telephone me at the Child Guidance Clinic.

Thank you for your cooperation and assistance.
APPENDIX B

CONSENT FORM
APPENDIX B

RESEARCH CONSENT FORM FOR LEGAL GUARDIAN AND MINORS

I hereby consent to my child's participation in the study entitled:

"A Clinical-Developmental Analysis of Interpersonal Problem Solving"

This research is being conducted by Steven Feldgaier, M.A. under the direction of F. Serafica, Ph.D., a faculty member in the Department of Psychology at The Ohio State University, who is authorized to use the services of others in carrying out this study.

The aims, nature and all procedures of the study have been explained to my satisfaction and all my questions have been adequately answered. It is my understanding that any further inquiries I make regarding this study will be answered. Also, I understand that subject anonymity will be maintained and all individual responses will be kept confidential. Finally, I understand that I am free to withdraw my consent and discontinue participation at any time following notification of the director of the project or its representative.

Signed: ______________________________
       Legal Guardian

Date: ________________________________

__________________________
Child's School

__________________________
Child's Date of Birth

__________________________
Child's Signature

I do not wish my child to participate in this study.

Signed: ________________________________
APPENDIX C

TEST OF INTERPERSONAL PROBLEM SOLVING (TIPS)

STORY A

John and his friends are playing a game together and John is the captain of the team. Now one thing the captain must do is pick someone to help him as his assistant. Bobby is John's best friend and they almost always do things together. Rick is not as close a friend but he wants to be the assistant very badly since he hardly ever gets a chance. Teddy, however, is the best player on the team and usually wins the game for his friends.

1. Do you think that John has a problem? What do you think John's problem is?

2. What are all the things you would be thinking about if you had to solve this problem? (What are all the things that are important to solve this problem?)

3. Tell me all the ways you can think of for John to solve this problem?

4. What might happen if (read each solution from 3)? (Anything else?)

5. What do you think is the best way to solve the problem? Why?
TEST OF INTERPERSONAL PROBLEM SOLVING (TIPS)

STORY B

Ron and his friends are trying to decide what they are going to do when they get home from school. Ron wants Paul, Randy, and George to go with him to the circus in the park. This is the last day for the circus and Ron really wants to see it. Paul would rather go home and watch his favorite television program and he's already asked Randy to come home with him. George, though, will do whatever everyone else does since he doesn't have any special plans. Ron really wants to go to the circus today but also wants to be with his friends.

1. Do you think Ron has a problem? What do you think Ron's problem is?

2. What are all the things you would be thinking about if you had to solve this problem? (What are all the things that are important to solve this problem?)

3. Tell me the ways you can think of for Ron to solve this problem?

4. What might happen if (read each solution from 3)? (Anything else?)

5. What do you think is the best way to solve this problem? Why?
TEST OF INTERPERSONAL PROBLEM SOLVING (TIPS)

STORY C

Mark and his friends, Jack and Gary, are playing with the new video game that Mark got for his birthday. Gary has been playing with it for a long time. Now Jack would like to play with it also because it is his favorite game but Gary just keeps playing with it. Mark has also said that he would like to play with the video game since he just got it for his birthday.

1. Do you think that Mark has a problem? What do you think Mark's problem is?

2. What are all the things you would be thinking about if you had to solve this problem? (What are the things that are important to solve this problem?)

3. Tell me all the ways you can think of for Mark to solve this problem?

4. What might happen if (read each solution from 3)? (Anything else?)

5. What do you think is the best way to solve this problem? Why?
TEST OF INTERPERSONAL PROBLEM SOLVING (TIPS)

STORY D

One day Kevin is at home alone when his best friend, Tommy, calls him and asks him if he would like to go outside and play with his new soccer ball. Since Kevin has nothing else to do he says, OK" and tells Tommy to come over to his house. Kevin is very happy that Tommy is bringing over his soccer ball since he really likes to play soccer. Just before Tommy gets there, however, Robert, one of Kevin's other friends stops by to ask him if he would like to see the new "Star Wars" movie. Kevin really likes "Star Wars" movies and this is the last day to see the show.

1. Do you think that Kevin has a problem? What do you think Kevin's problem is?

2. What are all the things you would be thinking about if you had to solve this problem? (What are all the things that are important to solve this problem?)

3. Tell me all the ways you think of for Kevin to solve this problem?

4. What might happen if (read each solution from 3)? (Anything else?)

5. What do you think is the best way to solve the problem? Why?
APPENDIX D

MEPS
One day George was standing around with some kids, when one of the kids said something nasty to George. George got very mad. He got so mad he decided to get even with the other boy.

The story ends with George happy because he got even.

Make up a real good story about what happens in between the beginning of the story, when one of the kids says something very nasty to George, and the end of the story, when he is very happy because he got even.

2. Al has just moved into the neighbourhood. He didn't know anyone and felt very lonely.

The story ends with Al having many good friends and feeling at home in the neighbourhood.

Make up a real good story about what happens in between Al's moving in and feeling lonely—that's the beginning—and when he has many good friends in the end.

3. This year the school decided that every class was going to choose a class leader. Jim wanted the class to choose him.

The story ends with Jim being chosen class leader by the kids in his class.

Make up a real good story about what happens from the time Jim first wanted to be class leader, and the end when they choose him to be class leader.
APPENDIX E

ALTERNATIVE THINKING TEST
Robert's friend has been pestering, you know, bugging him a lot lately when Robert wants to do his homework. What can Robert do so his friend won't bug him while he's doing his homework? (Anything else?)
APPENDIX F

IPS
APPENDIX F

INTERPERSONAL PROBLEM SOLVING (IPS)

Paul has three friends who are playing with him at his house. His dad comes home and surprises him with tickets to the circus for Saturday afternoon. There are five tickets: two for his mom and dad, one for Paul, and two for his friends. Paul cannot take all three friends, and no more tickets can be bought. Paul must decide who will go to the circus. John is Paul's best friend and sometimes gets hurt feelings if he's not included. Brian is not as close a friend, but his family doesn't have much money, and he doesn't get to do many fun things. Steve just moved here a few weeks ago. He really wants to make new friends, and last week he and his family took Paul to a movie.

1. Do you think that Paul has a problem? What do you think Paul's problem is?

2. What are all the things you would be thinking about if you had to solve this problem? (What are all the things that are important to solve this problem?)

3. Tell me all the ways you can think of for Paul to solve this problem?

4. What might happen if (read each solution from 3)? (Anything else?)

5. What do you think is the best way to solve this problem? Why?


