## ACCEPTABILITY OF PSYCHOLOGICAL INTERVENTIONS FOR PEDIATRIC PAIN ASSOCIATED WITH INVASIVE MEDICAL PROCEDURES

by

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#### ABSTRACT

Differences in perceived acceptability of treatments has been proposed as a means for explaining why recommended treatments are often not implemented or poorly utilized. Although treatment acceptability research has identified the acceptability of numerous psychological interventions and the variables influencing these evaluations, the construct of acceptability, its theoretical basis, and extent of generalizability has had minimal attention. To address these concerns, a series of four studies examined the acceptability of psychological and pharmacological interventions for the alleviation of pediatric pain and distress associated with invasive medical procedures. A conceptual model of treatment acceptability, adopted from a model of health beliefs, provided a framework for conceptualizing acceptability attitudes and how these attitudes may be formed and changed.

In Studies 1 and 2, an acceptability measure (AQ) appropriate for the evaluation of interventions for pediatric pain and distress was developed. Undergraduate students, presented with written descriptions of six different pain management interventions as applied to a child having difficulty coping with a painful medical procedure, rated the acceptability, predicted effectiveness, and general evaluation of these interventions as well as anticipated choice and predicted selfefficacy in implementing the interventions. In Study 3, 63 mothers evaluated the acceptability of one pharmacological and two psychological interventions designed to reduce pediatric pain and distress. Study 4 investigated how acceptability attitudes

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are influenced by experience with the effectiveness of an intervention. Acceptability attitudes of 90 mothers were assessed before and after exposure to an effective or ineffective implementation of a pain management intervention or a no effectiveness information exposure.

Across the studies, results indicated that the AQ differentiates among interventions and is an internally consistent and reliable instrument. Accelerative interventions (imagery, attention-distraction, deep breathing) were evaluated as more acceptable than reductive interventions (reprimands, ignoring), and a pharmacological intervention (oral Valium) fell in the middle range. Providing construct validity, acceptability attitudes were highly correlated with effectiveness predictions, general evaluation of the intervention, and anticipated treatment selection; and modestly correlated with predicted self-efficacy in implementing the intervention. Study 4 demonstrated that exposure to an effective implementation of an intervention improved acceptability attitudes and exposure to an ineffective implementation resulted in less positive acceptability attitudes. Acceptability attitudes did not change after exposure to an implementation of the intervention without effectiveness information. Suggestions for future research directions and potential implications for educating potential consumers about psychological interventions and their effectiveness are discussed.

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#### INTRODUCTION

Traditionally, psychological interventions have been evaluated primarily by their impact on measures of attitude and behavior change. However, exclusive reliance on these measures may be misleading and perhaps optimistic because such change measures provide information only about treatments implemented and completed. Examination of the social acceptability of various treatments may explain the imperfect correlation between a treatment being recommended and the initiation and/or completion of the treatment. Treatment acceptability refers to the perceived appropriateness of treatment procedures and involves evaluation of treatment procedures by potential consumers (Kazdin, 1980a). It is argued that treatment acceptability is an important avenue of research because treatment procedures viewed by potential consumers as more acceptable are more likely to be sought out and adhered to, and should result in fewer dropouts, greater client compliance, and greater motivation. Together, these positive attitudes should lead to more positive behavioral change and greater overall satisfaction with treatment.

In the past 15 years, treatment acceptability research has successfully catalogued the acceptability of a number of psychological interventions and variables influencing these evaluations (e.g., characteristics of the interventions, problem behaviors, and raters). However, the research area suffers from a number of significant limitations. First, the research has focussed almost exclusively on interventions applied to externalizing child behavior problems in clinical and educational

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contexts. Generalizability beyond these problems and contexts has seldom been explored. Second, the construct of treatment acceptability has received marginal development. It is unclear how treatment acceptability is related to other variables, and in particular, how acceptability is related to treatment effectiveness. Third and related to the previous concern, the research area has lacked a theoretical framework from which to proceed.

The present research program addressed these limitations by a) extending treatment acceptability research to the evaluation of psychological interventions for pediatric pain associated with invasive medical procedures, b) further developing the construct of acceptability by examining the relationship between acceptability and perceived efficacy, anticipated treatment selection, and predicted self-efficacy, and c) exploring the utility of placing treatment acceptability research within the theoretical framework of a health belief model.

This report of the research program consists of five sections. The first section describes the rationale and assumptions underlying treatment acceptability research, reviews the acceptability literature, and identifies pertinent issues in the area. The second section reviews the research evaluating psychological interventions for pediatric pain associated with invasive medical procedures. In the third section, a health belief model emphasizing the importance of beliefs as determinants of treatment selection is proposed as a framework for conceptualizing treatment acceptability attitudes and how these attitudes may be formed and changed. The fourth section

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describes a series of four studies. Studies 1 and 2 developed a measure of acceptability appropriate for the evaluation of interventions for pediatric pain and distress. Studies 3 and 4 addressed the relationship of treatment acceptability attitudes and effectiveness information, using a model of health beliefs to predict how effectiveness information may function to alter acceptability attitudes. In Study 3, mothers, representing a potential consumer group involved in selecting an intervention for children's pain, evaluated the acceptability of one pharmacological and two psychological interventions designed to reduce the pain and distress associated with an invasive medical procedure in children. In Study 4, acceptability attitudes were assessed by mothers before and after exposure to an effective or ineffective implementation of an intervention or to a no effectiveness information condition. Finally, the fifth section integrates and interprets the results of this research program.

In addition to providing a measure to identify acceptable and unacceptable psychological approaches to pain management in children, this research advances our understanding of the relationship between treatment acceptability and effectiveness. Such information offers important implications for educating potential consumers about treatments and their effectiveness, with the goal of maximizing positive treatment outcomes.

## TREATMENT ACCEPTABILITY RESEARCH

In any health care setting where problems are presented and solutions are sought, there is often a discrepancy between the recommendation of a treatment and the implementation of, or compliance with, the recommended procedure. Recommending an intervention does not necessarily guarantee it will be implemented, and this is particularly evident for psychological interventions (e.g., Brown, Borden, Wynne, Spunt, & Clingerman, 1987; Howard, Krause, & Orlinsky, 1986).

Ample data exists indicating that mental health service utilization is low relative to the prevalence of psychiatric disorders and attrition and noncompliance rates for psychological treatments are high. A 6-month prevalence study of four child psychiatric disorders (conduct disorder, hyperactivity, emotional disorder, somatization) in Ontario indicated a rate of 18.1% for one or more disorder among children 4 to 16 years of age (Offord, et al., 1987). Of these children with psychiatric disorders, only one in six (16.1%) had utilized mental health or social services in the previous 6 months. According to some estimates, more than 50% of patients discontinue treatment prematurely, regardless of the severity of the problem or the type of treatment (Eiduson, 1968). This problem appears in both adult and child samples. Reporting data for one child-quidance clinic offering traditional therapeutic interventions, Hunt (1961) indicated that 35% of clients dropped out during assessment or refused recommended treatment, 39% were referred elsewhere, and 19% entered treatment but dropped out. Only 7% of the referred children completed treatment. Similar data is reported by Weisz,

In their sample of children at nine Weiss, and Langmeyer (1987). public mental health clinics, 35% of the cases dropped out after treatment had been recommended and offered. Other studies report similar findings. Forehand, Middlebrook, Rogers, and Steffe (1983) defined drop-out as discontinuing after treatment was initiated and calculated a 28% dropout rate in their survey of parent training studies. Brown et al. (1987) reported that one third of the hyperactive children evaluated for a medication and therapy treatment study did not enter treatment. Other research suggests that once in treatment, compliance with child interventions is also less than optimal. Firestone (1982) found that approximately 20% of hyperactive patients had discontinued prescribed medication by the fourth month and that by the tenth month, only 55% of the children were still taking the medication. Similarly, Firestone and Witt (1982) reported that only 49% of the families who entered treatment for their hyperactive child actually finished the 4-month parent training program.

It has been suggested that an examination of attitudes toward treatments may provide much needed insight into the imperfect relationship between treatment recommendation and implementation. Wolf (1978) advocated that psychological interventions be socially validated by assessing: (1) the social importance of treatment goals, (2) the social appropriateness of the procedures, and (3) the social importance of the effects. Treatment acceptability, corresponding to the second aspect of social validity, refers to the perceived appropriateness of treatment procedures by potential consumers (Kazdin, 1980a). Treatment acceptability may include judgements of the

appropriateness of the treatment for the problem; whether the treatment is just, sensible, and nonintrusive; and whether the treatment concurs with popular notions of what constitutes treatment.

It is argued that treatment acceptability attitudes may be of particular use in clarifying the association between treatment recommendation and implementation. For example, it has been suggested that acceptable treatments are more likely to be sought out and adhered to (Kazdin, 1980b). Thus, acceptable treatments should result in fewer dropouts, greater client compliance and motivation, more positive behavioral changes, and greater satisfaction with the treatment. Unfortunately, despite their logical appeal, many of these assumptions regarding the importance of treatment acceptability remain untested.

In contrast to treatment acceptability, the social impact of treatments can also be examined by consumer satisfaction measures. However, because these measures are provided by clients who complete treatment and not by those who choose not to enter or to drop out of treatment, they give no indication of how the intervention might have been evaluated prior to treatment (Heffer & Kelley, 1987).

Closely related to, but not synonymous with treatment acceptability, is the concept of treatment effectiveness. An effective treatment is one that changes the problem behavior in the desired direction (Von Brock & Elliott, 1987). Effective treatments are not necessarily high on acceptability (e.g., using electric shock to reduce an autistic child's stereotypic behavior), nor are acceptable treatments necessarily the most

effective (e.g., attention training with a hyperactive child). However, the effectiveness of a treatment does appear to positively influence its acceptability (Clark & Elliott, 1988; Kazdin, 1984; Tingstrom, 1990), and it is assumed that acceptable treatments are more likely to be effectively implemented.

Treatment acceptability research offers considerable promise in promoting the financial, legal, and ethical accountability of psychological treatments. Treatment acceptability research can provide assurance to potential consumers and societal institutions (e.g., courts, institutional review boards) that others have found the intervention acceptable (Parloff, 1983). In addition, identifying specific treatment characteristics contributing to noncompliance or attrition allows unacceptable but effective interventions to be modified so as to be more acceptable, either by altering treatment parameters or by providing education about the treatment (Kazdin, 1980b; Singh & Katz, 1985; Tingstrom, 1989). Finally, assessment of treatment acceptability provides an opportunity to understand client attitudes and beliefs about psychological interventions before treatment begins, and contrasting these attitudes with later evaluations may help to illuminate the process by which change in attitudes occurs.

## REVIEW OF THE TREATMENT ACCEPTABILITY LITERATURE

Two primary programs of treatment acceptability research have emerged. One is represented in a series of studies by Kazdin investigating the acceptability of various interventions for child behavior problems (Kazdin, 1980a, 1980b, 1981, 1984, 1986; Kazdin, French, & Sherick, 1981). Extending Kazdin's work,

Witt and his colleagues have developed a program of research investigating the acceptability of interventions in school settings (Elliott, Witt, Galvin, & Moe, 1986; Elliott, Witt, Galvin, & Peterson, 1984; Martens, Witt, Elliott, & Darveaux, 1985; Witt, Elliott, & Martens, 1984; Witt & Martens, 1983; Witt, Martens, & Elliott, 1984; Witt, Moe, Gutkin, & Andrews, 1984; Witt & Robbins, 1985). Each of these programs of research has developed its own methodology and assessment measures and will be described below.

## Research Design and Assessment Measures

In Kazdin's research, subjects are presented with an audiotaped description of a child's problem and several treatment procedures designed to alleviate the problem. Two such descriptions are used with child age, gender, intelligence, and setting varying across descriptions (Kazdin, 1980a, 1981, 1984, 1986; Kazdin et al., 1981). In earlier studies (Kazdin 1980a, 1980b), both descriptions contained a mix of highly disruptive and noncompliant child behavior. More recently, hyperactive and conduct disordered behavior are evaluated separately (Kazdin, 1981, 1984, 1986; Kazdin et al., 1981).

Subjects listen to these case and treatment descriptions and evaluate each treatment procedure on the Treatment Evaluation Inventory (TEI; Kazdin, 1980a). The TEI consists of 15 items in a Likert-like format assessing aspects such as whether the treatment is acceptable for the child's problem behavior; willingness to carry out the procedure; suitability of the procedure for the child; and the likability, fairness, and humanity of the procedure. According to Kazdin (1980a), factor

analysis of the TEI yields a one-factor solution accounting for 51.4% of the variance. Contrary to Kazdin's report, Kelley, Heffer, Gresham, and Elliott (1989) extracted a two-factor solution for the TEI. Accounting for 42% of the variance, the first primary factor reflected general acceptance and the second factor, accounting for 19% of the variance, reflected a concern for perceived side effects. Subjects in Kazdin's studies also rate each treatment on 15 bipolar adjectives representing the Evaluative, Potency, and Activity dimensions of the Semantic Differential (SD; Osgood, Suci, & Tannenbaum, 1957). The SD has been widely used in attitude research and is thought to tap the affective component of attitudes (Baron & Byrne, 1977).

In contrast to Kazdin's method of evaluating several treatments, Witt typically asks subjects to read a case description depicting a child's problem behavior in the classroom, and then to evaluate the acceptability of one treatment plan. Multiple cases are used to operationalize several combinations of independent variables (e.g., level of problem severity). Treatment acceptability is measured by the Intervention Rating Profile (IRP), a 20-item Likert-type scale assessing teachers' perceptions of the acceptability of classroom interventions (Witt & Martens, 1983). A principal components factor analysis of the IRP yielded one primary factor accounting for 41% of the variance (labeled as General Acceptability) and four secondary factors described as risk to the child; teacher time required; negative effects on other children; and teacher skill required for implementation. Using Cronbach's alpha, internal consistency for the entire scale was .91. Later

refinement to simplify its factor structure resulted in a 15-item single factor scale reflecting general acceptability (IRP-15; Witt & Elliott, 1985). Internal consistency of the IRP-15 was found to be high (Harris, Preller, & Graham, 1990; Martens et al., 1985).

To discriminate between effectiveness and acceptability, Von Brock and Elliott (1987) developed the Behavior Intervention Rating Scale (BIRS). This scale includes the IRP-15 items as a measure of acceptability and an additional nine items representing treatment effectiveness. Factor analysis of the BIRS yielded factors of Acceptability, Effectiveness, and Time of Effectiveness (i.e., rate of change).

Research investigating variables influencing treatment acceptability including intervention type, characteristics of interventions, characteristics of the behavior problem, and rater characteristics is reviewed below.

### Intervention Type

The acceptability of numerous interventions for child behavior problems in clinical and educational contexts has been catalogued by Kazdin, Witt, and various investigators. Subjects, including children, teachers, parents, students, hospital and institutional staff, and psychologists, have consistently distinguished among alternative treatments on the basis of acceptability (e.g., Elliott, Turco, & Gresham, 1987; Kazdin, 1984; Tarnowski, Kelly, & Mendlowitz, 1987). In examining interventions assessed in more than one study, some general conclusions can be reached. Acceptable interventions (defined as achieving mean scores greater than the mid-point on the

particular acceptability measure) include positive reinforcement, positive practice, differential reinforcement, and response cost. Interventions rated as unacceptable across studies include corporal punishment, shock, and paradoxical intentions. Receiving mixed reviews are time out, overcorrection, ignoring, token systems, stimulus control, medication, and reprimands. Generally, interventions designed to increase appropriate behaviors have been rated as more acceptable than interventions designed to reduce inappropriate behavior (e.g., Cross Calvert & McMahon, 1987; Elliott et al., 1986; Tarnowski et al., 1987; Turco & Elliott, 1986). Response cost is an exception to this general rule; it is consistently rated as an acceptable strategy to decrease negative behavior (e.g., Little & Kelley, 1989; Kelley et al., 1989).

## Characteristics of Interventions

Although many intervention characteristics have been demonstrated to influence acceptability attitudes, treatment effectiveness has generated the greatest research interest. Several researchers (e.g., Clark & Elliott, 1988; Kazdin, 1981, 1984) have examined the relationship between effectiveness information (i.e., reported potency of treatment) and treatment acceptability. Generally, treatments described as strong or effective and producing rapid effects are viewed as more acceptable (Clark & Elliott, 1988; Kazdin, 1984; Tingstrom, 1990; Tingstrom, McPhail, & Bolton, 1989; Von Brock & Elliott, 1987). Kazdin's (1981) findings are an exception to this conclusion. He found efficacy information did not influence acceptability ratings; however results may have been due to the narrow range of

effectiveness information presented. The influence of effectiveness information has been examined in these studies by contrasting strong versus weak interventions (Clark & Elliott, 1988; Kazdin, 1981, 1984) or effectiveness information with no effectiveness information (Tingstrom, 1990; Von Brock & Elliott, 1987). Only one study has contrasted effective with ineffective instances of an intervention and found that interventions reported as effective were rated as more acceptable than interventions reported as ineffective. The difference between the effective instance and a condition where no information about effectiveness was provided was only marginal (Tingstrom et al., 1989).

In addition, source of effectiveness information has been shown to influence ratings of acceptability. Von Brock and Elliott (1987) demonstrated that depending on the severity of the problem behavior, source of outcome information (i.e., consumer satisfaction information, research-based outcome information, or no information) differentially affected ratings of acceptability. Providing research-based effectiveness information for treatments aimed at mild behavior problems significantly increased acceptability ratings compared with a no information condition. However, for treatments targeting more severe behavior problems, the source of effectiveness information did not influence acceptability evaluations. Although Von Brock and Elliott (1987) did not find that consumer satisfaction information influenced acceptability, Tingstrom et al. (1989) did find that consumerbased effectiveness information influenced ratings of

acceptability, at least for treatments of severe classroom behavior problems.

From the research conducted thus far, it is evident that effectiveness information plays an important role in acceptability evaluations. However, additional research is essential to further our understanding of the mechanisms underlying this relationship. In particular, it is not known whether effectiveness information can be used to alter existing acceptability attitudes.

## Characteristics of Client Behavior Problem

As noted in the description of methodologies, the acceptability of interventions is determined with reference to a particular problem or case vignette. Typically, these case descriptions vary along one or more dimensions. Of these dimensions, severity of the problem behavior has been the most widely investigated.

With few exceptions (e.g., Kelley, Grace, & Elliott, 1990; Tarnowski, Mulick, & Rasnake, 1990), severity of the problem behavior has been demonstrated to positively influence raters' evaluations of treatment acceptability (e.g., Elliott et al., 1987; Frentz & Kelley, 1986; Harris et al., 1990; Kazdin, 1980a; Martens et al., 1985; Tarnowski, Rasnake, Mulick, & Kelly, 1989; Witt & Robbins, 1985). For interventions applied in educational settings, acceptability has been shown to vary according to the severity of the child behavior coupled with the complexity and time involvement of the particular intervention (Elliott et al., 1984; Harris et al., 1990; Witt, Elliott, & Martens, 1984; Witt, Martens, & Elliott, 1984). Teachers view interventions requiring

less time involvement as less acceptable for severe, as opposed to mild and moderate behavior problems (Witt, Martens, & Elliott, 1984). As with time involvement, although simpler interventions are seen as most acceptable for mild behavior problems, more complex interventions are seen as most acceptable for more severe problems (Elliott et al., 1984).

Aside from severity of the problem behavior, general conclusions regarding the influence of case description characteristics on acceptability ratings are tentative because few case characteristics have been investigated in more than one study. Gender, age, or grade of the child, location of the misbehavior, and label attached to the description of a child (i.e., learning disabled, mentally retarded) generally have not been shown to significantly influence acceptability ratings (Epstein, Matson, Repp, & Helsel, 1986; Norton, Austen, Allen, & Hilton, 1983; Tingstrom et al., 1989). Martens and Meller (1989) reported that intelligence (average or below average) and popularity of the child significantly influenced teacher ratings of acceptability. Interventions were rated significantly less acceptable for popular students with below average intelligence, but for unpopular students, level of intelligence had no influence on teacher ratings of acceptability.

## Rater Characteristics

Differences between various groups' evaluations of treatment acceptability might be expected due to differences in knowledge and experience, perceptions of the problem, and/or attitudes toward treatment. However, conclusions are difficult to draw

across studies because of differences in the groups selected and the treatments assessed.

A number of studies have compared male and female raters to determine whether gender of the rater influences acceptability ratings. Studies failing to find gender differences have examined undergraduate students (Kazdin, 1980b; Singh & Katz, 1985), secondary school students, parents, teachers, and nurses (King & Gullone, 1990). Alternatively, Miller and Kelley (1990) found that mothers and fathers differentially rated several common child management strategies, although order of treatment preference was similar across genders. Given these inconsistent findings, further research is needed to identify problem and treatment parameters related to gender differences.

In separate studies, Kazdin compared ratings of acceptability obtained from children who were psychiatric inpatients, their parents, and hospital staff on an inpatient unit (Kazdin, 1984, 1986; Kazdin et al., 1981). In the first study (Kazdin et al., 1981), children rated treatments as significantly less acceptable than did their parents, and staff ratings fell between these two groups. However, the relative rankings of the treatments were identical across groups. Reinforcement of incompatible behavior was rated as most acceptable followed by positive practice, medication, and time In contrast, significant differences between parents' and out. children's ratings of acceptability were not found in a second study (Kazdin, 1984), although the relative rankings in the two groups were different. Time out was rated as the most acceptable intervention by the parents, and children rated medication as

most acceptable (Kazdin, 1984). In a third study (Kazdin, 1986), differences were found both between group ratings and rankings. Parents viewed both outpatient psychotherapy and hospitalization as significantly more acceptable than did children, and parents ranked hospitalization as most acceptable compared with children who ranked outpatient psychotherapy as most acceptable.

For interventions applied in educational settings, Elliott et al. (1987) contrasted fifth graders', teachers', and school psychologists' assessments of the acceptability of three forms of group reward contingencies. No significant differences among groups of raters were found, but teachers and school psychologists differentiated among the three forms of treatment in terms of acceptability and the children did not. In another study, teachers evaluated procedures to decrease disruptive behavior as more acceptable than did parents, although both groups agreed on the rankings of procedures from most to least acceptable (Norton et al., 1983). Epstein et al. (1986) found no differences in the acceptability ratings made by regular and special education teachers for five treatments recommended for a hyperactive child. However, the contrast between groups was likely reduced by the fact that the regular teachers were all enrolled in special education coursework.

Given parents' investment in their child's welfare, parenting status might be expected to influence evaluations of interventions. Pickering, Morgan, Houts, and Rodrigue (1988) evaluated whether parents differed from non-parents in their perceptions of interventions for self-injurious behavior. Overall, parents did not differ from non-parents in ratings of

acceptability with one exception. Parents rated shock as significantly less acceptable than did non-parents. In another study, Pickering and Morgan (1985) did not find significant differences among parents of autistic, handicapped, and nonhandicapped children on acceptability ratings for four procedures designed to change self-injurious behaviors. Inconsistent results were obtained in two studies comparing acceptability ratings provided by parents who viewed their children as problematic compared with parents who rated their children as nonproblematic (Frentz & Kelley, 1986; Miller & Kelley, 1990).

In general, differences between adult rater groups in educational and clinical settings have not been substantial and most comparisons have yielded similar relative rankings of treatments. In contrast, children's acceptability ratings appear to differ from those of parents or staff. Because the interventions assessed are designed to modify problematic child behavior, it is not surprising that differences emerge when comparing the direct recipients of treatment, in this case children, to those of parents, staff, or teachers. It is unknown whether this difference between child and adult rater groups apply in other contexts, such as pediatric pain. However, it could be argued that parents' opinions may be most pertinent in treatment situations given that they are most likely to select treatment options for their child or to offer their child a choice of interventions they have already judged to be suitable.

Additional variables identified as influencing parents' acceptance of various child management strategies include income,

marital adjustment, and child behavior (Frentz & Kelley, 1986; Heffer & Kelley, 1987; Kelley et al., 1990; Miller & Kelley, 1990). For example, low and middle-upper income parents differed in their acceptance of five child management interventions (Heffer & Kelley, 1987). In a noteworthy study, Kelley et al. (1990) compared abusive, potentially abusive, and control group parents' views of commonly used child management strategies and found that potentially abusive parents viewed punitive child management strategies as more acceptable than the comparison groups. Taken together, these studies suggest that client and treatment characteristics interact in determining treatment acceptability.

Two studies suggest that greater knowledge of social learning principles is associated with greater acceptability of behavioral interventions. Regular elementary classroom teachers rated the acceptability of four classroom interventions in a study conducted by McKee (1984). Teachers in the high knowledge group, defined by performance on a measure of knowledge of social learning principles, rated the four interventions as more acceptable than teachers in the low knowledge group. Supporting this relationship, Clark and Elliott (1988) found significant correlations between teachers' knowledge of behavioral principles and ratings of acceptability for two social skills training procedures. An important component of such knowledge may be information about the effectiveness of various interventions.

Teaching experience has also been found to relate to assessments of treatment acceptability. In two studies, interventions were rated as less acceptable by more experienced

teachers as opposed to less experienced teachers (Witt, Moe, Gutkin, & Andrews, 1984; Witt & Robbins, 1985). In contrast, Hyatt, Tingstrom, and Edwards (1991) found no differences in acceptability ratings for time out as a function of teaching experiences. Why teaching experience may be inversely related to acceptability is unknown, but two hypotheses are suggested. Experienced teachers may have had greater opportunities to observe or experience the difficulties associated with particular treatments. Second, age cohort differences in exposure to social learning principles during training might also account for the relationship. These hypotheses could be tested not only with teachers but with other professionals, such as nurses, who implement psychological interventions.

#### RESEARCH ISSUES

#### Construct Validity

From this review, it can be seen that a substantial literature examining factors relevant to treatment acceptability has arisen in a relatively short period of time. As stated previously, the basic rationale for such research is the premise that prior attitudes towards treatment will predict subsequent choice of treatment, treatment compliance and participation, treatment success, and satisfaction with treatment. Although these associations are frequently and routinely stated (e.g., Elliott, 1988; Reimers, Wacher, & Koeppl, 1987; Witt & Elliott, 1985), they have minimal empirical verification.

Evidence to support these associations is as follows. Preliminary attempts to relate treatment acceptability to treatment selection have been made in two investigations. McKee

(1984) found ratings of acceptability made by teachers for classroom interventions were related to their ratings of which treatments they would select for implementation. Similarly, Pickering et al. (1988) noted a relationship between acceptability and intervention preference in ratings of interventions for self-abusive behavior. In both of these studies, treatment selection was assessed by rank ordering preferences for treatments after having rated the acceptability of all interventions.

Two studies provide preliminary evidence linking acceptability, client compliance, and satisfaction. Guibert, Firestone, McGrath, Goodman, and Cunningham (1990) demonstrated that perception of the treatment rationale (i.e., treatment credibility) was related to treatment compliance. Children participating in a behaviorally-oriented treatment program for migraine headaches who thought the program was less credible were more likely to drop out and/or not follow through with treatment instructions. Treatment credibility ratings increased following completion of the program, at least for those subjects who remained in treatment. Liu, Robin, Brenner, and Eastman (1991) noted that 46% of a sample of mothers of hyperactive children assessed for treatment did not complete the post-intervention assessment. Of these, 75% indicated that they had not complied with the treatment recommendation. The fact that many of the mothers who failed to return the post measures also failed to give the prescribed medication, indirectly points to a relationship between compliance and acceptability. More direct evidence linking acceptability, compliance, and satisfaction is

provided by Johnston and Fine (1992). Parents of hyperactive children evaluated two methods of evaluating methylphenidate (a placebo-controlled trial versus typical clinical practice) on measures of treatment acceptability and satisfaction. Pretreatment acceptability attitudes were modestly related to consumer satisfaction measures ( $\underline{r} = .35$ ) and, after a 3-week medication trial, posttreatment acceptability attitudes were moderately correlated with consumer satisfaction measures ( $\underline{r} = .65$ ). Surprisingly, treatment compliance (e.g., pill counts, missed appointments) was not related to either acceptability attitudes or consumer satisfaction. The relationship between acceptability attitudes and treatment compliance is important and, given these conflicting results across studies, requires further investigation before definitive conclusions can be reached.

Two studies suggest that the acceptability of interventions can be altered. Singh and Katz (1985) and Tingstrom (1989) both demonstrated that lectures describing specific behavioral interventions to undergraduate psychology students and prospective teachers increased the acceptability of these behavioral interventions. In the Singh and Katz study (1985), effectiveness information included statements regarding the intervention's "rapidity, magnitude, and durability" and cases were used to illustrate strong and weak treatment effects. Thus, effectiveness appears as an important component of the information offered regarding interventions. Further investigation as to the specific influence of effectiveness modifying acceptability attitudes is warranted.

Actual use and experience with an intervention have also been shown to improve ratings of acceptability. In three separate studies, parents' acceptability ratings for an intervention designed to modify their child's disruptive behavior increased from pre-treatment to post-treatment (Johnston & Fine, 1992; Little & Kelley, 1989; Liu et al., 1991). It could be assumed that these increases in acceptability ratings were related to improvement in problematic behavior due to the effective implementation of the recommended intervention. Reimers and Wacker (1988) offer data suggesting that one month after implementing the recommended intervention, parental ratings of effectiveness had an even greater influence on acceptability ratings than when rated prior to its implementation. However, in the Johnston and Fine (1992) and Liu et al. (1991) studies, acceptability was unrelated to rated improvements in child behavior. This failure to demonstrate a relationship between acceptability attitudes and effectiveness may have been due to a restricted range of initial acceptability attitudes in these studies because parents unwilling to consider medication would have been excluded. Alternatively, the findings may be limited by a restricted range of treatment effectiveness. For example, 75% of the children in the Johnston and Fine (1992) study were judged to be improved on medication. Despite the failure to relate acceptability and effectiveness, both studies support the premise that experience generates greater knowledge and understanding of the intervention and it is this enhanced knowledge that is responsible for changes in acceptability attitudes. However, before this conclusion can be firmly made,

research needs to examine how acceptability attitudes change over time when interventions are perceived as effective, ineffective, and when general information regarding the intervention is separated from effectiveness information.

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Furthermore, research examining the association between acceptability and client behavior is needed. Measures of treatment choice and utilization should be explored as ecologically valid means of verifying the link between acceptability ratings and client behavior. As a construct, treatment acceptability remains at a rudimentary level until links with other treatment and client variables are empirically verified. The present research was directed at developing the construct of treatment acceptability and in particular, examined the relationship between acceptability attitudes and knowledge of treatment effectiveness.

## Generalization Issues

As the previous review indicates, most treatment acceptability research employs analogue methodology in which fictitious case descriptions are rated by potential consumers. Treatment acceptability research has frequently used undergraduate students as raters (e.g., Fincham & Spettell, 1984; Kalfus & Burk, 1989; Kazdin, 1981; Morgan & Rodrigue, 1988; Tingstrom et al., 1989; Witt, Elliott, & Martens, 1984; Witt & Martens, 1983) and assumed that results from student evaluations generalizes to more direct consumers of treatment. This assumed generalizability may be questioned because students represent one extreme on the continuum of "potential consumers" of child treatments. To date, two investigations have examined the issue

of sample generalizability (Cross Calvert & Johnston, 1988; McMahon, Johnson, & Robbins, 1989). In both studies, undergraduate students and mothers of non-referred children completed ratings of acceptability (TEI; Kazdin, 1980a), usefulness, and difficulty (Parent's Consumer Satisfaction Questionnaire; Forehand & McMahon, 1981) for the Forehand-McMahon parent training program for treating child noncompliance. Results of both studies indicated that students viewed the parenting program in a manner similar to mothers, but mothers viewed the parenting program as more acceptable than students, although this trend was not statistically significant in the McMahon et al. (1989) study. Given that students and parents produce similar ratings, with students being somewhat more conservative evaluators of treatment than parents, the continued use of student samples for pilot and instrument development purposes is considered defensible.

As noted previously, most treatment acceptability research has focused on interventions applied in either educational or clinical contexts. Future research is needed to assess the acceptability of psychological interventions in other treatment settings. During the past 20 years, there has been an accelerating interest in the merger of behavioral science and medicine in an effort to improve health care. Only recently has interest begun to focus on behavioral pediatrics as a field of inquiry (e.g., Russo & Varni, 1982). Treatment acceptability research may hold considerable importance in this field because mental health professionals serving as consultants frequently rely on medical professionals (i.e., nursing staff, physicians)
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and parents to implement recommended psychological interventions in medical settings. In this context, acceptability judgments may be an important link between recommendation and intervention usage and satisfaction. Additionally, because of the complexity of the treatment setting, there is usually more than one interested consumer group and these various groups may hold differing or conflicting acceptability judgments. For example, due to differences in background, knowledge, experience, and perceptions of the problem, consumers of pediatric pain management strategies (i.e., child patient, parents, nursing staff, physicians) may all hold different attitudes towards psychological interventions. However, these potential differences have yet to be explored empirically.

To date, only two studies have investigated the acceptability of interventions applied in the context of pediatric medical settings. In the first study (Tarnowski et al., 1987), nursing staff assessed the acceptability of six behavioral interventions applied to externalizing behavior problems (e.g., noncompliance, aggressive responding) in pediatric medical patients in an inpatient setting. Consistent with previous treatment acceptability research, accelerative interventions (e.g., verbal praise) were more acceptable than reductive treatments (e.g., time out), and interventions applied to a severe behavior problem were judged to be more acceptable than those applied to a mild problem. Treatment ratings were not significantly influenced by severity of the medical problem. Although results were generally consistent with previous acceptability studies, nurses' ratings were considerably lower

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than those typically obtained from parents or teachers. Thus, treatment acceptance may be setting or staff specific and further exploration of these potential differences appears warranted.

In a second study, Tarnowski, Gavaghan, and Wisniewski (1989) addressed the acceptability of interventions for pediatric pain. Because of its direct relevance to the present research program, this study will be discussed later (see page 45). SUMMARY OF THE TREATMENT ACCEPTABILITY LITERATURE

The foregoing review has argued that further work is essential to develop the theoretical basis and construct validity of treatment acceptability. Additional recommendations include the need to address generalizability issues and the evaluation of a wider range of psychological interventions for child problems other than externalizing behaviors in contexts beyond the clinic and classroom.

The present research program addressed these issues by examining the treatment acceptability of interventions for pediatric pain associated with invasive medical procedures. Using a psychological model of health beliefs, predictions regarding the influence of effectiveness information on treatment acceptability attitudes were tested. Construct validation for treatment acceptability was provided by examining the relationships between acceptability attitudes, perceived efficacy of interventions, self-efficacy in implementing the intervention, and anticipated choice of treatment.

The following section provides a rationale for selecting the area of psychological interventions for pediatric pain associated

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with invasive medical procedures as the direction to extend the treatment acceptability literature.

#### INTERVENTIONS FOR PEDIATRIC PAIN

#### PEDIATRIC PAIN

The International Association for the Study of Pain has defined pain as "an unpleasant sensory and emotional experience, associated with actual or potential tissue damage, or described in terms of such damage" (Mersky, 1979, p. 250). Recognized as a multidimensional phenomenon, pain encompasses physical stimuli, autonomic changes, sensory physiology, cognitive functions, affective states, and behavioral phenomena (Ross & Ross, 1988).

In contrast to the medical and psychological literatures concerning adult pain, the problem of children's pain has received limited attention. However, research has increased dramatically since the late 1970's (Ross & Ross, 1988), addressing concerns such as the assessment and management of pediatric pain (e.q., Elliott & Olson, 1983; Jay, 1988; LeBaron & Zeltzer, 1984; Varni, Thompson, & Hanson, 1987), preparation for hospitalization and aversive medical or dental procedures (e.g., Melamed & Siegel, 1975; Wright & Alpern, 1971), and developmental changes in children's understanding of pain and illness (e.g., Bibace & Walsh, 1980; Brown, O'Keefe, Sanders, & Baker, 1986; Gaffney & Dunne, 1986; Hergenrather & Rabinowitz, 1991). Recent books and comprehensive review articles (e.g., Beyer & Byers, 1985; Jay, Elliott, & Varni, 1986; McGrath & Unruh, 1987; Ross & Ross, 1988) attest to the increasing recognition of the uniqueness of childhood pain. Despite this increasing recognition, several empirical investigations have documented the inadequate management of pain in children relative to adult pain (e.g., Bush, Holmbeck, & Cockrell, 1989; Schecter, 1989).

#### INVASIVE MEDICAL PROCEDURES

Within the context of medical settings, children typically encounter pain from two sources: disease- or injury-related pain and pain associated with diagnostic or treatment procedures. Invasive medical procedures can be defined as any operative or diagnostic technique, typically involving the use of instruments, that necessitate penetration of tissue or the invasion of a body orifice (Anderson & Masur, 1983). Pain and discomfort are associated with most, if not all, invasive procedures (Blount et al., 1989; Jay, 1988).

Children with malignant disease typically undergo numerous painful procedures as part of their medical treatment. Treatment-related pain in this population includes post-surgical, post-radiation, and post-chemotherapy pain and pain associated with invasive diagnostic and treatment procedures (Foley, 1979). For example, children diagnosed with cancer may undergo frequent intravenous and intramuscular injections, and periodic bone marrow aspirations (BMAs) and lumbar punctures (LPs). BMAs and LPs are usually repeated at least every 2 weeks during the early phases of treatment and during any relapse (Blount et al., 1989). BMAs involve the insertion of a needle into the child's hip bone and the suctioning of marrow to be examined for the presence or absence of cancer cells. A lumbar puncture involves the insertion of a needle into the spinal column. Spinal fluid is withdrawn for inspection of potential cancer cells. Pediatric cancer patients and their parents typically report BMAs and LPs as the most painful and traumatic events of their therapeutic regime, with BMAs rated as more painful (Jay & Elliott, 1990;

Jay, Elliott, Ozolins, Olson, & Pruitt, 1985; Jay, Ozolins, Elliott, & Caldwell, 1983; Zeltzer, Kellerman, Ellenberg, Dash, & Rigler, 1980; Zeltzer & LeBaron, 1982). Given the focus on pediatric pain associated with invasive medical procedures and the distressing nature of BMA procedures, the remainder of this review primarily focuses on BMA-related pain except where noted.

Three sources of pain are typically experienced in BMAs: а sharp stinging pain as the needle pierces the skin, heavy pressure as the needle penetrates the bone covering, and an intense pain as the marrow of the bone is suctioned (Hilgard & LeBaron, 1984). Local anaesthesia anesthetizing the skin surface and bone is widely administered (Hockenberry & Bolgna-Vaughan, 1985; McGrath & Unruh, 1987) but does not change the pain associated with the bone marrow removal. General anesthesia is typically not used, due to its expense and associated medical risks (Davies & Strunin, 1984). Intramuscular injections to induce heavy sedation have also been relatively unpopular because of significant side effects (i.e., sedation lasting several hours after the procedure), the painfulness of the injection, possible paradoxical effects (i.e., child becomes excitable rather than sedated), and increased sense of helplessness during the experience of pain (Jay, Elliott, Katz, & Siegel, 1987; Jay, Elliott, Woody, & Siegel, 1991; McGrath & Unruh, 1987; Patterson & Klopovich, 1987; Zeltzer, Jay, & Fisher, 1989). A recent alternative pharmacological approach known as "conscious sedation" uses midazolam, a relatively short-acting sedative, that often produces amnesia for the medical procedure. However, its use remains somewhat controversial due to response

variability, risk of prolonged sedation, and need for increased staffing to monitor vital signs (Reves, Fragen, Vinik, & Greenblatt, 1985).

Pain and distress are significant problems for children undergoing invasive medical procedures such as BMAs. Katz, Kellerman, and Siegel (1980) conducted behavioral observations of 115 children with acute leukemia undergoing BMAs and found that anxiety and discomfort were virtually ubiquitous and this has been confirmed by other investigators (Blount et al., 1989; Jay et al., 1983). Zeltzer and LeBaron (1982) reported that children with cancer rated BMA pain at 4.51 on a scale where 5 was considered the most pain imaginable. LPs were rated at 3.7. Besides self-report data, high levels of behavioral and physiological distress have been observed in most children undergoing these procedures (Jay et al., 1983; Katz et al., 1980).

In addition, often a conditioned pattern of anxiety is observed in children prior to undergoing BMAs and LPS (Katz, 1980; Katz et al., 1980; Kellerman, Zeltzer, Ellenberg, & Dash, 1983). Anticipatory anxiety can be severe as evidenced by nausea, vomiting, anorexia, insomnia, nightmares, irritability, withdrawal, depression, skin rashes, and crying prior to the administration of the scheduled procedure (Jay et al., 1985; Katz et al., 1980).

During the actual procedure, young children are frequently resistant, hysterical, and/or uncontrollable (kicking, fighting, screaming), creating significant management difficulties for parents and medical staff (Jay et al., 1985; Katz, Kellerman, &

Ellenberg, 1987). Extreme behavioral resistance can interfere with administration of the procedures and may result in nonproductive punctures. High levels of perceived aversiveness may also lead children and parents to adopt a negative view of anticancer treatment (i.e., "The treatment is worse than the disease."), with resulting poor compliance with therapeutic regimes and less than optimal psychosocial adjustment (Dolgin, Katz, Doctors, & Siegel, 1986; Katz, 1980).

Observational studies of the distress associated with invasive medical procedures have noted variations depending on characteristics of the procedure and the child. Distress typically increases at the beginning of a painful procedure, is maximal during the actual procedure, and decreases after the procedure is complete (Blount, Sturges, & Powers, 1990; Katz et al., 1980; Katz, Kellerman, & Siegel, 1982; LeBaron & Zeltzer, 1984; van Aken, van Lieshout, Katz, & Heezen, 1989). Compared with older children, younger children (under 7 years) exhibit more diffuse verbal and physical expressions of distress over a longer duration (Blount, Landolf-Fritsche, Powers, & Sturges, 1991; Jay et al., 1983, 1987; Katz et al., 1980, 1982; van Aken et al., 1989). With advancing age, a trend towards increased behavioral withdrawal and muscle tension (Katz et al., 1980; van Aken et al., 1989) as well as increased flinching and groaning has been noted. Generally, girls exhibit higher levels of anxiety and verbal resistance than boys (Jay et al., 1983; Katz et al., 1980, 1982, 1987; LeBaron & Zeltzer, 1984).

Several investigators have examined the relationship between previous experience with painful medical procedures and

children's reactions to BMAs to determine whether children receiving recurrent painful procedures show evidence of habituation (Jay, Elliott, Katz, & Siegel, 1984; Jay et al., 1983; Katz et al., 1980; Kellerman et al., 1983). Both Katz et al. (1980) and Kellerman et al. (1983) reported that children do not habituate or adjust to BMAs over time or with experience. Instead, McGrath and DeVeber (1986) found that without intervention, children's anxiety prior to LPs consistently increased over the first 2 years of treatment. Wall (1985) reports evidence suggesting that children responding with high levels of distress to a painful procedure demonstrate even greater distress on subsequent procedures. In contrast, Jay et al. (1983) reported that some children do habituate over time and with experience, although it may take as long as 2 to 3 years. Additional results reported by Jay et al. (1984) indicated that behavioral distress decreases with experience only when children received behavior therapy. Physiological arousal (e.g., heart rate, blood pressure) did not necessarily reflect this reduction in behavioral distress. Further research is needed to investigate the role of such factors as age, temperament, preexisting behavior patterns, and type of intervention in predicting children's adjustment to painful medical procedures.

Health care providers have reported a variety of pain management strategies in an attempt to alleviate the pain and distress pediatric oncology patients experience with invasive medical procedures. Hockenberry and Bolgna-Vaughan (1985) surveyed methods used to prepare children for invasive medical procedures in 29 pediatric oncology institutions. Twelve percent

of the institutions routinely premedicated children prior to BMA procedures, 68% of the institutions reported "sometimes" using premedication, and 20% reported "never" using premedication. For LPs, premedication was "always" used by 7% of the institutions, "sometimes" used by 59%, and "never" used by 34%. When premedications were used, there was no clear consensus as to drug or dose, although the drugs most commonly used were a DPT combination (Demerol, Phenergen, and Thorazine), Chloral Hydrate, and Valium. Topical anesthesia (Xylocaine) was used by 87% of the institutions. Noninvasive methods, defined by the authors as relaxation, distraction, and/or imagery were "always" used in 14% of the institutions while 69% reported "sometimes" using these methods. Seventeen percent of the institutions in the survey reported "never" using relaxation techniques. Considered as a unique noninvasive strategy, hypnosis was reportedly used "sometimes" at 30% of the institutions and 70% reported "never" utilizing hypnosis. Although the extent to which the 29 institutions surveyed are representative of clinical practice in pediatric oncology units in North America is unknown, the survey suggests that both noninvasive and pharmacological methods for alleviating pain and distress may be underutilized. Many investigators speculate that the undertreatment of pediatric pain reflects ignorance or misconceptions concerning the nature of children's pain (e.q., Ross & Ross, 1988; Schechter, 1989; Thompson & Varni, 1986).

In summary, invasive medical procedures, such as BMAs, are significantly stressful events for children who must undergo them either once or on an ongoing basis (Jay, 1988). The magnitude of

the problem is revealed by a number of factors. Pain and distress seems to be almost universal, anticipatory anxiety commonly occurs, anxiety and distress during the procedure may interfere with the administration of the procedure and present management difficulties for parents and medical staff, and habituation does not routinely occur. The unpleasantness associated with treatment procedures may lead to a negative view of anticancer treatments, poor compliance with the treatment regime, and ultimately poor psychosocial adjustment. Additionally, the limited research conducted suggests that both pharmacological and psychological pain management strategies for invasive medical procedures are underutilized. These reasons, combined with the humanitarian goal of minimizing suffering, point to the need for research promoting interventions aimed at ameliorating pain and anxiety in children undergoing invasive medical procedures. The investigation of the acceptability of psychological interventions for pediatric pain associated with invasive medical procedures is one avenue of research directed towards advancing this goal.

## PSYCHOLOGICAL INTERVENTIONS FOR INVASIVE MEDICAL PROCEDURES

Because pharmacological approaches to the reduction of pain and distress during BMAs have not been consistently or satisfactorily effective (Patterson & Klopovich, 1987), recent interest has focused on psychological interventions for reducing the associated distress. Hypnosis and cognitive-behavioral interventions are the strategies most frequently reported as useful for the amelioration of acute pain and distress associated with BMAs (Zeltzer et al., 1989).

Although a large literature exists documenting the effectiveness of preparation via provision of information to children about to undergo medical procedures, these informational interventions have not been widely evaluated for BMA procedures (with the exception of filmed modeling as part of Jay's cognitive-behavioral package). Given the lack of evaluation and the focus of this presentation on psychological interventions utilized during BMA procedures, preparation procedures will not be discussed further. Instead, the following sections review two psychological approaches most commonly used with BMAs: hypnosis and a cognitive-behavioral program (package).

## Hypnosis

Children have been identified as excellent candidates for hypnotic training because of their facility for imagination and fantasy (Dash, 1981; Gardner & Olness, 1981; Hilgard & LeBaron, 1982, 1984; Kuttner, Bowman, & Teasdale, 1988). Perhaps as a consequence, hypnosis has been the most frequently reported psychological intervention for acute distress and pain in pediatric cancer patients (Jay, 1988; Jay et al., 1986).

As defined by Orne (1980), hypnosis is an altered state of consciousness, or condition, occurring when appropriate suggestions are used to elicit distortions of perception, memory, or mood. A hypnotic state differs from the normal waking state and the stages of sleep but is sometimes difficult to distinguish from related states as muscle relaxation, distraction, and certain cognitive activities such as daydreaming (Olness & Gardner, 1978). Alternatively, others have argued that an altered state of consciousness is unnecessary to obtain high

levels of responsiveness to suggestions and that hypnosis relies on several social-psychological variables including situational demand characteristics and the adoption of specific roles in the hypnotic situation (Meeker & Barber, 1971).

Because pain is a complex psychophysiological phenomenon subjective in experience, hypnosis has been identified as an ideal intervention to effectively block or reinterpret the psychological component of the experience (Hilgard & Hilgard, 1975). Indeed, studies have demonstrated that psychologicallyinduced hypnotic changes impact on basic physiological stress reactions (e.g., Crasilneck & Hall, 1973; Finer, 1980; Zimbardo, Rapaport, & Baron, 1969). Although the mechanism by which hypnosis works is not clearly understood, available evidence points to cognitive mechanisms as playing the most important role (Turner & Chapman, 1982).

In the pediatric pain literature, hypnosis has been used as a label for various pain management techniques including imagery (e.g., Olness, 1981), imaginative involvement (e.g., Kuttner et al., 1988), and other types of distraction. Zeltzer and LeBaron (1982) identify fantasy and dissociation as essential components of hypnosis, but it is unclear how these components differ from techniques such as emotive imagery, guided imagery, and attention distraction (e.g., Jay et al., 1985) which have been described under the umbrella of cognitive-behavioral techniques. Due to this confusion, this review will specify how hypnosis was operationalized in each study. Obviously, future research is needed to clarify the distinctions among the various techniques

to avoid misleading terminology and to identify the critical elements of each technique.

Numerous case studies and uncontrolled reports have documented the efficacy of hypnosis in reducing treatment-related anxiety and pain in pediatric patients undergoing BMAs and LPs (e.g., Dash, 1981; Hilgard & LeBaron, 1982; Kellerman et al., 1983; Olness, 1981; Zeltzer, 1980). However, greater support can be found in four controlled-outcome studies. Zeltzer and LeBaron (1982), publishing the first randomized study of hypnosis during BMAs and LPs, compared the efficacy of hypnotic techniques (imagery, fantasy, deep breathing) with a condition employing supportive counselling and distraction in a sample of 33 cancer patients (ages 6-17 years). Self-reported measures of anxiety and pain indicated that the hypnotic intervention was consistently more effective than the alternative treatment in reducing distress, although both conditions significantly reduced distress compared with pretreatment levels. Kuttner et al. (1988) compared the efficacy of a hypnotic treatment (imaginative involvement) and a behavioral treatment (distraction) with an attention-placebo control condition in children undergoing BMAs. Dependent measures included self-report, observer ratings of anxiety and pain, and observations of specified behaviors suggesting pain, anxiety, or distress. Results indicated that both treatments were superior to a standard medical treatment control. For younger children (3-6 years), hypnosis was significantly more effective than either the control or distraction treatment. Both hypnosis and distraction techniques were found to be helpful with older (7-10 years) children. Wall

and Womack (1989) compared the efficacy of standardized instruction in hypnosis (hypnotic induction, relaxation, visual imagery) with an active cognitive strategy (voluntary concentration on motoric movement or sequential information) in a sample of 20 cancer patients (5-18 years). Both groups received two training and practice sessions and were cued by audiotape at the time of the BMA or LP to use the technique learned during the sessions. Both techniques were effective in reducing selfreported and observed pain, but neither technique reduced selfreported anxiety. Finally, a study by Katz et al. (1987) compared hypnotic techniques (hypnotic induction, active imagery, muscle relaxation, and suggestions) to non-directed play on selfreported measures of fear and pain in a sample of 36 children (6-12 years) undergoing repeated BMAs. Both groups reported decreased fear and pain from baseline to post-intervention, and no significant decreases were found on observational measures in either condition.

Taken together, these studies suggest that hypnotic techniques demonstrate considerable promise in reducing the distress associated with aversive medical procedures, although their superiority over other psychological interventions has not been consistently demonstrated. Additional research is needed to determine the essential and distinctive components of hypnosis and the individual variables (e.g., hypnotic suggestability, age, ability to imagine, self-management versus need for a coach) that might predict greater success in using the intervention. Cognitive-Behavioral Interventions

Cognitive-behavioral interventions encompass those interventions focusing not only on behavior, but also on individual cognitions, expectancies, appraisals, self-statements, and images accompanying overt behavior (Meichenbaum & Turk, 1976). The underlying rationale is that cognitions help determine behavior, and modification of cognitions assists in altering behavior. In the case of invasive medical procedures, the child's cognitions are thought to mediate the experience of pain and the accompanying stress reactions. Therefore, modification of negative and maladaptive cognitions can serve to reduce behavioral distress. Most cognitive-behavioral interventions emphasize the development and utilization of specific coping strategies for anxiety reduction. Both laboratory studies (e.g., Ahles, Blanchard, & Leventhal, 1983) and studies with clinical populations (e.g., Jay et al., 1985) have demonstrated the usefulness of cognitive approaches in reducing various measures of pain.

In a series of studies, Jay and her colleagues have investigated the application of cognitive-behavioral techniques to children's BMA-related distress (Jay et al., 1985, 1987, 1991). They developed a multicomponent cognitive-behavioral intervention package designed to teach effective coping skills and reduce children's distress during BMAs and LPs. Partially based on Meichenbaum's (1976) stress-inoculation model, the package consists of five primary components: filmed modeling, positive reinforcement, breathing exercises, imagery/distraction, and behavioral rehearsal.

Three studies support the efficacy of Jay et al.'s cognitive-behavioral intervention package for reducing distress associated with BMAs. A pilot study with five pediatric cancer patients (3-7 years) indicated that the intervention package was effective for reducing behavioral distress (Jay et al., 1985). A 3-year treatment outcome study with 55 children undergoing BMAs compared the efficacy of the cognitive-behavioral package with a Valium sedation condition and a minimal treatment attention control condition. Valium was selected as the comparison pharmacological treatment because of its cost effectiveness, minimal side effects, short duration, and ease of oral administration. The cognitive-behavioral intervention package was significantly more effective than the minimal treatment attention control condition in reducing behavioral distress, self-reported pain, and physiological arousal during BMAs (Jay et al., 1987). Comparison with the Valium sedation condition indicated that Valium was effective in reducing anticipatory distress but less helpful than the cognitive-behavioral package during the actual procedure. A third study found that children receiving the intervention package plus Valium showed only about one-third as much reduction in behavioral distress from baseline to intervention as those in the cognitive-behavioral intervention only group (Jay et al., 1991). Although it was hypothesized that Valium, by lowering anticipatory anxiety, would enhance the learning and utilization of coping skills, the results suggest that Valium may actually impede the learning of the cognitivebehavioral strategies. However, results of this study do provide additional support for the efficacy of the cognitive-behavioral

intervention package, as children's distress levels across three modalities (behavioral, self-report, physiological) decreased significantly from baseline.

#### Psychological Interventions Summary

Although psychological strategies such as hypnosis and cognitive-behavioral techniques have shown promise in reducing BMA-associated pain and distress, deciding which intervention to select may require consideration of factors other than treatment efficacy. Existing research has not consistently demonstrated the superiority of one psychological intervention over another. One possible reason may be that the critical components of the interventions have not been determined. Evidence from a metaanalysis of 27 studies of pain management interventions with children conducted across five disciplines (nursing, medicine, psychology, education, dentistry) using 20 years of research concurs in failing to demonstrate superiority of any particular intervention (Broome & Lillis, 1989; Broome, Lillis, & Smith, 1989). Although not specific to invasive medical procedures, the meta-analysis included experimental studies testing pain management interventions designed to alleviate the distress experienced by children (birth to 18 years) during painful procedures (e.g., fingerstick, injection, venipuncture, cast removal, diagnostic or medical procedure such as LP or cardiac catheterization). Effect sizes were highest for behavioral outcomes followed by self-report and physiological outcomes. A11 effect sizes were positive but of relatively small magnitude. Effect sizes did not differ significantly as a function of the focus of the intervention, designated either as cognitive

(provision of factual information designed to alter the perception of the event), emotive (provision of coping skills and/or emotional support during the painful experience), or biophysical (provision of strategies designed to alter physiologic responses during the experience). This meta-analysis showing similar effects obtained across various treatments lends support to the contention that factors other than intervention type may be implicated in determining an intervention's effectiveness.

The considerable variability existing within and across individuals in responsiveness to pain management procedures also suggests that factors other than effectiveness must be examined in selecting treatments (e.g., Jay et al., 1991; Katz et al. 1987; Kuttner et al., 1988). Within individual children, the effectiveness of different interventions varies across time. For example, Kuttner et al. (1988) found that the effectiveness of distraction seemed to increase with repeated practice. Other interventions may be more potent initially and decrease with repeated use. Blount, DePaola, Powers, Cotter, and Swan (1990) found increases in coping and decreases in distress for three children trained in distraction and therapeutic blowing during BMAs and LPs. However, one child's level of distress and coping returned to baseline levels after the second training session. In the Jay et al. study (1985), the cognitive-behavioral package effectively reduced behavioral distress for all five patients during the first session. However, during the second session, one patient showed some regression of intervention effects. Variability in effectiveness of psychological interventions

across subjects also exists. Averaged across children, Jay and colleagues reported mean reductions in observed behavioral distress ranging from 18 to 50% in two separate studies (Jay et al., 1985, 1987). Jay et al. (1991) also report that for some children, distress levels (across all modalities) remains unacceptably high. Even following intervention, 24% of the children receiving BMAs rated their fear level as "very scared" or "very, very scared" and 34% rated their pain level as "it hurt a lot" or "it hurt very very much." This variability in response to pain management interventions is obvious both within and across children.

Furthermore, treatment and patient characteristics appear to interact, such that particular treatments may be more effective for particular individuals. The goal of future research should be to identify the individual characteristics that interact with intervention effectiveness. Possible variables include the child's age (e.g., Kuttner et al., 1988), quality of previous experience with the procedure (e.g., Dahlquist et al., 1986), coping style (e.g., Smith, Ackerson, & Blotcky, 1989), hypnotic susceptibility (e.g., Katz et al., 1987), and parental attitudes and expectations (e.g., Jay et al., 1983). In particular, treatment acceptability attitudes, both in children and parents, may be one important characteristic that interacts with intervention effectiveness.

ACCEPTABILITY OF INTERVENTIONS FOR PAINFUL MEDICAL PROCEDURES

From the previous review, it can be seen that a preliminary data base exists indicating that despite underutilization, psychological interventions are effective in reducing pediatric

distress associated with invasive medical procedures. However, available research has neither demonstrated the superiority of one pain management intervention over another, predicted the observed variability in effectiveness within and across individuals, nor considered the potential interactions between patient attitudes and treatment characteristics. Broadening the evaluative criteria for interventions to examine variables related to the applied significance and acceptability of treatment procedures (Wolf, 1978) appears to be a logical next step.

Thus far, two studies have investigated the acceptability of psychological interventions in pediatric medical settings. As reviewed previously, Tarnowski et al. (1987) investigated the acceptability of behavioral interventions for managing behavior problems exhibited by children with medical problems and demonstrated a pattern of results consistent with previous acceptability research. However, ratings provided by nurses were considerably lower than those typically obtained from parents or teachers for the same interventions, suggesting that acceptance of treatments may be setting or staff specific.

With regard to the acceptability of pediatric pain management interventions, one study has been published. In this study by Tarnowski, Gavaghan, and Wisniewski (1989), pediatric nurses reviewed one of four written case descriptions describing a 10-year-old inpatient at a pediatric hospital. The four cases varied on two levels of pain severity (mild vs. severe) and two levels of the diagnostic status of the patient's pain (organic vs. nonorganic). Subjects then rated, on the IRP, the

acceptability of six interventions (behavioral self-management, contingency management, verbal praise, time out, pharmacologic treatment, extinction) used to treat the pediatric pain. With the exception of extinction, rated as least acceptable, all behavioral treatments were rated as more acceptable than the pharmacologic intervention. Neither pain severity nor diagnostic status significantly influenced acceptability ratings. However, significant interactions noted that when diagnostic status was specified as organic in etiology, treatments were rated as slightly lower in acceptability, with the exception of the pharmacologic treatment which was rated as more acceptable. Similarly, interventions were rated as more acceptable for severe pain symptoms, with the exception of the self-management intervention which was rated as more acceptable when applied to mild pain symptoms.

Why might the examination of treatment acceptability in the context of interventions for pediatric pain be important? First, there is evidence that, as consumers of treatment, parents and children have preferences and opinions as to the helpfulness of psychological and pharmacological interventions. For example, Hilgard and LeBaron (1982) offered 63 patients undergoing BMAs hypnotic help in pain control. Only 24 patients accepted. Similarly, in Jay et al.'s (1985) study, some parents refused participation because they did not want their child to receive any drugs for the BMA. Alternatively, other parents insist on sedation and are unwilling to consider the utility of psychological interventions (Zeltzer et al., 1989). Additionally, evidence suggests that pediatric pain is

significantly undermanaged by medical staff despite the availability of adequate pharmacological and nonpharmacological methods and this undermanagement is thought to be at least partially attributable to attitudes towards pain and its management (Hockenberry & Bologna-Vaughan, 1985; Schecter, 1989). It seems critical to identify the acceptability of various interventions and to investigate how pretreatment acceptability attitudes are formed and how these attitudes might be modified if effective interventions are being overlooked.

Parents' views of the acceptability of various pain management interventions seem to be particularly important considerations given that parental attitudes and expectations may mediate children's perceptions and reactions (Jay, 1988). Jay et al. (1983) found a strong positive relationship between parental anxiety and children's distress during BMAs. Similar to this possible transmission of anxiety, children's acceptance of pain management interventions may reflect their parent's attitudes. However, as yet, parental attitudes towards various interventions for invasive medical procedures have not been investigated.

Finally, efforts are needed to understand factors influencing the formation and change of treatment acceptability attitudes in the pediatric setting. Given the incomplete effectiveness of available interventions for the pain and distress associated with invasive medical procedures, the question of whether treatment acceptability attitudes are modified through experiences with effective or ineffective uses of an intervention becomes important. For example, it has been documented in a number of studies that medical staff with greater

exposure to suffering in patients infer lesser degrees of physical pain (Baer, Davitz, & Lieb, 1970; Davitz & Davitz, 1981; Lenburg, Glass, & Davitz, 1970). A trend in the data collected by Fanslow (1985) indicated that attitudes toward cancer and cancer therapies were most positive among young nurses with little work experience. As age and length of work experience increased, nurses' attitudes became more negative. If positive attitudes towards an intervention are adversely affected by evidence of ineffectiveness, it may be important to better educate staff and families as to the limitations of psychological techniques and the variability expected in their effectiveness. Merging Treatment Acceptability and the HBM 49 MERGING TREATMENT ACCEPTABILITY AND THE HEALTH BELIEF MODEL

Although models outlining relationships among treatment acceptability, client experiences in treatment, and treatment outcome have been proposed (e.g., Elliott, 1986, 1988; Reimers et al., 1987; Witt & Elliott, 1985), most treatment acceptability research has been atheoretical, driven by pragmatic concerns for accountability, self-scrutiny, cost-effectiveness, and the public's perception of psychological services. Further work is needed to create a theoretical framework from which to test assumptions of the relationships among treatment acceptability, consumer satisfaction, and treatment effectiveness to increase the clinical relevance of treatment acceptability research and suggest new directions for research (Cross Calvert & Johnston, 1990). In this regard, the social psychology literature on the formation and change of health beliefs appears especially relevant.

In particular, the health psychology field has made substantial contributions to understanding the determinants of health promoting behaviors, such as treatment compliance, and the factors undermining these behaviors. Much of this contribution has been through the provision of theoretical and conceptual frameworks to elucidate the practice of health behaviors (Taylor, 1990). One conceptual model that has proven exceptionally useful is the Health Belief Model (HBM; Becker, 1974; Becker & Maiman, 1975; Rosenstock, 1974). This model attempts to explain and predict acceptance of health care recommendations. Developed in the early 1950s, the model seeks to understand why individuals fail to engage in a wide variety of health-related behaviors, Merging Treatment Acceptability and the HBM 50 such as not taking preventative measures or not complying with prescribed medical regimens. The current formulation of the model reflects well-established contributions from psychological theories such as value-expectancy theory (Maiman & Becker, 1974), self-efficacy theory (Bandura, 1986), and Roger's (1984) protection/motivation theory.

According to recent formulations of the model (Rosenstock, Strecher, & Becker, 1988), beliefs contributing to a given health practice include the following components.

a) <u>Perceived severity of the health threat</u>: An individual's evaluation of the seriousness of the consequences resulting from the health threat. This may include evaluation of both physical consequences (e.g., death, disability, pain) and social consequences (e.g., disruption of social relationships, inability to work).

b) <u>Perceived personal vulnerability to the threat</u>: An individual's evaluation of personal risk or susceptibility to the health threat.

c) <u>Self-efficacy</u>: An individual's conviction that he/she has the ability to successfully execute the health behavior that will reduce the health threat.

d) <u>Response efficacy</u>: An individual's assessment of the effectiveness of the specific health behavior in reducing the health threat. This dimension includes a cost-benefit analysis whereby potential costs of undertaking the health measure (e.g., expense, side effects, unpleasantness, inconvenience, time consuming) are weighed against potential benefits of engaging in the behavior. Merging Treatment Acceptability and the HBM 51 The probability that an individual will engage in a health practice will be greatest when the threat to health is severe, and perceived vulnerability, self-efficacy, and response efficacy are high (see Figure 1). The model also predicts that changes to one or more of the beliefs will result in a corresponding change in health behavior.

Since its initial development, considerable empirical support for the model has accumulated (Janz & Becker, 1984; Taylor, 1990). In a review of 46 HBM studies conducted prior to 1984, Janz and Becker (1984) conclude that substantial empirical evidence (from both retrospective and prospective studies) supports the utility of the HBM dimensions in explaining and predicting individual health-related behavior in such areas as prevention (e.g., vaccinations, screening tests), compliance with recommended medical treatment (e.g., diet compliance, adherence to medication, appointment keeping), and clinic utilization (e.g., use of pediatric medical facilities). Relevant to the present research, the model also has been supported in investigations of parents engaging in health practices on behalf of their children (e.g., mothers' compliance with medication prescribed for their children, clinic utilization [Becker, Drachman, & Kirscht, 1974; Kirscht, Becker, & Eveland, 1976]). Reviewing the empirical evidence for each of the HBM dimensions across various study designs and behaviors, Janz and Becker (1984) conclude that perceived costs of a particular health behavior is the most powerful of the HBM dimensions followed by perceived vulnerability to the threat, perceived benefits of the health behavior, and perceived severity of the threat. Examining



Figure 1. Basic Elements of the Health Belief Model. Adapted from "Selected Psychosocial Models and Correlates of Individual Health-Related Behaviors" by M. H. Becker, D. D. Haefner, and S. V. Kasl, 1977, Medical Care, <u>15</u>, pp. 27-46.

Merging Treatment Acceptability and the HBM 53 studies concerned only with compliance and clinic utilization, behaviors most relevant to the area of treatment acceptability, the strongest predictors tend to be perceived costs and benefits of the intervention and severity of the threat. The selfefficacy dimension has been added to the model only recently (Rosenstock et al., 1988). Although a growing body of literature supports the importance of self-efficacy in helping to account for initiation and maintenance of behavioral change (e.g., Bandura, 1986; Schunk & Carbonari, 1984), few published studies have specifically addressed the influence of self-efficacy upon health-related behaviors (Strecher, DeVellis, Becker, & Rosenstock, 1986).

As a psychosocial model, the HBM is not without limitations. First, the model presumes that health is a highly valued goal for most individuals. Second, it assumes that cues to action, either internal (e.g., symptoms) or external (e.g., media campaigns, interpersonal communication), are present. Third, factors other than health beliefs (e.g., economic, social, or cultural forces) obviously impact on health behaviors and are not included in the HBM. Despite these limitations, the model continues to provide a beneficial framework for health psychology research.

The HBM provides a useful framework for conceptualizing the previously atheoretical treatment acceptability literature. Both the treatment acceptability literature and the HBM advocate the same goal; that is, the promotion of well-being or health. Both areas were developed in an attempt to understand why people fail to accept and implement recommended health interventions. Although the HBM has generally focussed on physical health, it Merging Treatment Acceptability and the HBM 54 may also be appropriate in understanding the mental health behaviors that have been the centre of the treatment acceptability literature.

Contrasting the HBM dimensions with the previous review of the treatment acceptability literature reveals a number of consistencies. Corresponding to response efficacy, intervention effectiveness has been a variable of interest and importance in a number of acceptability studies. Generally, interventions described as strong or effective are viewed as more acceptable. Similarly, cost/benefit variables such as side effects, complexity, and time involvement required by interventions have been examined in the acceptability literature and generally reveal relationships to treatment acceptability that would be expected according to the HBM (e.g., Kazdin, 1980a; Witt, Martens, & Elliott, 1984). Corresponding to the HBM dimension of perceived severity of threat, acceptability research has shown that the more severe the problem behavior, the higher the acceptability ratings for proposed interventions. In contrast with the HBM, acceptability research has not emphasized the consequences of the behavior problem as a factor influencing acceptability ratings, although such a relationship appears feasible.

The remaining two dimensions of the HBM, perceived personal vulnerability and self-efficacy, do not appear to have parallels in the treatment acceptability literature. Due to the analogue nature of most treatment acceptability studies (i.e., reading a case description of a child with a behavior problem), it is likely that the personal relevance (i.e., vulnerability) to the

Merging Treatment Acceptability and the HBM 55 rater has been minimal. Similarly, it is unknown whether selfefficacy in implementing the intervention is related to treatment acceptability and treatment choice. It can be speculated that as part of their evaluation of an intervention, raters may consider whether they would be willing or have the ability to execute the intervention. Depending upon the situation described, raters may vary in the degree to which they identify themselves as potential interventionists (e.g., parents evaluating behavior management strategies to be employed at home vs. parents evaluating behavior management strategies to be used by teachers in the classroom). It is expected that self-efficacy has the greatest impact on acceptability judgements when raters are closely identified with the interventionist. Furthermore, raters may judge an intervention to be acceptable but remain unlikely to select it if they feel incompetent to perform the particular intervention. Therefore, self-efficacy may be related to treatment acceptability and treatment selection but the strength of this relationship may be dependent upon the degree that the rater is identified as the interventionist. Self-efficacy warrants exploration as a mediating link between acceptability attitudes and treatment selection.

The proposed treatment acceptability model, based on an adaptation of the HBM framework, appears in Figure 2. This model seems most applicable to acceptability judgements made by direct or potential consumers rather than individuals making judgements for the benefit of others (e.g., school board setting policies to be implemented by teachers). The proposed model suggests that factors entering into treatment acceptability judgements include



Figure 2. Conceptual Model of Treatment Acceptability.

Merging Treatment Acceptability and the HBM 57 characteristics of the problem behavior (e.g., perceived vulnerability and severity), rater characteristics (e.g., demographic and psychosocial variables), and characteristics of the intervention (e.g., perceived effectiveness, type of intervention). The impact of acceptability attitudes on treatment selection and implementation is then mediated by evaluation of self-efficacy in carrying out the intervention.

Using this framework, the investigations conducted in this presentation attempted to further develop the construct of acceptability by examining the relationship between acceptability and perceived intervention effectiveness and the relationship between acceptability and self-efficacy in implementing the treatment. Perceived severity and personal vulnerability were not explored at this time, but the personal relevance of the stimulus materials was maximized through the use of parent samples (in Studies 3 and 4) and specific instructions (i.e., asking mothers to imagine themselves as the parent of the child described in Studies 3 and 4). Similarly, severity was maximized in the case vignette by describing a child having difficulty coping with a medical procedure.

Summary and Overview 58

## SUMMARY AND OVERVIEW OF THE INVESTIGATIONS

The preceding review summarized the treatment acceptability literature and argued for the need to further develop the generalizability and construct validity of treatment acceptability. Examining the acceptability of psychological interventions for the reduction of pediatric pain associated with invasive medical procedures provides an area to extend the treatment acceptability literature and address these concerns. The HBM provides a useful framework to guide this extension by providing a framework for conceptualizing treatment acceptability attitudes and how these may be formed and changed. In applying the HBM to treatment acceptability, hypotheses regarding relationships among perceived effectiveness of treatments, feelings of self-efficacy in implementing the treatment, treatment acceptability, and treatment selection are specified.

The research program consisted of four studies. The primary purpose of Studies 1 and 2 was to develop a measure of acceptability appropriate for the evaluation of interventions for pediatric pain and distress. Using this measure, Studies 1, 2, and 3 assessed the relationships between treatment acceptability, intervention effectiveness, treatment choice, and feelings of self-efficacy in implementing the treatment. Study 4 examined how effectiveness information (effective, ineffective, and no effectiveness information) functioned to influence acceptability attitudes.

#### STUDY ONE

#### **PURPOSES**

The primary purpose of Study 1 was to develop stimulus materials and a questionnaire measure to assess the acceptability of interventions for pediatric distress associated with aversive medical procedures. Such a questionnaire measure, once developed, will be useful not only within the context of the proposed research, but across a range of interventions, settings, and patient and rater populations within the domain of pediatric psychology. In Study 1, efforts focused on developing a measure possessing adequate psychometric properties (i.e., internal consistency, test-retest reliability, validity) and sensitive to differences in the acceptability of various treatment procedures.

Secondary purposes of Study 1 included: a) an examination of the acceptability of alternate interventions for pediatric pain as rated by undergraduate students, a potential consumer group; and b) the development of measures of treatment effectiveness and treatment choice.

#### **HYPOTHESES**

1. It was hypothesized that the questionnaire developed in this study, the Acceptability Questionnaire (AQ), would differentiate among various psychological and pharmacological interventions in terms of their relative acceptability as applied to pediatric distress associated with aversive medical procedures. Based on previous research (e.g., Tarnowski, Gavaghan, & Wisniewski, 1989), it was hypothesized that accelerative interventions (i.e., attention-distraction, breathing exercises, and imagery) would be rated as more

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acceptable than reductive interventions (i.e., ignoring and reprimands). It was expected that oral Valium would be rated as more acceptable than ignoring and reprimands but less acceptable than attention-distraction, breathing exercises, and imagery.

2. Based on previous treatment acceptability research (e.g., Kazdin, 1986; Von Brock & Elliott, 1987; Witt & Martens, 1983), it was hypothesized that the AQ would be positively correlated with the Evaluative dimension of the Semantic Differential (SD). This correlation would demonstrate convergent validity for the AQ. It was expected that the Activity and Potency dimensions of the Semantic Differential would not be correlated with the AQ, thereby providing evidence of discriminant validity for the AQ measure.

3. Also reflecting the general findings of previous treatment acceptability research (e.g., McKee, 1984; Pickering et al., 1988; Von Brock & Elliott, 1987), it was expected that the AQ would be positively correlated with ratings on the Effectiveness Rating Scale (ERS) and with rank orderings of treatment choice (TC). Such correlations would demonstrate convergent and, in a preliminary sense, predictive validity for the AQ.

Specific predictions regarding the relationships between the demographic characteristics of the sample and the questionnaire measures were not made. Rather, exploratory analyses were conducted to examine possible relationships.

#### DESIGN

A within-subjects design was employed with each subject evaluating each of six pain management interventions (breathing
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exercises, attention-distraction, imagery, ignoring, reprimands, and oral Valium). A within-subjects design was selected to minimize the number of required subjects, reduce error variance due to person factors, and because previous treatment acceptability studies using this design have failed to demonstrate order effects (e.g., Kazdin, 1980a, 1980b). Order of intervention presentation (6 levels) and gender of subject (male or female) served as between-subjects variables. The withinsubjects variable was represented by each subject evaluating each of the six pain management interventions.

## METHOD

## Subjects

Participants were 224 undergraduate students (114 male, 110 female) recruited from introductory psychology courses where course credit was given for research participation. Students ranged in age from 17 to 36 years (M = 19.6 years) and the majority were first or second year students (91.2%) enrolled in the Faculties of Arts (64.3%) or Science (22.3%). Students identified their ethnic heritage as North American (41.4%), Asian (36.3%), European (15.3%), or from other ethnic backgrounds (7.0%; e.g., East Indian, African). Most students (86.5%) indicated that they had had no experience with medical, physiological, or health sciences either through past research studies, courses, or work experience.

## Stimulus Materials

Based on the methodology of previous treatment acceptability research (e.g., Cross Calvert & McMahon, 1987; Kazdin 1980a; Witt & Martens, 1983), a scenario was written describing pediatric

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pain associated with an aversive medical procedure. A vignette of a 5-year old boy with cancer about to undergo a bone marrow aspiration (BMA) was created. Gender of the child was chosen to reflect the more frequent incidence of leukemia in boys and 5 years of age was chosen to reflect the peak incidence between 2 and 6 years (Behrman, Vaughan, & Nelson, 1987). The vignette included the child's diagnosis, the rationale for the medical procedure, and the types of pain and distress typically experienced (see Appendix A). Following the case vignette, six different interventions were described as possible ways to help the child cope with the pain and anxiety of the BMA. These included five psychological interventions (attention-distraction, imagery, breathing, ignoring, reprimands) and one pharmacological intervention (oral Valium) (see Appendix B).

Three of the psychological interventions were those identified in previous research as frequently used and beneficial for children undergoing BMAs and LPs (e.g., Hilgard & LeBaron, 1984; Jay et al., 1987; Katz et al., 1987; Kuttner et al., 1988; Ross & Ross, 1988). These included the following.

<u>Breathing exercises</u>: Partial relaxation is promoted by blowing bubbles or blowing on a pinwheel.

<u>Imagery</u>: Vivid images involving elements incompatible with the experience of pain (e.g., superheroes, pleasant scenes, pleasant events) are developed and practiced.

Attention-distraction techniques: Attention is focussed on an activity that distracts from the medical procedure, either externally (e.g., counting objects, pop-up storybooks, kaleidoscope) or internally (e.g., mental games). Two additional psychological interventions were included in this study. These interventions were:

Ignoring: No attention is directed toward the child when he/she is engaged in pain-related behaviors (e.g., crying, grimacing, screaming). When the child is not engaged in these activities, attention is again directed towards the child (e.g., conversation, physical contact).

<u>Reprimands</u>: When the child initiates pain-related behavior, an adult quietly but firmly tells him/her to stop.

Ignoring and reprimands are interventions recommended for externalizing child behavior problems, but have not been recommended as beneficial for children undergoing aversive medical procedures. In treatment acceptability research dealing with externalizing child problems, these interventions have generally been rated as less acceptable than interventions designed to increase positive behaviors (e.g., positive reinforcement) (Cross Calvert & Johnston, 1990). Ignoring and reprimands were included in Study 1 to determine whether the AQ would be sensitive to differences in acceptability across interventions recommended for pediatric pain and those not recommended for pediatric pain and typically seen as of low acceptability in other child treatment contexts.

Finally, a low risk pharmacological intervention (i.e., oral Valium) was included. Among medical interventions, oral Valium administered 30-60 minutes prior to a medical procedure has been recommended to induce general relaxation and sedation (Krogh et al., 1991). Intervention descriptions were created to be clear, accurate, equivalent in information provided, and similar in word length. Aspects of interventions demonstrated to influence ratings of acceptability in previous research, such as side effects and effectiveness information, were systematically excluded from the treatment descriptions. The advice of 13 health professionals knowledgeable in the area of pediatric pain and its management (i.e., physicians, pediatric psychologists, nurse clinicians, clinical psychologists, social workers) was sought in creating the case vignette and intervention descriptions. These professionals rated aspects of the case vignette and descriptions of the six interventions as accurate, realistic, understandable, and sufficiently complete (i.e., mean ratings greater than the mid-point on 6-point rating scales). Dependent Measures

# Acceptability Questionnaire

As the primary dependent measure, the AQ was developed to assess the acceptability of various pediatric pain management strategies. Development of such a measure was necessary because existing treatment acceptability measures are limited to assessing interventions for child behavior problems in educational, institutional, and home situations (Kazdin, 1980a; Von Brock & Elliott, 1987; Witt & Martens, 1983) and are not appropriate for assessing interventions for distress associated with aversive medical procedures. Twenty-one items were included on the AQ and were patterned after items on existing treatment acceptability measures (Kazdin, 1980a; Martens et al., 1985; Von Brock & Elliott, 1987; Witt & Martens, 1983). Items covered

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aspects of treatment acceptability such as the general appropriateness of the intervention, the likelihood of negative side effects, risks to the patient, time required for the intervention, and the amount of skill necessary for implementation (see Appendix C). Previous factor analyses of treatment acceptability measures (e.g., Cross Calvert & Johnston, 1988; Elliott & Treuting, 1991; Kelley et al., 1989; Witt & Martens, 1983) have indicated the importance of such dimensions within the construct of treatment acceptability.

Students were asked to respond to each item on a 6-choice Likert-like scale ranging from "Strongly disagree" to "Strongly agree". Thirteen of the 21 items were phrased in the positive direction and the remainder in the negative direction in an effort to control for response set. All items were scored so that higher scores indicated greater acceptability. Effectiveness Rating Scale

Items patterned after those found on the Effectiveness factor of the Behavior Intervention Rating Scale (BIRS; Von Brock & Elliott, 1987) were developed to operationalize the construct of predicted treatment effectiveness. These items formed the Effectiveness Rating Scale (ERS; see Appendix D). Students were asked to respond to each item on a 6-choice Likert-like scale ranging from "Strongly disagree" to "Strongly agree". Eight of the 15 items were phrased in the positive direction and the remainder in the negative direction. When items were scored, higher scores indicated greater predicted effectiveness.

The ERS was included in the study to offer information as to the relationship between AQ scores and estimates of treatment effectiveness. Previous research has found that the constructs of acceptability and effectiveness are closely related, yet independent constructs (Von Brock & Elliott, 1987). In this study, it was expected that the AQ and ERS would be positively correlated, but rank orderings of interventions on the two dimensions of acceptability and effectiveness would not necessarily be identical. For example, interventions such as reprimands may be viewed as effective but unacceptable. It should be noted that, although the differential effectiveness of the described pain management strategies has not been demonstrated in the pediatric pain literature, the ERS was included in this study to examine the <u>perceived</u> or <u>predicted</u> effectiveness of each of these strategies (Peterson, Everett, Farmer, Mori, & Chaney, 1988).

## Semantic Differential

In addition to the AQ and ERS, which were designed to assess specific aspects of treatment acceptability and predicted effectiveness, ratings on 15 bipolar adjectives were used to provide more global evaluations of each intervention. These adjectives represented the Evaluative (e.g., good-bad, kindcruel), Potency (e.g., strong-weak, heavy-light), and Activity (e.g., fast-slow, active-passive) dimensions of the Semantic Differential (SD; Osgood et al., 1957; see Appendix E) and have been used in previous treatment acceptability research (e.g., Davis, Rawana, & Capponi, 1989; Kazdin, 1980a; Von Brock & Elliott, 1987). The Evaluative dimension represents an overall, general evaluation of an intervention and in past acceptability research, has been highly correlated with ratings of acceptability (e.g., Von Brock & Elliott, 1987). The dimensions of Potency and Activity reflect treatment characteristics expected to show relative independence from the construct of acceptability (e.g., Kazdin, 1980a; Pickering et al., 1988). Scores on each of the three SD scales can range from 5 to 35 (ratings from 1 to 7 for each of 5 bipolar adjectives), with lower scores indicating greater positive evaluation, potency, and activity.

## Treatment Choice Ranking

Students were also asked to rank order how likely they would be to choose each of the six pain management interventions for the child in the case vignette (see Appendix F). This measure allowed the examination of the relationship between treatment acceptability ratings and anticipated treatment choice.

Procedures

All measures were administered in small groups. Students first completed consent and demographic information forms. Each subject received a packet containing: instructions, the case vignette of a child cancer patient about to undergo an aversive medical procedure (BMA), descriptions of the six pain management interventions, an AQ, ERS, and SD for each intervention description, and finally the TC ranking. The pain management interventions were presented in a counterbalanced order across subjects, and each intervention was rated before the next was presented. Students proceeded at their own pace and most students completed the packet within 45 minutes.

To assess test-retest reliability of the AQ and ERS, the first 64 students recruited were asked to repeat their participation 1 week later. Students received the same packet of materials as in the first administration and interventions were presented in the same order. Debriefing for these students occurred after the second administration. For all other students, written debriefing information was provided immediately following their participation.

## RESULTS

Prior to the analyses of reliability, order and intervention type effects, and the relationships among dependent variables; the AQ and ERS at Time 1 were each factor analyzed to determine which items to retain for analyses.

# Factor Analyses of the AQ

Given that factor analyses of previous acceptability measures have found either a one-factor solution (IRP-15, Harris et al., 1990; TEI, Kazdin, 1980a), a two-factor solution (TEI; Cross Calvert & Johnston, 1988; Kelley et al., 1989) or a fivefactor solution (IRP; Witt & Elliott, 1985), factor analyses of the AQ were exploratory. Factor analysis was selected over principal components analysis to allow for the possibility that the construct of acceptability is not unitary.

Responses of 210 students (subjects with missing data were excluded) to each AQ item were summed across the six interventions and subjected to a maximum-likelihood factor analysis. The analysis yielded six factors with eigenvalues greater than unity (eigenvalues of 36.7, 5.8, 3.2, 1.8, 1.6, and 1.2 respectively). Comparing both oblique and varimax rotations, a Harris-Kaiser oblique rotation provided cleaner factor loadings in terms of simple structure, as both intercorrelations among the factors and the number of complex variables were minimized.

The resulting factor structure was examined with the intent of how best to capture maximum variance, yet provide the briefest and simplest measure possible. Nine of the 21 original items had factor loadings above .30 on the first factor. Comparing the eigenvalues of the factors, Factor I appeared as a primary factor with the remaining factors as secondary factors. Similarly, Factor I also accounted for the largest proportion of the common variance (38.6% vs. 16.3%, 12.6%, 11.6%, 11.1%, and 9.8% respectively). Finally, items loading on this first factor were easily interpreted as reflecting a general, overall dimension of acceptability. Therefore, for the purposes of the current research program, Factor I was retained for the remaining analyses and was designated as the AQ. Table 1 shows the items loading on Factor I. In all the remaining analyses, the AQ consisted of these nine items with six phrased in the positive direction. The nine items were summed, using uni-weighting, such that scores could range from 9 to 54, with higher scores indicating greater acceptability. A score in the mid-30s would appear to index minimal acceptability.

## Factor Analyses of the ERS

A similar factor analysis procedure was conducted with the ERS. The measure yielded four factors with eigenvalues greater than unity (eigenvalues of 208.5, 11.4, 1.5, and 1.1). Again, the Harris-Kaiser oblique rotation provided the cleanest factor loadings in terms of simple structure. The resulting factor structure was examined with the goal of providing a brief and

Acceptability Questionnaire Items Loading on Factor I

Acceptability Questionnaire Items	Factor Loading
The intervention is reasonable for the situation described.	. 93
The intervention is a good way to reduce the child's distress.	.83
This would be an acceptable intervention for reducing the distress experienced by the child.	.81
Overall, my general reaction to this intervention is positive.	.72
Most parents and/or staff would find this intervention suitable for the situation described.	.68
This is an unacceptable intervention for the child's situation. <sup>a</sup>	.52
I dislike the intervention used in this situation. <sup>a</sup>	.34
I would not suggest the use of this intervention to parents or staff. <sup>a</sup>	.32
It would be okay to use this intervention with other children.	. 30

<sup>a</sup>Scoring was reversed prior to data analyses for items phrased in the negative direction.

simple measure of predicted effectiveness yet capturing maximum variance. Nine of the 15 items loaded above .30 on the first factor. The eigenvalue of this first factor relative to the remaining factors argued for one primary factor. Additionally, Factor I accounted for the largest proportion of the common variance (41.4%). Finally, items loading on Factor I were interpreted as reflecting a general evaluative assessment including the degree, maintenance, and generalization of change resulting from the intervention. Therefore, this factor was retained as the dependent variable for the remaining analyses. Table 2 presents the items loading on this first factor. Items on the remaining factors were excluded from further consideration. For the remaining analyses, the ERS was composed of nine items, with seven phrased in the positive direction. The nine items were summed, using uni-weighting, such that scores could range from 9 to 54, with higher scores indicating greater predicted effectiveness.

## Psychometric Analyses

Due to expected differences in ratings across interventions, psychometric analyses considered ratings for each intervention separately. Unless otherwise specified, all psychometric analyses were conducted with data gathered during the first administration (Time 1) only.

Internal consistencies of the AQ and the ERS were calculated by Cronbach's alpha for each intervention and can be seen in Table 3. The AQ and ERS each demonstrated good internal consistencies across the six interventions.

Effectiveness Rating Scale Items Loading on Factor I

Effectiveness Rating Scale Items	Factor Loading
Additional medical procedures will be easier to complete when the intervention is applied.	. 69
The intervention could be applied to additional procedures and still be effective.	.68
The intervention should produce enough change so that the child's distress is no longer a problem in the medical setting.	.64
Using this intervention should not only improve the child's distress with this medical procedure, but also in other stressful situations (e.g., getting needles).	. 63
The intervention would improve the child's distress to the point that it would not be noticeably different from another child who was coping better.	.57
Overall, the intervention would be beneficial for the child.	.56
It would be more difficult to complete the medical procedure when the child is using this intervention. <sup>a</sup>	. 49
Soon after using the intervention, the parent/ staff would notice a positive change in the child's distress.	. 44
This intervention is unlikely to be effective. <sup>a</sup>	.36

<sup>a</sup>Scoring was reversed prior to data analyses for items phrased in the negative direction.

# Internal Consistency of the Acceptability

Questionnaire and Effectiveness Rating Scale

Intervention	ÂQ	ERS
Attention-distraction	.93	.90
Breathing	.92	.90
Ignoring	.90	.91
Imagery	.94	.91
Oral Valium	.92	.75
Reprimands	.92	.93

<u>Note</u>. Internal consistency calculated by Cronbach's alpha. <u>N</u>=224.

Test-retest reliabilities for the AQ, ERS, SD, and TC ranking for each intervention were calculated by correlating first administration scores (Time 1) with second administration scores (Time 2) for each subject ( $\underline{n} = 64$ ). These correlations are presented in Table 4.

Correlations between the AQ and the ERS, SD, and TC ranking were calculated and are presented in Table 5. The negative correlations of the AQ with the SD scales and TC ranking reflect the fact that lower scores on these measures indicate more positive evaluations. To reduce the probability of Type I error in considering these correlations, alpha was set at  $\underline{p} < .002$ (.01/5 correlations per intervention). AQ scores were significantly correlated with the ERS, the Evaluative scale of the SD, and the TC ranking across all interventions. For the Activity and Potency scales, 7 of the 12 correlations with the AQ were nonsignificant.

General Approach to Examining Differences Among Interventions

In Study 1 and the remaining studies, differences among interventions were examined utilizing the following general strategy. The AQ was designated as the primary measure and the ERS, Evaluative dimension of the SD, and TC measures were designated as secondary measures. The first analysis examined differences in AQ scores across the pain management interventions by way of a univariate analysis of variance (ANOVA) with  $\alpha$  set at .05. The outcome of this initial analysis guided the analyses of secondary measures. That is, secondary measures were considered only if significant differences were found on the primary measure. To control for family-wise error in the secondary

# Test-Retest Reliabilities of the Dependent Measures

AQ	ERS	SD Eval	SD Pot	SD Act	TC
.72	.72	.66	.56	. 49	.67
.79	.76	.65	.57	.63	.69
.71	.77	.77	.38	.46	.75
.73	.68	.62	.62	.69	.74
.73	.60	.74	.70	.72	.88
.65	.73	.56	.61	.60	.84
	AQ .72 .79 .71 .73 .73 .65	AQ ERS   .72 .72   .79 .76   .71 .77   .73 .68   .73 .60   .65 .73	AQ ERS SD Eval   .72 .72 .66   .79 .76 .65   .71 .77 .77   .73 .68 .62   .73 .60 .74   .65 .73 .56	AQ ERS SD Eval SD Pot   .72 .72 .66 .56   .79 .76 .65 .57   .71 .77 .77 .38   .73 .68 .62 .62   .73 .60 .74 .70   .65 .73 .56 .61	AQ ERS SD Eval SD Pot SD Act   .72 .72 .66 .56 .49   .79 .76 .65 .57 .63   .71 .77 .77 .38 .46   .73 .68 .62 .62 .69   .73 .60 .74 .70 .72   .65 .73 .56 .61 .60

<u>Note</u>. AQ = Acceptability Questionnaire; ERS = Effectiveness Rating Scale; SD Eval = Semantic Differential Evaluative dimension; SD Pot = Semantic Differential Potency dimension; SD Act = Semantic Differential Activity dimension; TC = Treatment Choice ranking. <u>n</u>=64. All correlations are significant, <u>p</u> < .01.

Intervention	ERS	SD Eval	SD Pot	SD Act	TC
Attention-distraction	.85*	82*	30*	17	46*
Breathing	.84*	74*	35*	25*	42*
Ignoring	.86*	84*	.14	.12	51*
Imagery	.87*	78*	27*	17	50*
Oral Valium	.64*	82*	.00	06	64*
Reprimands	.84*	83*	.11	.20*	54*

# Correlations Between the AO and Secondary Measures

<u>Note</u>. AQ = Acceptability Questionnaire; ERS = Effectiveness Rating Scale; SD Eval = Semantic Differential Evaluative dimension; SD Pot = Semantic Differential Potency dimension; SD Act = Semantic Differential Activity dimension; TC = Treatment Choice ranking. <u>N</u>=224.

\*p < .002.

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analyses, a multivariate analyses of variance (MANOVA) was used. The ERS and SD Evaluative were grouped as dependent variables in one repeated measures MANOVA. Significant overall effects in the MANOVA analysis (p < .05) were followed by univariate analyses with  $\alpha$  reduced to control for Type I error (.05/number of secondary measures). In this study, TC rankings were considered in a separate analysis because of the linear relationship among scores.

Significant interactions in either the primary ANOVA or univariate analyses following the MANOVA were examined by tests of simple main effects with reduction in  $\alpha$  according to the number of comparisons. Tukey multiple comparison procedures followed where appropriate. As the Tukey test maintains the family-wise error rate for the entire set of pairwise comparisons,  $\alpha$  was set at .05.

As the <u>F</u> test is extremely robust to violations of the homogeneity of variance assumption with equal or near-equal sample sizes, this assumption was only tested when substantially different sample sizes were involved. Only violations of these tests ( $\underline{p} > .05$ ) are reported.

## Primary Analyses

A 2 X 6 X 6 within-subjects ANOVA was conducted for the AQ total score with two between-groups variables (gender of subject, order of interventions) and one within-subjects variable (intervention) at Time 1. Mauchly's sphericity test failed to reject the hypothesis of compound symmetry (p < .01). Therefore, Greenhouse-Geisser corrections were made on the degrees of freedom for analyses involving the within-subjects effects.

Three significant effects were obtained: order, intervention, and Order X Intervention,  $\underline{F}(20, 850) = 3.01$ ,  $\underline{p} < .01$ . No other significant effects were found.

Simple main effects were used to investigate the Order X Intervention interaction with  $\alpha$  reduced to .008 (.05/6 levels). Significant differences ( $\underline{\mathbf{p}}$ s < .008) among interventions were obtained for each order considered,  $\underline{F}s(4, 849) = 89.72, 55.62$ , 89.54, 101.62, 74.83, 86.23, orders 1 through 6 respectively. Summarizing results of the Tukey tests across orders, attentiondistraction, breathing, and imagery, which were not rated as significantly different from each other, were generally rated as more acceptable than oral Valium, which in turn was rated as significantly more acceptable than reprimands and ignoring ( $\underline{p}_{s} <$ Ignoring and reprimands were not rated as significantly .05). different from each other (see Table 6). Simple main effects examining differences among orders for each intervention were not conducted because order effects were not of primary interest in this investigation. However, by visual inspection, reprimands and ignoring appeared to be evaluated most positively when they were the first intervention evaluated and less positively evaluated when they were the fifth or sixth intervention evaluated. It appeared that breathing, imagery, attentiondistraction, and oral Valium were each evaluated more positively when they directly followed either reprimands or ignoring. Table 7 presents the means and standard deviations for the AQ for each intervention summed across the six orders of presentation. Attention-distraction, breathing, imagery, and oral Valium were rated in the acceptable range (defined as a mean score greater

Tukey Comparisons of Interventions on

AO, ERS, and SD Evaluative Measures

by Order of Presentation

Order	Intervention

# Acceptability Questionnaire

1	AD	IM	ov	BR	<u>RP IG</u>
2	BR	AD	<u>IM</u>	ov	<u>RP IG</u>
3	AD	IM	BR	ov	<u>RP IG</u>
4	<u>BR</u>	AD	IM	<u>vo</u>	IG RP
5	AD	IM	BR	ov	<u>RP IG</u>
6	IM	BR	AD	<u>_ov</u>	<u>RP IG</u>

# Effectiveness Rating Scale

1	AD	IM	_0V_	BR	RP	IG
2	BR	AD	IM	ov	IG	RP
3	AD	IM	BR	ov	<u>RP</u>	IG
4	BR	ov	IM	AD	IG	RP
5	AD	ov	IM	BR	IG	RP
6	IM	BR	AD	ov	RP	IG

(<u>table continues</u>)

Or	der	Intervention					
	Semantic	Differe	ntial	Eval	uativ	e Sca	le
1		AD	<u>IM</u>	BR	ov	RP	IG
2		BR	AD	IM	ov	<u>RP</u>	<u>IG</u>
3		AD	IM	BR	ov	RP	IG
4		BR	AD	IM	<u>ov</u>	IG	<u>RP</u>
5		IM	AD	BR	ov	IG	RP
6		IM	BR	AD	ov	RP	IG

<u>Note</u>. AD = attention-distraction; BR = breathing; IG = ignoring; IM = imagery; OV = oral Valium; RP = reprimands. Any two interventions underlined by the same line are not significantly different, whereas any two interventions not underlined by the same line are significantly different,  $\underline{p} < .05$ .

## Intervention Means and Standards Deviations for the

AQ and TC Ranking

Intervention	AQ	ТС
Attention-distraction	42.3 (7.9)	2.3 (1.1)
Imagery	41.1 (8.2)	2.4 (1.1)
Breathing	41.0 (7.9)	2.7 (1.1)
Oral Valium	37.3 (7.9)	3.0 (1.5)
Reprimands	19.7 (8.7)	5.3 (.8)
Ignoring	17.3 (8.7)	5.3 (.9)

<u>Note</u>. AQ = Acceptability Questionnaire; TC = Treatment Choice ranking. Higher ratings on the AQ greater treatment acceptability. Lower ratings on the Treatment Choice ranking indicate higher ranked treatment choice. Numbers in parentheses are standard deviations. <u>N</u>=224. than the midpoint of the AQ) and reprimands and ignoring were rated in the unacceptable range.

## Secondary Analyses

Given the significant effects for the primary measure, a 2 X 6 X 6 within-subjects MANOVA was conducted with two betweensubjects variables (gender of subject, order of interventions) and one within-subjects variable (intervention). The secondary measures (ERS, SD Evaluative) served as dependent variables. The MANOVA indicated significant main effects for order and intervention. These effects were modified by a significant Order X Intervention interaction, E(50, 985) = 3.06, p < .01, and Gender X Intervention interaction, F(10, 193) = 2.05, p < .01. No other significant effects were found.

These effects were followed by univariate analyses with  $\alpha$ reduced to .017 (.05/3 secondary measures including the TC ranking). Mauchly's test of sphericity failed to reject the hypothesis of compound symmetry on both the ERS and SD Evaluative measures (ps < .01). Therefore, Greenhouse-Geisser corrections were made on the degrees of freedom for analyses involving the within-subject effects. For the ERS, significant Order X Intervention, E(19, 794) = 3.58, p < .017, and Gender X Intervention, E(3, 794) = 4.16, p < .017, interactions were found.

Simple main effects tests investigated the significant Order X Intervention interaction. Significant differences ( $\underline{p}s < .008$ ) among interventions were obtained when each order was considered,  $\underline{Fs}(3, 794) = 93.47, 40.99, 81.40, 97.31, 91.41, 77.29, orders 1$ through 6 respectively. Summarizing the results of Tukey tests across orders, attention-distraction, breathing, imagery, and oral Valium were not generally rated as different from each other, but were rated as more effective than reprimands and ignoring, which were typically not rated as significantly different from each other (see Table 6). Simple main effects tests considering each intervention separately were not conducted because order effects were not of primary interest in this investigation. However, visual inspection of the means suggested a similar pattern as noted for the AQ ratings. Table 8 presents the ERS means and standard deviations for each intervention summed across order of presentation. Attention-distraction, breathing, imagery, and oral Valium were rated in the effective range (defined as a mean score greater than the midpoint of the ERS) and reprimands and ignoring were rated in the ineffective range.

Simple main effects tests considering the Gender X Intervention interaction indicated significant differences among interventions for males,  $\mathbf{F}(3, 794) = 194.63$ ,  $\mathbf{p} < .025$ , and for females,  $\mathbf{F}(3, 794) = 270.82$ ,  $\mathbf{p} < .025$ . Tukey tests showed that females rated attention-distraction, breathing, and imagery as not significantly different from each other, but as significantly more effective than oral Valium ( $\mathbf{p}s < .01$ ). Oral Valium was evaluated as significantly more effective than reprimands and ignoring ( $\mathbf{p}s < .01$ ), which were not rated as significantly different from each other. Males rated imagery, attentiondistraction, breathing, and oral Valium as not significantly different from each other but as significantly more effective than reprimands and ignoring ( $\mathbf{p}s < .01$ ), which were not rated as

Intervention Means for ERS and SD Evaluative Scale

Intervention	ERS	SD Eval
Attention-distraction		
Males <sup>a</sup>	38.7 (6.4)	11.6 (4.6)
Females <sup>b</sup>	40.1 (7.1)	10.3 (5.4)
Marginal <sup>C</sup>	39.4 (6.8)	10.9 (5.0)
Imagery		
Males	38.8 (5.3)	11.4 (4.3)
Females	39.1 (7.9)	10.7 (5.3)
Marginal	39.0 (6.7)	11.1 (4.8)
Breathing		
Males	38.0 (6.6)	11.4 (4.5)
Females	39.0 (7.4)	11.1 (5.1)
Marginal	38.5 (7.0)	11.3 (4.8)
Oral Valium		
Males	37.1 (5.3)	15.0 (4.9)
Females	36.4 (5.8)	16.4 (5.9)
Marginal	36.7 (5.6)	15.7 (5.4)
Reprimands		
Males	22.0 (9.2)	27.9 (6.5)
Females	19.1 (7.8)	30.2 (5.0)
Marginal	20.6 (8.6)	29.0 (5.9)
Ignoring		
Males	20.2 (8.4)	29.7 (5.5)
Females	17.9 (8.2)	30.9 (5.2)
Marginal	19.1 (8.3)	30.3 (5.4)

Note. ERS = Effectiveness Rating Scale; SD Eval = Semantic Differential Evaluative dimension. Higher ratings on the ERS indicates greater predicted effectiveness. Lower ratings on the SD Evaluative Scale indicates greater positive evaluation. Numbers in parentheses are standard deviations.

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 $a_n = 114$ .  $b_n = 110$ .  $c_N = 224$ .

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significantly different from each other (see Table 9). Comparing each intervention across the two genders revealed only one significant difference. Males rated reprimands, E(1, 207) =5.25, <u>p</u> < .025, as more effective than the females. ERS intervention means for males and females summed across orders are presented on Table 8.

Follow-up univariate analyses for the SD Evaluative scores also revealed significant Order X Intervention, F(20, 834) =4.31,  $\underline{p}$  < .017, and Gender X Intervention,  $\underline{F}(4, 834) = 4.16$ ,  $\underline{p} < 100$ .017, interactions. Simple main effects investigating the Order X Intervention interaction found significant differences (ps < .008) among interventions for each order considered, Fs(4, 834) =158.61, 92.53, 123.98, 158.18, 141.23, 141.03, orders 1 through 6 respectively. Summarizing across orders for the results of the Tukey tests, attention-distraction, breathing, and imagery were generally not rated as significantly different from each other, but were generally rated more positively than oral Valium. In turn, these interventions were rated as more positive than reprimands and ignoring, which were not rated as significantly different from each other (see Table 6). SD Evaluative means and standard deviations for each intervention summed across order of presentation are presented in Table 8. Simple main effects tests examining each intervention separately were not conducted because order effects were not of primary interest in this investigation. Again, visual inspection of the means suggested a pattern similar to the AQ ratings.

Simple main effects tests of the Gender X Intervention interaction indicated significant differences among interventions

Tukey Comparisons of Interventions on ERS

and SD Evaluative by Gender of Rater

Intervention

## Effectiveness Rating Scale

Females	AD BR	<u> </u>	ov	<u>RP IG</u>
Males	IM AD	BR	<u>vo</u>	<u>RP IG</u>
Semantic	Differential	Eva]	luative	e Scale
Females	AD IM	BR	ov	RP IG
Males	<u>BR IM</u>	AD	ov	<u>RP IG</u>

<u>Note</u>. AD = attention-distraction; BR = breathing; IG = ignoring; IM = imagery; OV = oral Valium; RP = reprimands. Any two interventions underlined by the same line are not significantly different, whereas any two interventions not underlined by the same line are significantly different,  $\underline{p} < .05$ . for males, E(4, 834) = 359.33, p < .025, and females, E(4, 834) = 435.89, p < .025. Both males and females rated attentiondistraction, imagery, and breathing, as not significantly different from each other, but as significantly more positive than oral Valium, which in turn was evaluated more positively than reprimands and ignoring (ps < .01), which were not rated as significantly different from each other (see Table 9). Males rated reprimands, E(1, 207) = 7.47, p < .01, more favorably than did females. Table 8 presents the SD Evaluative means for males and females for each intervention summed across presentation order.

Because the TC rankings are linearly dependent, it was not possible to conduct a MANOVA of these scores. Instead, the six mean intervention ranks (TC) were compared in a within-subjects repeated measures ANOVA test across the six interventions with  $\alpha$ reduced to .017 (.05/3 secondary measures). Order of presentation and gender of rater were not considered in this analysis. Mauchly's test of sphericity failed to reject the hypothesis of compound symmetry (p < .01); therefore, Greenhouse-Geisser corrections were made on the degrees of freedom. Intervention was found to be a significant effect, F (3, 830) = 309.14,  $\underline{p} < .01$ . Tukey follow-up procedures ( $\underline{p} < .05$ ) indicated that attention-distraction and imagery, which were not ranked as significantly different from each other, were ranked significantly higher than oral Valium, ignoring, and reprimands. Breathing was not ranked as significantly different than imagery, but was ranked significantly higher than oral Valium, which in turn was ranked as significantly higher than ignoring, and

reprimands. Ignoring and reprimands were not ranked significantly different from each other (see Table 10).

Summarizing across all orders of presentation, students generally rated the accelerative psychological interventions attention-distraction, breathing, and imagery as similar in terms of their perceived acceptability, predicted effectiveness, global evaluation, and anticipated treatment selection. The reductive interventions, reprimands and ignoring, were always rated as significantly less acceptable, less positive, less effective, and received lower rankings of treatment preference than the other interventions. Oral Valium tended to fall midway between the accelerative and reductive interventions.

## Supplementary Analyses

Exploratory analyses were conducted correlating the AQ, ERS, and SD Evaluative measures with the demographic variables (subject age, year in university, number of hospitalizations, number of painful medical procedures experienced, and perceived pain tolerance). No significant correlations emerged, suggesting that these demographic variables are not related to acceptability attitudes.

## DISCUSSION

The primary purpose of Study 1 was to develop stimulus materials and a questionnaire measure to assess the acceptability of interventions for pediatric distress associated with aversive medical procedures. Results suggest that the AQ consists of a primary factor that reflects general treatment appropriateness.

Tukey Comparisons of Interventions on

Treatment Choice Ranking Summed Across

Order and Gender

AD IM BR OV IG RP

<u>Note</u>. AD = attention-distraction; BR = breathing; IG = ignoring; IM = imagery; OV = oral Valium; RP = reprimands. Any two interventions underlined by the same line are not significantly different, whereas any two interventions not underlined by the same line are significantly different,  $\underline{p} < .05$ . Internal consistency of the AQ is high and test-retest reliability over a 1-week period is unacceptably low for some of the interventions.

Across the AQ, ERS, and SD Evaluative measures, an interaction between order of evaluation and intervention type emerged, such that reading and evaluating one pain management intervention influenced the evaluation of subsequent interventions. Although simple main effects tests were not conducted for each order separately, inspection of the mean ratings across orders suggested that when reductive interventions (ignoring, reprimands) were evaluated prior to accelerative interventions, they were rated more favorably than when they followed the more positive accelerative interventions. That is, reductive interventions were rated less favorably when they followed the accelerative interventions. These order effects may account for the low to modest test-retest reliabilities of the measures. That is, ratings on the second administration may have been influenced by the fact that students were now aware of all of the interventions. For example, knowledge of accelerative interventions may permanently alter ratings of reductive interventions.

Providing evidence of convergent validity, the AQ was significantly correlated with the Evaluative dimension of the SD (Hypothesis 2), the ERS, and the TC ranking (Hypothesis 3). Tentative and partial support for the discriminant validity of the AQ was provided by the low correlations with the Activity and Potency scales of the SD (Hypothesis 2). However, as these scales had the most variable test-retest reliabilities across interventions, the design of Study 1 precludes knowing whether their low correlations with the AQ indicate discriminant validity or measurement error.

The psychometric properties of the secondary measures were also investigated. The ERS was found to have high internal consistency, with the exception of ratings of the predicted effectiveness of oral Valium. Like the AQ, low to modest testretest reliabilities were obtained for the ERS, Evaluative, Potency, and Activity dimensions of the SD, and TC rankings. Again, interactions between order of evaluation and intervention type may have contributed to the less than optimal test-retest reliabilities.

Despite the impact that order of presentation had upon evaluations, a similar pattern of intervention evaluation emerged across measures of acceptability, predicted effectiveness, and global evaluation. Students readily differentiated among various interventions for pediatric pain associated with invasive medical procedures. Across all orders, accelerative interventions (attention-distraction, breathing, imagery) were evaluated more favorably than reductive interventions (ignoring, reprimands), confirming Hypothesis 1. These findings are consistent with previous research assessing treatment acceptability for child behavior problems in clinical and educational contexts (e.g., Cross Calvert, & McMahon, 1987; Tarnowski et al., 1987; Turco & Elliott, 1986). Oral Valium received higher treatment rankings and was perceived as significantly more acceptable, effective, and positive than the reductive interventions. Relative to the accelerative interventions, oral Valium generally received lower

ratings of acceptability, effectiveness, global evaluation, and treatment choice, but these differences were not usually statistically significant given the conservative approach taken to the data analyses. Among the interventions, attentiondistraction, breathing, imagery, and oral Valium were rated in the acceptable and effective range. Ignoring and reprimands were both rated as unacceptable and ineffective.

Results of this study provide evidence that males and females differentially rated the effectiveness and global evaluation of pain management strategies. In evaluating the interventions' acceptability, males and females did not significantly differ, although the interaction between gender and intervention did approach statistical significance (p = .068). Although the rank ordering of interventions was similar across genders on all measures, males rated reprimands, a reductive intervention, as more favorable and effective than did females. These gender differences will be discussed further in the final discussion.

In conclusion, the findings of Study 1 indicate that the 9item AQ is an internally consistent and valid instrument for assessing the acceptability of interventions for pediatric distress associated with medical procedures. However, less than expected test-retest reliabilities were obtained, not only for the AQ, but for the secondary measures as well. Due to these concerns and the possibility that they may be attributable to carryover effects, Study 2 attempted to replicate the findings of Study 1 removing the potential for carryover effects.

## STUDY TWO

#### PURPOSES

The results of Study 1 suggested that at least for some interventions, the AQ had an unacceptably low level of testretest reliability. However, carry-over effects emanating from the within-subjects design may have confounded the assessment of reliability and it is possible that the AQ is a more reliable measure when completed for only one intervention. Alternatively responses to the AQ may be unstable over time. Unfortunately, the design of Study 1 precludes knowing which of these interpretations is correct. Therefore, the primary purpose of Study 2 was to replicate Study 1 using a between-subjects design that would eliminate carry-over effects. It was anticipated that test-retest reliability of the measure would improve when students evaluated only one intervention.

Additional purposes of Study 2 included exploration of the relationship between acceptability attitudes and self-efficacy and further refinement and validation of the AQ and ERS measures. Based on practical considerations and given the similarities among the findings for accelerative and reductive techniques in Study 1, one of each type of intervention (reprimands and breathing) was excluded from consideration in Study 2. HYPOTHESES

The hypotheses for Study 2 were the same as those stated in Study 1. In abbreviated form these were:

1. It was expected that the AQ would differentiate among various psychological and pharmacological interventions in terms of their relative acceptability as applied to pediatric distress associated with aversive medical procedures. It was expected that the accelerative interventions (i.e., attention-distraction and imagery), would be evaluated as more acceptable than the reductive intervention (i.e., ignoring). Given the results of Study 1, oral Valium was expected to be rated as more acceptable than ignoring, and as acceptable as the accelerative interventions.

2. The AQ would be significantly correlated with the Evaluative dimension of the SD, the ERS, and the TC measure, and not significantly correlated with the Activity and Potency dimensions of the SD.

Additional hypotheses included the following:

3. Based on the HBM, it was hypothesized that a selfefficacy measure (SE) would be positively correlated with the AQ, thereby providing convergent validity for the AQ and elaborating a further link in the proposed treatment acceptability model. It was also expected that the SE measure would be positively correlated with the TC measure.

4. It was anticipated that the AQ would be reliable over time and internally consistent.

5. Based on the results of Study 1, no significant differences in males' and females' ratings of the acceptability of the interventions was expected.

## DESIGN

A 2 X 4 design was employed with gender of the subject (male or female) and pain management intervention (attentiondistraction, imagery, oral Valium, or ignoring) both as betweensubject variables.

## METHOD

# Subjects

The present study employed 148 (73 males, 75 females) undergraduate students recruited from introductory psychology courses where course credit was given for research participation. Students ranged in age from 17 to 48 years ( $\underline{M}$  = 19.7). The majority of the students were enrolled in their first or second year (87.7%) in the Faculty of Arts (52.3%) or Sciences (30%). When asked to indicate their ethnicity, two major groups emerged. Fifty-six percent of the students identified themselves as Canadian (and usually recognized their ethnic heritage, e.g., The "German Canadian") and 33.3% identified themselves as Asian. remaining 11% identified themselves with a variety of ethnicities. Most students (89.2%) indicated that they had had no experience with medical, physiological, or health sciences either through past research studies, courses, or work experience.

## Stimulus Materials

Stimulus materials were derived from those used in Study 1. For the current investigation, the same case vignette was used. As mentioned, the number of interventions to be evaluated was reduced from six to four.

# Dependent Measures

## AQ, ERS, and SD

As developed in Study 1, the 9-item AQ and 9-item ERS were used to evaluate the perceived acceptability and predicted effectiveness for each intervention. The 9-item AQ was embedded within a set of 10 additional acceptability items that were not included in the scoring of AQ for this study. These additional items were included for future exploration of acceptability attitudes, but were not considered in the present set of studies. The Evaluative, Activity, and Potency dimensions of the SD were also included.

#### Treatment Choice Measure

As a measure of treatment choice for the assigned intervention, students were asked to rate on a 10-point scale: "Imagine Kim is about to undergo his next BMA and you need to select an intervention to help him. How likely would you be to select <u>(intervention)</u>?" In contrast to the Treatment Choice ranking employed in Study 1, a higher score for the Treatment Choice measure in Study 2 indicated greater likelihood of selecting the intervention.

## Self-Efficacy Measure

Self-efficacy (SE) was assessed by asking students to rate on a 10-point scale: "If you were asked to help Kim during his next BMA, how confident are you that you could carry out (intervention) successfully? (Assume you have been given adequate training.)"

## Procedures

Students participated in the investigation in small groups. Each subject first completed consent and demographic forms. Within each gender, students were randomly assigned to intervention by way of the packet of materials they received. Thirty-seven students were assigned to attention-distraction (19 males, 18 females), 37 were assigned to oral Valium (18 males, 19 females), 36 to ignoring (18 males, 18 females), and 38 to
imagery (18 males, 20 females). In each packet, the case vignette was presented along with a description of one of the pain management interventions. Students were asked to evaluate the intervention on the AQ, ERS, SD, TC, and SE measures. Approximately 15 minutes were required for study completion.

To assess test-retest reliability of the AQ and ERS, all students were asked to return one week later to repeat their participation and 83.8% (n = 124) did so. Following participation, debriefing information was provided and students received information about the effectiveness of several pain management interventions.

## RESULTS

## Preliminary Analyses

Age and year in university were compared across the four groups of students assigned to different interventions. ANOVAs revealed no significant differences among groups on either variable. Similarly, ethnicity and faculty enrollment were compared across the four groups of students and chi-square analyses failed to detect differences among groups on either variable.

Test-retest reliabilities for the AQ, ERS, SD dimensions, TC, and SE measures were calculated using Pearson correlations between the first (Time 1) and second administration scores (Time 2). Correlations are presented in Table 11 and indicate good to excellent stability of scores.

The remaining psychometric analyses considered Time 1 data only. Internal consistency of the AQ and ERS were calculated Table 11

# Test-Retest Reliabilities of the Dependent

<u>Measures</u>

<u>r</u>
.92*
.91*
.92*
.82*
.72*
.85*
.83*

<u>Note</u>. <u>N</u>=124.

\*<u>p</u> < .01.

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using Cronbach's alpha and found to be .94 and .69 respectively across all subjects. Correlations between the AQ and the ERS, SD dimensions, TC, and SE measures were calculated and are presented in Table 12. Alpha was set at  $\underline{p} < .002$  to decrease the likelihood of Type I error (.01/6 correlations). The AQ was highly correlated with the ERS, TC, and Evaluative dimension of the SD and modestly correlated with the SE measure. The correlation between the Activity dimension of the SD and the AQ was nonsignificant. Unexpectedly, the AQ was significantly and positively correlated with the Potency scale of the SD. Finally, a strong positive relationship was noted between the SE and TC measures ( $\underline{r} = .65$ ,  $\underline{p} < .001$ ).

# Main Analyses

The remaining analyses followed the general strategy outlined in Study 1 with the exception that the SE measure added in Study 2 and the revised TC measure were now included in the MANOVA of secondary measures.

With regard to the primary measure, a 2 X 4 ANOVA was conducted on AQ scores with two between-subjects variables (gender of subject, intervention). A main effect for intervention was found, F(3, 136) = 38.7, p < .01. Neither the main effect for gender nor the Intervention X Gender interaction was significant. Follow-up multiple comparison procedures indicated that imagery and attention-distraction, which were not rated significantly different from each other, were evaluated as significantly more acceptable than oral Valium and ignoring (ps < .05). Oral Valium was evaluated as significantly more acceptable Table 12

<u>Correlations between the Acceptability</u>			
Questionnaire and Secondary Measures			
Dependent Measure	Ľ		
Effectiveness Rating Scale	- 88*		
Semantic Differential Evaluative Scale	85*		
Semantic Differential Potency Scale	.45*		
Semantic Differential Activity Scale	.01		
Treatment Choice	.87*		
Self-Efficacy	.57*		

<u>Note. N</u>=148.

\*<u>p</u> <. 002.

than ignoring ( $\underline{p}$  < .05). Table 13 presents the mean AQ score for each intervention.

## Secondary Analyses

Given the significant effect for intervention on the primary measure, a 2 X 4 MANOVA followed with intervention and gender as between-subjects variables and the secondary measures (ERS, SD Evaluative, TC, SE) as dependent variables. The only significant effect in the multivariate analysis was for intervention, E(12,408) = 9.89, p < .01.

Follow-up univariate analyses examined the intervention effect for each of the secondary measures with  $\alpha$  reduced to .0125 (.05/4). Tukey multiple comparison procedures examining differences among interventions followed where appropriate (ps < .05). The intervention effect was significant for each of the secondary measures, Fs(3, 137) = 25.91, 48.53, 18.63, 9.29, for the ERS, SD Evaluative, TC, and SE measures respectively. Table 13 presents the results of the Tukey comparisons for each dependent measure as well as the means and standard deviations for each intervention.

Summarizing the findings of the multiple comparison tests across all dependent measures, ignoring was consistently rated as significantly different and less positive than the remaining interventions. Imagery and attention-distraction were rated most positively across dependent measures and as not significantly different from each other. With the exception of self-efficacy and predicted effectiveness, oral Valium was rated significantly less positively than imagery and attention-distraction but more positively than ignoring.

# Table 13

Mean Ratings of the AQ. ERS. SD Evaluative, TC, and SE Measures

Dependent Meagure	Intervention			
	IM	AD	ov	IG
Acceptability Questionnaire	42.2 <sub>a</sub>	41.8 <sub>a</sub>	37.0	25.4
	(5.9)	(7.0)	(7.3)	(9.5)
Effectiveness Rating Scale	39.5 <sub>b</sub>	39.4 <sub>b</sub>	35.8 <sub>b</sub>	27.5
	(4.0)	(6.0)	(5.2)	(9.3)
SD Evaluative	11.2	13.0	16.3	24.2
	(3.4)	(4.9)	(4.9)	(5.9)
Treatment Choice	7.8 <sub>d</sub>	7.6 <sub>d</sub>	6.3	4.5
	(1.3)	(2.0)	(2.2)	(2.6)
Self-Efficacy	6.2	6.4	6.8	<b>4.</b> 3
	(2.0)	(2.2)	(2.3)	(2.3)

<u>Note</u>. IM = imagery; AD = attention-distraction; OV = oral Valium; IG = ignoring. Higher scores indicate greater acceptability, predicted effectiveness, negative evaluation, likelihood of choosing the intervention, and self-efficacy for the Acceptability Questionnaire, Effectiveness Rating Scale, Semantic Differential Evaluative Scale, Treatment Choice, and Self-Efficacy measures respectively. Numbers in parentheses are standard deviations. For each dependent measure, means having the same subscript are not significantly different (p < .05).

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Exploratory correlations were conducted to determine whether associations existed between the various demographic variables (age, year in university) and dependent measures (AQ, ERS, SD, TC, SE). No significant relationships emerged. DISCUSSION

The principal goal of this study was to assess the testretest reliability of the AQ with the potential for carryover effects eliminated. Contrasting the results of the present study with Study 1, test-retest reliabilities increased on dependent measures when students evaluated only one pain management intervention (Hypothesis 4). Although the expected degree of long-term stability of acceptability attitudes is unknown, at least acceptability attitudes appear stable over a 1-week period. Given the short time interval between test and retest, the reliability coefficients may have been inflated by students remembering their responses from the first testing to the second. Future consideration of the expected stability of acceptability attitudes will be enhanced by further psychometric studies of the AQ examining its reliability over a range of time intervals. The ERS and the Evaluative dimension of the SD also appear to be reliable measures of predicted effectiveness and global evaluation. Although not as high as the AQ, ERS, and SD Evaluative scale, test-retest reliabilities of the TC and SE measures are adequate.

This study also contributes further information regarding the psychometric properties of the AQ and the secondary measures. Consistent with Study 1, internal consistencies of the AQ (Hypothesis 4) and ERS were high. Lending further evidence of

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convergent validity, the AQ was highly correlated with measures of predicted effectiveness, global evaluation, and treatment selection (Hypothesis 2) and moderately correlated with a measure of self-efficacy in carrying out the proposed intervention (Hypothesis 3). As a moderate but significant correlation was obtained between the AQ and Potency dimension of the SD, the second hypothesis that the AQ would not be significantly correlated with the Activity and Potency dimensions was only partially supported. This unexpected inverse relationship, such that greater acceptability ratings were associated with less potent interventions, is contrary to previous research showing no relationship between these variables.

With respect to the role of self-efficacy in the treatment acceptability model, the SE measure was positively correlated with both the AQ ratings and the TC measure (Hypothesis 3). As predicted, feelings of greater self-efficacy in implementing an intervention were associated with a more positive acceptability attitude towards the intervention and with higher ratings of treatment choice for the intervention.

Students in this sample were able to differentiate among the psychological and pharmacological interventions for pediatric pain in terms of their relative acceptability (Hypothesis 1) and predicted effectiveness. Consistent with the results of Study 1 and previous research (e.g., Turco & Elliott, 1986), results of the present study indicate accelerative interventions (imagery, attention-distraction) were evaluated as more acceptable and effective than reductive interventions (ignoring) and that evaluations of a pharmacological intervention fell in the middle. In contrast to Study 1 results, oral Valium was rated as significantly less acceptable than the accelerative interventions. This pattern of intervention evaluation converges with results obtained by Tarnowski, Gavaghan, and Wisniewski (1989) investigating nurses' acceptability ratings of pain management intervention. Students were also able to differentiate among the interventions on measures of general evaluation, treatment choice, and self-efficacy and results followed the pattern outlined above.

The prediction that males and females would not differ in acceptability evaluations of the four interventions (Hypothesis 5) was supported in the present study. In this regard, the results replicate those of Study 1. However, Study 1 did demonstrate a gender by intervention effect in ratings of effectiveness and general evaluation. Gender differences were not detected in Study 2 on any of these secondary measures. This failure to replicate the interactions of Study 1 may be due to the smaller sample size of Study 2 and the decreased power associated with a between-subjects design. Additionally, as reprimands were not included in the interventions evaluated in Study 2, it is possible that males and females only differed with regard to this specific intervention.

In summary, results of the present study indicate that the AQ and ERS possess good test-retest reliabilities if completed for one intervention. Additional contributions of this study include further validation of the AQ measure and advancement of the construct of treatment acceptability by the establishment of links between acceptability attitudes and predicted effectiveness, treatment selection, and self-efficacy.

### STUDY THREE

### PURPOSES

The primary purpose of Study 3 was to evaluate the perceived acceptability and effectiveness of three interventions for the management of pediatric distress during aversive medical procedures. To address concerns regarding generalizability from students to more direct consumers of treatment, evaluators in Study 3 were mothers of healthy 3- to 12-year old children, a sample closer to actual consumers of interventions for pediatric pain. This study provides a systematic replication of Studies 1 and 2 and contributes to the further development of the construct of treatment acceptability.

The three interventions evaluated in Study 3 were imagery, attention-distraction, and oral Valium. Ignoring was not assessed because it is not typically recommended as a pain management strategy and because the AQ's sensitivity to differences in acceptability attitudes had already been demonstrated in Studies 1 and 2.

An additional purpose of this study was to identify a psychological intervention with a normal distribution of acceptability ratings (i.e., no ceiling or floor effects, unimodal) to be used in Study 4 where the purpose was to examine whether effectiveness information alters acceptability attitudes. HYPOTHESES

Given that previous acceptability research suggests that students produce acceptability rankings similar or somewhat more conservative than those of parents (e.g., Cross Calvert & Johnston, 1988; McMahon et al., 1989), the following hypotheses were based on the results of Studies 1 and 2:

1. It was expected that attention-distraction and imagery would not be rated as significantly different from each other but that both would be rated as more acceptable than oral Valium. Due to inconsistent results obtained from Studies 1 and 2 as to whether oral Valium is significantly less acceptable than the accelerative interventions, this prediction was based on the findings of Study 2, given its greater similarity in methodology to Study 3.

2. The AQ would be positively correlated with the Evaluative dimension of the SD, the ERS, and TC measures, and not significantly correlated with the Potency and Activity dimensions of the SD.

3. The SE measure would be positively correlated with the AQ and TC measures.

## DESIGN

A 3 X 2 between-subjects design was used with each subject evaluating one pain management strategy (oral Valium, attentiondistraction, or imagery) and stimulus materials describing either a male or female child.

### METHOD

### Subjects

Sixty-three mothers of healthy, 3- to 12-year old children served as subjects. Mothers of children in this age group represent a large potential consumer population for interventions designed to reduce pediatric pain associated with aversive medical procedures, such as BMAs. Given the focus on assessing

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acceptability attitudes prior to the initiation of interventions, mothers of children who had had experience with repeated invasive medical procedures and/or nonspontaneous interventions to reduce pediatric pain were excluded from this study. However, it was expected that all mothers of children in this age group have had some experience with common childhood and adult pain experiences (e.g., immunizations, minor falls, stomachaches, childbirth, dental procedures, bloodtests).

Although it would have been desirable for both mothers and fathers to participate, this study was limited to mothers, because in the majority of cases, the mother is the parent that accompanies the child through a painful medical procedure and this is the consumer group that the results of this study will be generalized. Evidence to support this role of mothers is provided by Jay and Elliott's (1990) study evaluating the efficacy of a stress inoculation intervention for parents accompanying their child undergoing LPs and BMAs. In their sample of 86 parents, 79% were mothers, 17% were fathers, and 4% were grandparents.

Mothers were solicited through a variety of sources including posted notices in community centres, libraries, and preschool centres, and requests for volunteers placed in local newspapers and on a cable television messageboard. Interested mothers contacted the researcher by telephone and were provided with a brief overview of the study. Eligibility for the study was determined during the initial telephone contact. To participate, the mother must have had a child between 3 and 12years old, at least a Grade 10 education, no experience with repeated invasive medical procedures either for themselves or their child, and no training in pain management techniques. A minimum education level was selected to increase the likelihood that the mothers would be able to comprehend the written materials. A total of 73 enquiries were received, of which 9 did not meet the eligibility criteria.

The modal number of children per family in this sample of mothers was two ( $\underline{M} = 2.4$ ,  $\underline{SD} = 1.5$ ). Age of the mothers ranged from 21 to 47 years (M = 34.2, <u>SD</u> = 5.3). Fifty-four (85.7%) of the mothers were married or in long-term relationships and the remaining nine were either single (1.6%), divorced (9.5%), or separated (3.2%). Socioeconomic status (SES) for each subject was determined using the Hollingshead Four-Factor Index (Hollingshead, 1975). A wide range of SES was represented, from unskilled laborer to professionals, with the mean SES score falling in the middle to upper-middle class range. The educational level was as follows: 1.6% (n = 1) had completed grade 10, 34.9% ( $\underline{n}$  = 22) had completed high school, 47.6% ( $\underline{n}$  = 30) had completed at least one year of college or specialized training, 12.7% (n = 8) had completed university, and 3.2% (n = 12) had completed graduate school. The majority of the sample (95.2%, n = 59) described their ethnicity as Canadian and usually acknowledged their ethnic heritage (e.g., German Canadian). Three mothers (4.8%) identified their ethnicity as British. Stimulus Materials

To increase personal relevance of the materials to the raters, corresponding to the perceived vulnerability dimension of the HBM, mothers were asked to imagine themselves as the parent

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of the child described in the stimulus materials, and the case vignette was reworded to facilitate this (e.g., "Your child's treatment ..."). Descriptions of each intervention were also modified to facilitate the parent imagining themselves as the interventionist, that is, the person guiding the child's imagination (imagery), diverting the child's attention (attention-distraction), or administering the prescribed medication (oral Valium). To further increase the personal relevance of the materials, child gender in the case vignette was matched to the gender of the mother's child closest in age to the child described in the case vignette (i.e., 5 years of age). Consequently, 39 (61.9%) of the mothers read the male case vignette and 24 (38.1%) of the mothers read the female case vignette.

### Dependent Measures

The AQ, ERS, SD, and TC measures, as developed in Studies 1 and 2, were used in the present study. To increase the reliability of the one-item SE measure, an additional item was added. On the second item, mothers were asked to rate, on a 10point scale: "Would you feel competent (i.e., have the necessary skills) to carry out <u>(intervention)</u> with your child during the next BMA?"

Instructions preceding the assessment measures reminded the mothers to imagine themselves as the child's parent. Items on the AQ, ERS, TC, and SE measures were reworded where possible to facilitate this (e.g., from "the child" to "my child").

### Procedures

Participants were told that the purpose of the study was to evaluate an intervention designed to help children cope with painful medical procedures by reading about the intervention and completing questionnaires. To minimize any potential bias towards the psychological interventions, the study was presented as part of a health research program associated with the University of British Columbia, although no attempt was made to conceal the project's association with the Department of Psychology. If the mother agreed to participate and met the eligibility criteria, a convenient time and place for participation was established. Administration occurred either individually or in small groups (e.g., home, preschool, community centre). Despite the location or size of the group, effort was made to standardize the administration of the study with the provision of preliminary verbal instructions, responses to questions, and debriefing information. In the group formats, mothers were asked not to discuss the written materials until all members had completed the study. Most mothers required approximately 15 minutes to complete the study.

Mothers were randomly assigned to one of three interventions (attention-distraction, imagery, oral Valium) by way of the packet of written materials they received. Mothers proceeded at their own pace because all instructions were contained within the packet. The packet consisted of: consent form, demographic information form, case vignette, intervention description, and AQ, ERS, SD, TC, and SE measures.

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Following participation in the study, mothers were given debriefing information concerning the purpose of the study, other interventions assessed, and the current knowledge on the effectiveness of psychological and pharmacological interventions for pediatric pain and distress.

## RESULTS

## **Preliminary Analyses**

A series of analyses were performed to test the equivalence among groups on salient subject variables. Univariate ANOVAs were conducted with number of children in the household, maternal age, SES, and maternal education as dependent variables. No significant differences among groups were detected on any of these variables. Chi-square analyses revealed no differences across the three groups on marital status and ethnicity.

Univariate ANOVAs were conducted to determine whether the groups of mothers reading male versus female vignettes differed with regard to number of children in the household, maternal age, education, or SES. No significant differences were detected between groups for education or SES. The hypothesis of equal variances was rejected by homogeneity of variance tests for the analyses involving number of children and maternal age (Bartlett-Box  $\underline{F} = 5.34$ ,  $\underline{p} < .05$  and  $\underline{F} = 4.81$ ,  $\underline{p} < .05$  respectively). For this type of violation (larger group with the larger variance), the probability of type I error is less than  $\alpha$  (Glass & Stanley, 1970). Therefore, Welch's correction was used. No significant differences between groups were detected. Chi-square analyses failed to reveal significant differences between groups with regard to ethnicity and marital status.

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Internal consistencies of the AQ and ERS were calculated using Cronbach's alpha and were found to be .93 and .87 respectively. The two self-efficacy items were correlated at .63  $(\underline{p} < .001)$ . Therefore, for the remaining analyses, the two items were summed and presented as the SE measure with scores potentially ranging from a minimum of 2 to a maximum of 20. Main Analyses

Following the general strategy described in Study 1, data analyses examined differences in AQ scores, the primary measure, across the three pain management interventions and gender of the stimulus materials. An ANOVA with intervention and gender of the stimulus materials as between-subjects variables and AQ score as the dependent variable was conducted. No statistically significant differences emerged among interventions, gender, or the interaction of intervention and gender. Because of the unequal number of subjects matched to each gender of the stimulus materials, the assumption of equal variances was tested. Both Barlett-Box and Cochran's tests of homogeneity of variance rejected the assumption of equal variances,  $\mathbf{E}$  = 5.85 and  $\mathbf{C}$  = .71, ps < .05 respectively. For this type of violation (smaller group with the larger variance), the probability of a type I error is greater than  $\alpha$  (Glass & Stanley, 1970). As results of the ANOVA failed to reject the null hypothesis, additional corrections for heterogeneity of variance were not conducted. Table 14 presents the mean AQ scores for each intervention.

### Secondary Analyses

Given that a statistically significant effect was not found on the initial ANOVA for the AQ score, subsequent tests of the Table 14

# Mean Ratings of the AQ, ERS, SD Evaluative, TC, and SE

<u>Measures</u>

Dependent Meagure	Intervention			
	AD	IM	0 <b>V</b>	
Acceptability Questionnaire	42.6	41.0	41.8	
	(8.7)	(9.2)	(9.1)	
Effectiveness Rating Scale	42.1	40.1	37.5	
	(5.9)	(8.8)	(7.5)	
SD Evaluative	9.6	11.5	14.7	
	(5.4)	(6.3)	(6.9)	
Treatment Choice	8.5	7.3	7.8	
	(2.1)	(2.7)	(2.3)	
Self-Efficacy	16.7	12.3	16.4	
	(3.1)	(5.7)	(3.7)	

<u>Note</u>. AD = attention-distraction; IM = imagery; OV = oral Valium. Higher scores indicate greater acceptability, predicted effectiveness, negative evaluation, likelihood of choosing the intervention, and self-efficacy for the Acceptability Questionnaire, Effectiveness Rating Scale, Semantic Differential Evaluative Scale, Treatment Choice, and Self-Efficacy measures respectively. Numbers in parentheses are standard deviations. secondary measures (ERS, SD Evaluative, TC, SE) were not conducted. Mean scores of these secondary measures are presented on Table 14.

Correlations between the AQ score and the ERS, SD dimensions, TC, and SE measures were calculated and are presented in Table 15. To reduce the probability of Type I error, alpha was set at p < .002 (.01/6 correlations). AQ scores were highly correlated with the ERS, Evaluative dimension of the SD, and the TC measure. Correlation between the AQ score and the SE measure was modest but significant. Correlations between the AQ score and the Activity and Potency scales were nonsignificant. As predicted, the SE and TC measures were moderately correlated ( $\chi =$ .56, p < .001).

## Supplementary Analyses

Finally, exploratory analyses were conducted correlating the dependent measures (AQ, ERS, SD, TC, SE) and demographic variables (age, number of children, marital status, education, SES). No significant correlations emerged suggesting that these demographic variables are not related to acceptability attitudes, perceived effectiveness, global assessments of evaluation, activity, potency, treatment choice, and self-efficacy. *DISCUSSION* 

The purpose of Study 3 was to systematically replicate the previous two studies and to examine the extent of generalizability from students to parents prior to the selection of a psychological intervention for use in Study 4. Such replication with a different sample population provides additional validation of the construct of acceptability and Table 15

<u>Correlations between the Acceptability</u>	
Questionnaire and Secondary Measures	
Dependent Measure	r
Effectiveness Rating Scale	.77*
Semantic Differential Evaluative Scale	74*
Semantic Differential Potency Scale	14
Semantic Differential Activity Scale	09
Treatment Choice	.78*
Self-Efficacy	.56*

<u>Note</u>. <u>N</u>=63.

\*<u>p</u> < .002.

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supports the proposed conceptual model of treatment acceptability. Generally, parental evaluations of interventions were similar to those obtained by students in Studies 1 and 2, even with minor modifications in the stimulus materials.

The prediction that imagery and attention-distraction would not be rated significantly different from each other but both would be rated as more acceptable than oral Valium (Hypothesis 1) was only partially confirmed. Mothers in this study did not view imagery, attention-distraction, and oral Valium as significantly different from each other. Gender of the child had no significant impact on mothers' evaluations of acceptability of the interventions. Interpretation and integration of these results with the other studies in this research program and the treatment acceptability literature will be offered in the final discussion.

Results of this study support the proposed conceptual model of treatment acceptability linking acceptability with predicted effectiveness, treatment selection, and self-efficacy. Acceptability attitudes were highly correlated with predicted effectiveness, general evaluation and treatment choice (Hypothesis 2). The predicted correlation between self-efficacy and acceptability and treatment choice was also confirmed (Hypothesis 3). More positive acceptability attitudes towards a proposed pain management intervention were associated with greater predicted effectiveness, feelings of greater selfefficacy in implementing the intervention, and higher ratings of treatment choice. Providing discriminant validity, acceptability was not related to evaluations of the intervention's potency or activity (Hypothesis 2).

Finally, an additional purpose of this study was to select a psychological intervention for use in Study 4 where the impact of effectiveness information upon acceptability judgements was examined. The rationale for the selection of imagery is discussed in Study 4.

### STUDY FOUR

### **PURPOSES**

Findings of Studies 1, 2, and 3 support the conclusion that even with minimal information, evaluators differentiate among various psychological and pharmacological interventions in terms of their acceptability as applied to pediatric distress. In these studies, the most clear and consistent distinction has been between reductive interventions, which have been evaluated as unacceptable and ineffective, and accelerative interventions, which have been evaluated as acceptable and effective.

Beyond knowing the static position of acceptability attitudes for various pain management interventions, it is also important to understand whether these attitudes can be altered and the mechanisms by which this might occur. For example, such knowledge might prove important in an applied setting when an effective intervention is recommended but is at risk of not being implemented because it is perceived as unacceptable. Can acceptability attitudes be modified and if so, what type of information will facilitate this change?

To this end, the primary purpose of the fourth study was to investigate how treatment acceptability attitudes are influenced by experience with the effectiveness of various pain management interventions. Using mothers as research participants, acceptability attitudes were assessed before and after exposure to an effective or ineffective implementation of a pain management intervention or a no information exposure. Ratings on the ERS were used to confirm the manipulation of effectiveness information. Following from the HBM, it was expected that

information demonstrating the effectiveness of an intervention would result in an increase in acceptability ratings whereas information suggesting the ineffectiveness of an intervention would result in a decline in acceptability ratings.

## **HYPOTHESES**

It was predicted that:

1. Acceptability ratings would increase for mothers exposed to an effective instance of the psychological intervention and decrease for mothers exposed to an ineffective instance of the psychological intervention. It was expected that acceptability ratings would remain unchanged for mothers who received no effectiveness information.

2. Based on the results of Study 3, it was predicted that mothers reading the male and female versions of the stimulus materials would not differ in terms of their acceptability attitudes.

## DESIGN

Study 4 is a pretest-posttest control group design with two between-groups variables of condition (effective, ineffective, or no effectiveness information) and gender of stimulus materials (male or female); and one repeated measure of time (pretest, posttest).

### METHOD

## Subjects

Ninety mothers of healthy 3- to 12-year old children served as subjects in this study and were recruited through community groups such as Brownies, Scouts, women's service groups, and preschools. As in Study 3, each mother had a child between 3-

and 12-years old, at least a Grade 10 education, no experience with repeated invasive medical procedures either for themselves or their child, and no training in pain management techniques. A total of 102 enquiries were received, of which 12 did not meet the eligibility criteria.

The modal number of children per family represented in this sample of mothers was two ( $\underline{M} = 2.3$ ,  $\underline{SD} = 1.0$ ). Age of the mothers ranged from 22 to 46 years (M = 34.1, SD = 4.9). Eightysix (95.6%) of the mothers were married or in long-term relationships and the remaining four were either separated (1.1%), widowed (1.1%), or divorced (2.2%). The educational level of mothers was as follows: 5.6% ( $\underline{n} = 5$ ) had completed grade 10, 43.3% (n = 39) completed high school, 33.3% (n = 30) had completed at least one year of college or specialized training, 16.7% ( $\underline{n}$  = 15) had completed a university degree, and 1.1% (n = 1) had completed graduate school. The majority of this sample (94.4%, n = 85) described their ethnicity as Canadian and frequently acknowledged their ethnic heritage (e.g., Canadian with Swedish background). Three mothers (3.3%) identified their ethnicity as British, one mother (1.1%) described herself as black, and one (1.1%) identified her ethnicity as East Indian. SES for each mother was determined using the Hollingshead Four-Factor Index (Hollingshead, 1975). A wide range of SES was represented, from unskilled laborer to professional, with the mean SES score falling in the upper-middle class range. Stimulus Materials

A normal distribution of acceptability ratings was desired to allow for ratings to change following the presentation of

effectiveness information. Based on the results of Study 3, imagery was selected as the psychological intervention with the most normal distribution of acceptability ratings (e.g., no ceiling or floor effects). Among the mothers in Study 3, AQ scores for imagery ranged from 14 to 54 with the mean and median being 41 and 42.5 respectively and a standard deviation of 9.2.

The case vignette and imagery description from Study 3 were used in this study with minor modifications to reduce the probability of ceiling effects on AQ ratings and the potential influence of experimental demand characteristics. For example, demand characteristics may have led mothers to surmise that all psychological interventions were to be evaluated positively. Previous acceptability studies have shown that the more severe the problem behavior, the higher the acceptability ratings for any proposed treatment (e.g., Frentz & Kelley, 1986; Tarnowski et al., 1987; Turco & Elliott, 1986). Therefore, some descriptors of the child's anxiety were deleted or modified in the case vignette. Mothers were also informed that, although some children find the BMA procedure to be very painful and upsetting, other children do not seem to be as bothered. In the description of imagery, information was included about alternative psychological interventions (e.g., deep breathing, rewards) that have been used to help children cope with painful medical procedures. It was expected that placing the child's behavior and imagery within the context of a range of child behavior and interventions would permit mothers to express a greater range of evaluation. As in Study 3, mothers were asked to imagine

themselves as the parent of the child described and as the interventionist guiding the child in using imagery.

As a vehicle for presenting effectiveness information, a transcript presentation of imagery being used with a child undergoing a BMA procedure was developed. Written transcripts were selected over actual or contrived audio or videotape presentations to allow tighter control over the independent variable (i.e., effectiveness information) and to hold constant other aspects of the presentation that might influence ratings of acceptability (e.g., verbal and nonverbal behavior of adults prior to and during the procedure).

This transcript was created using material from actual videotapes of BMA procedures recorded by researchers at British Columbia's Children's Hospital and in vivo observations by the author at the same hospital. The transcript, which was introduced to the mothers as the actual transcription of a videotaped procedure, described the procedure room, the people present, the stages of the medical procedure (positioning the child on the table, soaping before the BMA, administration of a local anesthetic, the BMA, postprocedure); verbal interactions among the child, parent, and medical staff; and relevant nonverbal behaviors of the child, parent, and medical staff. Other psychological strategies commonly used in combination with imagery (e.g., directed deep breathing and relaxation, positive reinforcement) were not included in the transcript to prevent confounding of the evaluation of imagery.

As a check on the accuracy and realism of the described medical procedure, the no information version of the transcript

(to be described below) was reviewed by five health professionals (three pediatric oncology nurses, one anesthesiologist, one pediatric oncologist) knowledgeable about BMA procedures. Reviewers rated the transcript on three 10-point scales concerning the BMA procedure's medical accuracy, completeness, and typicality. Ratings of accuracy ranged from 8 to 10 ( $\underline{M}$  = 9.3), ratings of completeness ranged from 8 to 10 ( $\underline{M}$  = 9.5), and ratings of how typical the description was ranged from 7 to 10 ( $\underline{M}$ = 8.8). Any inaccuracies noted by the reviewers were corrected in the final version of the transcript.

Three versions of the transcript were created varying only in imagery effectiveness information (effective, ineffective, no effectiveness information). All versions contained the same information regarding the mother's direction of the child's use of imagery; the implementation of the medical procedure; and the verbal and nonverbal behavior of the physician and nurse. Effectiveness information was manipulated by varying the description of the child's pain and distress behavior in response to using imagery, and the mother's behavior in response to the effectiveness of imagery in reducing the child's distress. For the effective version (EFF; see Appendix G), the child appeared to cope successfully with the procedure with minimal pain or distress. The ineffective version (INEFF; see Appendix H) described the child using the intervention but still appearing to experience considerable pain and distress. The no information transcript (NOINFO; see Appendix I) described the mother directing the child to use imagery, as in the other versions, but gave no information on its effectiveness; that is, the child's

level of pain and distress was not described. All descriptions of child behavior were excluded from the no information version.

The child behavior described in the EFF and INEFF transcripts was based on behavior definitions used in well established measures for assessing distress and coping during BMAs and LPs. These included the Child-Adult Medical Procedure Interaction Scale-Revised (Blount, Sturges, & Powers, 1990), the Observation Scale of Behavioral Distress (Jay et al., 1983) and the Procedure Behavior Rating Scale (Katz et al., 1980). The child behaviors used to indicate effective coping included audible deep breathing, nonprocedural talk, humor, and coping statements. The behaviors used to indicate ineffective coping included verbalizations of fear, resistance, and pain; crying; screaming; requesting emotional support; physical resistance; and muscular rigidity. Through a series of pilot testings on a convenience sample, transcripts were revised to maximize the distinctiveness between effective and ineffective instances of imagery. The final pilot sample was composed of 39 subjects (12 males and 27 females), ages 15 to 62 years (M = 30.3 years), all unfamiliar with the purposes of the study. Using a 10-point scale with the anchors "very ineffective", "neutral or don't know", and "very effective", 12 subjects gave an average rating of 8.7 to the EFF transcript, 12 subjects gave an average rating of 5.7 to the NOINFO transcript, and 15 subjects provided an average rating of 3.2 for the INEFF transcript. A one-way ANOVA, E(2, 36) = 62.47, p < .01, and follow-up multiple comparison procedures confirmed that the three transcripts were rated as significantly different from each other (p < .05).

Subjects also evaluated how clear and understandable the transcripts were in describing the medical procedure and the imagery techniques; and how credible the transcripts were in describing the mother and child behavior. With the exception of the child behavior credibility rating for the NOINFO condition, subjects' ratings on each of these dimensions were indicative of clear, understandable, and credible transcripts (defined as mean scores greater than 5 on a 10-point scale). One-way ANOVAs indicated that the three transcripts did not differ significantly on any of these dimensions. With regard to the credibility of the child's behavior, subjects in the EFF and INEFF conditions rated the child's behavior as credible ( $\underline{M}$  = 7.1 and  $\underline{M}$  = 8.4 respectively) but subjects in the NOINFO condition rated the child's behavior as not credible ( $\underline{M} = 2.8$ ), presumably because description of the child behavior was omitted for this transcript. Originally, instructions prior to the transcript for all conditions were identical and noted only that "portions of the videotape [transcript], such as discussions among the medical staff, have been excluded." On the basis of the pilot results, instructions for the NOINFO condition were expanded to state that child behaviors had been purposely excluded.

Male and female versions of the case vignette, intervention description, and transcripts were created. Gender of the child in the stimulus materials was matched to the mother's child closest to 5 years of age to increase the personal relevance of the materials.

### Dependent Measures

As used in Study 3, the dependent measures included the AQ, ERS, SD, TC, and SE measures. The ERS functioned as a manipulation check for the independent variable of effectiveness information. To decrease the likelihood of ceiling effects and the influence of experimental demand characteristics, additional instructions preceding the questionnaires stated: "There are no right or wrong answers. People vary in their opinions. We are interested in <u>your honest opinions</u> as a parent."

## Procedures

Potential participants were told that the purpose of the study was to have mothers evaluate an intervention designed to help children cope with repeated painful medical procedures. If the mother agreed to participate and met the eligibility criteria, a convenient time and place for participation was established. Administration occurred either individually or in small groups (e.g., at a preschool or community centre) and effort was directed toward standardizing the procedures across locations and group sizes. Approximately 45 minutes was required to complete the study and mothers were paid \$5.00 for their participation.

Mothers were randomly assigned to one of three conditions (EFF, INEFF, NOINFO) by way of the packet of written materials they received. Mothers proceeded at their own pace because all instructions were contained within the packet. The packet consisted of two parts. The materials in Part 1 were identical to those in Study 3 with revisions as previously noted and included: consent form, demographic information form, case

vignette, description of imagery, AQ, ERS, SD, TC, and SE measures (designated as the PRE measures). After completing Part 1, mothers continued to Part 2 of the packet. This included the transcript with one of three levels of effectiveness information and the AQ, ERS, SD, TC, and SE measures repeated (designated as the POST measures). Prior to the last set of questionnaires, mothers were instructed to think back to the first case vignette and to imagine the child previously described.

Mothers were debriefed following completion of the study. Mothers were given both written and oral information concerning the purposes of the study, and were told of alternative psychological interventions for pediatric pain and distress and current knowledge regarding their effectiveness. In particular, mothers were informed that the transcript they read was not an actual videotape, and for the EFF and INEFF groups, was not representative of the intervention's effectiveness with any particular child. Debriefing emphasized the variability in effectiveness of any psychological pain management strategy. *RESULTS* 

# Group Equivalence

To assess group equivalence (EFF vs. INEFF vs. NOINFO) at the PRE administration, univariate ANOVAs were conducted using SES, education, maternal age, and number of children as dependent variables. No significant differences were detected on these variables. Similarly, chi-square analyses did not detect group differences with regards to ethnicity or marital status.

Fifty-one (56.7%) of the mothers read the female case vignette and 39 (43.3%) read the male case vignette. Univariate

ANOVAs and chi-square tests were conducted to determine whether the male and female groups differed with regards to demographic characteristics and no significant differences were detected.

# Main Analyses

The impact of effectiveness information on the primary and secondary dependent measures was assessed through a series of repeated measures ANOVAs. An analysis of covariance using pretest scores as covariates is often recommended over repeated measures ANOVA for pretest-posttest designs because of its greater sensitivity to detect potential group differences (Huck & McLean, 1975). However, for this study, using pretest scores as covariates would not clearly show whether mothers' attitudes towards imagery significantly changed from pretest to posttest, nor whether these changes were differentially affected by gender of the stimulus materials and/or type of effectiveness information. Therefore, a repeated measures approach to the analysis was taken. Of greatest interest in the analysis was the Condition X Time interaction indicative of differential attitude change with type of effectiveness information. Overall, data analyses followed the general strategy described in Study 1.

As homogeneity of within-group variances is extremely robust to violations with equal or near-equal sample sizes, this assumption was tested only when analyses tested the effects involving gender of the stimulus materials where there were unequal numbers of male and female materials. Only one violation of this assumption ( $\mathbf{p} > .05$ ) occurred (SD Evaluative score at POST). For this type of violation (smaller group with the larger variance), the probability of Type I error is greater than  $\alpha$  (Glass & Stanley, 1970). Therefore, as the effects involving gender of the stimulus materials were found to be nonsignificant, no further corrections were made.

To determine whether provision of effectiveness information had its intended impact, the ERS was analyzed as a manipulation check. A repeated measures ANOVA was conducted with condition and gender as between-subjects variables and time as the withinsubjects variable. Results indicated a significant main effect for gender, F(1, 84) = 6.87, p < .01, and a significant interaction of Condition X Time, F(2, 84) = 15.10, p < .01. **A**11 other main effects and interactions were nonsignificant. Examination of the main effect of gender revealed that mothers who read the female stimulus materials rated imagery as more effective ( $\underline{M}$  = 41.6) than mothers who read the male version ( $\underline{M}$  = 37.8). Simple main effects tests investigating the Condition X Time interaction found significant differences among conditions only at POST, F(2, 84) = 5.29, p < .025. Tukey tests indicated that the EFF and NOINFO versions were not rated as significantly different from each other, but both were rated as significantly more effective than the INEFF version, ( $\underline{p}s < .01$ ). Time was a significant effect for each effectiveness information condition,  $F_{s}(1, 84) = 12.03, 13.78, 6.03, \text{ for the EFF, INEFF, and NOINFO}$ conditions respectively,  $\underline{p}s < .025$ . ERS scores significantly increased from PRE to POST in the EFF and NOINFO conditions and significantly decreased in the NOINFO condition. These results show that the manipulation of effectiveness information was successful: providing an effective instance of imagery increased effectiveness ratings and providing an ineffective instance of

imagery resulted in decreased effectiveness ratings. Mere exposure to the intervention (i.e., the NOINFO condition) also resulted in increased effectiveness ratings. Table 16 presents the mean PRE and POST ERS scores for each condition.

To assess the impact of effectiveness information and gender of stimulus materials on the primary measure, the AQ score, a repeated measures ANOVA was conducted and yielded a main effect of gender and interactions of Gender X Time, E(1, 84) = 4.16, p <.05, and Condition X Time, E(2, 84) = 14.44, p < .01. All other main effects and interactions were nonsignificant.

Dismantling the Gender X Time interaction, significant differences in acceptability scores for gender of stimulus materials were found only at POST, E(1, 84) = 14.65, p < .025, although the gender effect at PRE approached statistical significance (p = .026). At POST, mothers who read the female stimulus materials rated imagery as more acceptable (M = 45.7) than mothers who read the male version (M = 39.2). No consistent time effects were obtained for either male or female stimulus materials.

Simple main effects for the Condition X Time interaction indicated significant differences among conditions only at POST, E(2, 84) = 7.20, p < .025. Tukey procedures revealed that the EFF and NOINFO conditions were not different, but both were rated as significantly more acceptable than the INEFF condition (ps <.01). AQ scores significantly increased from PRE to POST for the EFF condition, Es(1, 84) = 5.74, p < .025, and significantly decreased for the INEFF condition, E(1, 84) = 20.84, p < .025. AQ scores did not change significantly in the NOINFO condition.
# Table 16

# PRE and POST Mean AQ, ERS, SD Evaluative, TC, and

# SE Scores for Effectiveness Information Conditions

	Time of Administration	
Condition	PRE	POST
Effective		
Acceptability Questionnaire	42.7 (8.3)	45.6 (8.4)
Effectiveness Rating Scale	39.1 (7.3)	42.8 (8.0)
Semantic Differential Evaluative Scale	11.8 (5.7)	9.3 (5.7)
Treatment Choice	7.6 (2.4)	8.5 (2.3)
Self-Efficacy	12.6 (4.7)	15.1 (5.1)
No Information		
Acceptability Questionnaire	42.3 (7.6)	<b>44.4</b> (7.7)
Effectiveness Rating Scale	38.8 (7.5)	<b>41.7</b> (8.3)
Semantic Differential Evaluative Scale	10.8 (5.5)	10.0 (6.1)
Treatment Choice	7.7 (2.5)	8.3 (2.1)
Self-Efficacy	13.3 (4.4)	15.1 (4.8)
	(table	continues)

	Time of Administration	
Condition	PRE	POST
Ineffective		
Acceptability Questionnaire	43.6 (7.6)	38.5 (9.5)
Effectiveness Rating Scale	40.8 (7.1)	36.7 (8.2)
Semantic Differential Evaluative Scale	11.6 (6.7)	13.1 (8.5)
Treatment Choice	8.4 (2.2)	7.3 (2.7)
Self-Efficacy	12.4 (4.8)	12.1 (5.7)

<u>Note</u>. Higher scores indicate greater acceptability, predicted effectiveness, negative evaluation, likelihood of choosing intervention, and self-efficacy. Numbers in parentheses are standard deviations. Table 16 presents the mean AQ scores for effectiveness conditions at PRE and POST. These results show that acceptability ratings increased following effectiveness information and decreased following ineffectiveness information.

Despite these mean group changes, the question of the extent that effectiveness information produced meaningful and reliable changes in individual mothers' acceptability attitudes remains. One strategy for assessing the meaningfulness of the change experienced by each group member is to use a reliable change index (RCI), which calculates change from pretest to posttest divided by the standard error of the difference between the two test scores. (See Jacobson, Follette, & Revenstorf [1984] for a detailed discussion of this approach.) The RCI provides a method for determining the probability that each subject's magnitude of change is beyond the bounds that one might reasonably expect given measurement error.

Supporting the results of the statistical significance tests, using the RCI indicated that 20% of the mothers in the EFF condition demonstrated reliable increases in their acceptability attitudes. Although mean AQ scores did not significantly change after exposure to the no effectiveness information condition (p =.12), the RCI indicated that 20% of mothers' acceptability attitudes did improve substantially in this condition. Finally, in the INEFF condition, 40% of the mothers demonstrated reliable decreases in acceptability attitudes, suggesting that ineffectiveness information affected twice as many mothers' acceptability attitudes as either the effective or no effectiveness information conditions.

#### Secondary Analyses

Given that significant effects were found on the primary measure (AQ), a repeated measures MANOVA examined the secondary measures (SD Evaluative, TC, SE). Condition and gender of the stimulus materials served as between-subjects variables and time served as the within-subjects variable. The MANOVA revealed a main effect of gender, E(3, 78) = 3.45, p < .05, and a Condition X Time interaction, E(6, 158) = 5.18, p < .01. All other effects were nonsignificant.

Follow-up univariate analyses with  $\alpha$  reduced to .017 (.05/3) examined the gender effect and Condition X Time interaction for each of the secondary measures. The gender effect was significant only on the TC measure, F(1,81) = 8.36, p < .01. Mothers who read the female version indicated that they would be more likely to select imagery ( $\underline{M} = 8.5$ ) than mothers who read the male stimulus materials (M = 7.2). The Condition X Time interaction was significant for each of the secondary measures,  $F_{s}(2, 82) = 6.69, 14.70, 10.92, p_{s} < .017, for SD Evaluative, TC,$ and SE measures respectively. In all cases, no significant differences among conditions were detected at either PRE or POST. Trends towards significance were noted for SD Evaluative ( $\underline{p}$  = .05), TC ( $\underline{p}$  = .07), and SE ( $\underline{p}$  = .07) at POST. For the SD Evaluative measure, imagery was evaluated more positively at POST than at PRE by mothers exposed to the EFF condition, F(1, 82) =10.06,  $\underline{p}$  < .025. Time was not a significant effect on SD Evaluative scores in either the INEFF (p = .05) or NOINFO conditions. PRE-POST differences on the TC measure indicated that mothers were more likely to select imagery after exposure to

the EFF condition,  $\underline{F}(1, 81) = 11.37$ , and less likely to select imagery after exposure to the INEFF condition,  $\underline{F}(1, 81) = 14.49$ ,  $\underline{ps} < .025$ . TC scores did not significantly change for mothers in the NOINFO condition. Finally, SE significantly increased for mothers exposed to the EFF condition,  $\underline{F}(1,81) = 14.95$ ,  $\underline{p} < .025$ . Mothers' SE scores did not significantly change in the INEFF ( $\underline{p} =$ .07) and NOINFO conditions.

To summarize the simple main effects results for the secondary measures, providing effectiveness information led to increased SD Evaluative, TC, and SE ratings; providing ineffectiveness information led to decreased TC ratings; providing no effectiveness information did not result in any significant changes in SD Evaluative, TC, and SE ratings. Table 16 presents the mean SD Evaluative, TC, and SE scores for each condition at PRE and POST.

#### Supplementary Analyses

An additional issue addressed by Study 4 was the influence of effectiveness information on mothers who held either higher or lower acceptability attitudes towards imagery. It is of particular clinical interest to understand the influence of effectiveness information when it is contrary to acceptability attitudes. For example, what influence does effectiveness information have in changing the attitudes of individuals who view psychological interventions such as imagery as highly unacceptable? To this end, mothers with scores in the upper and lower thirds of the distribution of initial AQ scores who were presented with either no effectiveness information or contrary effectiveness information were selected for exploratory analyses.

Thus, the Lower Acceptability group included 23 mothers with initial AQ scores that fell in the lower third of the initial AQ distribution: 12 in the EFF condition and 11 in the NOINFO condition. To retain 20 mothers in each of the Higher and Lower Acceptability groups, the three mothers in the Lower Acceptability group with the highest scores were dropped from further consideration, resulting in 10 mothers in the EFF condition and 10 mothers in the NOINFO condition. The Higher Acceptability group included 20 mothers: 13 in the INEFF condition and 7 in the NOINFO condition. Due to the disparate number of subjects per condition in the Higher Acceptability group, the assumption of homogeneity of variance for AQ scores was tested and the degree of heterogeneity was found to be not significant ( $\mathbf{p} > .05$ ).

It was predicted that mothers in the Lower Acceptability group exposed to the effective instance of the psychological intervention would show an increase in acceptability ratings compared to Lower Acceptability mothers receiving no effectiveness information. It was also expected that acceptability ratings would decrease for the Higher Acceptability mothers exposed to the ineffective instance of the psychological intervention compared to the Higher Acceptability mothers who received no information.

The AQ data were analyzed in two separate repeated measures ANOVAs, one for the Higher Acceptability group and one for the Lower Acceptability group. In each analysis, two betweensubjects variables (effectiveness information condition, gender

of stimulus materials) and one within-subjects variable (time) were used.

For the Lower Acceptability group, the analysis yielded a significant time effect,  $\underline{F}(1, 16) = 11.87$ ,  $\underline{p} < .05$ , with acceptability attitudes increasing from PRE ( $\underline{M} = 34.0$ ) to POST ( $\underline{M} = 38.9$ ). All other main effects (including effectiveness information condition) and interactions were nonsignificant.

The same set of analyses were conducted for the Higher Acceptability group and yielded two significant effects: time and Condition X Time,  $\underline{F}(1, 16) = 7.73$ ,  $\underline{p} < .05$ . Significant differences among conditions were detected only at POST,  $\underline{F}(1, 18)$ = 8.25,  $\underline{p} < .01$ , with lower AQ scores in the ineffectiveness condition. Only in the INEFF condition did AQ scores decrease from PRE to POST,  $\underline{t}(12) = 3.82$ ,  $\underline{p} < .025$ . AQ scores did not significantly change in the NOINFO condition. Mean AQ scores for the Lower and Higher Acceptability groups for each effectiveness condition are presented in Table 17.

To summarize the results of these supplementary analyses, providing mothers with initially lower acceptability attitudes either effectiveness information or no effectiveness information increased acceptability ratings. For mothers with initially higher acceptability attitudes, providing ineffectiveness information resulted in decreased acceptability ratings; provision of no effectiveness information did not result in significant changes in acceptability ratings.

### DISCUSSION

Results of Study 4 clearly demonstrate that acceptability attitudes can be altered with the provision of information

# Table 17

# PRE and POST Mean AQ Scores for Lower and Higher

		Time of Administration	
Condition	n	PRE	POST
	Lower Acceptabilit	y Group	
Effective	10	33.4 (6.5)	37.6 (9.1)
No Information	10	34.5 (7.5)	40.1 (6.8)
	Higher Acceptabilit	y Group	
No Information	7	50.1 (3.0)	50.4 (3.7)
Ineffective	13	49.7 (2.4)	41.5 (7.7)

Acceptability Groups

Note. Numbers in parentheses are standard deviations.

regarding the effectiveness of a pain management intervention. Information demonstrating the effectiveness of an intervention improved acceptability attitudes and information demonstrating an intervention's ineffectiveness lowered acceptability attitudes. Exposure to an example of the intervention's application without effectiveness information did not result in changes in acceptability attitudes, although predicted effectiveness improved. Additionally, gender effects indicated that imagery was perceived as more acceptable, effective, and more likely to be selected when applied for girls rather than boys.

The manipulation check established that mothers exposed to the effective and ineffective instances of imagery actually perceived the information as intended. As expected, mothers' effectiveness predictions improved after exposure to an effective application of imagery and declined after exposure to an ineffective application. Counter to expectations however, providing mothers with an example of imagery's application without information regarding its effectiveness improved mothers' predictions of effectiveness. Given that the pilot study confirmed that the NOINFO transcript did not contain information related to the effectiveness of imagery (i.e., child, parent, or staff behavior), alternate explanations for the effects of the NOINFO transcript are needed. One possibility is that the pilot subjects and mothers experienced different cues as to what was expected of them. Having completed Part I of the study (i.e., reading the case vignette and intervention description, completing questionnaires), mothers may have been sensitized to the type of judgements they would be asked to make, unlike the

pilot subjects who did not participate in Part I. Therefore, Part I of the experiment may have prompted mothers to adopt a data gathering approach in reading the transcript, seeking evidence to assist them in their anticipated evaluations.

A second possible explanation is that the NOINFO transcript, like the EFF and INEFF transcripts, supplied mothers with greater details and knowledge of imagery's implementation during an invasive medical procedure and that this information altered views of treatment effectiveness. This implementation information would include such dimensions as ease of use, complexity of the intervention, time involvement, pleasantness, potential for risks and/or side effects, and skill level required of the interventionist. These dimensions are integral to a costbenefit analysis which in turn enters the assessment of intervention effectiveness, according to the HBM.

A third possible explanation is that mothers may have assumed that imagery was effective because there was no child behavior described in the transcript. An attempt to avert this assumption was made by forewarning the NOINFO readers that child behaviors had been purposely excluded from the transcript. However, mothers may have relied on the behavior of the mother and staff in the transcript as indicators of imagery's effectiveness in controlling child distress and, as there was no indication in the transcript of distress, may have assumed that imagery was indeed effective. Referring to this absence of information as nonevents, Ross (1977) points out that many judgements are based, at least in part, on the nonoccurrence of certain events. However, because nonbehavior is generally less

available and salient than actual behavior, actual noninfluential events (e.g., content of the imagery intervention) in this transcript are more likely to be used for judgements than events that have not occurred (Nisbett & Ross, 1977). Given that subjects in the pilot group with the same introduction to the transcript rated the intervention as neutral in effectiveness information, this explanation is less plausible than the previous two explanations.

An integration of these alternate explanations likely provides the strongest account of the increase in predicted effectiveness for mothers in the NOINFO condition. Cues generated from Part I of the investigation likely triggered mothers to use a data gathering approach in reading the transcript, and effectiveness judgements were then based on a cost-benefit analysis provided to a large extent by actual details of the implementation of imagery (e.g., inferring skill level required) and perhaps to a lesser extent by the nonoccurrence of events indicating child distress.

Turning to the main question of Study 4, the results confirmed Hypothesis 1; mothers' acceptability attitudes improved after exposure to an effective implementation of imagery, declined after exposure to an ineffective implementation, and remained stable with exposure to no effectiveness information. Descriptive data reporting the proportion of individual mothers whose acceptability attitudes reliably changed from pretest to posttest corroborate these results. By demonstrating that effectiveness information can alter acceptability attitudes, Study 4 extends previous research demonstrating that

interventions described as strong or effective are viewed as more acceptable than interventions described with no effectiveness information (Tingstrom, 1990; Tingstrom et al., 1989), or interventions described as weak or ineffective (Clark & Elliott, 1988; Kazdin, 1984, Tingstrom et al., 1989). Study 4 also extends previous research demonstrating that acceptability attitudes can be improved with education (Singh & Katz, 1985; Tingstrom, 1989) and specifies effectiveness information as one mechanism of education.

Given Study 4's attempt to provide mothers with a realistic experience of imagery's implementation incorporating effectiveness information, the findings are also considered in light of studies where parents assess treatment acceptability before and after actual experience with interventions. Consistent with the results of this study, and supporting the relationship between acceptability and effectiveness, Reimers and Wacker (1988) found that one month after implementing a recommended intervention, treatment effectiveness had the largest and only influence on parents' acceptability attitudes (r = .90), compared to ratings of willingness to implement the intervention, disruption caused by the intervention, and time needed to implement the intervention. Alternatively, two studies have failed to support the relationship between acceptability attitudes and effectiveness as found in Study 4. Although both Liu et al. (1991) and Johnston and Fine (1992) found that all parents became more accepting of a pharmacological intervention for their child's hyperactive behavior after experience with the intervention, acceptability was unrelated to effectiveness of the

These failures to demonstrate a relationship intervention. between acceptability attitudes and experience with an intervention's effectiveness may be attributable to a restricted range of initial acceptability attitudes in samples biased in favour of the treatment. In both studies, parents unwilling to consider medication (i.e., with low acceptability ratings) would not have participated. To illustrate, of the 46% of the mothers who did not complete the post-intervention assessment in the Liu et al. study, 75% indicated that they had not complied with the treatment recommendation. In addition, most children (75%) in the Johnston and Fine (1992) study were judged improved on medication; therefore experiences with the ineffectiveness of the intervention were likely not well represented. In contrast, the present analogue investigation permitted systematic variation of experience with the effectiveness of an intervention, although it was only a single experience, and attrition due to low initial acceptability attitudes was not problematic. Thus, one could argue that Study 4 provides a stronger test of the influence of effectiveness information upon acceptability attitudes than the studies with negative findings.

Effectiveness information also influenced evaluations of the intervention along dimensions other than acceptability attitudes, providing additional support for the conceptual model of treatment acceptability. Exposure to an effective implementation of the intervention resulted in more positive global evaluation of the intervention, increased predicted self-efficacy in implementing the intervention, and increased probability of choosing the intervention. Exposure to an ineffective

implementation of the intervention resulted in a decline in the likelihood of choosing the intervention and trends in the data revealed less positive evaluations and decreased self-efficacy in performing the intervention. Providing an example of the intervention without effectiveness information did not alter the intervention's general evaluation, likelihood of selecting the intervention, or self-efficacy. Generally, these evaluations are consistent with changes noted in acceptability attitudes and provide additional support for linking these variables in the conceptual model of acceptability.

The effects of providing contrary effectiveness information upon acceptability attitudes for mothers with initially lower or higher acceptability attitudes were examined. For mothers who initially viewed imagery as marginally acceptable, presenting either an example of imagery's implementation without effectiveness information or with positive effectiveness information led to improvements in acceptability attitudes. For mothers with initially higher acceptability attitudes, although the NOINFO condition exerted no effect, presenting one example of imagery's ineffective implementation was sufficient to lead to less positive acceptability attitudes. Together with the RCI results found in the entire sample, this finding suggests that ineffectiveness information may have greater salience than effectiveness information. It should be noted that, although acceptability attitudes declined with ineffectiveness information, mothers continued to view imagery as well within the acceptable range at the post assessment. Implications of these results are discussed in the final discussion.

Finally, gender effects in this study indicated that imagery was viewed as more acceptable and effective when mothers read the female versus the male stimulus materials, disconfirming Hypothesis 2. Previous research systematically varying gender of the child has not found differences in acceptability or effectiveness predictions for behavioral management interventions (Norton et al., 1983). Other than Study 3 where no differences were found, gender differences in parent ratings have not been investigated in studies of the acceptability of pain management interventions. The final discussion considers the effects of gender of rater and gender of stimulus materials in greater detail and offers suggestions for further research.

### GENERAL DISCUSSION

This final discussion is divided into four sections that integrate and interpret the results of this research program. The sections address the major goals of the research program, secondary research findings, potential limitations of the research program, and clinical implications.

# RESEARCH PROGRAM GOALS

### Acceptability Questionnaire

The first purpose of this research program was to develop a psychometrically-sound acceptability measure suitable for assessing interventions for pediatric pain and distress and useful for research and clinical applications. High coefficient alpha estimates, ranging from .89 to .94 across Studies 1, 2, and 3, demonstrate that the AQ is an internally consistent instrument and comparable to other treatment acceptability measures with alpha estimates ranging from .89 to .98 (Harris et al., 1990; Kelley et al., 1989; Witt & Martens, 1983; Witt & Elliott, 1985). Assessment of test-retest reliability indicates that the AQ is reliable, at least when assessed for one intervention over a oneweek period, suggesting that acceptability attitudes are relatively stable. Finally, analyses of the AQ demonstrate that it differentiates among alternative interventions for reducing pediatric pain and distress. Owing to the AQ's homogeneity of items, reliability, and ability to differentiate among interventions, it appears to be a useful research tool for assessing acceptability attitudes towards pediatric pain management interventions and as a means for advancing an understanding of the construct of treatment acceptability.

Although the AQ has demonstrated utility as a research instrument in this program of studies, further research is needed to examine its test-retest reliability over a longer time interval, its application to other invasive medical procedures and interventions, and its clinical usefulness in consulting with parents, children, and medical staff. As noted by Kelley et al. (1989), length and readability may impinge upon the social validity of acceptability measures; both warrant additional consideration with the AQ.

## Validity of the Treatment Acceptability Construct

A second purpose of this research program was to develop and extend the construct of treatment acceptability. The fact that a primary factor reflecting general acceptability attitudes emerged through factor analyses of the original AQ item pool, lends support to the construct of acceptability and corroborates factor analytic studies of other acceptability measures (Kelley et al., 1989; Harris et al., 1990, Witt & Elliott, 1985). Five additional acceptability factors on the AQ were not retained for data analyses in this research because they appeared to be secondary relative to the first factor in eigenvalues, proportion of variance accounted for, and interpretability. As noted in Study 1 and in the literature (e.g., Kelley et al., 1989; Witt & Elliott, 1985), these secondary acceptability factors require further examination to determine whether treatment acceptability is best seen as a unitary or multifactor construct.

Providing convergent validity and supporting predicted relationships, acceptability attitudes were highly correlated with effectiveness predictions, general evaluations of the

interventions, and anticipated treatment selection; and modestly correlated with predicted self-efficacy in conducting the interventions. Correlations were of such magnitude to suggest that treatment acceptability is related to, but unique from, constructs such as effectiveness, general evaluation, treatment selection, and self-efficacy. Generally, acceptability attitudes were unrelated to judgements of an intervention's potency or activity, suggesting that acceptability, activity, and potency are distinct, unrelated attributes of an intervention. The robust nature of these correlational relationships is apparent in their replication across three independent investigations varying in research design and stimulus materials, and across sample populations that varied substantially in age, parenting status, education, and ethnicity. The treatment acceptability construct is further substantiated by the demonstration in Study 4 that systematic variation of effectiveness information had the predicted impact upon acceptability attitudes.

Finally, this program of research further strengthens the construct of treatment acceptability by extending the research area beyond the evaluation of behavioral interventions for externalizing child behavior problems in clinical and educational contexts, to a range of psychological and pharmacological interventions applied for pediatric pain. This context provides an opportunity to test the generalizability of the hypothesized relationships between treatment acceptability and other variables. Confirming previous treatment acceptability studies, potential consumers distinguished among various psychological and pharmacological pain management interventions on the basis of

their acceptability, and rated accelerative interventions as more acceptable than reductive interventions. The strong associations between acceptability attitudes and predictions of treatment efficacy and general evaluation of interventions found in the study of child behavior problems (e.g., Elliott & Treuting, 1991; King & Gullone, 1990), also extends to the evaluation of pain management interventions. New links were also established among acceptability attitudes, anticipated treatment selection, and predicted self-efficacy in implementing the intervention. These associations will be discussed in reference to the HBM in the following section.

Having accomplished the goal of broadening the treatment acceptability construct, a number of suggestions for future research directions are offered to further advance the construct of acceptability. Given that confidence can be placed in the reliability of the AQ when completed for one intervention, further validation work is necessary. Suggestions include contrasting groups expected to differ in acceptability attitudes (e.g., groups with high and low knowledge of behavioral principles, parents with positive and negative experiences with an intervention) to determine whether the AQ is able to distinguish among groups; and correlating the AQ with other selfreport acceptability measures less specific to pediatric pain management interventions (e.g., the TEI Short-Form, Kelley et al., 1989) and other behavioral indicators of treatment acceptability (e.g., medical staff signing up for a workshop on pediatric pain management). The area of pediatric pain provides a fruitful area for continuing examination of the

generalizability of the acceptability construct. Extensions include examining other invasive procedures (e.g., venipunctures, dental procedures), characteristics of the procedures (e.g., frequency and duration), other pain management interventions (e.q., pharmacological interventions such as midazolam, cognitive-behavioral intervention packages), other consumer groups (e.g., medical staff, children, fathers, parents of ill children), different rater characteristics (e.g., parental anxiety, knowledge of behavioral principles), and alternate research methodologies (e.g., videotape demonstrations of actual clinical cases and interventions as stimulus materials). Further research is also needed to relate treatment acceptability to actual client behavior such as the degree to which an intervention is implemented as planned (Gresham, 1989), compliance with the intervention, and consumer satisfaction. The HBM as a Framework for Conceptualizing Treatment Acceptability

The third goal of this research program was to explore the utility of conceptualizing treatment acceptability within the theoretical framework of the HBM. Review of the acceptability literature noted that the area is built on the premise that acceptability attitudes influence a number of outcome variables including whether the treatment is selected, and if so, client motivation, compliance, attrition, and satisfaction. Other than this network of associations, the orientation of the research area has been pragmatic and without a theoretical framework. The HBM provides a clinically relevant framework for organizing and conceptualizing previous treatment acceptability research and for

generating new directions for investigation (e.g., relationships between self-esteem and acceptability attitudes). Results of this research program support predictions made from the proposed conceptual model of treatment acceptability linking acceptability with predicted effectiveness, treatment selection, and selfefficacy. Acceptability attitudes were highly correlated with predicted effectiveness, and varying effectiveness information impacted upon acceptability attitudes in the predicted directions. More positive acceptability attitudes towards a proposed pain management intervention were associated with greater feelings of self-efficacy in implementing the intervention and higher ratings of treatment choice. Higher ratings of treatment choice were also associated with greater feelings of self-efficacy in implementing the intervention. Thus, demonstration of these relationships lend support to the conceptual model of acceptability.

Given these relationships, the proposed conceptual model of treatment acceptability (see page 56) accurately represents the results of this research program and suggests an additional link between self-efficacy and treatment selection. Due to the use of correlational analyses in Studies 1, 2, and 3, results do not demonstrate causality, and it is best to assume at this time that relationships among acceptability, predicted effectiveness, selfefficacy, and treatment selection are bidirectional. Because effectiveness information was experimentally manipulated, results of Study 4 do imply that changing effectiveness information impacts on self-efficacy, treatment acceptability, and treatment selection. Across the studies, gender of the rater was the only

rater characteristic shown to be related to predicted effectiveness and possibly treatment acceptability (Study 1); however this finding warrants further investigation. As outlined, this conceptual model offers additional research avenues. For example, other psychosocial variables that may influence treatment acceptance include attributions regarding the characteristics of the problem behavior and psychological mindedness. Although not specifically addressed in this research program, perceived vulnerability may also be addressed in attempts to explain potential differences among consumer groups in their views of treatment acceptability and treatment selection.

In short, the proposed conceptual model of acceptability adopted from the HBM appears beneficial as a catalyst for the treatment acceptability field and it is hoped that it continues to be useful in guiding acceptability research. Its adequacy as a theoretical model will depend on the results of research that assesses the relationships among other components of the model such as acceptability and perceived vulnerability (e.g., comparing acceptability attitudes of parents of well versus ill children), rater characteristics (e.g., differential gender expectations of the expression of pain and distress), treatment selection, and use. Undoubtedly, integration of other relevant theoretical perspectives such as theories of informationprocessing, decision-making, and attitude change (e.g., Janis & Mann, 1977; McGuire, 1985; Petty & Cacioppo, 1981) will also serve to enhance the model's applied value.

## Relationship between Acceptability Attitudes and Effectiveness

The fourth goal of this research program was to examine the relationship between acceptability attitudes and perceived efficacy and to specify how effectiveness information functions to influence acceptability attitudes. Consistent with previous research (Elliott & Treuting, 1991; King & Gullone, 1990), Studies 1, 2, and 3 confirmed the strong association between acceptability attitudes and perceived effectiveness.

Previous research has shown that, at least for undergraduate students, acceptability attitudes improve with education (Singh & Katz, 1985; Tingstrom, 1989). In these studies, education consisted of lectures describing the interventions, effectiveness of the interventions, case illustrations, and general learning principles. As with studies examining parents' attitudes before and after actual experience with a recommended intervention (Johnston & Fine, 1992; Liu et al., 1991), all interventions were evaluated more favourably after the educational experience. Unfortunately, these studies have not specified precisely the variables responsible for attitude change. Study 4 extends this literature by demonstrating one mechanism sufficient to alter acceptability attitudes. Exposure to an effective implementation of a psychological intervention improved acceptability attitudes and exposure to an ineffective implementation resulted in less positive acceptability attitudes.

It is argued that Study 4 provides a stronger test of the impact of effectiveness information upon acceptability attitudes than two previous studies that failed to establish a relationship between acceptability attitudes and treatment effectiveness

(Johnston & Fine, 1992; Liu et al., 1991). In both of these studies, parents assessed treatment acceptability before and after actual experience with an intervention designed to modify their child's disruptive behavior. The failures to find relationships between acceptability attitudes and treatment effectiveness in these studies may be due to a restricted range of initial acceptability attitudes in samples that were biased in favour of treatment; subjects unwilling to consider medication would not have participated. For example, Liu et al. (1991) noted that 46% of the original sample did not complete the postintervention assessment. Of these, 75% indicated that they had not complied with the treatment recommendation. The findings of these studies might also have been limited due to a restricted range of treatment effectiveness. For example, most children (75%) in the Johnston and Fine study (1992) were judged to be improved on medication. In comparison, Study 4 included a relatively wide range of initial acceptability attitudes and systematically varied effectiveness information. Alternatively, the lack of congruence between the results of Study 4 and the Johnston and Fine (1992) and Liu et al. (1991) studies may be attributable to differences in the child behavior problem, the interventions evaluated, and/or the duration of experience with the intervention. Future research is needed to address the extent of generalizability of Study 4's results to naturalistic contexts and to the impact of repeated and perhaps varied experiences with an intervention's effectiveness.

The results of Study 4 offer important implications for mental health professionals serving as consultants to the direct

consumers of pediatric pain management interventions--medical staff, parents, and children. As demonstrated in this and other research, interventions perceived as more acceptable are more likely to be viewed as effective, selected for use, and associated with feelings of self-efficacy in implementing the intervention. Because of these relationships, one goal consultants are likely to have is to improve the acceptability attitudes that parents and medical staff hold towards recommended interventions. Assessing potential consumers' attitudes towards recommended interventions therefore becomes an important task. The present research suggests that providing potential consumers with a detailed example of the intervention's effective application will improve acceptability attitudes, as may simply providing the same informative example without specific effectiveness information. In pediatric settings, such examples and effectiveness information could be provided to parents and medical staff most realistically by a videotape presentation.

In applied settings, consultants rarely wish to intentionally diminish acceptability attitudes towards a recommended intervention. However, consultants need to be aware that acceptability attitudes can decline following minimal exposure to an ineffective implementation of an intervention. For example, in a pediatric medical setting, it would not be unusual for parents to share with other parents their experiences with the effectiveness of recommended interventions or for medical staff to exchange information regarding their experiences with the effectiveness of interventions. Although the present results do not address the impact of repeated or varied

experiences with the effectiveness of an intervention or the duration of attitude change, they do prompt speculation regarding reasons for the underutilization of psychological and pharmacological pain management interventions (Hockenberry & Bologna-Vaughan, 1985; Schechter, 1989). Given the known variability in the effectiveness of pediatric pain management interventions, it is quite likely that both parents and medical staff will encounter at least some instances in which these interventions fail to be effective. If ineffective experiences with a pain management intervention are more salient than effective instances, it might be expected that medical staff's and parents' acceptability attitudes will be adversely affected, resulting in a failure to recommend or implement these interventions. This possibility underscores the need to educate potential consumers of the variability of psychological pain management interventions. Further research is needed to evaluate actual consumers' (i.e., medical staff, parents of distressed children, children) evaluations of interventions and to address the impact of repeated experiences with the effectiveness of an intervention.

### SECONDARY RESEARCH FINDINGS

In addition to addressing the goals of the research program, the four studies provided the opportunity to examine order of presentation effects, the acceptability of various pediatric pain management interventions, and potential gender differences in evaluations. These findings are briefly reviewed.

# **Order Effects**

The presence of order effects in Study 1 indicated that reading and evaluating one pain management intervention influenced the evaluation of subsequent interventions. As noted previously, within-subjects designs are commonly employed in the assessment of acceptability attitudes. In previous research, order effects have either not been reported (e.g., King & Gullone, 1990; Lobacz & Little, 1991; Tarnowski, Gavaghan, & Wisniewski, 1989; Tingstrom et al., 1989) or have not been detected (e.g., Kazdin et al., 1981; Mittl & Robin, 1987; Pickering et al., 1988; Singh, Watson, & Winston, 1987). As far as can be ascertained from the literature, no other study has reported the presence of order and carryover effects. The unexpected order effects found in this research are of obvious importance to the field of treatment acceptability where consumer attitudes may be differentially influenced by the presentation order of alternative interventions. Not only is there a need to more fully investigate the impact of presentation order on acceptability attitudes, there is also a need to determine what is typical practice from the consultant's perspective in order that the research has ecological validity. Of the effective interventions available, do consultants recommend only the one intervention they find most acceptable, the one they believe matches the client best, or do consultants recommend all effective interventions? It is in the last instance that order effects will prove most important in their practical implication.

## Intervention Evaluations

Consistent with the results of previous acceptability studies (e.g., Cross Calvert & McMahon, 1987; Elliott et al., 1984), this series of studies provides evidence that accelerative interventions are evaluated as more acceptable than reductive interventions for the management of pediatric pain. Both students' and parents' acceptability ratings of attentiondistraction, breathing, and imagery were in the acceptable range and all were rated similarly. Students' acceptability ratings of ignoring and reprimands were clearly in the unacceptable range and not different from each other. Overall, these findings are consistent with the only other study to assess the acceptability of interventions for pediatric pain (Tarnowski et al., 1989) where extinction (i.e., ignoring) was rated as an unacceptable intervention, and a self-management procedure, consisting of muscle relaxation, imagery, and breathing techniques, was rated as the most acceptable intervention. This similarity in relative positions of interventions across this and previous research is notable given that the interventions were evaluated as applied to different pediatric pain management problems with different populations of evaluators.

With regards to the acceptability of a pharmacological intervention, across Studies 1, 2, and 3, oral Valium was consistently evaluated in the acceptable range, above the reductive interventions. When compared to accelerative interventions, oral Valium was evaluated as similar in acceptability in Studies 1 and 3, and only students in Study 2 evaluated oral Valium as less acceptable than the accelerative

interventions. Similar to the relative rankings of Study 2, the Tarnowski, Gavaghan, and Wisniewski (1989) study also found that a pharmacological intervention was rated as more acceptable than extinction (i.e., ignoring) but less acceptable than the accelerative interventions. However, contrary to Study 2, in the Tarnowski, Gavaghan, and Wisniewski (1989) study, the nurse raters placed the pharmacological intervention in the unacceptable range. These differences may be attributable to differences in rater groups, type of pharmacological intervention, pediatric pain problem, and research design. The acceptability of medication may also depend upon attributions made regarding the pain etiology. Tarnowski, Gavaghan, and Wisniewski (1989) found that nurses rated a pharmacological intervention as more acceptable for an organically caused pain problem as opposed to a nonorganically caused pain problem. Similarly, laypersons considered parents of an attention deficit disordered child less justified in placing and continuing their child on psychotropic medication than the parents of an epileptic child showing the same disruptive behavior (Summers & Caplan, 1987). Understanding how parents and medical staff attribute etiology of pain problems may prove helpful in understanding the obstacles to implementing pharmacological and psychological interventions in medical settings. In this regard, the attribution literature (e.g., Weiner, 1985) may offer a useful starting point in stimulating this type of research.

# Gender of Rater

Because Studies 1 and 2 utilized both male and female undergraduate students, data analyses examined whether gender of

the rater influenced the evaluation of pediatric pain management strategies. In both studies, similar rank orderings of interventions were obtained across genders on all measures. Significant gender differences were found in Study 1 on measures of perceived effectiveness and global evaluation, with males viewing reprimands as more effective and favourable than females. Gender differences in ratings of acceptability attitudes approached statistical significance. Study 2 failed to reveal significant gender effects. Due to changes in research design from Study 1 to Study 2, reprimands were not evaluated in Study 2 and fewer subjects evaluated interventions; consequently Study 2 had less power to detect differences should they exist. Although only a few studies in the treatment acceptability literature have systematically examined gender differences, at least three studies support the conclusion that males and females may evaluate interventions differently. Kazdin (1980a) found that undergraduate males rated shock as more acceptable and reinforcement as less acceptable than did females. In a parent population, Miller and Kelley (1990) found gender differences as well, although the distinction between accelerative and reductive interventions was not as clear. Fathers favoured spanking and medication over mothers, whereas mothers favoured positive reinforcement, response cost, and time out over fathers. In terms of effectiveness ratings, Peterson et al. (1988) found that male undergraduate students rated strategies for preparing children for stressful medical procedures as more effective than did female students and gender of the rater interacted with age of the target child. Taken together, these studies suggest that

males and females may view interventions differently, but at this point, there is no clear understanding of the intervention characteristics that account for these differential evaluations. Additional research is needed because gender differences may hold important implications for treatment decisions.

# Gender of Stimulus Materials

Male and female versions of the stimulus materials in Studies 3 and 4 permitted the examination of potential gender differences of the acceptability of pediatric pain management interventions. However, results were inconsistent across studies. Whereas, Study 3 found no differences in acceptability ratings as a function of gender of the stimulus materials across three interventions, Study 4 found that imagery was viewed as more acceptable and effective when mothers read the female versus the male stimulus materials. To explore the potential for gender differences specific to imagery in Study 3, a separate ANOVA on AQ scores was conducted contrasting ratings of imagery for boys versus girls and no significant differences were found. Indeed, visual inspection of the means noted, contrary to Study 4, that imagery was viewed as less acceptable and effective when mothers read the female versus the male stimulus materials. These inconsistent findings are puzzling given the similarity in sample groups and research design, and further replication is necessary before confidence can be placed in either set of results.

One possible approach to examining gender and rater differences involves exposing mothers and fathers to identical stimulus materials (e.g., written case vignette or transcript such as used in Study 4) varying only the child's gender and

having parents evaluate the child's pain and distress, their perception of the need to intervene, and personal vulnerability. Not only would this investigation address gender issues, but it would allow further exploration of the conceptual model of treatment acceptability.

LIMITATIONS OF THE RESEARCH PROGRAM

## Analogue Methodology

A limitation of the present research program is its analogue methodology including the use of undergraduate students and mothers of healthy children as raters of acceptability; paperand-pencil measures; and written stimulus materials. For pragmatic reasons, undergraduate students were selected because the psychometric goals of Studies 1 and 2 called for relatively large sample sizes. Although concerns regarding the generalizability of results from student evaluations to more direct consumers of treatment have been previously stated, studies comparing student and parent evaluations have noted similar rankings (Cross Calvert & Johnston, 1988; McMahon et al., 1989). Therefore, the use of student samples for pilot and instrument development purposes was considered justified. It is of interest to note that despite clear differences in ethnicity, age, education, and parenting status, students and parents in these studies provided similar evaluations of interventions (as noted by visual inspection of mean ratings). For example, approximately one-third of the students in Studies 1 and 2 described their ethnicity as Asian whereas all of the mothers in Study 3 described their ethnicity as Canadian or British, yet, differences in average AQ ratings were minimal. For attention-

distraction, average AQ ratings only ranged from 41.8 (students) to 42.6 (mothers). The maximum difference appeared on ratings of oral Valium, but only ranged from 37.0 (students) to 41.8 (mothers).

The choice of parents who were not active consumers of pain management interventions in Studies 3 and 4 also limits the external validity of the results. Because the goal of Study 4 was to examine the role of effectiveness information in the modification of acceptability attitudes, it was important to have subjects who were relatively naive about the effectiveness of alternative interventions for child pain management. Therefore, parents of children without experience with painful medical procedures were selected over parents of children undergoing painful medical interventions. As in Studies 1 and 2, this choice favored internal over external validity. Parents of children faced with upcoming invasive medical procedures would be a logical next population with which to extend this area of investigation.

The present set of studies relied upon paper-and-pencil measures to evaluate the interventions presented and thus, the results are subject to the limitations of self-report measures (e.g., subject biases, social desirability). For example, the TC measure was included as a preliminary means to assess treatment selection given that the link between acceptability attitudes and treatment selection has been widely stated but not been empirically investigated. Although the TC measure provided an estimate of behavioral intention, the strength of the relationship between self-reports of intentions and actual

behavior has been the subject of extensive research. Summarizing much of this research, Fishbein and Azjen (1975) suggest that intentions can accurately predict behavior if the behavior, object, situation, and time are measured at the same level of specificity and if the measure of intention reflects intention at the time the behavior is measured. Based on these conclusions, the use of the TC measure as a preliminary predictor of behavior was seen as reasonable. Future research should consider supplementing or replacing self-report measures with behavioral indicators that are separated in time from the assessment of acceptability. For example, as a measure of treatment acceptability and choice, parents in a pediatric setting could indicate their intervention preference for an upcoming parent education workshop.

Within the limits of the analogue methodology, efforts were directed towards maximizing the external validity of the studies by creating written materials to be as realistic and meaningful to the raters as possible (Berkowitz & Donnerstein, 1982). The transcript materials used in Study 4 were based on actual videotapes and in vivo observations of BMA procedures. Knowledgeable health professionals rated the transcript materials, case vignette, and intervention descriptions as accurate, complete, and realistic. Attempts to maximize the meaningfulness of the materials included personalizing the materials (Studies 3 & 4), encouraging subjects to give serious consideration to the written materials and their responses, and stressing the importance of reporting their honest opinions towards the intervention. However, the degree to which these attempts were successful is unknown.

The decision to utilize potential consumers of pediatric pain management interventions, paper-and-pencil measures, and written materials serves to increase internal validity but simultaneously limits the generalizability of the obtained findings. However, as has been argued in the review of the treatment acceptability literature, it was considered appropriate at this time to direct research energy towards construct and theory development in treatment acceptability. With this accomplished, the issue of external validity can now be more appropriately addressed.

### Additional Generalization Issues

Caution is advised before extending the findings of this research program to other pediatric pain problems, pain management interventions, or to more direct consumers of interventions. This set of studies examined a limited range of interventions applied for a specific medical procedure and a child of a specific age. Whether these results extend to other invasive medical procedures that vary in frequency and duration (e.g., venipunctures, burn debridement), other interventions, or to other age groups is unknown. Similarly, it is unknown whether these results extend to more direct consumers of interventions, that is, parents of children undergoing painful medical procedures, children undergoing painful medical procedures, children undergoing painful medical procedures, the procedures. A logical next step is to demonstrate the relationships between acceptability and effectiveness predictions, self-efficacy, and anticipated treatment selection within these populations.

Furthermore, due to selection criteria and sampling procedures, it is likely that the parent samples in Studies 3 and 4 underrepresented single parents, mothers with lower educational achievement, and parents whose ethnicity was not Canadian. Even though exploratory correlations between dependent measures and various demographic variables failed to identify significant relationships, two other studies have shown a relationship between acceptability attitudes towards child management interventions and parent income (Heffer & Kelley, 1987; Kelley et al., 1990). In these studies, the acceptability of a reductive child management strategy (spanking) increased as family income decreased. Future research examining the acceptability of pediatric pain management interventions should consider utilizing a sample with a wider range of demographic characteristics. IMPLICATIONS FOR CLINICAL PRACTICE

Due to the analogue nature of the present research, clinical prescriptions must be made with caution. However, the following tentative implications are offered to consultants in pediatric settings.

1. It appears that commonly used strategies to promote child coping, such as imagery, diverting the child's attention, and deep breathing are viewed as appropriate and effective ways to help children cope with the distress associated with painful medical procedures. Similar to these strategies, a pharmacological treatment is also viewed as acceptable and effective. This information can provide assurance to parents and
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medical staff that others have found these strategies appropriate. Strategies that attempt to reduce the child's expression of pain and distress, such as ignoring and reprimands, are seen as unacceptable and ineffective. Unless these strategies can be shown to be markedly superior in effectiveness to more acceptable strategies, their use is not recommended.

2. Prior to recommending any intervention, it may be important to consider how the potential user views the intervention's appropriateness. These views are related to expectations about how well the intervention will work, likelihood of using the intervention, and estimations of confidence in carrying out the intervention. These in turn, may influence outcome. Although further research is required to assure its applicability to other medical procedures, interventions, and consumers, the AQ may provide a useful means for assisting consultants appraising potential users' views towards interventions before recommendations are made. In this way, consultants can recommend interventions that are both effective and acceptable, with the goal of maximizing successful outcomes.

3. When faced with parents or medical staff with less than enthusiastic views towards a recommended strategy, one approach to improving these views is to present a detailed example of the intervention's successful use. In a pediatric setting, such examples could be incorporated into an informational videotape presentation showing the effective use of the intervention for the specific medical procedure. These informational videotapes could be made available to medical staff, children, and their parents prior to selecting an intervention or as part of training to implement the intervention.

4. Finally, consultants need to be aware that consumers' views are adversely influenced by information concerning the ineffectiveness of an intervention. As shown in Study 4, views towards an intervention can decline with only one example showing its' ineffectiveness in helping a child cope with the distress of a painful medical procedure. This finding emphasizes the need to educate potential users (i.e., the child and his/her family, medical staff) that the effectiveness of an intervention can vary. For any individual child, effectiveness can vary over time and no intervention will be effective with all children. Hopefully, such educational efforts will prevent the deterioration of acceptability attitudes.

In conclusion, the present research program extends the generalizability and construct validity of treatment acceptability by examining the acceptability of pharmacological and psychological interventions for the reduction of pediatric pain associated with invasive medical procedures. A conceptual model of treatment acceptability adopted from the HBM offers a useful framework for organizing previously conducted acceptability research and generating new research directions. Finally, the research program advances our understanding of the relationship between treatment acceptability and effectiveness by demonstrating that effectiveness information can alter acceptability attitudes. Given the documented underutilization of pediatric pain management strategies (Hockenberry & Bologna-Vaughan, 1985; Schechter, 1989) and the importance of maximizing positive treatment outcomes, the present research offers important implications for educating potential consumers about interventions and their effectiveness.

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#### APPENDIX A

#### Instructions

This portion of the study investigates your reactions to different interventions used to help children cope with painful medical procedures. Attached is a description of a child undergoing a painful medical procedure and six different interventions to help the child cope with the procedure. Following each intervention is a rating scale that assesses your perceptions and reactions to the intervention.

#### <u>Case Vignette</u>

Up until a few months ago, Kim was a healthy, active 5 year old boy. Kim's parents began to notice that he was very pale, bruised easily, and complained of being tired and achy. After ruling out more common illnesses, Kim's family doctor referred him to a specialist and he was diagnosed as having leukemia, a potentially life threatening cancer of the blood and bone marrow.

Kim's treatment was very intensive with the goal of bringing about a remission (absence of leukemia cells and symptoms of the disease). Kim found that his treatment included many painful procedures such as bloodtests, injections, and bone marrow aspirations (BMAs). Most children with cancer report that the Bmas are the most painful and traumatic events of their entire treatment and Kim agreed! Until he reached remission, he needed a BMA approximately every other week to determine the status of the disease and the effectiveness of the treatment. Once in remission, the BMAs would be less frequent but still necessary as a way of checking that the cancerous cells had not returned.

A bone marrow aspiration (BMA) is a diagnostic procedure lasting about 15-20 minutes and involves the insertion of a large needle into the bone, usually in the hip bone, through which a small amount of bone marrow is suctioned out to determine the presence or absence of cancer cells. During the BMA, it is necessary for the child to lie on his stomach, absolutely still. Three sources of pain are typically reported during the procedure:

1. A sharp stinging pain as the needle pierces the skin.

2. A heavy pressure pain as the needle penetrates the bone covering.

3. An intense pain as the marrow of the bone is suctioned into the syringe.

Although the doctor could give Kim a local anesthetic that anesthetizes the skin surface, Kim disliked getting another needle and it didn't change the pain associated with the bone marrow removal. His parents wondered why he couldn't have a general anesthesia; however, the medical staff were reluctant to give general anesthesia due to the significant additional risks associated with its use, especially with young children.

When Kim knew a BMA was coming up, he was restless, cried often, and had a difficult time getting to sleep. On the day of the procedure, Kim was sick to his stomach and occasionally vomited. As you would expect, he begged his parents and the medical staff not to have to go through with the BMA. Kim also found it very difficult to hold still during the procedure. He screamed, kicked, and fought and eventually it was necessary to hold him down until the procedure was over. This, of course, was trying for everyone--the doctor, nurses, Kim's parents, and especially Kim. Everyone agreed that Kim's anxiety before and during the procedure made the pain worse. Instead of getting better with each procedure, Kim's distress was getting worse.

Everyone agreed that something needed to be done to help Kim cope with the painful BMA procedure.

## APPENDIX B

### Intervention Descriptions

## Attention-Distraction

An intervention that has been used with other children is known as <u>Attention-Distraction</u>. It was reasoned that Kim was over focussing his attention on the events of the BMA and his bodily sensations, which resulted in greater anxiety and an amplification of the pain. In practice sessions beforehand, and during the next BMA, Kim was guided in the refocussing of his attention onto other activities such as playing "I spy", counting objects, looking at pop-up storybooks or pictures, playing a game, or looking through a kaleidoscope.

#### Breathing Exercises

An intervention that has been used with other children is known as <u>Breathing Exercises</u>. It was reasoned that Kim needed to learn some physical strategies to help his body be more relaxed and less anxious. In practice sessions beforehand, and during the next BMA, Kim was guided to take a deep breath in and to let it out slowly, and to continue doing this by breathing in deeply, slowly, and regularly. To make this task more visual and appealing to him, Kim blew bubbles and blew on a pinwheel.

## Ignoring

An intervention that has been used with other children is known as <u>Ignoring</u>. It was reasoned that Kim was receiving a lot of attention for the way he was presently handling the Bmas. His parents and the medical staff fussed over him, and tried to reassure him during the procedure. During the next BMA, everyone involved did not give any attention at all to Kim's complaints and behavior until it stopped. They looked away and didn't talk to or physically comfort Kim when he was crying, screaming, or grimacing.

#### Imagery

An intervention that has been used with other children is known as <u>Imagery</u>. It was reasoned that if Kim used his imagination to focus on something he found very pleasant and involving, he would be less able to focus on the pain. In practice sessions beforehand, and during the next BMA, Kim was guided on a "magic carpet ride" where he imagined floating on a carpet high in the sky, seeing his favorite people and places. He was instructed to picture these people and places as clearly as he could.

## <u>Oral Valium</u>

An intervention that has been used with other children is known as <u>Oral Valium</u>. It was reasoned that a drug such as Valium could decrease some of the physiological responses associated with Kim's anxiety and distress (e.g., increased heart rate and respiration). Valium is a sedative drug and can be taken by mouth. To help Kim cope with the next BMA, Kim was given an appropriate dose approximately 30 minutes before the procedure so that the drug would reach its peak during the procedure and last 4 to 5 hours.

### Reprimands

An intervention that has been used with other children is known as <u>Reprimands</u>. It was reasoned that Kim was having difficulty controlling his thoughts, feelings, and behavior before and during the BMA, that these had become almost habitual, and that he needed extra help in gaining greater control of his reactions. During the next BMA, whenever he began to cry, scream, or resist, he was given a verbal cue in an authoritative and firm voice. These were statements such as, "Stop crying!", "No!", or "Hold still!"

## APPENDIX C

## Acceptability Questionnaire

You have just read about a child having difficulty coping with a medical procedure and a description of <u>(intervention)</u> to help the child <u>cope with the procedure</u>. Please evaluate the intervention by circling the number that best describes your agreement or disagreement with each statement. You <u>must</u> answer each question.

	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Slightly Agree	Ag	5 ree		Str	6 ong Agr	ly ee
					SD					SA
1. the	The inter child's d	vention is a istress.*	i good way t	to reduce	1	2	3	4	5	6
2. for proc	The inter children cedures (e	vention woul undergoing o .g., getting	d be inappo ther types needles, 1	copriate of medical (Vs).	1	2	3	4	5	6
3. situ	This inter ation desc	rvention is cribed.*	reasonable	for the	1	2	3	4	5	6
4. situ	I dislike ation.*	the interve	ention used	in this	1	2	3	4	5	6
5. with	It would h n other ch	be okay to u ildren.*	se this int	cervention	1	2	3	4	5	6
6. the	This inter child.	rvention is	cruel or un	nfair to	1	2	3	4	5	6
7. the	This is an child's s	n unacceptab ituation.*	le interver	ntion for	1	2	3	4	5	6
8. inte	I would no	ot suggest t to parents o	he use of t or staff.*	his:	1	2	3	4	5	6
9. inte	I would be ervention :	e willing to if I were he	carry out lping the c	this child.	1	2	3	4	5	6
10. for cult	The inter a variety ures).	rvention wou of children	ld be appro (e.g., dif	priate ferent ages	1 ,	2	3	4	5	6
11. for chil	This woul reducing t d.*	ld be an acc the distress	eptable int experience	ervention d by the	1	2	3	4	5	6
12. huma	This intennely.	ervention tr	eats the ch	nild	1	2	3	4	5	6

13. Most parents and/or staff would find this intervention suitable for the situation described.*	1	2	3	4	5	6
14. There are a number of risks associated this intervention.	1	2	3	4	5	6
15. This intervention is unlike those I have used myself in stressful situations.	1	2	3	4	5	6
16. It would be unacceptable to apply this intervention to individuals who are not given an opportunity to choose for themselves.	1	2	3	4	5	6
17. This intervention is suitable for children with other kinds of medical conditions.	1	2	3	4	5	6
18. This intervention is consistent with common sense or everyday ideas about ways of handling children's distress.	1	2	3	4	5	6
19. This intervention would be appropriate for other stressful, non-medical situations (e.g., music or sports competitions, school exams).	1	2	3	4	5	6
20. The intervention would likely result in negative side-effects for the child.	1	2	3	4	5	6
21. Overall, my general reaction to this intervention is positive.*	1	2	3	4	5	6

\*<u>Note</u>: These items were retained for data analyses and designated as the AQ.

# APPENDIX D

# Effectiveness Rating Scale

	SD					SA
1. The child's distress will increase once the intervention is discontinued.	1	2	3	4	5	6
2. Using this intervention should not only improve the child's distress with this medical procedure, but also in other stressful situations (e.g., getting needles).*	1	2	3	4	5	6
3. The intervention would improve the child's distress to the point that it would not be noticeably different from another child who was coping better.*	1	2	3	4	5	6
4. The intervention will prove ineffective in changing the child's distress.	1	2	3	4	5	6
5. The intervention is unlikely to reduce the child's distress for the next procedure.	1	2	3	4	5	6
<ol> <li>The child is unlikely to experience a reduction in distress during this procedure.</li> </ol>	1	2	3	4	5	6
7. The intervention should produce enough change so that the child's distress is no longer a problem in the medical setting.*	1	2	3	4	5	6
8. This intervention is unlikely to be effective.*	1	2	3	4	5	6
9. Other distressing behavior related to the procedure is unlikely to be improved by the intervention (e.g., anxiety before the procedure, trouble eating and sleeping).	1	2	3	4	5	6
10. The intervention could be applied to additional procedures and still be effective.*	1	2	3	4	5	6
11. The intervention would quickly alleviate the child's distress.	1	2	3	4	5	6
12. Soon after using the intervention the parent/staff would notice a positive change in the child's distress.*	1	2	3	4	5	6
13. It would be more difficult to complete the medical procedure when the child is using this intervention.*	1	2	3	4	5	6

14. Additional medical procedures will be 1 2 3 4 5 6 easier to complete when the intervention is applied.\*
15. Overall, the intervention would be 1 2 3 4 5 6 beneficial for the child.\*

\*<u>Note</u>: These items were retained for the analyses and designated as the ERS.

## APPENDIX E

## Semantic Differential

Please place a checkmark on the line that best describes how you would rate <u>(intervention)</u>. If it is difficult to rate, still try very hard to mark what you think of the plan. There is no need to spend much time on any one of the items as your first impression is what we would like.

1.	Good	 					 Bad
2.	Kind	 					 Cruel
3.	Pleasant	 	<del></del>		<u> </u>		 Unpleasant
4.	Valuable	 					 Worthless
5.	Fair	 			<i></i> _		 Unfair
6.	Strong	 <u></u>					 Weak
7.	Heavy	 			<u> </u>		 Light
8.	Hard	 			<del></del>		 Soft
9.	Large	 					 Small
10.	Thick	 . <u></u>	<u></u>	<del></del>			 Thin
11.	Active	 			<del></del>	<u> </u>	 Passive
12.	Hot	 					 Cold
13.	Sharp	 					 Dull
14.	Fast	 					 Slow
15.	Ferocious	 				<u> </u>	 Peaceful

# APPENDIX F

# Treatment Choice Ranking

Imagine Kim is about to undergo his next BMA and you need to select an intervention to help him. Of the six interventions you have read about and evaluated, please rank order your preferences where "1" would be your first choice, "2" your second choice, "3" your third choice, and so on until "6" is your least preferred choice.

Intervention	<u>Rank</u>				
Imagery					
Ignoring					
Breathing Exercises					
Oral Valium					
Reprimands					
Attention-distraction					

#### APPENDIX G

#### Effectiveness Information Transcript: Male Version

To provide you with more detailed information on BMAs and the use of <u>Imagery</u> as a coping technique, a child undergoing a BMA at BC Children's Hospital in Vancouver was videotaped. To ensure that the child's and family's confidentiality are maintained, the videotape has been transcribed and names have been changed. In order to reduce the length and complexity of what you are to read, the following transcript details only the BMA procedure and the use of <u>Imagery</u>. That is, portions of the videotape, such as discussions among the medical staff, have been excluded.

The "video" took place approximately one year ago in an examination room of B.C. Children's Hospital. The room has a large examining table that can be raised or lowered, bright lights overhead that can be positioned where needed, two stools for the doctor and parent to sit on, a small table where the supplies needed for the procedure are placed, and cupboards at the rear of the room that house medical supplies (e.g., sterile cloths, needles, syringes, drugs, glass slides).

Four people are present in the procedure room. They are Jamie, a 6-year old child diagnosed with leukemia about to undergo his fifth BMA, his mother, the doctor, and nurse. The doctor and nurse have a great deal of knowledge and experience in the area of childhood cancers. The nurse in the "video" has worked at Children's Hospital since graduating five years ago and has been working with children diagnosed with cancer for the past three years. Jamie's pediatrician, the doctor in the "video", specialized in the field of Pediatric Oncology and has been on staff at Children's Hospital for the past ten years.

Unfortunately, Jamie has had a difficult time coping with the various medical procedures associated with the diagnosis and treatment of his disease. He has come to dislike the medical staff and in particular, he especially dislikes the BMA procedure. Some children do not seem to be bothered very much by the BMA procedure, while other children like Jamie find it painful and very distressing. Because Jamie's distress was becoming worse, it was decided after the last BMA that Jamie needed help in learning how to cope with the procedure. Since Jamie's mother always stayed with Jamie when he was in the hospital, she agreed to learn how to help Jamie use Imagery during BMAs and other painful procedures. It was reasoned that if Jamie used his imagination to focus on something he found pleasant and involving, he would be less able to focus on the pain. Although Jamie's mother was very skeptical that Imagery could be helpful, she agreed to give it her best effort. Jamie and his mother have been practicing using Imagery everyday for the week prior to the BMA in the "video" and have even tried to use it with other procedures like getting needles. Jamie's mother has become skilled at helping Jamie stay focussed and involved in whatever he imagines and not responding to his distress. As Jamie prefers to know what is going to happen and how it will feel, the

doctor and nurse have agreed to keep him informed about what is happening during the procedure. However, to help Jamie stay focussed and avoid distracting his imagining, both the doctor and nurse agreed to talk less than usual with Jamie and his mother during the procedure.

As this "video" begins, Jamie is sitting on his mother's lap beside the examining table. The doctor and nurse are unwrapping packages, laying out the necessary equipment for the procedure.

(to Jamie) It sounds like Christmas in here with all that MOTHER: paper ripping. JAMIE: I'm scared Mommy--I don't want any pokes. (Child holds tightly to mother and his stuffed bear.) I don't have to get on the table yet. MOTHER: (looking at child and reassuring him) No, you don't have to get on the table yet. We can just sit for a few minutes longer. (pause) So today we're going to use our imagination like we practiced. We're going to imagine all kinds of neat things so your body won't notice as much what the doctor is doing, and you'll feel much better during the procedure. JAMIE: (in a quiet voice) We can try. MOTHER: How are we going to travel on our imaginary trip? A hot air balloon or a magic carpet? Balloon. JAMIE: NURSE: Okay Jamie, we're ready for you to hop on the table. MOTHER: Onto the table we go. Let's pretend we're getting into the basket of the hot air balloon. JAMIE: I'm going to be the pilot. (Child gets off of mother's lap and stands.) [Mother and nurse lift Jamie onto the examining table. Nurse positions him appropriately. Here's a pillow for your head so you can lie on your side NURSE: and talk to mom. MOTHER: Okay sweetie. I'm going to be right here holding your hand all of the time. [Child lies on his side facing his mother who sits on a stool The child's back faces the doctor who is on the other facing him. side of the table.] Are you comfie in the balloon basket? Let's get ready to **MOTHER:** take off on our trip! (Mother strokes child's arm and softly begins) Just close your eyes...and we'll take off on our floating We're taking off from the ground...and slowly rising up ride... and up (voice rises) and up... (Child closes eyes and appears to be listening to his mother's voice and focussing on imagining.) MOTHER: We're taking off...going higher and higher...above the fluffy clouds... Remember, we need to hold still while we're on our balloon ride... We'll just let our balloon take us higher and We're floating high above the clouds... The wind will higher... take us wherever we want to go... NURSE: And now we need to scrunch your shirt up and pull your pants down so we can see your back.

[Child lies still as nurse adjusts clothing to expose waist and Doctor opens a package containing sterile latex gloves and hips. puts them on.] (continuing to stroke child's arm) Let's travel to some MOTHER: place you'd like to be... Some place nice and pleasant... Some place that Jamie would like to see... I wonder where that might be? JAMIE: (in a soft voice) My house. The doctor is putting on his gloves. NURSE: MOTHER: (reassuring child) Jamie, you're doing a good job of holding still in the balloon. [Doctor then sits down on a stool facing Jamie's back. Beside the doctor is a small table with the necessary supplies laid out.] We're going to wash your back first Jamie. It's going to DOCTOR: feel cold. [Doctor dips a special sponge into a purple antiseptic solution and applies it to the area of Jamie's right upper hip.] JAMIE: (child giggles) AAAH, that's cold! He should warm that up firstl DOCTOR: I know, I'm sorry. I'm just going to wash it 3 times and get everything nice and clean and ready. Okay? NURSE: (standing next to the table beside mother and child) You're going to have big purple circles on your bum! [Doctor repeats the washing two more times, washing in large circles around the site of the BMA.] So we've travelled in our hot air balloon to our house... MOTHER: Are we outside or inside? (Child's eyes are closed; child appears to be following mother's directions.) JAMIE: We're in the family room. DOCTOR: Now we're going to put on a special blanket to keep you warm... This blanket has a special window that goes on top. [A green sterile blanket with a 2-inch square window is taped onto The window is placed over Jamie's back hip bone.] Jamie. NURSE: This will keep you toasty and warm! (Child's eyes are closed; child is still and appears to be relaxed and breathing deeply.) (looking somewhat relieved at the way the procedure is MOTHER: qoing) We're inside our house and we're in the family room... Who's in the family room? Who do you see? JAMIE: (qiqqling) Me and you and Jasper. Jasper and Jamie and Mommy... What is Jasper doing? **MOTHER:** She's sitting on my lap... She's purring because I'm JAMIE: petting her. [Doctor picks up needle from tray and with his other hand, probes the area in the window to select the site for the BMA.] JAMIE: What's he doing? (child's body remains still and relaxed) Tell me when he's going to start. The doctor is just feeling your back with his fingers. NURSE: (softly) It's time for a little poke now Jamie to freeze DOCTOR: This part might sting. your back. (Child takes slow deep breaths and gently squeezes his mother's hand.) [Needle is inserted through the skin, local anesthesia is injected.]

(low pitched moan) Owww! (Child's body flinches slightly; JAMIE: child's face tightens then relaxes again.) [Doctor removes needle and lightly rubs skin at the site of the injection. Doctor picks up another needle from the tray.] JAMIE: (calmly) That hurt. Is there another poke? DOCTOR: (softly) And one more poke to freeze a little deeper. You might feel a little burning when the freezing goes in. MOTHER: (quietly to the nurse) I think this is really helping him... (to child, continuing to direct the child's imagination) Jasper is very soft isn't she?... Soft and warm... Keep picturing clearly... Jasper is sitting on your lap... So soft...and furry...and warm... [Doctor inserts the second needle a little deeper into the site and injects the local anesthesia] (Child momentarily catches breath and winces, then breathes out slowly and relaxes again.) JAMIE: Owww--that pinches. (Child continues to breathe slowly and deeply.) [Doctor removes needle and lightly rubs the skin at the injection site.] JAMIE: (calmly) Now we rest for awhile? DOCTOR: Now we wait a few minutes for your back to go to sleep. MOTHER: (stroking the child's arm) Keep your eyes closed and let's imagine some more... Imagine as clearly as you can... What is Jasper doing now? (Child closes his eyes and continues to focus on imagining.) She's run off to hide. JAMIE: (looking pleased with Jamie and in an animated voice) **MOTHER:** Jasper is hiding!... Where is she hiding?... Let's look for Where can that silly cat be? her... JAMIE: (in a drowsy voice) Behind the couch... **MOTHER:** (continuing) What a silly kitty... Hiding behind the couch... I wonder what else is happening?... Look out the There's a big surprise out there! window... (Child appears to be imagining as his mother guides him.) Jamie: There's a trampoline outside! MOTHER: We have a trampoline! JAMIE: Yeah... A big trampoline... (following the child's lead) A giant trampoline... Who's MOTHER: jumping on our trampoline? JAMIE: Me and my brother... You and your brother...jumping on the giant trampoline... **MOTHER:** Are you goofing around? We're jumping... Higher and higher... JAMIE: MOTHER: Jumping higher and higher... How high can you jump? We can jump higher than the trees... JAMIE: (interrupting) Alright. How are you doing Jamie? DOCTOR: Okay... I'm using my imagination... JAMIE: DOCTOR: Okay Jamie. I'm going to check the skin now to see if it feels okay. [Doctor probes aspiration site with needle.] So that's frozen. That's good. DOCTOR: [Skin and tissue, but not the bone, are frozen.] MOTHER: (in a soothing voice) Keep picturing in your mind...as clearly as you can... What else can you do on the trampoline?

(Child's eyes remain closed and child seems to be concentrating on imagining.) DOCTOR: Okay, I think we'll start. (dreamily and still concentrating on imagining) We can do JAMIE: flips... [To begin the BMA, the doctor selects a small scalpel and makes a very small cut (1/8") in the skin at the site of the BMA. The scalpel is discarded and the doctor picks up the special BMA needle.] (Child's body remains relaxed; child continues to breathe slowly and deeply.) MOTHER: (remaining calm and continuing to stroke child's arm) Backward flips and forward flips... Jamie can do all kinds of flips in the air... Up he goes... Somersaults in the air... Front somersaults...and back somersaults... Up and down... Front and back... [Doctor advances the needle through the skin and tissue to the surface of the bone.] (Child continues to breathe slowly and deeply.) NURSE: (to Jamie) You remember how this next part feels? You'll feel the pushing. [To penetrate the bone, the doctor pushes the needle through the bone using a screwing motion with firm, steady, well controlled pressure.] NURSE: The doctor is pushing now. JAMIE: (Child's eyes are closed; body appears fairly relaxed as child makes a low moan) Aaaahh... That hurts... MOTHER: (looking calm) There you go... Doing good Jamie... You're bouncing on the trampoline... Up and down... Flipping every which way... Flipping high in the sky... How does it feel floating so high up in the air? [The doctor feels the needle enter the marrow of the bone. He then attaches an empty syringe onto the back of the needle.] DOCTOR: Okay Jamie, I think that's far enough. (Child's face and body remain quite relaxed; child breathes deeply and evenly.) NURSE: The pushing has stopped. MOTHER: (in a soothing voice) It's okay Jamie... And now you look beside the trampoline...and someone very special is there to surprise you... A very special person... Who could it be? [Suction is applied and a small amount of red marrow enters the syringe.] JAMIE: (Child breathes out slowly) Aaahh... It's pulling... Is it coming out? Yes. And it's going to be checked... Okay we've already NURSE: got one tube out. (looking pleased, continues to stroke the child's arm) MOTHER: Who is your special visitor Jamie? Who is the surprise person who has come to see you? (calmly) It's Auntie Patty. JAMIE: [A second syringe is fitted onto the back of the needle. Again suction is applied for a few seconds and a small amount of marrow is suctioned into the syringe.] (calmly) Is it coming out? JAMIE: NURSE: Yes, it is coming out.

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MOTHER: (to doctor and nurse, looking relieved) I can't believe how much better this is going than the last time! [The syringe is carefully removed from the needle and handed to the nurse. The nurse takes the syringes and smears several glass slides with the specimen of marrow.} MOTHER: What has Auntie Patty got in her hand? I think she's got a present there for you. JAMIE: (calmly) Can I open it? MOTHER: Go ahead and open it. I wonder what's inside. DOCTOR: Okay Jamie, we're all finished for today. I'm going to take the needle out and put on a big bandaid. [Aspiration needle is carefully removed. Doctor applies a large swab and presses on the site.] NURSE: It's out Jamie. JAMIE: Are we finished? NURSE: Yes, we're all done... Bandaid time! JAMIE: That went guicker this time! That wasn't so bad! MOTHER: (looking very pleased and relieved that the procedure is over) Yes, this went far better this time! [A large bandage is taped onto the site of the BMA] NURSE: Okay, let's get you dressed.

## APPENDIX H

## Ineffectiveness Information Transcript: Female Version

[NOTE: Introduction to the transcript included in Appendix G.] MOTHER: (to Jenny) It sounds like Christmas in here with all that paper ripping. JENNY: I'm scared Mommy--I don't want any pokes. (Child holds tightly to mother and her stuffed bear.) I don't have to get on the table yet. MOTHER: (looking at child and reassuring her) No, you don't have to get on the table yet. We can just sit for a few minutes longer. (pause) So today we're going to use our imagination like we practiced. We're going to imagine all kinds of neat things so your body won't notice as much what the doctor is doing, and you'll feel much better during the procedure. (in a guiet voice) We can try. **JENNY:** How are we going to travel on our imaginary trip? A hot MOTHER: air balloon or a magic carpet? JENNY: Balloon. NURSE: Okay Jenny, we're ready for you to hop on the table. MOTHER: Onto the table we go. Let's pretend we're getting into the basket of the hot air balloon. I'm going to be the pilot. (Child clings to mother and **JENNY:** resists being lifted onto the table.) Don't make me get on the table! (Mother and nurse strain to lift Jenny onto the examining table. Nurse positions her appropriately.] NURSE: Here's a pillow for your head so you can lie on your side and talk to mom. MOTHER: Okay sweetie. I'm going to be right here holding your hand all of the time. [Child lies on her side facing her mother who sits on a stool The child's back faces the doctor who is on the other facing her. side of the table.] MOTHER: Are you comfie in the balloon basket? Let's get ready to take off on our trip! (Mother strokes child's arm and softly begins) Just close your eyes...and we'll take off on our floating We're taking off from the ground...and slowly rising up ride... and up (voice rises) and up... (Child closes eyes and appears to be listening to her mother's voice and focussing on imagining.) MOTHER: We're taking off...going higher and higher...above the fluffy clouds... Remember, we need to hold still while we're on our balloon ride... We'll just let our balloon take us higher and higher... We're floating high above the clouds... The wind will take us wherever we want to go... NURSE: And now we need to scrunch your shirt up and pull your pants down so we can see your back. **JENNY:** (beginning to cry) Don't pull up my shirt! I don't want to do this!

[Mother holds child still as nurse adjusts clothing to expose waist Doctor opens a package containing sterile latex gloves and hips. and puts them on.] (continuing to stroke child's arm) Let's travel to some MOTHER: place you'd like to be... Some place nice and pleasant... Some place that Jenny would like to see... I wonder where that might be? **JENNY:** (in a trembling voice) My house. (hears package ripping) What's he doing? I don't want to be here! (Child attempts to sit up but is held down by nurse.) MOTHER: Jenny, you need to hold still in the balloon. NURSE: The doctor is putting on his gloves. [Doctor then sits down on a stool facing Jenny's back. Beside the doctor is a small table with the necessary supplies laid out.] DOCTOR: We're going to wash your back first Jenny. It's going to feel cold. [Doctor dips a special sponge into a purple antiseptic solution and applies it to the area of Jenny's right upper hip.] (Child's body noticeably stiffens and she begins to cry) **JENNY:** AAAH, that's cold! I don't want to be cold Mommy. (Child kicks her legs and hits mother. Mother ignores the hitting and tries to hold her child's hand.) DOCTOR: I know, I'm sorry. I'm just going to wash it 3 times and get everything nice and clean and ready. Okay? NURSE: (standing beside the table and holding child still) You're going to have big purple circles on your bum! [Doctor repeats the washing two more times, washing in large circles around the site of the BMA.] MOTHER: So we've travelled in our hot air balloon to our house... Are we outside or inside? (Child's eyes are closed; child appears to be following mother's directions.) JENNY: We're in the family room... (speaks quickly) I want to go This is going to hurt! home! DOCTOR: Now we're going to put on a special blanket to keep you This blanket has a special window that goes on top. warm... [A green sterile blanket with a 2-inch square window is taped onto Jenny. The window is placed over Jenny's back hip bone.] This will keep you toasty and warm! NURSE: **JENNY:** (Child's eyes are open and in a whiney voice) Are they going to poke me? I want Daddy! (begins to cry again) (Child attempts to sit up but is firmly held by the nurse.) (looking somewhat upset at the way the procedure is going) MOTHER: We're inside our house and we're in the family room... Who's in the family room? Who do you see? JENNY: Me and you and Jasper... (angrily) Jasper needs me at home! **MOTHER:** Jasper and Jenny and Mommy... What is Jasper doing? She's sitting on my lap... She's going to bite me! **JENNY:** (starts to cry again) [Doctor picks up needle from tray and with his other hand, probes the area in the window to select the site for the BMA.] (alarmed) What's he doing? (child's body tenses) He's **JENNY:** going to poke me! (starts to kick her legs again)
(holding the child's legs still) The doctor is just NURSE: feeling your back with his fingers. (softly) It's time for a little poke now Jenny to freeze DOCTOR: your back. This part might sting. (Child's body stiffens; child hits her mother's arm.) (in a distressed and pleading tone) C'mon Jenny. Keep MOTHER: imagining with me! (Nurse continues to firmly hold child's legs and body still.) [Needle is inserted through the skin, local anesthesia is injected.] JENNY: (high pitched scream) OWWWW! (child's body jumps child clenches teeth and jaws; eyes are pinched shut.) Make him stop! [Doctor removes needle and lightly rubs skin at the site of the Doctor picks up another needle from the tray.] injection. **JENNY:** (sobbing) That hurts! Make them stop Mommy! No more pokes! DOCTOR: (softly) And one more poke to freeze a little deeper. You might feel a little burning when the freezing goes in. MOTHER: (quietly to the nurse) I don't see how this is helping (to child, continuing to direct the child's imagination) her... Jasper is very soft isn't she?... Soft and warm... Keep picturing clearly... Jasper is sitting on your lap... So soft...and furry...and warm... [Doctor inserts the second needle a little deeper into the site and injects the local anesthesia.] (Child holds her breath, screams, tenses body, flinching with the needle, and attempts to kick her legs.) (crying) OWWWWWWW! That hurts!!! (Child gasps between **JENNY:** cries) [Doctor removes needle and lightly rubs the skin at the injection site.] (shouting angrily) I want to go home! **JENNY:** DOCTOR: Now we wait a few minutes for your back to go to sleep. (stroking the child's arm) Keep your eyes closed and MOTHER: let's imagine some more... Imagine as clearly as you can... What is Jasper doing now? (Child closes her eyes and refocuses on imagining.) **JENNY:** She's run off to hide. Mommy, it still hurts! It's not helping! MOTHER: (still trying to keep Jenny focussed) Jasper is hiding!... Where is she hiding?... Let's look for her... Where can that silly cat be? (whining) Behind the couch... I want to go home to get **JENNY:** Jasper. MOTHER: (looking noticeably upset but continuing) What a silly kitty... Hiding behind the couch... I wonder what else is happening?... Look out the window... There's a big surprise out therel (Child appears to be imagining as her mother guides her.) JENNY: There's a trampoline outside! I know he's going to poke me some more! **MOTHER:** (trying to stay focussed) We have a trampoline! JENNY: Yeah... A big trampoline... MOTHER: (following the child's lead) A giant trampoline... Who's jumping on our trampoline?

JENNY: Me and my brother... MOTHER: You and your brother...jumping on the giant trampoline... Are you goofing around? We're jumping... It hurts to jump! **JENNY:** MOTHER: Jumping higher and higher... How high can you jump? We can jump higher than the trees... (sobbing) It's going **JENNY:** to hurt! DOCTOR: (interrupting) Alright. How are you doing Jenny? JENNY: (alarmed) Don't hurt me! No more pokes! (tries to sit up but is restrained by the nurse) DOCTOR: Okay Jenny. I'm going to check the skin now to see if it feels okay. [Doctor probes aspiration site with needle.] DOCTOR: So that's frozen. That's good. [Skin and tissue, but not the bone, are frozen.] MOTHER: (trying to be calm) C'mon Jenny, let's keep with this. Keep picturing in your mind...as clearly as you can... What else can you do on the trampoline? (Child's eyes are closed and child seems to be concentrating on imagining.) DOCTOR: Okay, I think we'll start. Jenny: (becoming alarmed) NO! No pokes! (wailing) It's going to hurt! [To begin the BMA, the doctor selects a small scalpel and makes a very small cut (1/8") in the skin at the site of the BMA. The scalpel is discarded and the doctor picks up the special BMA needle.] (Child tenses body and holds breath.) MOTHER: (Becoming tense but continuing to stroke child's arm) Backward flips and forward flips... Jenny can do all kinds of flips in the air... Up she goes... Somersaults in the air... Front somersaults...and back somersaults... Up and down... Front and back ... [Doctor advances the needle through the skin and tissue to the surface of the bone.] **JENNY:** (Yells loudly) You're hurting me! Mommy! Stop! (to Jenny) You remember how this next part feels? NURSE: You'll feel the pushing. [To penetrate the bone, the doctor pushes the needle through the bone using a screwing motion with firm, steady, well controlled pressure.] The doctor is pushing now. NURSE: (Child grimaces her face, tenses her body and makes a high JENNY: pitched scream) OWWWWW!!! I'm imagining but it's still hurting! Mommy!! Take it out! OWWWWW!! (looking very distressed) There you go... C'mon, let's **MOTHER:** keep trying Jenny... You're bouncing on the trampoline... Up and down... Flipping every which way... Flipping high in the sky... How does it feel floating so high up in the air? [The doctor feels the needle enter the marrow of the bone. He then attaches an empty syringe onto the back of the needle.] DOCTOR: Okay Jenny, I think that's far enough. (Child's face and body remain tensed; child breathes between sobs. Nurse continues to hold her still.) NURSE: The pushing has stopped.

(trying to soothe her) It's okay Jenny... And now you MOTHER: look beside the trampoline...and someone very special is there to surprise you... A very special person... Who could it be? [Suction is applied and a small amount of red marrow enters the syringe.] (Child holds breath sharply and screams) AAAAAAH! JENNY: It's hurting! Is it coming out? NURSE: And it's going to be checked... Okay we've already Yes. got one tube out. MOTHER: (alarmed at her child's distress but continues to stroke the child's arm) Who is your special visitor Jenny? Who is the surprise person who has come to see you? (crying) It's Auntie Patty... (angrily) Take it out! JENNY: [A second syringe is fitted onto the back of the needle. Again suction is applied for a few seconds and a small amount of marrow is suctioned into the syringe.] JENNY: (crying) Is it coming out? How much longer? NURSE: (still restraining her) Yes, it's coming out. (to doctor and nurse, looking upset) This really isn't MOTHER: going any better than the last time. [The syringe is carefully removed from the needle and handed to the The nurse takes the syringes and smears several glass nurse. slides with the specimen of marrow.] MOTHER: What has Auntie Patty got in her hand? I think she's got a present there for you. (whimpering) Can I open it?... How much longer? JENNY: **MOTHER:** (looking frustrated) Go ahead and open it. I wonder what's inside. DOCTOR: Okay Jenny, we're all finished for today. I'm going to take the needle out and put on a big bandaid. [Aspiration needle is carefully removed. Doctor applies a large swab and presses on the site.] It's out Jenny. NURSE: Are we finished? JENNY: NURSE: Yes, we're all done... Bandaid time! JENNY: That took a long time! That was worser than ever! MOTHER: (looking disappointed but relieved that the procedure is over) Yes, this didn't go any better this time. [A large bandage is taped onto the site of the BMA.] NURSE: Okay, let's get you dressed.

## APPENDIX I

## No Effectiveness Information Transcript: Male Version

[NOTE: Introduction to the transcript is found in Appendix G, with the following addition (indicated by bold type) in the first paragraph: "That is, portions of the videotape, such as responses by the child and discussions among the medical staff, have been excluded."]

(to Jamie) It sounds like Christmas in here with all that **MOTHER:** paper ripping... (looking at child and reassuring him) No, you don't have to get on the table yet. We can just sit for a few minutes longer. (pause) So today we're going to use our imagination like we practiced. We're going to imagine all kinds of neat things so your body won't notice as much what the doctor is doing, and you'll feel much better during the procedure... How are we going to travel on our imaginary trip? A hot air balloon or a magic carpet? Okay Jamie, we're ready for you to hop on the table. NURSE: MOTHER: Onto the table we go. Let's pretend we're getting into the basket of the hot air balloon. [Mother and nurse lift Jamie onto the examining table. Nurse positions him appropriately.] NURSE: Here's a pillow for your head so you can lie on your side and talk to mom. MOTHER: Okay sweetie. I'm going to be right here holding your hand all of the time. [Child lies on his side facing his mother who sits on a stool facing him. The child's back faces the doctor who is on the other side of the table.] **MOTHER:** Are you comfie in the balloon basket? Let's get ready to take off on our trip! (Mother strokes child's arm and softly Just close your eyes...and we'll take off on our floating begins) ride... We're taking off from the ground...and slowly rising up and up (voice rises) and up... We're taking off... going higher and higher...above the fluffy clouds... Remember, we need to hold still while we're on our balloon ride... We'll just let our balloon take us higher and higher... We're floating high above the clouds... The wind will take us wherever we want to go... NURSE: And now we need to scrunch your shirt up and pull your pants down so we can see your back. [Nurse adjusts clothing to expose waist and hips. Doctor opens a package containing sterile latex gloves and puts them on.] MOTHER: (continuing to stroke child's arm) Let's travel to some place you'd like to be... Some place nice and pleasant... Some place that Jamie would like to see... I wonder where that might be? NURSE: The doctor is putting on his gloves. [Doctor then sits down on a stool facing Jamie's back. Beside the doctor is a small table with the necessary supplies laid out.] DOCTOR: We're going to wash your back first Jamie. It's going to feel cold.

[Doctor dips a special sponge into a purple antiseptic solution and applies it to the area of Jamie's right upper hip.] I'm just going to wash it 3 times and get everything nice DOCTOR: and clean and ready. Okay? NURSE: (standing next to the table beside mother and child) You're going to have big purple circles on your bum! [Doctor repeats the washing two more times, washing in large circles around the site of the BMA.] So we've travelled in our hot air balloon to our house... MOTHER: Are we outside or inside? DOCTOR: Now we're going to put on a special blanket to keep you This blanket has a special window that goes on top. warm... [A green sterile blanket with a 2-inch square window is taped onto The window is placed over Jamie's back hip bone.] Jamie. This will keep you toasty and warm! NURSE: MOTHER: We're inside our house and we're in the family room... Who's in the family room? Who do you see? Jasper and Jamie and Mommy... What is Jasper doing? [Doctor picks up needle from tray and with his other hand, probes the area in the window to select the site for the BMA.] The doctor is just feeling your back with his fingers. NURSE: (softly) It's time for a little poke now Jamie to freeze DOCTOR: This part might sting. your back. [Needle is inserted through the skin, local anesthesia is injected. Doctor removes needle and lightly rubs skin at the site of the Doctor picks up another needle from the tray.] injection. DOCTOR: (softly) And one more poke to freeze a little deeper. You might feel a little burning when the freezing goes in. MOTHER: (continuing to direct the child's imagination) Jasper is very soft isn't she?... Soft and warm... Keep picturing clearly... Jasper is sitting on your lap... So soft...and furry...and warm... [Doctor inserts the second needle a little deeper into the site and injects the local anesthesia. Doctor removes needle and lightly rubs the skin at the injection site.] DOCTOR: Now we wait a few minutes for your back to go to sleep. MOTHER: (stroking the child's arm) Keep your eyes closed and let's imagine some more... Imagine as clearly as you can... What is Jasper doing now? (with an animated voice) Maybe Jasper's hiding!... Where is she hiding?... Let's look for her... Where can that silly cat be? What a silly kitty... Hiding behind the couch... I wonder what else is happening?... Look out the There's a big surprise out there!... We have a window... trampoline!... A giant trampoline... Who's jumping on our trampoline?... You and your brother...jumping on the giant trampoline... Are you goofing around?... Jumping higher and higher... How high can you jump? DOCTOR: (interrupting) Alright. How are you doing Jamie? I'm going to check the skin now to see if it feels okay. [Doctor probes aspiration site with needle.] DOCTOR: So that's frozen. That's good. [Skin and tissue, but not the bone, are frozen.] MOTHER: (in a soothing voice) Keep picturing in your mind...as clearly as you can... What else can you do on the trampoline?

DOCTOR: Okay, I think we'll start. (To begin the BMA, the doctor selects a small scalpel and makes a very small cut (1/8") in the skin at the site of the BMA. The scalpel is discarded and the doctor picks up the special BMA needle.] MOTHER: (continues to stroke child's arm) Backward flips and forward flips... Jamie can do all kinds of flips in the air... Up he goes... Somersaults in the air... Front somersaults...and back somersaults... Up and down... Front and back... [Doctor advances the needle through the skin and tissue to the surface of the bone.] (to Jamie) You remember how this next part feels? You'll NURSE: feel the pushing. [To penetrate the bone, the doctor pushes the needle through the bone using a screwing motion with firm, steady, well controlled pressure.] The doctor is pushing now. NURSE: There you go... You're bouncing on the trampoline... Up MOTHER: h... Flipping every which way... Flipping high in the How does it feel floating so high up in the air? and down... sky... [The doctor feels the needle enter the marrow of the bone. He then attaches an empty syringe onto the back of the needle.] DOCTOR: Okay Jamie, I think that's far enough. The pushing has stopped. NURSE: MOTHER: (in a soothing voice) It's okay Jamie... And now you look beside the trampoline...and someone very special is there to surprise you... A very special person... Who could it be? [Suction is applied and a small amount of red marrow enters the syringe.] NURSE: The marrow is coming out. And it's going to be checked... Okay we've already got one tube out. MOTHER: (continuing to stroke the child's arm) Who is your special visitor Jamie? Who is the surprise person who has come to see you? [A second syringe is fitted onto the back of the needle. Again suction is applied for a few seconds and a small amount of marrow is suctioned into the syringe.] NURSE: The marrow is coming out. [The syringe is carefully removed from the needle and handed to the The nurse takes the syringes and smears several glass nurse. slides with the specimen of marrow.] MOTHER: What has Auntie Patty got in her hand? I think she's got a present there for you... Go ahead and open it. I wonder what's inside. DOCTOR: Okay Jamie, we're all finished for today. I'm going to take the needle out and put on a big bandaid. [Aspiration needle is carefully removed. Doctor applies a large swab and presses on the site.] It's out Jamie. We're all done... Bandaid time! NURSE: [A large bandage is taped onto the site of the BMA.] NURSE: Okay, let's get you dressed.