EMPIRICAL VALIDATION OF TREATMENT TARGETS FOR THE MANAGEMENT OF DIABETES IN CHILDREN

by

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(ABSTRACT)

In the present study we used an empirical validation approach to determine psychosocial variables related to adaptive management of diabetes in two samples of diabetic children and their families. Children from the Kansas University Medical Center (n = 31) and children from the Virginia Diabetes Association (n = 25) provided results of the glycosylated hemoglobin test (a measure of diabetic control); completed self-report measures on variables of anxiety, coping, family adjustment, and health locus of control; and underwent structured interviewing. Parents completed parallel self-report measures, as well as an

assessment of child behavior. In addition, a subsample of parent-child dyads participated in a role-play measure of family interactions around the child's diabetes. All demographic variables and psychosocial measures were not significantly different across the Kansas and Virginia samples. Children in optimal control of diabetes had more structured and organized family environments, more frequently believed that "powerful others" were responsible for their health, and showed lower levels of negative coping with family problems than children in nonoptimal diabetic control. Surprisingly, children in optimal diabetic control showed poorer knowledge of diabetes and its management than children in nonoptimal control. Psychological interventions to promote adaptive diabetic control should incorporate findings related to family environment, locus of control, and the child's style of coping with family problems.

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Empirical Validation of Treatment Targets for the Management of Diabetes in Children

Insulin-dependent diabetes mellitus (IDDM) is one of the most common endocrine disorders in children, affecting approximately 1 in 800 youth (Bennett, 1981). In IDDM, the pancreas does not produce insulin, which is necessary for the body to utilize available blood glucose to meet energy requirements. Thus, children with IDDM must undergo exogenous insulin replacement multiple times per day in order to survive. In addition, children with IDDM need to follow strict management regimens involving frequent monitoring of blood sugar levels, regulating food intake, and engaging in regular exercise (Johnson, 1988; Stein, Goldberg, Kalman, & Chesler, 1984). The management of IDDM is not a static process; rather the child must make ongoing adjustments in diet, insulin and exercise in order to prevent episodes of hypo- and hyper-glycemia. Further, children with IDDM may feel stigmatized by obvious aspects of their illness (e.g., self-injecting insulin, testing blood and urine, avoiding sweets), and must face the prospect of complications later in life such as renal failure, blindness, heart disease and circulatory difficulties (Johnson & Rosenbloom, 1982).

Numerous investigations have sought to improve children's adherence, or "compliance" to the diabetic

regimen (e.g., Lowe & Lutzker, 1979; see Stark, Dahlquist, & Collins, 1987 for a review). While some of these studies have shown significant relations between adherence and diabetic control (e.g., Hanson, Henggeler, & Burghen, 1987), other studies have not documented such a relationship (e.g., Simonds, Goldstein, Walker, & Rawlings, 1981), leading Johnson (in press) to conclude "...researchers have failed to document consistent, clinically significant relationships between compliance and diabetic control in IDDM samples" (p. 14).

Similarly, efforts to improve children's knowledge of diabetes and its management have shown inconsistent treatment outcomes. For example, Lorenz, Christensen and Pichert (1985) found 90 children who participated in an educational summer camp for diabetics to show substantial deficits in diet-related knowledge and skill despite fairly intensive instruction in dietary management. More concerning are observations made by Johnson (1988), who reports that educational programs often teach children about diabetes using a standardized format based on assumptions regarding similarity in responses to the disease. For example, children are taught to detect "classic" symptoms of hypo- and hyper-glycemic states, to enable early remedial action (e.g., by eating carbohydrates). This approach is based on the view that children have similar experiences

following increases or decreases in blood glucose levels. However, Johnson (1988) cites research that suggests that children have differing experiences to hypo- and hyperglycemia; although there is a group of commonly reported symptoms, the pattern of these symptoms differ from one patient to another. Hence, in some educational programs, children may be taught to recognize symptoms that are in reality nonfunctional for them as predictors of blood glucose levels.

In addition to variables of knowledge and adherence, metabolic control of diabetes has been related to family, psychological, and health-care system variables (Johnson, 1984). In particular, family variables have been shown to relate to diabetic adherence/control. For example, Anderson, Miller, Auslander, and Santiago (1981) compared adolescents in good, fair and poor control on a measure of family adjustment. Families of adolescents in good control were found to be more cohesive and less conflicted than families of youth in fair or poor control. In addition, parents of the well-controlled children were more involved in sharing responsibility for the management of the child's diabetes. Evans and Hughes (1987) examined the relationship between metabolic control and family organization in children and adolescents (ages 10 - 17 years). There was a tendency for children in good metabolic control to come from

families that were fairly rigidly organized (e.g., standard routines and family rules). Hanson, Henggeler, and Burghen (1987) found the level of parental support to be directly related to child adherence to the diabetic regimen in a study of diabetic adolescents and their families.

The management of anxiety about diabetes may be a variable of importance to metabolic control of the illness. Anderson et al. (1981) found adolescents in poor metabolic control to report more anxiety about their illness than youths in good metabolic control on a structured interview measure of adaptation to diabetes. Bobrow, AvRuskin, and Siller (1985) found poorly adherent adolescent girls to express more anxiety about complications of diabetes than adherent girls. Using a structured interview method, Simonds (1977) found that mothers of children in poor control reported more anxiety about their youngsters' illness than mothers of children in good metabolic control.

Child behavioral competencies and problems have been shown to impact metabolic control in diabetic children. Using multiple regression analysis, Hanson et. al. (1987) found that socially competent youngsters were less likely than less competent children to have problems in metabolic control when faced with life stressors. Simonds (1977) found higher levels of parent-reported behavior problems in poorly controlled as compared to well controlled children.

Child locus of control has been shown to relate to metabolic control in diabetic children. For example, Brand, Johnson, and Johnson (1986) assessed diabetic youth attending a summer camp, and found that negative life events were associated with increased urine ketones (an indicator of negative physical functioning) in internally oriented, but not externally oriented youth. Evans and Hughes (1987) found metabolic control in children to be related to an external locus of control, and relatively rigidly organized family structures.

Finally, child coping style may be a variable important to diabetic control. Delamater, Kurtz, Bubb, White, and Santiago (1987) assessed children in good, fair, and poor metabolic control, and found the poorly controlled children to use more avoidance/help-seeking and wishful thinking than children in the other two subgroups.

In the above review variables of family relations, anxiety, child behavior, locus of control, and coping were shown to be associated with diabetic control. Generally in these investigations, one or two variables were assessed, without examination of the range of variables that may prove important to metabolic control of diabetes. In addition, very few studies (with some exceptions, e.g., Rose, Firestone, Heick, & Faught, 1983) have targeted these factors in interventions with diabetic children (cf. Hanson

& Henggeler, 1984). Given that adherence- and knowledge-based interventions have been shown to be inconsistently related to metabolic control, these psychosocial variables warrant further investigation. What appears to be needed is a multivariate approach to the assessment of potential psychosocial treatment targets for children with diabetes. Weist, Ollendick, and Finney (in press) have suggested a method for assessing the clinical importance of potential treatment targets termed "empirical validation." The essence of empirical validation is documenting that the presence of (or improvement in) a treatment target is associated with enhanced clinical outcomes for the client population of interest. Background information on treatment target selection with children and the empirical validation process is presented in Appendix B.

The purpose of this study was to use an empirical validation strategy called template matching (Cone & Hoier, 1986) to further assess the clinical importance of family, anxiety, behavioral, locus of control, and coping variables to diabetic control in children. Using template matching, treatment targets can be selected based on the determination of how "successful" performers negotiate the demands of the situation of interest. One method to identify successful performers is to assess their performance on an established index. With diabetic children, an accepted index of

diabetic control is the glycosylated hemoglobin (GHB) test. The GHB test is widely used and assesses metabolic control of the illness over a three month period. We used GHB results to identify children in optimal control of diabetes, and compared their performances on various psychosocial measures to the performances of children in nonoptimal diabetic control to identify variables empirically associated with adaptive management of diabetes.

Hypotheses

1. Parents of children in poor metabolic control will report significantly higher levels of family conflict than parents of children in good control.

2. Children in good control will receive significantly higher levels of family support for their diabetes than children in poor metabolic control.

3. Children in poor control will display significantly more behavioral problems than children in good metabolic control.

4. Children in good control will be rated significantly higher in social competence than children in poor metabolic control.

5. Children in good metabolic control will have significantly lower levels of state anxiety regarding their diabetes than children in poor control. Children in good control will also be significantly lower on trait anxiety

than children in poor control.

6. Children in good metabolic control will be significantly more internal in health locus of control than children in poor metabolic control.

7. Children in good metabolic control will have significantly higher levels of knowledge about diabetes than children in poor control.

8. Children in good control will be significantly more adherent to the diabetes regimen than children in poor control.

Method

Subjects

Two samples of diabetic children and their families participated in the study. The first sample was recruited through the Virginia branch of the American Diabetes Association (VADA) and included 13 children who participated in a workshop on adaptive management of diabetes, and 12 children from the Peninsula Youth Group, a branch of the VADA located in the Norfolk area. The second sample was comprised of 31 children who were receiving ongoing treatment for diabetes at the University of Kansas Medical Center. In the Virginia sample there were 10 males (age range 10 - 17, mean = 12.3) and 15 females (age range 8 - 19, mean = 13.2). In the Kansas sample there were 14 males (age range 9 - 18, mean = 14.3) and 17 females (age range 10

- 18, mean = 12.9). In the total sample there were 24 males (age range 9 - 18, mean = 13.5) and 32 females (age range 8 - 19, mean = 13.3). All children had Type 1 (insulin dependent) diabetes of at least one year's duration.

Measures

Metabolic control in the children was assessed by results of the glycosylated hemoglobin (GHB) laboratory test. Each participant provided GHB test results obtained within one month prior to the completion of assessments. For the Virginia sample, physicians provided GHB results from one of four laboratories, while GHB results were obtained from one laboratory for the Kansas sample. Across these laboratories GHB reference values (i.e., normal range) varied dependent upon the type of measurement procedure used. To allow for comparability of values across different laboratories, pediatric endocrinologists affiliated with each laboratory were contacted and asked to provide values indicative of excellent, good, fair and poor diabetic control for children. For example, for the Kansas sample, values less than 9.5, 11, and 13 were reported to indicate excellent, good, and fair diabetic control (respectively), with any value over 13 indicating poor control. A similar procedure was used for the other four laboratories, which enabled the classification of all participants into one of the four categories of diabetic control.

To assess general family environment, two measures were used, the Family Environment Scale (FES), and the Diabetes Family Behavior Checklist (DFBC). The FES is a reliable and well validated measure that assesses family relationships in a number of domains (e.g., supportiveness, conflict, organization) (Moos & Moos, 1986). The FES was completed by parents. To assess more proximal behaviors related to family adjustment to, and management of the child's diabetes, an adaptation of the Diabetes Family Behavior Checklist (DFBC) was used. The original DFBC (Schafer, McCaul, & Glasgow, 1986) assesses the frequency of supportive and nonsupportive family behaviors that may influence adherence to the diabetes self-care regimen. The DFBC has been adapted by S. B. Johnson (personal communication, September 9, 1989). The modified version of the DFBC, is an 18 item checklist that assesses the occurrence of only supportive family behaviors, as assessed separately by parents and children (nonsupportive behaviors are not assessed due to poor test-retest reliabily of this subscale in the original measure). Reliability and validity data for this modified scale are presently being collected. The modified DFBC was completed by children and parents.

The Child Behavior Checklist (CBCL) was completed by parents to assess behaviors presented by the children. The CBCL, one of the most frequently used and reliable and valid

measures of child behavior, assesses internalizing and externalizing child behavior problems, as well as child social competence (Achenbach & Edelbrock, 1983).

The State-Trait Anxiety Inventory (STAI) was used to assess state and trait anxiety in participating children, and their primary parent. The STAI provides two scores, a state score, which assesses transitory, situationally responsive anxiety, and a trait score, which assesses dispositional anxiety that is stable over time, and has been normed for adolescents down to age 12 (Spielberger, Gorsuch, & Lushene, 1973). To assess anxiety in children under age 12, a downward extension of the STAI, the State-Trait Anxiety Inventory for Children (STAIC) was used (Spielberger, Edwards, Lushene, Montuori, & Platzek, 1973). Both the STAI and STAIC have been found to possess sound psychometric properties.

To measure child locus of control, the Multidimensional Health Locus of Control Scale (MHLCS; Thompson, Butcher, & Berenson, 1987) was used. The MHLCS provides three subscale scores: A Powerful Others subscale score, which measures the degree to which the child believes his health is in the hands of his parents and health care providers; an Internal score, measuring internal locus of control; and a Chance score, which measures the degree to which the child believes his health is due to chance factors. The MHLCS has been

found to have acceptable test reliability and validity.

To assess child coping style, a measure called the KIDCOPE (Spirito, Stark, & Williams, 1988) was used. The KIDCOPE is a checklist designed to measure the use of cognitive and behavioral coping strategies in children. There are two versions of the checklist; one for children ages 7 to 12, and the other for adolescents ages 13 to 17. After describing a situation that has recently been stressful for them, children report on the frequency of use, and perceived efficacy of 10 coping strategies including distraction, social withdrawal, wishful thinking, self-criticism, blaming others, problem solving, emotional regulation, cognitive restructuring, social support, and resignation. The KIDCOPE has been found to have acceptable test-retest reliability and concurrent validity with other measures of child coping.

Two measures of knowledge about diabetes were completed by children and parents. The Test of Diabetes Knowledge - Revised (TDK-R) was used to evaluate child knowledge of diabetes in the initial (workshop) 13 child-parent dyads from the Virginia sample. This scale has been reported to have adequate psychometric properties (Harkavy, Johnson, Silverstein, Spillar, McCallum, & Rosenbloom, 1983); however, due to complaints by initial participants regarding excessive length, and some dated items on this measure, an

alternative measure, the Diabetes Knowledge Test (DKT) was used with subsequent participants from the Virginia and Kansas samples. The DKT contains 36 items that assess knowledge of the management of diabetes, and physiological aspects of the disease, and has been found to have adequate psychometric properties for both children and adults (Hess & Davis, 1983).

The Diabetes Care Profile (DCP) was used to assess child adherence and general adaptation to diabetes. The DCP contains subscales that assess problems in metabolic control, adherence, perceived barriers to adherence, sensitivity to long-term outcomes of the illness, and social support. The DCP has been shown to have sound psychometric properties when used with adults (Davis, Hess, Harrison, & Hiss, 1987) and efforts are underway to extend its use for children and adolescents (W. K. Davis, personal communication, September 6, 1989).

In addition to the above self- and parent-report measures, a structured interview was conducted to solicit from the children their views on personal factors important to effective management of their illness. Structured interview questions tapped areas of coping with school and family problems, attitudes about having diabetes, and physiologic sensitivity to signs of hypoglycemia and hyperglycemia. Eight interview questions were selected from

an initial pool of 14 questions based on ratings of overall relevance to management of diabetes in children by three diabetes educators (see Table 1).

Insert Table 1 about here

A subsample of twelve parent-child dyads was selected to undergo role-play assessment of family interactions around diabetes-specific (e.g., child adherence) and general (e.g., child school performance) issues. Role-play scenes were designed to assess family supportiveness and conflict resolution in diabetes-related and general situations, with half the scenes requiring that the child initiate the interaction, and the other half requiring that the parent initiate the interaction (see Table 2).

Insert Table 2 about here

Procedure

For the Virginia sample, initial participants were recruited for the study in conjunction with their participation in a workshop on Adaptive Management of Diabetes by the VADA. Fliers describing the workshop and the study were sent to 45 families. Of these, 13 families registered for the workshop; all of these families agreed to

participate in the study. These families were then mailed a packet which included a consent form, a cover sheet (describing selected project assessments and requesting that they be completed confidentially), and self- and parent-report measures including the FES, DFBC, and MHLCS. These measures were chosen to be completed by participants at home to decrease assessment time at the workshop; it was felt that each of these measures could not plausibly be biased by being completed independently. The parent self-identified as the primary monitor of the child's diabetes (usually the mother) was requested to complete parental assessments for each family. The packet also contained a release-of-information form to enable physicians to release information to project investigators. Approximately four days following the mailing of these assessments, families were called by the primary investigator, who emphasized the independent completion of assessments and answered questions. Families were then requested to bring project assessments with them to the workshop.

Physicians were sent a data sheet requesting information on all GHB tests completed over the past two years, along with a self-addressed, stamped envelope to return the data sheet to the investigators.

Remaining assessments were completed at the workshop, prior to the beginning of the program. Child assessments

included the knowledge tests, the DCP, the KIDCOPE and the STAI (both versions), in that order. Parents were encouraged to help the children complete the DCP, if necessary, without influencing the content of responses on items assessing adjustment to diabetes. Children were instructed to complete the remaining assessments independently, with instructions and assistance provided individually to each child by project assistants. Prior to completion of the State Anxiety Scales, the investigators prompted the children to think of managing their diabetes to obtain a measure of diabetes-related anxiety.

Upon completion of these assessments, children underwent structured interviewing individually with one of the project assistants in adjoining rooms. Project assistants first engaged the children in informal talk to put them at ease, then asked pre-rehearsed interview questions. The children's responses were tape recorded for later analysis.

While the children completed the above assessments, primary parents (usually mothers) completed the STAI. Prior to completing the State Anxiety Scale, parents were encouraged to think of their child's diabetes to obtain a measure of parental anxiety about their child's illness.

Selected parent-child dyads (based on GHB results indicating either optimal or nonoptimal diabetic control)

then underwent role-play assessment. Six children in excellent diabetic control (4 males, 2 females, mean age = 12.8) and six children in fair to poor control (4 males, 2 females, mean age = 13.6) were selected to enable an analysis of family behaviors that may contribute to adaptive management of diabetes. These assessments were conducted in a separate room. Prior to assessment, each parent-child dyad was provided with an explanation of the role-play procedure and encouraged to respond realistically. The dyad then practiced on one mock scene. The investigator operated video equipment and read background narration for each scene. Each scene continued until the dyad cued the investigator that the interaction was over (e.g., by not talking for 10 to 15 seconds, or looking at the investigator). Scenes were presented in randomized order for each parent-child dyad. Following each scene, the investigator provided a standard praise statement (e.g., "that was great!").

Following the collection of all project assessments, participants were thanked, the purposes of the project were reviewed, and a small monetary reward ($5.00) was provided to them.

Procedures with remaining participants from the VADA sample (i.e., children from the Pensinsula Youth Group) replicated the above, with the exception of three

participants, who completed self- and parent-report measures independently at home. However, the investigator mailed each of these participants a letter emphasizing the importance of confidential and independent completion of assessments, and called each participant twice, to ensure the same, and to answer questions.

Procedures for the Kansas sample replicated those of the Virginia workshop sample, with the exception that all self- and parent-report measures were completed at the assessment site, and children were provided with a somewhat larger monetary reward ($20.00) following participation. The larger reward was offered to KUMC participants due to a general standard for children to receive this amount (or more) for participation in research.

Behavioral Observation of Role-Play Videotapes

Prior to formal observation, the investigator randomly selected two of the twelve videotapes for review; one containing a child in excellent diabetic control, the other containing a child in poor diabetic control. The investigator then viewed the tapes looking for commonly assessed social behaviors, as well as novel behaviors displayed by parents or children. Based on this review, variables of problem solving style, defensiveness in interaction, quality of outlook (e.g., expecting positive vs. negative outcomes), parental identification of negative

consequences of poor adherence, active listening, enthusiasm of parent praise, and child assertiveness were identified as behaviors of potential importance to diabetic control. Seven point Likert rating scales were then developed for each behavior. In addition, to capture more general relationship dimensions in the parent- child dyads, four interaction ratings were adapted from Olson's Circumplex Model (Olson, 1989). These were parent leadership; and parent-child engagement, negotiation, and clarity in communication. Behavioral anchors for specific parent and child behaviors, and relationship ratings are presented in Table 3.

Insert Table 3 about here

A research assistant who was kept naive to the purposes of the project and blind to subject classification was then recruited to serve as the primary observer. The assistant memorized behavioral definitions and underwent one hour of training with the senior author. During observer training, a practice tape was independently rated on each of the behavioral dimensions. Following each scene, ratings were independently made, followed by discussion of agreements and disagreements. The investigator kept a running tally of interjudge agreements and disagreements for each behavior.

Discussion of individual behaviors continued until ratings were within one point of each other for both observers across four consecutive observations. Upon attainment of this criterion, discussion was then focused on other behaviors in a sequential process, until all behaviors had been observed reliably. The primary observer then independently scored the videotapes on the behavioral and relationship dimensions. The investigator randomly selected two of the tapes and scored behavioral dimensions for reliability purposes. In addition, the investigator randomly selected eight tapes and scored them on the four relationship dimensions. Pearson product-moment correlations were then computed for behavioral and relationship ratings between primary and reliability observers. For all parent behaviors correlations were above .70. Correlations for relationship ratings were similarly above .70, except for one behavior, relationship cohesion, for which the correlation was .63. However, on the four child behavioral dimensions reliability coefficients were found to be poor (below .55; see Table 4).

Insert Table 4 about here

Results

A series of one-way MANOVAS was conducted on

demographic, illness-related, and selected psychosocial variables to assess whether there were significant differences between the Virginia and Kansas samples. No significant multivariate effects for sample were found for demographic variables (age, sex, parent occupation, and family size; F [4,52] = .21, p = .95) or for illness-related variables (duration of diabetes, control problems, and diabetic control status; F [3,50] = 2.13, p = .11). Similarly, no significant multivariate effects for sample were found for variables of knowledge about diabetes (F [2,52] = .09, p = .91), family environment (F [3,54] = 1.10, p = .36), child anxiety (F [2,56] = .96, p = .39), parent anxiety (F [2,54] = 2.26, p = .11), child behavior (F [3,54] = 1.12, p = .35), health locus of control (F [3,53], = 1.72, p = .17), or child coping (F [10,45] = .58, p = .82). Given the absence of significant multivariate effects for sample site, the two samples were collapsed for subsequent analyses.

Next, psychosocial variables of family environment, family behavior, child anxiety, parent anxiety, child behavior, health locus of control, and child coping were correlated with sex and age. None of these variables were correlated significantly with sex. In contrast, variables of family behavior (r = -.43), child anxiety (r = .25), health locus of control (r = - .42), and child coping (r = .27) were correlated significantly with age. Subsequent

analyses used two-way MANOVAS (age by diabetic control) to explore the influence of age and diabetic control. Children aged 12 and under were categorized as "younger", while children aged 13 and above were categorized as "older." There were 24 children who fell in the age range of 8 to 12, and 32 adolescents who fell in the age range of 13 to 19. With regard to diabetic control, there were 26 children (15 younger, 11 older) classified as being in optimal control of diabetes (GHB values rated as excellent) and 30 children (9 younger, 21 older) classified as being in nonoptimal control (GHB values rated as good, fair, or poor).

In the following, age x control MANOVAs (followed by univariate analyses when appropriate) for demographic, diabetes-specific, and psychosocial variables are presented. There were a number of nonsignificant findings. F values, degrees of freedom, and probabilities are presented only for the significant findings (see Table 5 for a summary of measures and their associated variables).

Insert Table 5 about here

Demographic/Illness Variables

A two-way (age x control) MANOVA was computed for demographic variables of mother occupation, father occupation, and family size. This analysis failed to reveal

significant multivariate effects for age, control, or age x control. A two-way (age x control) MANOVA was then computed for illness-related variables of duration of diabetes and control problems (e.g., episodes of hypoglycemia, ketoacidosis, hospitalizations), and was found to be nonsignificant for age, control, and for the interaction effect.

Diabetes-Specific Measures

Adherence. An age x control ANOVA was conducted on a subscale from the DCP measuring adherence to the diabetic regimen. This analysis revealed nonsignificant main effects for age and control; however, there was a significant age x control interaction (F [1,50] = 4.24, p = .04). Simple main effects analyses indicated that younger children were significantly more adherent than older children for the nonoptimal control status only (F [1,27] = 7.47, p = .01).

A two-way (age x control) ANOVA was conducted on the number of adherence problems reported during stuctured interviewing, and was found to be nonsignificant for age, control and age x control. A similar age x control ANOVA on the number of reasons to go off the diabetes regimen also failed to reveal significant age, control or interaction effects (see Table 6).

Knowledge. Scores from the Test of Diabetes Knowledge (TDK; n = 13) and from the Diabetes Knowledge Test (DKT; n =

43) were standardized. Two-way (age x control) ANOVAs were then conducted on standardized knowledge scores for children and for their primary parents. For children, significant effects were found for age (F [1,51] = 3.80, p = .05), with older children having higher knowledge scores than younger children, and for control status (F [1,51] = 3.95, p = .05), with children in nonoptimal control having higher knowledge scores than children in optimal control. An age x control interaction was not found. For parents, no significant effects were found for age, control, or age x control (see Table 6).

Adjustment to Diabetes. Two-way (age x control) ANOVAs conducted on the Sensitivity to Long Term Outcomes and the Barriers to Adherence subscales of the DCP were found to be nonsignificant for age, control, and age x control. An age x control ANOVA on the Social Support subscale of the DCP revealed a significant effect for age (F [1,52] = 6.37, p = .02), with younger children desiring more social support for diabetes than older children (see Table 6).

Modeling. A two-way (age x control) ANOVA was conducted on the children's ratings of the influence of a diabetic family member or friend on them. A significant control effect was found (F [1,50] = 4.30, p = .04), with children in nonoptimal control more frequently indicating that they had been negatively influenced by a diabetic family member

or friend than children in optimal control. Age and age x control effects were nonsignificant (see Table 6).

Family Supportiveness. Two-way ANOVAs (age x control) were conducted on scores from the Diabetes Family Behavior Checklist (DFBC) as completed by children and their parents. For children, a near-significant effect was found for age (F [1,52] = 3.68, p = .06), but not for control, or for age x control. Younger children perceived more family support for diabetes than older children. For parents, there were no significant effects for age, control, or age x control (see Table 6).

Physician Relations. A two-way (age x control) MANOVA was conducted on parent ratings of their relationship with the child's physician and ratings on the overall quality of medical care, and was found to be nonsignificant for age, control and age x control. A similar age x control MANOVA on child ratings of their physician relationship and medical care also failed to reveal significant multivariate effects (see Table 6).

Insert Table 6 about here

Physiological Sensitivity. Separate chi squares were computed to determine whether children in optimal control of diabetes were more sensitive to physiological signs of

hypoglycemia and hyperglycemia than children in nonoptimal control. Both chi squares were found to be nonsignificant.

Psychosocial Measures

Family Environment. The ten subscales of the Family Environment Scale (FES) were collapsed into three factors, Supportiveness, Conflicted, and Controlling, based on research by Kronenberger and Thompson (in press), supporting the utility and validity of these three factors for use with chronically ill children. A two-way (age x control) MANOVA conducted on these scales revealed significant multivariate effects for age (F [3,49] = 4.71, p = .006) and for control (F [3,49] = 3.36, p = .03), but not for age x control. Univariate analyses revealed significant effects for the Controlling factor only. Significant main effects were found for age (F [1,51] = 11.09, p = .002), with older children having more controlling family environments than younger children, and for diabetic control (F [1,51] = 10.09, p = .003), with optimally controlled children having more controlling families than nonoptimally controlled children. An interaction effect was not found (see Table 7).

Health Locus of Control. A two-way MANOVA was conducted on the Powerful Others, Chance, and Internalizing subscales of the Multidimensional Health Locus of Control Scale (MHLCS) and was found to be significant for age (F [3,49] =

4.92, p = .005) and for control (F [3, 49] = 2.95, p = .04) but not for the interaction effect. Univariate analyses revealed significant effects for the Powerful Others subscale only. Significant main effects were found for age (F [1, 51] = 12.54, p = .001), with younger children scoring higher on this subscale than older children, and for control (F [1,51] = 6.04, p = .02), with optimally controlled children scoring higher than nonoptimally controlled children. A significant age x control effect was not found (see Table 7).

Child Coping. An age x control MANOVA was conducted on the ten subscales of the KIDCOPE, and was found to be nonsignificant for age, control and for the interaction effect.

A series of ANOVAs was conducted on the children's self-reported coping with family and school problems during structured interviewing. Separate two-way (age x control) ANOVAs were conducted on positive and negative methods of coping with family problems. A significant effect for control status was found (F [1,51] = 4.69, p = .03), with children in nonoptimal control reporting more frequent use of negative methods of coping with family problems (e.g., yelling, secluding to their rooms) than children in optimal control. Effects for age and age x control were nonsignificant.

Similar two-way (age x control) ANOVAs were conducted on positive and negative methods of coping with school problems, and were found to be nonsignificant for age, control and for the interaction effect (see Table 7).

Child/Parent Anxiety. Separate age x control MANOVAs were conducted on State and Trait anxiety scores on the STAI for children and parents. For children, nonsignificant effects were found for age, control, and for age x control. There were also no significant multivariate effects for parents (see Table 7).

Child Behavior. A two-way MANOVA was conducted on Internalizing, Externalizing, and Total Behavior Problem scores of the CBCL. This analysis failed to reveal significant multivariate effects for age, control, or age x control. An age x control ANOVA was conducted on Social Competence scores of the CBCL and was found to be nonsignificant for age, control and for the interaction effect (see Table 7).

Insert Table 7 about here

Discriminant Function Analysis

A discriminant function analysis was performed on variables shown to be significantly related to metabolic control (i.e., optimal vs. nonoptimal) in previous

analyses. These variables were external locus of control, standardized knowledge, negative coping with family problems, controlling family environment, negative modeling, and adherence. In addition, a significant correlation between age and control status was found ($r = .27$, $p = .02$), with older children more likely to be in nonoptimal control. As such, age was also used as a predictor. One discriminant function was calculated, with a combined chi square (7) = 22.91, $p = .002$. This discriminant function accounted for 64% of the between group variability.

The loading matrix of correlations between predictors and the discriminant function indicates that the best predictors for distinguishing between optimally and nonoptimally controlled children were external locus of control ("powerful others" subscale from the MHLCS; $r = .51$), and standardized knowledge ($r = -.42$). These predictors were followed by predictors of negative coping with family problems ($r = -.31$), controlling family environment ($r = .23$), negative modeling ($r = .22$), age ($r = -.21$), and adherence ($r = .07$).

Role-Play Behavior

A one-way (optimal vs. nonoptimal control) MANOVA was conducted on parent role-play behaviors (active listening, outlook, acceptance, problem solving, praise for child behavior, and identification of consequences for poor

adherence), and was found to be nonsignificant. A one-way MANOVA conducted on ratings of parent-child relations (parent leadership; parent-child closeness, negotiation, and clarity in communication) was also found to be nonsignificant (see Table 8). Child role-play behaviors were not analyzed due to poor interobserver agreement.

Insert Table 8 about here

Discussion

The present study sought to document empirical relations between knowledge, adherence and psychosocial variables, with metabolic control in 56 diabetic children and adolescents. Using a variation of the template matching assessment strategy (Cone & Hoier, 1986), variables of knowledge about diabetes; adherence to the diabetic regimen; family environment, behavior and problem solving; anxiety about diabetes; child behavior; health locus of control; and child coping style were assessed in children in optimal (i.e., excellent) control of diabetes as compared to children in nonoptimal (i.e.. good, fair, or poor) diabetic control. In addition, the children's age was significantly related to primary dependent variables, and was included in two-way (age x control status) multivariate analyses. The children's age was also significantly related to control

status, with older children more likely to be in nonoptimal control than younger children. Focusing on findings pertaining to metabolic control, children in optimal control of diabetes were found to have more "controlling" family environments on the Family Environment Scale (FES; Moos & Moos, 1986), and to score higher on the "Powerful Others" locus of control subscale (assessing the belief that one's health is determined by parents and health-care providers; Thompson et. al., 1987) than children in nonoptimal control. Surprisingly, optimally controlled children were not significantly more adherent to the diabetes regimen, and had significantly poorer knowledge scores than nonoptimally controlled children. Nonsignificant effects were found for variables of family conflict, general family support, support for the child's diabetes, child behavior problems and social competence, and child and parent anxiety.

The fact that we found no significant differences between the Virginia and Kansas sample sites across demographic, illness-related, diabetes-specific, or psychosocial measures lends support for the generalizability of our findings. In most research efforts with diabetic children, participants are from one site, usually a medical center. While such an arrangement has advantages (e.g., standard measures of diabetic control and standard treatments), one cannot rule out that findings from such

investigations are limited to the particular sample under study. These sampling issues are receiving increasing attention among diabetes researchers, who are calling for multi-site research efforts (T. Wysocki, personal communication, April 11, 1991).

It is particularly noteworthy that we found our optimally controlled children to have more controlling family environments than children in less than optimal control. The controlling factor score of the FES is thought to represent the degree to which the family establishes and consistently enforces family rules and regulations, with parents clearly monitoring and directing family functions (Kronenberger & Thompson, in press). These findings are congruent with Anderson et. al. (1983), who found adaptive metabolic control of diabetes in children to be associated with family cohesion and significant parental involvement with the diabetes regimen, and with Evans and Hughes (1987) who found diabetic control in children to be related to rigidly organized family structures. In fact, our findings directly replicate those of an unpublished study by Thompson and Morris (1984), who found that children in good metabolic control of diabetes had significantly more controlling families (based on FES ratings) than children in poor diabetic control. In the present study, differences in family controlling behaviors were not limited to children;

optimally controlled adolescents also had more controlling families than nonoptimally controlled adolescents.

The above findings relating metabolic control to significant parental involvement prompt consideration of the common practice of encouraging adolescents (and even pre-adolescents) into independent management of their diabetes (Johnson, 1984). Adolescence is a difficult time of negotiating a variety of developmental tasks including mastering school work, developing and solidifying friendships, involvement in extracurricular activities and sports, dating, and developing college or career plans. These developmental tasks are particularly difficult for diabetic adolescents, who often feel very different (e.g., due to diet and activity restrictions, having to monitor blood glucose and self-inject insulin, etc.) in a phase of life that presses for peer conformity (Tattersall & Lowe, 1987). Thus, the pressures of independent self-management of diabetes may exceed the coping resources of many diabetic adolescents. This view is supported by Sullivan (1979), who in a survey of adolescent girls with diabetes, found approximately 40% of the sample to feel that they had been given primary responsibility for the management of their diabetes before they were ready to handle it.

In addition, empirical evidence has accumulated that efforts to promote independent management of diabetes may

lead to attenuated metabolic control. For example, Allen, Tennan, McGrade, Affleck, and Ratzan (1983) found poorer metabolic control in children who were self-injecting insulin on their own, as compared to children who received parental assistance with this task. Notably, while parents of well controlled children felt that their children were assuming appropriate responsibility for their diabetes, parents of poorly controlled children viewed their children as needing to take more responsibility. Similarly, LaGreca, Follansbee, and Skyler (cited in Johnson, 1984) found metabolic control in pre-adolescents to worsen the more they assumed independent responsibility for their illness. Commenting on efforts to promote independent self-management in diabetic children and adolescents, Johnson (1984) aptly summarizes: "Clearly more research is needed to delineate when youngsters should be encouraged to be responsible for which aspects of their diabetes care regimen as well as the importance of parent supervisory behaviors in this process" (p. 516).

In terms of health locus of control, we found our optimally controlled children to be higher on the Powerful Others subscale of the MHLCS (Thompson et al., 1987) than nonoptimally controlled children. This subscale measures the degree to which children believe that their health is determined by parents and health care providers. While this

finding is somewhat counterintuitive (e.g., as we hypothesized, one might expect that internally oriented youth would make greater efforts to appropriately manage their diabetes), studies have shown external locus of control to be related to positive health outcomes. For example, Brand, et al. (1986) found internal diabetic youth to have poorer metabolic control than externals when confronted with negative life events. In a study with diabetic children at a summer camp, Hamburg and Inoff (1982) found internal locus of control to relate to metabolic control in girls, but not in boys, for whom metabolic control was related to externality. Johnson (1984) has suggested that internally oriented children may react to uncontrollable aspects of their diabetes (e.g., blood glucose fluctuations associated with physical illness) with high levels of distress, with consequent deleterious impacts on their health status. In contrast, externally oriented children may recognize and accept that their physical health is significantly influenced by "powerful others," with such acceptance representing an adaptive (and stress reducing) coping mechanism in a situation characterized by high levels of dependence and uncertainty (cf. Winefield, 1982).

Regarding our knowledge findings, we found our optimally controlled youth to have significantly <u>poorer</u> knowledge about diabetes and its management than their

counterparts in nonoptimal control. While knowledge is assumed to underpin adherence (Christensen, 1983), and empirical evidence has accummulated linking knowledge to improved metabolic control (e.g., McCulloch, Young, Steel, Wilson, Prescott, & Duncan, 1983), findings are by no means conclusive. For example, other studies (e.g., Aloia, Donahue-Porter, Schlussel, Vaswani, & Rasulo, 1983; Orr, Golden, Myers, & Marrero, 1983) have found no relationship between the extent of knowledge about diabetes and metabolic control, while yet other studies (e.g., Hamburg & Inoff, 1982) found, as we did, knowledge about diabetes to be negatively correlated with metabolic control. In explaining absent and inverse relations between knowledge and metabolic control, it has been suggested that patients in poor control may receive more instruction about diabetes and its management, with resultant improvements in their knowledge (Johnson, 1984). Alternatively, poorly controlled youth may learn more about diabetes from increased contacts with the health care delivery system, associated with medical crises such as repeated hypoglycemic episodes or ketoacidosis. Yet another explanation would be that children in optimal control of diabetes are more likely to have parents who are highly involved in the monitoring and management of their adherence to the diabetic regimen. As such, the lower knowledge displayed by optimally controlled children may

reflect the fact that it is not necessary for them to have high levels of knowledge about diabetes, given their parents' control over their illness.

We did not find our optimally controlled children to be more adherent to the diabetes regimen than children in nonoptimal control. Given that adherence is assumed to underly metabolic control, these findings were unexpected. Our failure to find significant differences in adherence between optimally and nonoptimally controlled children may reflect the unidimensional nature (i.e., self-report) of our adherence measure. Perhaps with a multidimensional measure of adherence (e.g., including physician and parent ratings) significant differences in adherence would have been found. However, we did obtain an interaction effect on the adherence measure whereby older children were significantly less adherent than younger children for the nonoptimal control status only. Previous studies have found that adolescents with diabetes are less adherent than younger children (Johnson, in press). In our study, such a drop off in adherence was not evident for well-controlled adolescents, who reported levels of adherence very similar to younger children in optimal control. Integrating these findings with findings pertaining to family environment, it may be that "controlling" family behaviors serve to ensure that the child continues to adhere to the diabetes regimen

amidst the developmental issues and life changes of adolescence. Future research investigating the link between family behavior and child adherence appears to be warranted.

Our findings pertaining to child coping style were mixed. We found no differences between optimally and nonoptimally controlled children in self-reported coping strategies on the KIDCOPE. Our failure to find significant differences on this measure may have reflected its rather difficult format; children must first think of a recent stressful event, and then report on the use of various coping strategies in relation to that event. During testing, we received reports from more than a few children that it was difficult to think of a recent stressful event, and to recall exactly how they reacted to that event. However, we did find children in nonoptimal control to report higher levels of negative coping with family problems (e.g., argumentation, withdrawal from other family members) than well-controlled children. Investigators have reported that the effective use of social support serves to facilitate adherence behaviors and promote positive health status (Hanson & Hengeller, 1984; Janis, 1983). Although speculative, poor coping with family problems may serve to interfere with the use of family support, with resultant negative impacts on health status.

Our finding that children in nonoptimal control were

more likely to report being negatively influenced by a family member or friend with diabetes is congruent with other findings. For example, Carney and Schecter (1982) reported that diabetic children were more likely to have poor metabolic control if their parents kept snacks in the home and ate sugary foods in their presence. A likely contributor to susceptibility to such negative modeling influences is the fact that harmful impacts of poor diabetic control are often very subtle, particularly for hyperglycemia, with notable deleterious effects (e.g., visual, circulatory difficulties) not ensuing for many years. Per other behaviors that provide immediate reinforcement and only delayed, inconsistent punishment (e.g., smoking), self-control can be particularly difficult. Thus, exposure to a poor diabetic model may serve as a critical factor that "pushes" the child across the threshold into problematic diabetic control.

Our failure to find systematic differences in role-play behavior is likely related to methodological problems. First, we did not observe child behaviors reliably. Poor interobserver agreement of child role-play behaviors may relate to the limited variability in these behaviors. In general, children were somewhat passive in the interactions; their behaviors were typically of very short duration, and in reactance to parent behaviors. The absence of clear

variability in these behaviors may have increased the operation of independent judgement by the observers as they attempted to make fine distinctions in behavioral ratings. Second, there were difficulties in recruiting children to participate in the role-play measure, which resulted in a generally small sample. Third, due to recruiting difficulties, some of the nonoptimal children were in fair metabolic control of diabetes. A comparison of children in excellent versus poor control of diabetes may have resulted in clearer behavioral differences between the two groups. Future research, addressing these methodological issues appears to be indicated.

It must be emphasized that findings from the current study were based on a comparison of children in optimal (i.e., excellent) versus nonoptimal (i.e., good, fair, or poor) control of diabetes. Previous studies assessing the psychosocial adjustment of children with diabetes have generally compared children at the extremes of diabetic control (i.e., excellent vs. poor). This difference in comparison groups may at least partially account for our failure to replicate variables shown to relate to metabolic control of diabetes in previous investigations (e.g., child anxiety, child behavior; Anderson et al., 1981; Simonds, 1977). An additional point to consider is that while variables of family environment, health locus of control,

and style of coping with family problems were shown to relate to metabolic control of diabetes in our study, further investigation of these targets across populations of children with diabetes (e.g., varying in geographic and sociocultural background) is required to establish their generalizability. Issues relating to generalizability limits have been discussed by others (e.g., situational specificity, delineating "local norms"; Kazdin, 1979; Cone, 1980).

Investigators (e.g., Johnson, 1984) have called for empirically based programs to address the psychosocial needs of diabetic children. In the present project, we used an empirical validation approach (Weist, Ollendick, & Finney, in press) to treatment target selection for children with diabetes. Variables shown to relate to metabolic control od diabetes in previous investigations were identified, and then assessed in two samples of children, representing the first two stages of the empirical validation process (i.e., literature review, nomothetic research). The final stage in this process is to train empirically validated behaviors to children in idiographic interventions to explore the influence on outcome. The investigator would place more confidence in the clinical importance of assessed behaviors with affirmatory evidence at each level of the empirical validation process (Weist, Finney, Barnard, & Davis, 1991).

For example, based on our current findings, an empirically based treatment program would involve elements of: 1. improving the family's use of rules and routines to promote general family structure and consistent adherence to the diabetes regimen through adolescence, 2. assisting the child in accepting and feeling comfortable with the fact that competent adults (e.g., parents, nurses, physicians) control his/her health, 3. improving the child's coping with family problems, and 4. assisting the child in resisting negative modeling influences. We are currently implementing a treatment program designed as above with two diabetic adolescents in poor metabolic control. If the program proves useful to them in improving their metabolic control and adjustment to diabetes, and following replication of treatment benefits across additional cases, the empirical validity of our treatment targets would be further documented. It appears that only through such research will the treatment utility (Hayes, Nelson, & Jarrett, 1987) of our findings, and of the empirical validation approach to target selection be established.

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Table 1

Structured Interview Questions

1. What are the most important things that you do to manage your diabetes and keep your blood sugar levels stable?

2. What things are most likely to lead to problems in controlling your diabetes?

3. Do you know when your blood sugar is too high without testing it? How?

4. Do you know when your blood sugar is too low without testing it? How?

5. Sometimes things happen within the family that affect your diabetes (for example, your parents might argue or fight over something). How do you handle these things?

6. Sometimes things happen at school or with friends that affect your diabetes (for example, someone offers you candy). How would you handle things like that?

7. What things make you go off your regimen or schedule?

8. What are the good things about having diabetes?

Table 2

Role-Play Scenes for the Family Interaction Measure

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1. (GC) Mom has recently had some problems at work. When she comes home, she's very short tempered, and she never seems to have time to talk or do fun things anymore. _____, talk to your mom about how she's been acting.

2. (DC) _____, you feel like your mom is paying too much attention to your diabetes. She is always asking you whether you checked your blood sugar, what you recently have eaten and how you are feeling. You feel like you need some space. Talk to your mom about this.

3. (GS) Mom, you have just received a report that _____ has been doing outstanding in school lately. He/she is earning mostly A's and was an excellent help to the teacher on a project she recently completed. Mom, talk to _____ about how he/she is doing in school.

4. (DC) _____ has been having some problems adhering to his/her diabetes regimen. He/she has been sneaking sweets, and complains about having to exercise and monitor his/her blood glucose. His/her blood sugars have been running high for the past few weeks. Mom, talk to _____ about this.

5. (DS) For three weeks, _____ has been monitoring his/her blood sugar, taking insulin, watching his/her diet and exercising as he/she should. Overall, he/she seems to have an excellent attitude about managing his/her diabetes. Mom, talk to _____ about he/she has been doing.

6. (GC) _____ has been having some problems completing his/her homework, and his/her grades have dropped from A's and B's to B's, C's and D's. Mom, you're confused about this drop in _____'s performance. Talk to him/her about it.

7. (GS) _____, you've been worrying about some boys/girls at school who have been acting like they don't like you. You're worried that more people in your class may not like you. Talk to your mom about it.

8. (DS) _____, recently you have had two episodes of severe hypoglycemia. You are very concerned about your health and afraid of another episode. Talk to your mom about your concerns.

Note: GC = general conflict; DC = diabetes-specific conflict; GS = general support/encouragement; DS = diabetes-specific support/encouragement.

Table 3

Behavioral Anchors used to Score Role-Play Videotapes

1	2	3	4	5	6	7
Active Listening (P C)						
unresponsive or invalidates other's statements			somewhat responsive			very responsive
Acceptance of the Other Person's View (P C)						
defensive nonaccepting			some acceptance			readily accepts other's view
Identification of Consequences for Poor Adherence (P)						
none			one conseq. identified			three plus identified
Outcome Expectancy (Outlook) (P C)						
expresses exasperation/ frustration/ hopelessness			moderately positive			clear confidence in positive outcomes
Problem Solving						
Directness in Defining Problems (P)						
indirect/ illusive			states general problem			directly states specific problem
Suggests Solutions to Problem (P)						
zero solutions			one-two solutions			three plus solutions
Plans Implementation of Chosen Solution (P)						
no stated plan			vague plan			specific plan

(table continues)

Table 3

Behavioral Anchors (cont.)

Involvement of Child in Problem Solving (P)						
1	2	3	4	5	6	7
none parent dictates			some			joint collegial decisions
Child Assertiveness (C)						
1	2	3	4	5	6	7
passive or very aggressive			vague/tentative statement of view or mild aggressive			directly states view no aggression
Praise for Child Behavior (P)						
1	2	3	4	5	6	7
minimal artificial sarcastic			some enthusiasm			genuine enthusiasm
Leadership (P-C)						
1	2	3	4	5	6	7
unclear parent-child roles			parent somewhat in control			parent clearly in control
Parent-Child Relationship (P-C)						
1	2	3	4	5	6	7
disengaged conflicted			moderate closeness			connected
Negotiation (P-C)						
1	2	3	4	5	6	7
limited parents impose decision			somewhat democratic flexible			democratic collegial flexible
Clarity (P-C)						
1	2	3	4	5	6	7
inconsistent unclear verbal messages incongruence verbal-nonverbal			some clarity			verbal messages very clear congruence

Note: P = rating of parent behavior; C = rating of child behavior; P-C = rating of parent-child relationship dimension.

Table 4

Interobserver Reliability Coefficients for Parent and Child Role-Play Behaviors, and Relationship Ratings

Behavior	Reliability Coefficient
Parent Behaviors	
Active Listening	.848
Accepts Other's View	.847
Outlook	.845
Enthusiasm of Praise	.707
Identification of Consequences	.717
Problem Solving	
Statement of Problem	.845
Generates Solutions	.786
Plans Implementation	.723
Involves Child	.834
Child Behaviors	
Active Listening	.484
Accepts Other's View	.534
Outlook	.428
Assertiveness	.484
Relationship Ratings	
Parent Leadership	.760
Relationship Cohesion	.628
Clarity in Communication	.883
Negotiation	.730

Note: All coefficients represent the Pearson Product Moment correlation for behavioral or relationship ratings between observers 1 and 2.

Table 5

Measures and their Associated Variables

Measures	Variables	Completed By
Diabetes Care Profile	Adherence	C (P)
	Long Term Outcomes	C
	Barriers to Adherence	C
	Desire for Social Support	C
Test of Diabetes Knowledge	Diabetic Knowledge	C P
Diabetes Knowledge Test	Diabetic Knowledge	C P
Diabetes Fam. Checklist	Family Support	C P
Background Questionnaire	Modeling	C
	Physician Relations	C P
Structured Interview	Adherence Problems	C
	Reasons for Nonadherence	C
	Coping with Family and School Problems	C
	Physiological Sensitivity	C
Family Environment Scale	Supportive Family Env.	P
	Conflicted Family Env.	P
	Controlling Family Env.	P
Health Locus of Control Scale for Children	Internal LOC	C
	Powerful Others	C
	Chance	C
KIDCOPE	Distraction	C
	Social Withdrawal	C
	Cognitive Restructuring	C
	Self-Criticism	C
	Blaming Others	C
	Problem Solving	C
	Emotional Regulation	C
	Wishful Thinking	C
	Social Support	C
	Resignation	C
Child Behavior Checklist	Internalizing	P
	Externalizing	P
	Total Behavior Problems	P
	Social Competence	P
State-Trait Anxiety Inv.	State Anxiety	C P
	Trait Anxiety	C P

Note: C = child completed; P = parent completed; (P) = parent assistance.

Table 6

Mean Scores on Diabetes-Specific Measures for Optimally and Nonoptimally Controlled Children in Young and Older Age Groups

	Diabetic Control Status						
	Optimal			Nonoptimal			
Variables	Young	Older	All	Young	Older	All	Effects
Adherence	27.00	28.00	27.44	32.00	24.05	26.52	AxC
	(9.28)	(6.21)	(7.93)	(6.94)	(7.36)	(8.03)	
" Problems	1.40	1.81	1.58	2.00	1.85	1.90	
	(.91)	(.75)	(.86)	(1.22)	(.81)	(.94)	
Reasons for nonadherence	1.80	1.63	1.73	1.66	1.40	1.48	
	(1.14)	(1.12)	(1.12)	(1.22)	(.75)	(.91)	
*Stan. Knowledge							
Child	-.52	-.28	-.41	-.27	.50	.27	A C
	(1.19)	(1.01)	(1.10)	(.81)	(.67)	(.79)	
Parent	.09	.04	.07	-.13	.04	-.01	
	(1.14)	(.76)	(.99)	(.88)	(1.17)	(1.04)	
Adjustment							
Outcomes	15.13	15.18	15.15	12.89	16.80	15.59	
	(6.27)	(5.05)	(5.68)	(8.69)	(3.01)	(8.58)	
Barriers	8.47	10.36	9.27	8.55	13.60	12.03	
	(5.75)	(8.15)	(6.78)	(6.63)	(7.65)	(7.61)	
Soc. Support	29.86	26.73	28.54	31.44	25.71	27.43	A
	(6.81)	(6.76)	(6.84)	(7.14)	(5.07)	(6.24)	
Modeling	2.07	2.09	2.08	.44	1.55	1.21	C
	(1.90)	(2.12)	(1.95)	(1.01)	(1.90)	(1.74)	
Family Support							
Child	60.20	58.00	59.26	64.22	52.71	56.16	A*
	(11.77)	(19.09)	(14.98)	(11.05)	(9.56)	(11.20)	
Parent	67.66	60.36	64.57	60.66	57.42	58.40	
	(7.41)	(12.82)	(10.48)	(11.88)	(13.11)	(12.64)	
Physician Relations							
Child	3.93	3.91	3.92	4.22	3.60	3.79	
	(1.03)	(1.22)	(1.09)	(.97)	(1.35)	(1.26)	
Parent	4.73	4.36	4.57	4.11	4.33	4.26	
	(.45)	(.67)	(.58)	(1.05)	(.86)	(.90)	

Note: *Stan = standardized scores; A = significant age effect; C = significant control effect; AxC = significant age x control interaction; differences are significant at or below the .05 level; * indicates difference that is significant at the .06 level; standard deviations are in parentheses.

Table 7

Mean Scores on Psychosocial Variables for Optimally and Nonoptimally Controlled Children in Young and Older Age Groups

	Diabetic Control Status						
	Optimal			Nonoptimal			
Variables	Young	Older	All	Young	Older	All	Effects
Family Environment							
Support	262.3	239.8	253.3	277.0	245.3	254.8	
	(37.8)	(36.1)	(38.1)	(48.2)	(51.5)	(51.9)	
Conflict	-61.2	-58.2	-60.0	-75.1	-50.7	-58.0	
	(23.9)	(38.2)	(29.7)	(33.9)	(28.6)	(31.8)	
Control	124.7	133.1	128.1	97.6	125.6	117.2	A**C**
	(22.3)	(15.8)	(20.1)	(17.7)	(18.6)	(22.3)	
Locus of Control							
Powerful Others	18.00	15.18	16.76	16.11	12.86	13.83	A**C*
	(3.70)	(2.44)	(3.45)	(3.01)	(2.79)	(3.19)	
Internal	16.93	16.73	16.84	15.89	15.43	15.56	
	(1.59)	(2.19)	(1.84)	(2.36)	(2.76)	(2.62)	
Chance	12.21	12.00	12.12	10.55	12.09	11.63	
	(3.61)	(3.25)	(3.39)	(3.12)	(2.66)	(2.84)	
KIDCOPE							
Social Withdrawal	.36	1.00	.64	1.25	1.19	1.21	
	(.92)	(1.18)	(1.07)	(1.03)	(1.03)	(1.01)	
Self-Criticism	.57	.18	.40	.25	.81	.65	
	(1.01)	(.40)	(.81)	(.46)	(1.07)	(.97)	
Blaming	.85	.27	.60	.37	.67	.59	
	(.95)	(.65)	(.86)	(.74)	(.85)	(.82)	
Interview Coping							
Family							
Negative	.00	.27	.11	.44	.50	.48	C*
	(.00)	(.46)	(.33)	(.73)	(.68)	(.69)	
Positive	.73	.54	.65	.77	.60	.65	
	(.80)	(.69)	(.74)	(.67)	(.59)	(.61)	
School							
Negative	.33	.09	.23	.11	.25	.21	
	(.62)	(.30)	(.51)	(.33)	(.64)	(.56)	
Positive	.73	.91	.81	.66	.70	.68	
	(.70)	(.70)	(.69)	(.50)	(.65)	(.60)	

(table continues)

Table 7

Mean Scores on Psychosocial Variables (cont.)

	Diabetic Control Status						
	Optimal			Nonoptimal			
Variables	Young	Older	All	Young	Older	All	Effects
State Anxiety							
Child	30.00	36.45	32.73	29.11	36.86	34.53	
	(5.60)	(13.53)	(10.07)	(8.60)	(14.31)	(13.22)	
Parent	34.46	33.64	34.11	32.33	32.50	32.45	
	(12.94)	(11.29)	(12.04)	(6.32)	(8.41)	(7.71)	
Child Behavior							
Internalizing	57.87	51.09	55.00	57.44	59.14	58.63	
	(10.41)	(16.02)	(13.23)	(8.67)	(9.87)	(9.41)	
Externalizing	53.87	54.91	54.31	54.88	56.62	56.10	
	(8.89)	(12.12)	(10.16)	(10.50)	(8.58)	(9.06)	
Social Comp.	49.80	43.45	47.12	49.88	47.67	48.33	
	(10.80)	(12.86)	(11.84)	(11.00)	(11.85)	(11.46)	

Note: A = significant age effect; C = significant control effect; * = significant difference at or below the .05 level; ** = significant difference at or below the .005 level; standard deviations are in parentheses.

Table 8

Mean Scores on Parent Role-Play Behaviors and Relationship Ratings

	Diabetic Control Status	
	Optimal	Nonoptimal
Active Listening	4.58	5.21
Acceptance	4.52	4.02
Outlook	3.62	3.17
Enthusiasm of Praise	4.33	4.16
Identifying Consequences of Poor Adherence	1.95	2.16
Problem Solving		
Directness	3.45	3.61
Identifying Solutions	2.44	3.41
Planning Implementation	3.30	3.97
Involving Child	2.86	1.45
*Parent Leadership	6.16	5.66
*Relationship Cohesion	3.83	4.00
*Negotiation	2.33	2.83
*Communication Clarity	3.33	4.16

Note: All means are based on 1 - 7 Likert ratings; * indicates rating on relationship dimension for parent-child dyads.

Appendix A

Consent Forms

Appendix A1

Consent Form - Virginia Sample

COLLEGE OF ARTS AND SCIENCES

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061-0436

CHILD STUDY CENTER
(703) 231-6914

Dear Parent or Guardian:

We are conducting a project to determine factors that are related to effective management of diabetes in children and adolescents. Participation in the project will involve two to four hours of you and your child's time. After the project is completed, all participants will receive a report on possible ways to improve their children's adjustment to diabetes. Also, a cash award will be donated to the Peninsula Diabetes Youth Group for members' participation in the project.

The primary goal of the project is to determine what child and family factors are related to good control of diabetes in diabetic children and adolescents. If you agree to participate in the project, we will ask you and your child to complete several surveys that will be mailed to you. These surveys will be relatively brief and will focus on how your child and family have adjusted to your child's diabetes. Also, your physician will be asked to provide information on the medical care that has been provided to your child, such as the number of office visits, insulin dosages, and A1C tests (a measure of diabetic control called glycosylated hemoglobin) that have been provided over the past two years.

We will then ask you and your child to come to the Diabetes Treatment and Learning Center (DTLC) at the Riverside Regional Medical Center in Newport News, VA on the morning of April 21, 1990 (Saturday) to complete additional assessments. These assessments will take around one and a half hours. At the DTLC, your child will complete other surveys focusing on his/her general adjustment to diabetes. A brief (10 minute) interview will also be conducted with your child to determine what he/she feels is important to manage diabetes well. These interviews will be tape recorded, and later reviewed by project assistants. Also, during the workshop, we will ask you to complete a few brief questionnaires on your adjustment to your child's diabetes. You may also be asked to participate in a brief videotaped role-play assessment with your child on ways families handle issues about diabetes.

There are no special risks to you or your child for being in this study. All information about you and your child will be kept strictly confidential (private). All surveys and information sheets will only be available to our research staff. Numbers, rather than your names, will be used for summaries of information. Audio and video tape recordings will be kept strictly confidential (no names will be used during recording), and will be erased after review by project staff. No information that could be used to identify you will be reported in the results of the study.

You are free to withdraw from the study at any time, at no risk of prejudice or penalty. The study has been approved by the Human Subjects Research Committee and the Institutional Review Board at Virginia Tech.

If you have any questions about the study please call one of us directly at 703-231-6914. You may also call Dr. Helen Crawford, (703) 231-6520, Chair of the Human Subjects Committee, or Dr. Ernest Stout, (703) 231-5281, Chair of the Institutional Review Board at Virginia Tech, if you have any questions.

Thank you for taking the time to read this study description and consent form. If you wish to participate in the study, please complete the attached form and mail it in the addressed, stamped envelop in the next few days. Be sure to include your address and telephone number (and times you can be reached) so that we can reach you and send the questionnaires.

Sincerely,

Mark D. Weist, M.S.
Psychologist in Training

Jack W. Finney, Ph.D.
Assistant Professor and
Director, Child Study Center

Assessment of Diabetes Management in Children

Consent Form

Parent Permission:

_____ I agree to participate and give permission for my child to participate in the Assessment of Diabetes Management study.

_____ We do not wish to participate in the Assessment of Diabetes Management study.

Child's name:_____

Parent's name:_____

Parent's signature:_____ Date:_____

Child Permission:

_____ I agree to participate in the Assessment of Diabetes Management project.

_____ I do not wish to participate in the study.

Child's signature:_____ Date:_____

Family Address: _____

_____

_____

_____

Telephone: ( ) _____

Best times to be called:_____

Please return this form in the enclosed envelope.

Appendix A2

Consent Form - Kansas Sample

Assessment of Diabetes Management in Children
Permission Form

The purpose of this study is to determine what child and family factors are related to good control of diabetes in diabetic children and adolescents. If you agree to participate in the project, we will ask you and your child to complete several questionnaires at home. These will include questionnaires on how your family generally gets along, and you and your child's adjustment to diabetes. We will also ask your physician (with your consent) to provide information on the medical care provided to your child, such as the number of office visits and insulin dose changes that have been made over the past two years. We will only use past medical information; no laboratory work (e.g., blood tests) will be required. Initial assessments will take between one and two hours of you and your child's time. Following the completion of these questionnaires, we will ask you and your child to come to the Pediatric Endocrinology Clinic at KUMC to complete additional assessments. These will include additional questionnaires on you and your child's adjustment to diabetes, and a brief structured interview with your child on how he/she manages diabetes. These assessments will also take between one and two hours of you and your child's time. Responses to all questionnaires will be kept completely confidential. Parent responses will not be made available to participating children. Similarly, the responses of children and adolescents who participate in the project will not be made available to their parents. We may also ask you to participate in a brief video-taped role-play assessment of family issues around diabetes. The role-play assessment takes about ten minutes.

I authorize the collection of the above information under the direction of Martha U. Barnard, Ph.D., Pediatric Endocrinology Clinic, KUMC.

There are no special risks to you or your child for being in this study. All information about you and your child will be kept strictly confidential (private). All surveys and information sheets will only be available to our research staff. Numbers, rather than your names, will be used for summaries of information. No information that could be used to identify you will be reported in the results of the study.

There will be no financial costs for you to participate in this study. A small ($20) financial reimbursement will be given to your child for participation in the study. Also, you will receive a personalized report on possible methods that you can use to improve your child's management of diabetes. Participating in this project may or may not lead to any direct benefit to your child.

If I have any questions about this study, I may call Dr. Barnard at KUMC (913-588-6326).

In giving my consent, I acknowledge that my child's participation in this study is voluntary and that I may withdraw my child from the study at any time without prejudice to future treatment.

I understand that my child's medical records are confidential, however, they may be reviewed by research assistants who are working with Dr. Barnard.

Permission Form (cont.)

Child (Adolescent's) name	Parent (Guardian) name
Date	Parent (Guardian) signature

WITNESS

Date	Witness signature

RESPONSIBLE INVESTIGATOR

The above-named information has been explained to _____ and it appears that _____ understands it.

Date	Investigator signature

I have diabetes. I am being asked to be in a research project that may help health care professionals learn about things that children with diabetes and their families can do to better handle the illness. If I want to be in the research, one of my parents and I will have to complete some questionnaires on how we get along, and how I have adjusted to my diabetes. I also will be interviewed about my diabetes for about five minutes and my answers will be tape recorded. One of my parents and myself may also be asked to be in a role-play (like acting) situation of how families handle situations about diabetes. I understand that my responses to the questionnaires and the interview will be kept totally private. None of my responses will be shown to my parents. My doctor will also be contacted to answer some questions about the medical care that has been provided to me. I know that my parents have given permission for me to be in this research. If I sign my name, I am saying that I want to be in the research. I know that I don't have to be in this research project and that I can stop being in the project even if I signed my name. If I want to stop all I have to do is tell my parents or one of the research staff.

Signature of Child/Adolescent Subject

Appendix B

Measures that are not Copyrighted

Appendix B1

Health Locus of Control Scale

Health Questionnaire

Directions: This questionnaire has to do with beliefs that people have about their health. In the questionnaire are a series of statements followed by a four point rating scale. Next to each statement circle the number that most closely agrees with your beliefs. The higher the number the more you agree with the statement. Please answer every item and do not spend too much time thinking about any one. Since this is a measure of your beliefs about health, there are no right or wrong answers.

	Disagree Very Much			Agree Very Much
1. I am in control of my own health.	1	2	3	4
2. My own actions mostly determine how soon I will recover from an illness.	1	2	3	4
3. No matter what I do, If I am going to get sick, I will get sick.	1	2	3	4
4. The best way to keep from getting sick is to have regular medical checkups.	1	2	3	4
5. My family has alot to do with my becoming sick or staying healthy.	1	2	3	4
6. If I take the right actions I can stay healthy.	1	2	3	4
7. The main thing that effects my health is what I do.	1	2	3	4
8. My good health is mostly a matter of good luck.	1	2	3	4
9. If I take care of myself, I can avoid illness.	1	2	3	4
10. Most things that affect my health happen to me by accident.	1	2	3	4
11. Whenever I don't feel well I should see a doctor or a nurse.	1	2	3	4
12. When I get sick, I am to blame.	1	2	3	4
13. Luck is mostly what determines how soon I will recover from an illness.	1	2	3	4
14. Doctors and nurses control my health.	1	2	3	4

	Disagree Very Much			Agree Very Much
15. When I get well, its usually because other people (like family, friends, doctors) have been taking care of me.	1	2	3	4
16. I am likely to get sick no matter what I do.	1	2	3	4
17. If its meant to be, I will stay healthy.	1	2	3	4
18. I can only do what my doctor tells me to do about my health.	1	2	3	4

Appendix B2

Coping Questionnaire

First Name: _____ Initials: _____

Age: _____ Grade: _____ Birthdate: _____ Sex: _____

Teacher: _____ School: _____

INSTRUCTIONS: We are trying to find out how children deal with different problems. Think about a situation that has bothered you during the last month. Please describe the situation below:

1. Did this situation make you nervous?

Not at all A little Somewhat Pretty much Very much

2. Did this situation make you sad?

Not at all A little Somewhat Pretty much Very much

Now, please turn over this sheet and circle whether you used any of the following ways to help deal with this problem?

		Did you do this?		How much did it help?		
1.	I just tried to forget it.	yes	no	Not at all	A little	A lot
2.	I did something like watch TV or played a game to forget it.	yes	no	Not at all	A little	A lot
3.	I stayed by myself.	yes	no	Not at all	A little	A lot
4.	I kept quiet about the problem.	yes	no	Not at all	A little	A lot
5.	I tried to see the good side of things.	yes	no	Not at all	A little	A lot
6.	I blamed myself for causing the problem.	yes	no	Not at all	A little	A lot
7.	I blamed someone else for causing the problem.	yes	no	Not at all	A little	A lot
8.	I tried to fix the problem by thinking of answers.	yes	no	Not at all	A little	A lot
9.	I tried to fix the problem by doing something or talking to someone.	yes	no	Not at all	A little	A lot
10.	I yelled, screamed, or got mad.	yes	no	Not at all	A little	A lot
11.	I tried to calm myself down.	yes	no	Not at all	A little	A lot
12.	I wished the problem had never happened.	yes	no	Not at all	A little	A lot
13.	I wished I could make things different.	yes	no	Not at all	A little	A lot
14.	I tried to feel better by spending time with others like family, grownups, or friends.	yes	no	Not at all	A little	A lot
15.	I didn't do anything because the problem couldn't be fixed.	yes	no	Not at all	A little	A lot

Appendix B3

State Anxiety Scales

HOW-I-FEEL QUESTIONNAIRE

Developed by C. D. Spielberger, C. D. Edwards, J. Montuori and R. Lushene

STAIC FORM C-1

NAME _____ AGE _____ DATE _____

DIRECTIONS: A number of statements which boys and girls use to describe themselves are given below. Read each statement carefully and decide how you feel *right now*. Then put an X in the box in front of the word or phrase which best describes how you feel. There are no right or wrong answers. Do not spend too much time on any one statement. Remember, find the word or phrase which best describes how you feel right now, *at this very moment*.

1.	I feel	☐	very calm	☐	calm	☐	not calm
2.	I feel	☐	very upset	☐	upset	☐	not upset
3.	I feel	☐	very pleasant	☐	pleasant	☐	not pleasant
4.	I feel	☐	very nervous	☐	nervous	☐	not nervous
5.	I feel	☐	very jittery	☐	jittery	☐	not jittery
6.	I feel	☐	very rested	☐	rested	☐	not rested
7.	I feel	☐	very scared	☐	scared	☐	not scared
8.	I feel	☐	very relaxed	☐	relaxed	☐	not relaxed
9.	I feel	☐	very worried	☐	worried	☐	not worried
10.	I feel	☐	very satisfied	☐	satisfied	☐	not satisfied
11.	I feel	☐	very frightened	☐	frightened	☐	not frightened
12.	I feel	☐	very happy	☐	happy	☐	not happy
13.	I feel	☐	very sure	☐	sure	☐	not sure
14.	I feel	☐	very good	☐	good	☐	not good
15.	I feel	☐	very troubled	☐	troubled	☐	not troubled
16.	I feel	☐	very bothered	☐	bothered	☐	not bothered
17.	I feel	☐	very nice	☐	nice	☐	not nice
18.	I feel	☐	very terrified	☐	terrified	☐	not terrified
19.	I feel	☐	very mixed-up	☐	mixed-up	☐	not mixed-up
20.	I feel	☐	very cheerful	☐	cheerful	☐	not cheerful

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577 COLLEGE AVENUE, PALO ALTO, CALIFORNIA

SELF-EVALUATION QUESTIONNAIRE

Developed by C. D. Spielberger, R. L. Gorsuch and R. Lushene

STAI FORM X-1

NAME _____ DATE _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *feel* right now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	①	②	③	④
2. I feel secure	①	②	③	④
3. I am tense	①	②	③	④
4. I am regretful	①	②	③	④
5. I feel at ease	①	②	③	④
6. I feel upset	①	②	③	④
7. I am presently worrying over possible misfortunes	①	②	③	④
8. I feel rested	①	②	③	④
9. I feel anxious	①	②	③	④
10. I feel comfortable	①	②	③	④
11. I feel self-confident	①	②	③	④
12. I feel nervous	①	②	③	④
13. I am jittery	①	②	③	④
14. I feel "high strung"	①	②	③	④
15. I am relaxed	①	②	③	④
16. I feel content	①	②	③	④
17. I am worried	①	②	③	④
18. I feel over-excited and "rattled"	①	②	③	④
19. I feel joyful	①	②	③	④
20. I feel pleasant	①	②	③	④

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577 College Avenue, Palo Alto, California 94306

Appendix B4

Diabetes Family Behavior Checklists

Name_____ Date_____

Family member you are rating_____
His/Her relationship to you_____

DIABETES FAMILY BEHAVIOR CHECKLIST-R
(for patient)

We want to know how other family members do each of the following things. Just put down what usually happens at home — there are no right or wrong answers. Write down one number from the scale below for each item that best shows how often he/she does what is listed.

1	2	3	4	5
Never	Once a Month	Once a Week	Several Times a Week	Every Day

How often does he/she:

1. Praise you for eating right (i.e. not eating sweets or junk food). _____
2. Praise you for testing your urine or blood. _____
3. Suggest things that might help you take insulin on time. _____
4. Praise you for exercising regularly. _____
5. Help you decide if changes should be made based on urine/blood testing results. _____
6. Make sure you don't run out of injection supplies. _____
7. Make sure you don't run out of testing supplies. _____
8. Encourage you to participate in sports activities. _____
9. Plan family activities so that you can take your injections on time. _____
10. Plan family activities so that you eat on time. _____
11. Buy healthy snacks for you. _____
12. Eat at the same time that you do. _____
13. Exercise with you. _____
14. Make "desserts" that you can eat too. _____
15. Buy you things containing sugar to carry with you in case of an insulin reaction. _____
16. Offer to help test your urine or blood. _____
17. Make sure you have what you need for sports or exercise. _____
18. Have meals ready for you to eat 30-60 minutes after you inject. _____

adapted from Glasgow, McCaul and Schafer's Diabetes Family Behavior Checklist

Name:_____ Date_____

Youngster you are rating_____
His/Her relationship to you_____

DIABETES FAMILY BEHAVIOR CHECKLIST-R
(for parent)

We want to know how often you do each of the following things. Just put down what usually happens at home -- there are no right or wrong answers. Write down one number from the scale below for each item that best shows how often you do what is listed.

1	2	3	4	5
Never	Once a Month	Once a Week	Several Times a Week	Every Day

How often do you:

1. Praise your youngster for eating right (i.e. not eating sweets or junk food). _____
2. Praise your youngster for testing his/her urine or blood. _____
3. Suggest things that might help him/her take insulin on time. _____
4. Praise your youngster for exercising regularly. _____
5. Help your youngster decide if changes should be made based on urine/blood testing results. _____
6. Make sure your youngster doesn't run out of injection supplies. _____
7. Make sure your youngster doesn't run out of testing supplies. _____
8. Encourage your youngster to participate in sports activities. _____
9. Plan family activities so that your youngster can take his/her injections on time. _____
10. Plan family activities so that your youngster can eat on time. _____
11. Buy healthy snacks for your youngster. _____
12. Eat at the same time that your youngster does. _____
13. Exercise with your youngster. _____
14. Make "desserts" that your youngster can eat too. _____
15. Buy things containing sugar for your youngster to carry with him/her in case of an insulin reaction. _____
16. Offer to help test your youngster's urine or blood. _____
17. Make sure your youngster has what he/she needs for sports or exercise. _____
18. Have meals ready to eat 30-60 minutes after he/she injects. _____

adapted from Glasgow, McCaul and Schafer's Diabetes Family Behavior Checklist

Appendix B5

Background Questionnaires

Background Questionnaire

Name: _____ Child's name:_____

1. When was your child diagnosed with diabetes?_____

2. Mother's Occupation_____
   Highest grade completed in school_____

3. Father's Occupation_____
   Highest grade completed in school_____

4. Please list the names and ages of all children in your home:

Boys		Girls	
Name	Age	Name	Age
_____		_____	
_____		_____	
_____		_____	

5. Does anyone else who is in your family (or someone who is close to your family) currently have diabetes? yes no

   If so, what relationship is this person to your child?
   _____

   Now, please rate the influence this person has had on your child's adjustment to diabetes:

1	2	3	4	5
poor influence		not much influence		excellent influence

6. Please rate the quality of your relationship with your child's physician:

1	2	3	4	5
poor		ok		excellent

7. Please rate the quality of your child's relationship with his/her physician:

1	2	3	4	5
poor		ok		excellent

8. Please rate the quality of the medical care your child has received from his/her physician:

1	2	3	4	5
poor		ok		excellent

Background Questionnaire

Name: _____

1. Does anyone else who is in your family (or someone who is close to your family) currently have diabetes? yes no

If so, what relationship is this person to you?

_____

Now, please rate the influence this person has had on your adjustment to diabetes:

1	2	3	4	5
poor influence		not much influence		excellent influence

6. Please rate the quality of your parents' relationship with your physician:

1	2	3	4	5
poor		ok		excellent

7. Please rate the quality of your relationship with your physician:

1	2	3	4	5
poor		ok		excellent

8. Please rate the quality of the medical care you have received from your physician:

1	2	3	4	5
poor		ok		excellent

Appendix C

List of Copyrighted Measures

List of Copyrighted Measures

Measure	Copyright
Test of Diabetes Knowledge	Suzanne Bennett Johnson, University of Florida
Diabetes Knowledge Test	University of Michigan
Diabetes Care Profile	University of Michigan
Family Environment Scale	Consulting Psychologists Press, Inc.
Child Behavior Checklist	T. M. Achenbach, University of Vermont

Appendix D

Literature Review

Toward the Empirical Validation of Treatment Targets in Children

Target selection is the process by which the clinician determines the specific behaviors, cognitions, physiological responses or environmental factors to change in a presenting client. This process usually occurs after a more general problem area has been identified. For example, after determining that a child has difficulty getting along with his/her peers, the clinician decides what specific behaviors should be increased or decreased in order to enhance the child's social functioning. Such decisions serve a critical role in clinical assessment; those behaviors selected for change have a direct bearing on activities of the clinician in terms of assessment, treatment programming and modification, and case monitoring (Kazdin, 1985; Kratochwill, 1985). In addition, target selection decisions impact proximal processes such as the relationship between the therapist and the client, and more distal processes, such as long-term maintenance of therapeutic gains (Wilson & Evans, 1983).

Despite its recognized importance, clinicians generally receive minimal training in specific methods of target selection (Haynes, 1986; Kratochwill, 1985). Moreover, clinicians are subject to a range of biasing influences that affect clinical judgment and that often go unrecognized (e.g., early impressions of clients tend to be held firmly even in the face of disconfirming evidence [Meehl, 1960]). In addition, some clinicians fail to assess important areas during clinical assessment (e.g., the appropriate performance level of the targeted behavior [Van Houten, 1979]).

The above issues are particularly relevant to clinical intervention with children due to their limited involvement in the assessment and treatment process. In contrast to the majority of adult clients, most children do not

seek therapy on their own accord. Rather, they are brought in for assessment and/or treatment based on the determination of a problem by some significant adult(s). Once in the clinic, the child is generally provided with limited (if any) opportunity to provide input on what behaviors s/he would like to change. These factors, combined with the (sometimes negative) malleability of children to our interventions (see McCord, 1978), highlight the critical nature of targeting decisions with children and the ethical responsibilities of psychologists who work with children (Rekers, 1984; Sajwaj, 1977).

This review examines cognitive biases and assessment practices that attenuate target selection efforts with children. Recommendations on improving the quality of target selection (e.g., controlling cognitive biases, using conceptual criteria to guide target selection efforts) are briefly presented. Although we hypothesize these strategies to be valuable, we recognize that corrective procedures do not assure that intervention on selected targets will have clear, positive relationships to successful clinical outcomes. Alternatively, we present empirical methods of target selection (i.e., methods based on observation or experimentation vs. subjective judgment). The empirical approach to target selection is illustrated through presentation of two clinical examples: social skill deficits and juvenile diabetes. We conclude with a critique of proposed empirical methodologies, along with suggestions for future research.

Representative Cognitive Biases

Tversky and Kahneman (1974) provided an early and influential discussion of biases that operate during human information processing. Subsequently, investigators have documented that these and other biases operate during the clinical judgement process (Kanfer & Schefft, 1988). For example, clinicians

may evince a confirmatory bias in information gathering, whereby evidence that supports clinical hypotheses is sought, to the exclusion of nonsupportive evidence (Arkes, 1981). For example, a clinician treating a child for school phobia, might initially attribute the behavior to attachment problems with the mother in infancy, with any problem noted in the mother-child relationship then serving as confirmatory evidence for the attachment problem. This approach would lead to a treatment focus that might obviate attention to other variables functionally related to the child's phobic behavior (e.g., anxiety, negative self-statements, hyperventilation, or perhaps aspects of the school situation itself).

Another cognitive bias that impacts clinical judgement is the excessive weighing of salient and concrete information over sometimes more informative, albeit less striking data. The most common manifestation of this bias in clinical settings is the neglect of base rate data during clinical decision making (Faust, 1986). A partial reason for this neglect is that such "dry" statistical information tends not to be remembered as well as more colorful, emotionally laden material. As such, a clinician presented with a depressed child may recall a recent suicide in a neighboring community, but not recall information on the extremely low base rate of suicidal behavior in children. Consequently, hospitalization of the child might be recommended prematurely, a move that could detract from addressing functional target behaviors (e.g., family or school problems), as well as possibly lead to iatrogenic effects. Of course, this is not to imply that indications of suicide should not be taken seriously or examined fully.

In addition to the above, a range of other factors may bias the clinical judgement process. The clinician's theoretical orientation may restrict

assessment to a constricted range of variables. For example, a behavior therapist may neglect abstract complaints that, nonetheless, place severe limitations on present functioning. Interpersonal qualities such as clients' sex, race, ethnicity, education, and experience can activate stereotypes and biases in therapists (Arnoult & Anderson, 1988). Other factors, such as the psychological adjustment of the therapist or the mood of the therapist on a particular day can significantly influence (and bias) information processing (Arnoult & Anderson, 1988; Salovey & Turk, 1988). These examples illustrate a range of biases that may threaten clinical decision making, biases that empirical assessment processes (as presented later) may correct.

Deficient Assessment Practices

In the 1980s, investigators have shown increased recognition of the importance of target selection to overall treatment outcome. Along with this recognition has come the identification of numerous deficiencies in the target selection process, ranging from assessing behaviors along irrelevant dimensions to the neglect of important variables (e.g., performance criteria, cognitive and developmental factors). However, investigators have generally identified singular deficiencies in the target selection process, or have presented a few deficiencies in minimal depth. The following section reviews these deficiencies in somewhat greater detail.

Assessing Behavior along Irrelevant Dimensions

A significant problem in clinical assessment occurs when the clinician measures behavior along an erroneous or irrelevant dimension. This deficiency relates to the tendencies of clinicians to get tracked into the assessment of certain (often irrelevant) dimensions of behaviors at the expense of others. Highlighting this process, Fischetti, Curran and Wessberg (1977) found no

difference in the absolute number of social reinforcers provided to a female by heterosocially anxious and nonanxious males; however, the two groups did display a significant difference in the timing of reinforcing responses. McFall (1977), discussing the application of social skills training with shy males, concluded that interpersonal efficacy is not related to the amount of eye contact made, but is related to when eye contact occurred. Similarly, Duncan and Fiske (cited in Bellack, 1979) found that smooth "turn-taking" in conversation from one person to another depended on the precise placement of several "turn-taking cues" in the stream of conversation, not the number of such cues. Most cues involved a change in the pattern of a previous behavior (e.g., cessation of hand gesticulation) rather than the simple emission of a response. Taken together, the above studies underscore the need to consider multiple dimensions of behavior during the target selection process.

Limited Assessment

Monomethod assessment inarguably decreases the reliability and validity of target selection efforts. Many (if not most) treatment decisions are based solely on information obtained from the client during the initial interview (Arnoult & Anderson, 1988). Reliance on information from the behavioral interview rests on the assumption that clients can accurately observe and report on their behavior-environment relationships, and that their report of these relationships is accurate (Linehan, 1977). With children, reliance on interview information is particularly problematic, due to the frequent unreliability of children's reports about their own behavior (Ollendick & Meador, 1984). Obtaining information from parents or other significant adults (e.g., teachers) can partially redress this problem; however, the clinician is still left with considerable voids in his/her assessment of the child. For

example, parents are able to report only on the behaviors they observe in their children. Hence, the clinician must rely on the child's report for certain behaviors (e.g., those that occur with neighborhood playmates). An additional problem is that parental report of child behavior is often biased itself. For example, depressed mothers evince a bias toward reporting misbehavior and failing to report appropriate behavior in their children relative to nondepressed mothers (Kazdin, 1988).

Even when multiple methods of assessment are used, there is frequently the problem of inadequate sampling of behavior to make appropriate treatment decisions. Voeltz and Evans (1982) report that targets are frequently selected and treatment programs are designed based on only one or two data probes in the child's natural environment. Given the exigencies of institutional and residential settings, these programs undoubtedly are maintained well beyond their utility. Ideally, a multimethod approach, preferably including direct observation of the child's behavior in naturalistic or simulated settings, should be used to identify the full range of factors that contribute to client maladjustment before formal target selection occurs (Ollendick & Hersen, 1984).

Failure to Consider the Interrelationship of Responses

In target selection, one, two or three behaviors are commonly assessed in a manner which implies that the presenting problem is relatively circumscribed. However, in actuality many clinical problems involve a constellation of co-occurring cognitions, behaviors, and physiological responses; focusing on a specific target behavior may neglect the larger syndrome of which it is a part (Baer, 1982; Kazdin, 1985). Similarly, behaviors are at times subsumed within response classes, such that a change in

one behavior results in an increase or decrease in the occurrence of correlated behaviors (Skinner, 1938). The assessment of response covariation requires the a priori identification of behaviors the assessor believes have corollary or complementary functions with the target behavior and the simultaneous measurement of these responses along with the targeted response. Obviously, this measurement process is complex, as is the subsequent analysis. For example, response-response relationships do not occur in a linear causal sequence; rather, behaviors serve as discriminative stimuli, reinforcers and punishers for the emission of other behaviors, in a process that interacts with environmental stimulation.

Numerous clinical examples document the phenomenon of response covariation. Becker, Turner, and Sajwaj (1978) targeted ruminative vomiting in a retarded girl. Decreases in this problem co-occurred with increases in smiling and appropriate play with objects and with decreases in rocking and inappropriate hand gestures. Repp and Deitz (1974) found retarded children to increase appropriate touch of others following decreases in physically aggressive behavior. Similarly, Finney, Rapoff, Hall, and Christophersen (1983) reported on a case of negative covariation in multiple tics. These are but a few clinical examples of response covariation in children. The interested reader is referred to reviews of behavioral interrelationships by Baer (1982) and Voeltz and Evans (1982).

An additional behavioral interrelationship of importance is hierarchical response organization (Baer, 1982; Evans, 1985). Such response organization occurs when certain behaviors are prerequisite to the emission of other behaviors (i.e., response chains) and when "keystone" behaviors serve to hold an organization of behaviors together (Evans, 1985). Targeting early

sequences in response chains is a common technique, e.g., in the development of self-care skills in retarded children. Most behavioral clinicians are familiar with these straightforward techniques. However, response chaining can also target molar categories of prerequisite behaviors. For example, Weist and Ollendick (in press) found socially skilled boys to show higher levels of the molar behaviors of response effort and fluid adjustment of behavior (i.e., altering behavior to match changing interactional stimuli) than socially unskilled boys in a role-play measure of social behavior. Hay, Hay, and Nelson (1977) found reinforcing academic accuracy in children to lead to improved on-task behavior. This relationship, however, did not hold the other way; intervention to increase on-task behavior did not lead to increases in academic accuracy. These findings highlight the need for clinicians to consider the range of relevant antecedent or concurrent behavior before choosing targets for celeration.

The Neglect of Cognitive and Developmental Factors

In many areas of clinical assessment there is an almost exclusive emphasis on behavioral output variables, to the neglect of cognitive processes (Bellack, 1979). In the social skills area, behavior is viewed as a function of interpersonal perceptual factors such as knowledge of social mores, knowledge of the significance of various response cues, attention to appropriate aspects of the interaction, information processing ability, and the ability to predict and evaluate the consequences of behavior (Bellack, 1979; McFall, 1982). As such, training children to read social cues, to generate and evaluate response alternatives, and to monitor the effects of behavior, may have a more efficacious impact than training such molecular responses as eye contact or voice loudness. Obviously, children present

varying abilities in the encoding of social situations and the execution of effective action. Children with greater difficulties in social encoding may benefit more from a cognitively oriented skills training program. Conversely, children with greater problems in behavioral execution may benefit more from a behaviorally oriented approach. And, there will always be children with encoding and execution deficits, requiring combined cognitive-behavioral approaches. All of these variables, in addition to such factors as performance inhibition due to anxiety (Arkowitz, 1981), should be considered during the target selection process.

A common problem in the clinical child literature is the design of interventions for "children." Behavioral targets are frequently extended "downward" from adult populations and applied indiscriminately to children of various ages. For example, Weist and Ollendick (in press) traced a variety of behaviors associated with assertiveness and trained in children (e.g., voice loudness, speech duration, requests for new behavior, refusal of unreasonable requests) to studies training the very same behaviors to adult psychiatric inpatients in the early 1970s (e.g., Eisler, Miller, & Hersen, 1973). The problem with this approach is that behaviors appropriate at one age may be artificial, or even grossly inappropriate at another age. Kendall, Lerner, and Craighead (1984) point out that due to the processes of developmental change, the child is, in effect, a different person at different points in time. As such, the same experience (or intervention) will be processed differently, and have different impacts at various points in development. For example, Katz, Kellerman, and Siegel (1980) found the manifestation of anxiety in children undergoing bone marrow aspirations to show an age-related trend. The younger children showed a greater variety of anxious behavior than the

older children, and reacted to painful procedures with high intensity behaviors such as screaming, whereas the older children reacted to the procedures with muscular tension and rigidity. Based on these differences, one might target behaviors related to behavioral control in younger children and relaxation techniques in older children about to undergo such medical procedures. Ollendick and King (in press) have documented the importance of developmental factors in other areas of assessment as well.

The Neglect of Performance Criteria

Target selection decisions should not stop once behaviors have been selected for intervention. The clinician must also define the parameters of behavioral execution along latency, frequency, duration and intensity dimensions. Unfortunately, these steps in target selection are commonly neglected (Van Houten, 1979). Essentially, for any behavior that is targeted there is an optimum range of efficacy. Training children to emit behaviors below this level may result in minimal clinical impact; training behaviors to occur at excessively high levels may result in such problems as negative reactions by peers. Arkowitz (1981) presents the example of training a child to make eye contact and increase duration of speech, without setting performance parameters. Such an approach can lead to staring and uninterrupted speech in social encounters, a pattern that is probably less socially skillful than making minimal eye contact and speaking infrequently. Similarly, children may be ignored by their peers if they lack the skill to initiate social interaction, but if after training they initiate excessively social rejection may result, an outcome which is (arguably) worse than being ignored.

Poor (or Absent) Validation of Behavioral Targets Before Training

In general, there is a relative absence of attention to the validity of chosen targets during the target selection process. Kazdin (1985) reviews several of these validity concerns. Specifically, he suggests that application of diverse concepts of validity to clinical assessment has been frequently acknowledged, but rarely practiced. Target behaviors are commonly selected for purposes of convenience, face validity or standard practice, and often have a negligible relationship to the client's statement of the problem or functioning in everyday life. Further, some assessment tasks may yield samples of performance that are peculiar to the specific conditions of assessment (Bellack, 1979). For example, role-play behavior in children has been found to vary with the scene type (e.g., positive or negative) and with the sex of the role-play partner (Michelson, DiLorenzo, Calpin, & Ollendick, 1982; Reardon, Hersen, Bellack, & Foley, 1979). How well these behaviors correspond to behaviors children display in their natural environments is unknown.

In general, clinicians do not provide empirical justification for their target selection decisions (Bailey & Lessen, 1984; Hawkins, 1986). In lieu of efforts to empirically validate targets, many clinicians cite the advantages of generic training programs as if they applied to the specific instance (e.g., the benefits of changing certain behaviors in adults via social skills training are cited to justify targeting the same social behaviors in children). Moreover, even when benefits of targeting specific behaviors are documented prior to intervention (the rare exception), problematic and nonempirical methods for validation are frequently used (e.g., global ratings of overall social skill). These practices frequently suffer from low

reliability and rater bias (Barrett, Johnston, & Pennypacker, 1986). The crux of this issue is that the clinical benefits of targeting specific behaviors in children are generally not documented before training, likely resulting in the perpetuation of nonfunctional or perhaps dysfunctional targets in treatment programs.

From this brief review, it is evident that biases in target selection are compounded by a variety of deficiencies commonly found in the target selection process itself. Cognitive biases, conceptual formulation of problems, and deficient assessment practices compromise target selection in clinical assessment efforts. In the following section, we describe methods to "debias" biasing influences in early clinical decision making, and to improve the target selection process.

Suggested Methods to Improve Target Selection

Debiasing Methods

Debiasing methods are attempts to improve the accuracy of decision making through the removal or control of biasing influences (Fischhoff, 1982). One recommended debiasing tactic is to systematize the assessment process. For example, Hogarth (1987) suggests that the decision maker go through a series of steps during early assessment, including (a) structuring the problem (e.g., determining what alternative solutions are available); (b) assessing the consequences of alternative actions; (c) assessing uncertainties in the problem analysis; and, only after the previous steps have been completed, (d) choosing an alternative to solve the problem. Similarly, Elstein, Shulman, and Sprafka (1978) suggest that after selecting a target behavior, the clinician should (a) justify his/her choice, (b) seek to disconfirm the

choice, (c) consider alternative targets, and (d) consider which target, if altered, would have the most generalized impact on the client.

A variety of other methods have been offered to debias decision making: being aware of biasing influences on decision making (Fischhoff, 1982; Kanfer & Schefft, 1988), slowing down the decision making process (Elstein et al., 1978), being conservative and cautious when making clinical judgments (Faust, 1986), receiving training in probability assessment, particularly Bayesian statistics (Arkes, 1981), and using algorithms to help make decisions (e.g., progressively "ruling in" diagnoses using decision trees) (Kleinmutz, 1984). Intuitively these methods appear to promote accuracy in decision making; however, their utility for psychologists has yet to be demonstrated.

Clinical Approaches

A range of clinical approaches have also been suggested to improve target selection. For example, active self-monitoring during interviewing has been recommended by Kanfer and Grimm (1977). These authors suggest that during interviewing the clinician should ask such questions as (a) Is this a problem worth addressing?; (b) Is more information needed to make a tentative targeting decision?; (c) How would addressing this objective impact the client's total functioning?; and (d) Can this objective be accomplished within the limitations of the client's skills and life situation, and the therapist's abilities? Throughout this process, one question should guide the clinician's behavior: "Can and should I attempt to change this aspect of the client's total difficulties?"

As mentioned previously, the clinician should not rely on the client's verbal report alone in selecting targets for intervention. Instead, authors (e.g., Kazdin, 1985; Mash & Terdal, 1988; Ollendick & Hersen, 1984) recommend

that multiple assessment strategies be used. Along these lines, the clinician can use interviews of significant others, self-report inventories (e.g., the Youth Self-Report Form of the Child Behavior Checklist [CBCL; Achenbach, 1979]), other-report inventories (e.g., the Parent Report Form of the CBCL), analogue (e.g., role-play tests) and unstructured behavioral observations, classroom observations, and teacher ratings. The more overlap found in a problem area across assessment methods, the more confident the clinician can be of the importance of the behavior to the child's overall functioning. Additionally, the inclusion of individuals of importance to the child (e.g., peers, parents, teachers) in the assessment process increases the likelihood of choosing socially valid targets for change.

In other instances, family variables may prove to be centrally related to problems in the presenting child. A primary example is parents who issue "beta" commands; these commands fail to specify the requested behavior and thus are difficult for the child to comply with (Forehand, 1977). By altering the parents' style of commanding (e.g., to more appropriate "alpha" commands, which clearly specify the requested behavior), resolution of the problem may be achieved. Similarly, molar family variables may contribute to child behavioral problems. For example, with a family under serious financial strain, the mother may not provide enough attention to the child, who then seeks it through negative behavior (Wahler & Dumas, 1986). By assisting the family in acquiring needed resources (e.g., food stamps, clothing), the resultant improvement in family atmosphere may be sufficient to promote more adaptive interactions between mother and child. Numerous examples of nontraditional targeting could be provided; the important point is for therapists, during early assessment, to actively consider contextual and

peripheral avenues of target selection in order to achieve as complete a "picture" of the child as is possible.

Given the range of possible targets in the child, the family, and the environment, guidelines have been offered on factors to address in target selection. For example, Mash and Terdal (1981) suggest targeting behaviors that meet criteria of (a) leading to physical danger if unchanged; (b) providing entrees into natural reinforcement communities (i.e., behavioral "traps;" Baer & Wolf, 1972); (c) leading to the accomplishment of developmental milestones; (d) serving as early elements in response chains, and (e) maximizing the child's flexibility in adapting to new environments (e.g., problem solving, decision making skills). Although conceptually sound, many of these targeting suggestions have not yet undergone empirical investigation (Wilson & Evans, 1983).

Empirical Validation

The previous suggestions offer practical guidelines to the clinician for selecting appropriate target behaviors. While seemingly valid, these recommendations are based more on their intuitive appeal than their demonstrated utility; as such, no assurance can be provided that the recommended strategies will lead to improved clinical outcomes. As an alternative, empirical strategies of target selection have been called for by leaders in behavioral assessment (e.g., Bellack, 1979; Hawkins, 1975, 1986; Nelson & Hayes, 1986); however, such exhortations have been met with few recommended strategies to empirically validate targets, and even fewer research studies that have attempted empirical validation of treatment targets.

Empirical validation can be defined as the use of observation or experimentation to demonstrate a positive relationship between the selection of specific behavioral targets and the occurrence of reliable and valid indices of outcome associated with changes in those targets (Weist & Ollendick, in press). In other words, prior to intervening on a particular treatment target, the clinician first documents that changes in the target behavior have been associated with enhanced clinical outcomes in similar clients (i.e., matched on such variables as age, sex and sociocultural background), or demonstrates that the target behavior is in itself associated with adaptive functioning (e.g., by analyzing the behaviors displayed by successful performers). In effect, empirical validation is characterized by the relative absence of subjective target selection processes (and their attendant biases) on the part of the clinician.

Empirical validation is contrasted with social validation (Kazdin, 1977; Wolf, 1978) in that the latter approach seeks primarily to document that the implemented <u>treatment</u> has a clinically significant impact on the client, as judged by the client or significant others (e.g., peers, parents, teachers). The focus of empirical validation is on ensuring that the <u>treatment targets</u> selected for change are in fact related to positive clinical outcomes.

Social validation is generally a subjective process that commonly uses ratings by experts or significant others of the client's adjustment before and following psychological intervention. Wolf (1978) acknowledges: "...subjective data may not have any relationship to actual events. A program that is described by its consumers as well-liked or effective may not necessarily be either pleasant or effective" (p. 212). In contrast, empirical

validation strategies seek to ensure that treatment is implemented on effective target behaviors.

However, under the rubric of social validation, investigators have used objective strategies in target selection that approximate empirical validation. For example, Minkin et al. (1976) trained girls with behavioral problems in conversational behaviors that had been previously correlated with ratings of social competence by expert judges. In addition, before and after treatment Minkin et al. (1976) used the more traditional social validation strategy of having adult judges rate the social competence of participating girls. Hence, a combined validation procedure (Kazdin, 1977) was used to first document the importance of the target behaviors, and secondly, to evaluate the clinical importance of the treatment program. Such an approach, which merges the notions of empirical validation and social validation appears to offer an ideal strategy to promote efficacious and clinically important treatment impacts.

An additional point of importance is that empirical validation is a two stage process, which generally proceeds from nomothetic to idiographic analyses. First, a nomothetic assessment process occurs wherein the clinician (investigator) documents that specific behavioral targets are associated with positive treatment outcome criteria. For example, a template matching strategy (Cone & Hoier, 1986; see the discussion in the following section) could be used to identify behaviors that differentiate the social behaviors of popular from rejected boys at school. Following this nomothetic analysis, during which behaviors of potential clinical importance are identified, an idiographic approach would be used in the design of an intervention. In this stage, the clinician would match behaviors of the presenting client to the

list of initially validated behaviors, and train the client in behaviors determined to be deficient. A multiple-baseline-across-subjects design could then be used to document the clinical importance of the identified target behaviors across individual clients. If clinical improvements were demonstrated to occur across clients following intervention on targets identified in the above manner, then these targets would be assumed to be empirically valid for similar clients.

In the following section, four methods that represent first-stage empirical validation strategies are presented. The primary defining characteristic of these strategies is that they promote empirical decision making; that is, treatment targets are chosen based on observed relationships between the target behaviors and clinical indices of improvement.

Appropriate Post-Hoc Validation

As noted earlier, the targeting of specific behaviors in clinical practice is often unjustified, or alternatively, the generic benefits of previous training programs are used to justify the selection of particular target behaviors. In addition, this method of justifying treatment targets is commonly plagued by significant discrepancies in presenting problem and background characteristics (e.g., age, sex, community/cultural variables) between clients in the previously cited and current interventions.

It is suggested that target selection based on post-hoc validation may have empirical validity if the following criterion is met: The clinician/investigator selects behaviors for change from only well controlled studies on children of similar age, sex, circumstance, community and problem. However, this approach is still suboptimal, as clinical improvements in the

previous investigation may have arisen from nonspecific effects of the intervention itself, rather than from changes in the targeted behaviors.

Choosing Criterion-Valid Targets

The empirical validity of targets can be shown through the demonstration of a positive association between the occurrence of those targets and a criterion of successful performance. For example, Kupke, Hobbs and Cheney (1979), using multivariate statistics, examined the relationship between social behaviors and physical characteristics in college males and ratings of attractiveness by female peers. Personally attentive behaviors (e.g., questioning on how classes were going) and physical attractiveness were found to be significant predictors of female attraction. Similarly, Cobb (1972), using multiple regression procedures, found the classroom behaviors of attending and talking to peers about school work to significantly predict overall academic success. In both investigations, the empirical validity of the target behaviors was shown through their clear and positive relationship to the outcome criterion of interest (e.g., interpersonal attractiveness, academic success).

In any situation/setting, a range of behaviors are correlated with both positive and negative outcomes. These correlations can be formally computed, or simply "known." For example, if a day-care center has a policy of terminating physically aggressive children in its program, and a therapeutic goal is maintenance of the child in the center, then the selection of targets relating to decreasing aggressive behavior would be empirically valid. An important point is that targeted behaviors may have little face validity, but still be empirically sound. If, for example, displaying "proper" table manners is a behavior known to be necessary to remain enrolled in the day-care

center, then targeting this behavior would be empirically valid for a child whose goals included continued enrollment at the center. This point relates to Ayllon and Azrin's (1968) suggestion that clinicians focus on function, rather than topography in target selection.

Using Normative Data

The use of normative data in target selection has been suggested as a third method of empirical validation (e.g., Hawkins, 1986; Kazdin, 1977; Kratochwill, 1985; Ollendick & Cerny, 1981; Ollendick & Hersen, 1984). The use of sociometric ratings in the classroom, for example, provides molar information to the clinician on the presenting child's relationships with her peers. Such sociometric ratings reveal if the child, in relation to peers, is popular (well liked by more than a few peers), rejected (actively disliked by more than a few peers), neglected (not known to most peers), controversial (liked by some peers and not liked by others) or average (Asher & Dodge, 1986). When these ratings indicate that the presenting child is rejected, the clinician has information (shown to be reliable and valid) that peer problems exist. Given the impact of social relationships on overall adjustment, targeting the behavioral category of peer relations would be seen as an empirically valid treatment choice. Similarly, if a child with normal intelligence and no discernible learning disabilities scored poorly on standardized academic achievement tests, the clinician would have empirical justification for targeting academic skills and increasing the amount of school work done at home.

Normative data can also be used in the empirical prioritization of treatment targets (Mash & Terdal, 1981). For example, if a child presents behavior problems in school, an indication of their relative severity is

provided by their frequency of occurrence relative to other children in the classroom (Ollendick, 1986). Behaviors occurring at significantly higher frequencies are more likely to have a negative impact on the child's overall school performance (e.g., by preventing the occurrence of appropriate behavior, contributing to negative teacher responses etc.); hence, targeting these behaviors (rather than, for example, those personally repugnant to the clinician) would be an empirically valid strategy.

Template Matching Approaches

While choosing criterion-valid targets and using normative data are important empirical validation strategies, they often do not provide information on the specific behaviors the child should emit. Rather, information is provided on the advisability of targeting molar behavioral categories. As such, the clinician learns that the child needs to decrease classroom disruption, to increase appropriate interaction with peers, or to study more. Thereafter it is up to the clinician to break down these global responses into the component behaviors of which they are comprised. The drawback of this approach is that problems associated with nonempirical target selection, such as the use of subjective judgment, can once again exert influence as the clinician "decides" how the child should best interact with peers or study more.

The above problems are circumvented in a method of target selection termed template matching. Template matching, developed by Cone (1980) and based on earlier work by Bem and his associates (Bem & Funder, 1978; Bem & Lord, 1979), consists of the delineation of behavioral targets idiographically matched to children. After determining the relevant context of interest (e.g., the playground), the investigator examines the behaviors of "exemplar"

(i.e., successful) children in that context. The behaviors and levels of performance of exemplar children comprise a "template" of successful performance in the relevant context. Training client children to emit template behaviors is a relatively straightforward method of ensuring the empirical validity of targeted behaviors.

Although not formally identified as template matching, occasional reports of this approach can be found in the research literature dating back to the early 1970s. Barlow, Reynolds, and Agras (1973), for example, trained a transsexual male in the topographies of sitting, standing and walking--behaviors determined through observation of heterosexual men. Goldsmith and McFall (1975) trained psychiatric inpatients in social behaviors determined through the role-play performances of a group of eight "normals." More recently with children, Weist and Redmon (1986) trained substance-abusing adolescent males in refusal skills discerned through analysis of the role-play performances of former (i.e., rehabilitated) users. Hoier, McConnell, and Pallay (1987) used a direct observation procedure to assess the differences between children in special and regular education programs. Children in special education classes were observed to receive more individualized attention and reinforcement than children in regular education classrooms, suggesting the potential for targeting independent behaviors in special education students.

Current Use of Empirical Methods in Target Selection

In the above section, a sample of methods to empirically validate behavioral targets prior to intervention was presented. In order to assess how frequently such methods have been used in treatment outcome investigations with children, all issues of two journals - the Journal of Clinical Child

Psychology and Child and Family Behavior Therapy (formerly Child Behavior Therapy) were reviewed from 1979 to 1988. These journals were selected due to their inclusion of main stream clinical child investigations and due to their frequent inclusion of treatment outcome studies. To narrow the scope of the review, information was collected only on studies that targeted behaviors or cognitions pertinent to social interaction in children from 3 to 18 years of age (one study included a 20 year-old retarded male). Additionally, only studies that manipulated specific child behaviors (versus parental behavior or environmental stimuli) were included in the review. Brief reports were excluded as space limitations may have prevented the authors from reporting information relevant to their targeting decisions. Studies using punitive techniques to decrease the frequency of clearly problematic behaviors (e.g., self-injurious behavior) were not included, due to minimal latitude by the investigators in selecting target behaviors. Table 1 presents 25 studies that met these criteria. For each study, information is presented on the age and presenting problem of the children, the implemented treatment, specific targets of intervention, and how treatment targets were selected.

Insert Table 1 about here

As shown in Table 1, only one study out of 25 used an empirical method (as defined in the previous section) to select treatment targets. Shure and Spivack (1979) targeted interpersonal problem-solving skills in disadvantaged nursery school and kindergarten children, after citing literature demonstrating positive treatment outcomes following changes in the targeted behaviors for similar children who had received the training program. Thus,

this study meets the criteria for the empirical validation strategy of appropriate post-hoc validation. The only other study using a post-hoc validation strategy (i.e., citing literature indicating that changes in the targeted behaviors were associated with improved clinical outcomes) was conducted by Kelly, Furman, Philips, Hathorn, and Wilson (1979); however, in this study targets were selected from an investigation with normal children for application with retarded adolescents, leading to questions about the generalizability of targets across these populations. The most frequent method (six studies) of justification in target selection was the citation of general treatment outcome findings (i.e., spanning studies on different populations such as children and adults) supporting the efficacy of the training method (such as social skills training), but not the specific behaviors targeted. This method was followed by justification through procedural citation of previous research (five studies) (i.e., simply citing investigations that used certain training methods or targeted certain behaviors), providing no rationale for the training method used or specific behaviors targeted (five studies), and selecting targets from a recommended treatment technique (four studies). From the above, we can see that formal methods of empirical validation of treatment targets prior to intervention are rare occurrences in clinical child therapy outcome research.

Empirical Versus Traditional Target Selection

We further illustrate the use of empirical methods of target selection with children through contrast with more traditional approaches. Two clinical child problems, remediation of social skills deficits and management of juvenile diabetes, serve as examples in this illustration. For each problem,

traditional approaches to target selection (and problems resulting from their use) are presented, followed by examples of empirical alternatives.

Remediation of Social Skills Deficits

As indicated in Table 1, varied approaches were used in the selection of targets related to social behavior, from choosing social behaviors without any rationale or justification, procedural citation, and, the rare exception, generally appropriate post-hoc validation. While not captured in the above review, seminal treatment outcome studies on social behavior in children commonly extended targets downward from adult investigations for application with children. For example, Bornstein, Bellack and Hersen (1977) trained four unassertive children to improve eye contact, lengthen speech, increase loudness and increase the number of requests for behavior change; these behaviors were derived from a study that found them to be displayed more frequently by assertive than unassertive adult psychiatric inpatients (Eisler et al., 1973). Following Bornstein et al. (1977), other investigators assessed similar molecular response components in high and low assertive children, and across different situations (e.g., positive versus negative role-play scenes) (Michelson et al., 1982; Reardon et al., 1979). These investigations served to solidify the targeting of questionable assertive behaviors in children in subsequent treatment outcome studies (e.g., Geller, Wildman, Kelly, & Laughlin, 1980; Kirkland, Thelen, & Miller, 1982; Michelson & Wood, 1980; Rhodes, Redd, & Berggren, 1979).

While the targeting of assertive behaviors in children has continued since these early investigations, evidence has also accumulated that in some instances assertive behaviors may not be the most functional behaviors for children to display. Charlesworth and Hartup (1967) found submissive behavior

in children to result in a higher rate of positive reinforcement from peers than assertive behavior. Similarly, Feidler and Beach (1978) reported that assertive behavior in children was contraindicated in some situations, such as complying to a mildly unreasonable request by a peer may be a socially skilled behavior that functions to strengthen the friendship. Ollendick, Hart and Francis (1985) had children and "expert" adults rate the videotape performance of children on a role-play test of assertiveness, and then compared ratings of assertiveness by adult judges and ratings of "likability" by child judges. Adult ratings of assertiveness and child likability ratings were not consistently related to behavioral patterns in the children, and adult and child ratings generally did not correspond. These findings call into question the social importance of training children in assertive behaviors deemed important by adults. They also highlight a problem associated with traditional target selection wherein behaviors, once identified, are perpetuated in assessment and treatment programs despite clear evidence of a lack of relationship to successful outcome.

A method of empirically validating social behavior targets, as well as generating alternative targets, is provided by Weist and Ollendick (in press). To address the question of whether assertive behaviors were in fact functional for children, role-played "assertiveness" was assessed in groups of popular and rejected boys. Six behaviors traditionally associated with assertiveness and used in the adult literature (e.g., eye contact, refusal of unreasonable requests) and six behaviors inductively determined through review of videotaped role-play performances by the popular and rejected boys (e.g., rationales in speech, responding "energetically") were evaluated. The assumption was made that popularity served as an index of overall social

ability, and that if assertiveness was in fact an important, meaningful behavior for children to engage in, assertive behaviors would be shown at higher levels by the popular boys in comparison to their rejected peers.

Of the six traditional behaviors, only two (smiling and voice intonation) were displayed at significantly higher levels by the popular boys. In contrast, five of six inductively determined behaviors were displayed differentially by the popular versus rejected boys (e.g., popular boys displayed more elaborated rationales in speech, more often oriented their bodies to the role-play partner, and showed less context-inappropriate behavior). Hence, a range of behaviors that were not previously investigated in social skills interventions with children received initial empirical validation.

In a follow-up study, Weist, Borden, Finney, and Ollendick (1990) trained two interpersonally rejected boys in three of the behaviors receiving initial empirical validation by Weist and Ollendick (in press), using a multiple-baseline-across-behaviors design. Behaviors of appropriate body orientation, using adequate speech intonation, and stating consequences for denying unreasonable requests were targeted following idiographic analyses in which each boy was found to be deficient in these (but not other empirically validated) behaviors. Consistent with the multiple-baseline design, these behaviors increased upon (but not before) the introduction of training. In addition, both boys' parents reported significant improvements in their overall behavior as assessed by the CBCL (Achenbach & Edelbrock, 1983), and improvements in classroom behavior were reported by one of the boys' teachers. Pre- and post-sociometric ratings of the boys relationships with classmates showed no significant improvement, however. Thus, Weist et al. (1990) used a

two stage empirical validation strategy (initial nomothetic analysis followed by idiographic application) to establish the clinical importance of behaviors from a sample of behaviors (both traditionally and inductively derived) that had received first-stage empirical validation. However, the fact that skill training on the above behaviors did not result in improvements in social acceptance indicates that the empirical validity of the targeted behaviors has yet to be firmly established.

Management of Diabetes Mellitus

A variety of behaviors traditionally targeted to improve the management of diabetes mellitus in children, in actuality, show inconsistent relationships to positive clinical outcomes. For example, targeting knowledge about the disease and its management has at times proven ineffective, and even harmful. For example, Lorenz, Christensen, and Pichert (1985) found 90 children who participated in an educational summer camp for diabetics to show substantial deficits in diet-related knowledge and skill despite fairly intensive instruction in dietary management. Johnson (1988) reports that educational programs often teach children about diabetes using a standardized format based on assumptions regarding similarity in responses to the disease. Children are taught to detect "classic" symptoms of hypo- and hyper-glycemic states to enable early remedial action (e.g., by eating carbohydrates). This approach is based on the view that children have similar experiences following increases or decreases in blood glucose levels. However, Johnson (1988) cites research that suggests that children have differing experiences to hypo- and hyper-glycemia; although there is a group of commonly reported symptoms, the pattern of these symptoms differ from one child to another. Hence, using this traditional approach to target selection may result in children being taught

to recognize symptoms that are in reality nonfunctional for them as predictors of blood glucose levels.

Another problem found in traditional approaches to selecting intervention targets in diabetic children is the failure to consider developmental factors. After stressing this deficiency, Cerreto and Travis (1984) suggest potential behavioral targets for children of various developmental stages. Primary issues for diabetic infants and toddlers are to learn to cope with disrupted home routines, separation from parents, painful medical procedures, and dealing with strangers. For middle-aged children important themes are the development of independent management abilities, coping with feelings of being different from other children, and dealing with embarrassing information-seeking from peers. Particular issues for adolescents are body image problems, noncompliance to illness-management routines, and controlling alcohol intake. These developmentally sensitive treatment targets appear to warrant further empirical investigation.

In addition to the behaviors presented by Cerreto and Travis (1984), a range of other potentially meaningful treatment targets for diabetic children have received only minimal investigation. For example, Johnson (1988) suggests specific targets that address barriers to adherence with illness-management regimens in diabetic children (e.g., forgetting, negative social pressure, problems in planning). Jackson (1984) recommends the routine use of the diabetic meal plan by the entire family, as a method to promote dietary adherence in the diabetic child. Stein, Goldberg, Kalman, and Chesler (1984) suggest that diabetic children should perform complicated exercise regimens wherein rigorous and consistent exercise patterns are maintained while the child monitors physiological functioning across a variety of domains (e.g.,

blood glucose levels, visual disturbance, cardiovascular functioning). These relatively unexplored treatment targets in diabetic children may prove to relate to enhanced clinical outcomes; however, investigation is needed to establish their empirical validity.

An empirical method of selecting treatment targets for diabetic children might begin with a comprehensive assessment of children who successfully manage their illness (e.g., those showing optimal blood glucose levels on the glycosylated hemoglobin test). This assessment would include questionnaires on behaviors the children engage in to manage their diabetes, attitudes regarding the disease and its management, medical history variables, familial functioning, and physician behavior (e.g., insulin dose changes, complexity of the management regimen). Responses to these assessments would then be summarized into a "template" of successful diabetic management behaviors. Children with problems managing their diabetes would then receive the same assessments, and discrepancies between their behavior and the template would indicate potential treatment targets. If implemented regularly, the clinician would develop profiles of children who manage their illness well and those that evidenced management problems. Thus, determinations could be made following early assessment on whether the child is at risk for unstable glucose levels, enabling the timely provision of treatment (Finney & Weist, 1988).

Summary

A significant theme throughout this section has been that traditional approaches to target selection with children can result in a "tracking" of inappropriate treatment targets in interventions across time. This tracking can lead to the perpetuation of targets in intervention programs that are

minimally related to enhanced clinical outcomes (e.g., certain "assertive" behaviors), or, that are potentially harmful (e.g., teaching diabetic children to monitor generic signs of hypo- or hyper-glycemia). The other side of this issue is that tracking of treatment targets leads to a restriction in the range of behaviors or cognitions (or environmental factors) that are investigated in clinical child assessment. If investigators are spending time in assessment or treatment of cognitions or behaviors that have not been validated empirically, less time is available to generate alternative (and possibly more important) treatment targets. Empirical methods offer the means to avoid tracking in assessment and intervention through the provision of validation strategies for common targets (e.g., appropriate post-hoc validation, establishing criterion-related validity) and methods to generate alternative treatment targets (e.g., template matching).

Future Directions

Two issues appear to be salient to the future use and development of empirical validation strategies in clinical assessment. First, the use of such methods may appear to be prohibitively expensive and time consuming. Formal template matching procedures, for example, require the direct observation of behavior, necessitating the development of observation codes, training observers, and the purchasing of video equipment. Similar time and resource expenditures would be required to demonstrate a reliable positive relationship between a potential target behavior and a criterion of interest (e.g., between specific social behaviors and popular sociometric status). Although worth considering, these time and cost constraints should not deter the employment of empirical methods of target selection. Essentially, the vigor and formality with which assessment is conducted should match the

presenting problem of the identified client(s) and the resources of the clinician. Formal research projects, conducted in academic settings obviously will require and employ more costly and time consuming assessment methods. For the practicing clinician, empirical methods of target selection can be eventuated (or at least approximated) through regular review of the literature (to enable appropriate post-hoc validation of targets), less formal observation or assessment of exemplar children, and being aware of the "known" correlations in the child's environment (i.e., behaviors that are associated with success and/or failure in particular settings). The point is for the clinician to be concerned about the empirical validity of potential treatment targets, and to operate at some point on the informal to formal continuum of empirical methodologies.

The second issue is that it remains to be shown that empirical methods of target selection actually improve clinical outcomes in children. An especially stringent empirical validation approach would be to experimentally manipulate empirically derived targets in comparison to manipulations of unvalidated or subjectively validated behaviors. With results from such a study, the investigator would be in a better position to make causal conclusions regarding the importance of targeted behaviors. While at least one study has used this approach with adults (Kupke, Calhoun, & Hobbs, 1979), no studies have used this approach with children. It appears that only with successive demonstrations of superior treatment outcomes when empirical versus nonempirical approaches are employed will the treatment utility (Hayes, Nelson, & Jarrett, 1987) of empirical methodologies to target selection with children be documented.

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Table 1

Methods of Target Selection in Treatment Outcome Studies with Children

Study	Subjects	Treatment: Targets	How Targets Selected
Baum, Clark, McCarthy, Sandler, & Carpenter (1986)	4 boys (12-14)	SST, SIT, RT: self-statements, relaxation.	Citation of general findings in support of training methods.
Blue, Madsen, & Heimberg (1981)	25 AGG boys (6-8)	CST: ignoring, avoiding.	Post-hoc validation of training procedures.
Clark, Caldwell, & Christian (1979)	4 children in SPEC ED (under 12)	SST: inquiries, praise, general comments.	Procedural citation of previous studies.
Curl, Rowbury, & Baer (1985)	2 girls, 1 boy (4-6)	SST: using picture cues to initiate play.	No rationale provided.
Edelson & Rose (1981)	19 boys, 22 girls (9-11)	SST: "effective" responses to problems.	No rationale provided.
Flanagan (1986)	3 boys, 3 girls (6-8)	SST: shouts for help, running away, ignoring.	"Informal survey" of community members.

(table continues)

Table 1

Methods of Target Selection in Treatment Outcome Studies with Children

Study	Subjects	Treatment:Targets	How Targets Selected
Geller, Wildman, Kelly, & Laughlin (1980)	1 MR girl (16)	SST: refusal, praise.	No rationale provided.
Kelly, Furman, Philips, Hathorn, & Wilson (1979)	2 MR males (13 and 20)	SST: asking and answering questions, inviting.	Post-hoc validation of targets from an unmatched population.
Kelly, Wildman, Urey, & Thurman (1979)	10 MR males (12-17)	SST: questions, praise, self-disclosure.	Citation of general findings in support of training methods.
Kirkland, Thelen, & Miller (1982)	18 girls, 18 boys (14-16)	SST: "polite" responses to unreasonable requests.	Citation of general findings in support of training methods.
Lochman & Curry (1986)	20 AGG boys (9-11)	SIT, PST: self-statements, alternatives.	Procedural citation of previous studies.

(table continues)

Table 1

Methods of Target Selection in Treatment Outcome Studies with Children

Study	Subjects	Treatment:Targets	How Targets Selected
Lochman, Nelson, & Sims (1981)	12 children (elementary school)	SIT, PST: self-statements, alternatives.	Targets derived from an adult-oriented treatment program.
Long & Sherer (1984)	30 JD males (12-17)	SST: listening, expressing and understanding feelings, self-control.	No rationale provided.
Lovejoy & Routh (1988)	4 ED boys (6-10)	SST: attending, praising, smiling, encouraging.	Procedural citation of previous studies.
Maag, Parks, & Rutherford (1988)	4 ED boys (11-13)	CST: resistance to provocation, self-statements.	Targets derived from a description of a treatment technique.
Michelson & Wood (1980)	80 children (4th grade)	SST: variety of "assertive" behaviors.	Citation of "authority recommendations".

(table continues)

Table 1

Methods of Target Selection in Treatment Outcome Studies with Children

Study	Subjects	Treatment:Targets	How Targets Selected
Rao, Moely, & Lockman (1987)	16 children (preschool)	SST: no specific targets identified.	No specific behaviors were targeted.
Rhodes, Redd, & Berggren (1979)	1 ED male (15)	SST: eye contact, speech loudness, requests for new behavior.	Procedural citation of previous study.
Roseby & Deutsch (1985)	57 children (ages not specified)	SST: "assertive" communicating, identifying feelings.	Targets derived from a model of social behavior.
Serna, Schumaker, Hazel, & Sheldon (1986)	12 JD youths (13-18)	SST: accepting and giving feedback, resisting peer pressure.	Citation of undescribed previous validation study.
Shure & Spivack (1979)	131 poor children (3-6)	PST: alternatives, consequential thinking.	Appropriate post-hoc validation.

(table continues)

Table 1

Methods of Target Selection in Treatment Outcome Studies with Children

Study	Subjects	Treatment:Targets	How Targets Selected
Spirito, Finch, Smith, & Cooley (1981)	1 ED boy (10)	SIT: self-statements, knowledge.	Citation of general findings in support of training methods.
Vogelsong, Most, & Yenchko (1979)	6 boys, 10 girls (9-12)	SST: identifying and expressing feelings, empathy.	Targets adapted from a generic treatment program.
Warren, Baer, & Rogers-Warren (1979)	4 boys, 2 girls (4-6)	SST: praise.	Procedural citation of previous studies.
Yu, Harris, Solovitz, & Franklin (1986)	23 boys (7-12)	PST: alternatives, implementing solutions, understanding feelings.	Targets derived from a description of a treatment technique.

Note. Ages are in parentheses. SST = social skills training. SIT = self-instructional training. RT = relaxation training. CST = coping skills training. PST = problem solving training. AGG = aggressive. SPEC ED = special education. MR = mental retardation. JD = juvenile delinquent. ED = emotionally disturbed.

June, 1991

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Educational History:

Ph.D, Psychology (Clinical area, Child specialization): June, 1991 - Virginia Polytechnic Institute and State University (VPI&SU), Blacksburg.

Dissertation: "Empirical validation of treatment targets for the management of diabetes in children." Chair - Jack W. Finney, Ph.D.

Preliminary Paper: "Toward the empirical validation of treatment targets in children." Chair - Thomas H. Ollendick, Ph.D.

M.S., Psychology: August, 1988 - VPI&SU.

Thesis: "Assertiveness in boys: Evaluating the construct using template matching procedures." Chair - Thomas H. Ollendick, Ph.D.

M.A., Clinical Psychology: May, 1985 - West Virginia University (WVU), Morgantown.

B.A. Psychology: May, 1981 - West Chester University, West Chester, PA.

Professional Experience:

Medical Psychology Intern (July, 1990 to present) - Duke University Medical Center, Durham, NC. Currently serving as a psychology intern in a position involving major tracks in Pediatric Psychology, and in Clinical Child Psychology. Through the Pediatric Psychology Service conduct comprehensive psychological evaluations of chronically ill children and their families, provide consultative services to pediatric medical staff and patients, and provide ongoing individual and family-based therapy services. Supervisor: Robert J. Thompson, Jr., Ph.D. In child outpatient settings provide assessment and treatment services (individual and group) through programs serving conduct disordered, juvenile delinquent and abused/neglected children. Supervisors:

John E. Lochman, Ph.D., Richard R. Rumer, Ph.D., and Kathleen Wayland, Ph.D. On an inpatient unit for emotionally and behaviorally disturbed adolescents conducted psychological evaluations, co-led group therapy, and participated in multidisciplinary treatment team meetings. Supervisor: John F. Curry, Ph.D.

Instructor (August, 1989 - May, 1990, half time) - taught two advanced psychology classes (Behavior Modification) to junior and senior undergraduate psychology majors. Supervisor: Richard M. Eisler, Ph.D.

Psychology Extern (May, 1989 - July, 1989) - Saint Albans Psychiatric Hospital, Radford, VA. Provided psychological assessment and treatment services to adolescents hospitalized for severe emotional and behavioral disturbances. Supervisor: David Hamilton, Ph.D.

Graduate Assistant (September, 1988 - May, 1989, half time) - Assisted in the operation and management of the Child Study Center, an assessment and treatment center for children affiliated with the Department of Psychology at VPI&SU. Supervisor: Jack W. Finney, Ph.D.

Graduate Clinician (September, 1987 to May, 1990, part time) - Psychological Services Center, VPI&SU. Member of a practicum team providing psychological services to children and adults from the Blacksburg community. Supervisors: Thomas H. Ollendick, Ph.D., and Jack W. Finney, Ph.D.

Research Assistant (September, 1987 to August, 1988, half time) - Department of Psychology, VPI&SU. Coordinated a study funded by the National Cancer Institute to compare audiovisual versus written methods of teaching early cancer detection techniques. Supervisor: Jack W. Finney, Ph.D.

Program Director (July, 1985 to July, 1987) - St. Elizabeth's Home, Associated Catholic Charities, New Orleans, Louisiana. Developed and implemented a staff training program and comprehensive data-based treatment program in a 60-bed residential facility serving behaviorally disturbed girls ages 6 to 18. Supervised two residential units (each housing 15 girls served by approximately 10 staff) in the delivery of behavioral treatment programs. Conducted administrative duties (e.g., developing policies and procedures, overseeing staff management). Supervisor: Dennis R. Moore, Ph.D.

Psychology Intern (January, 1985 to July, 1985) - Fayette, Monroe, Raleigh and Summers (FMRS) Mental Health Council, Inc., Beckley, West Virginia. Served as a Child Outpatient Therapist with an ongoing caseload of approximately 25 clients, ages 3 to 18. Supervisor: Michael Mays, M.A.

Psychology Extern (July, 1984 to December, 1984, half time) - Summit Center for Human Development, Clarksburg, West Virginia. Served as a Child Outpatient Therapist, providing individual and family therapy for four ongoing cases. Supervisor: Peggy Allman, M.A.

Psychology Extern (September, 1983 to July, 1984, half time) - Fairmont Emergency Hospital, Fairmont, West Virginia. Provided direct clinical service (assessment, treatment planning, individual counseling) to area alcohol and drug abusers. Provided behavioral consultation to a geriatric unit when needed. Supervisor: Ruth Ann Panepinto, Ph.D.

Crisis Intervention Consultant (February, 1983 to August, 1983, part time) - Human Services Inc., Downingtown, Pennsylvania. Responded to mental health crises (e.g., counseling depressed and suicidal clients, arranging hospitalizations, initiating commitments, etc.) in a rural Pennsylvania county.

Mental Health Worker (December, 1981 to August, 1983) - Brandywine Hospital, Coatesville, Pennsylvania. Part of a team opening a short-term psychiatric unit. Served as a primary counselor for adolescents and adults needing acute mental health care (primarily for depression).

Recreation Counselor (January, 1980 to December, 1981) - The Devereux Foundation, West Chester, Pennsylvania. Responsibilities centered on the supervision and care of moderately and severely retarded teenage boys, aiding them in the development of daily living skills and coordinating recreational programs.

Consulting:

Psychologist (January, 1990 to July, 1990, part time) - Fairlawn Group Home, Radford, Virginia. Provided psychological consultative services to group home staff in the management and care of 12 moderately and severely retarded adults.

Consultant (November, 1989 to May, 1990, part time). Teaching Assistance Center, Lynchburg, Virginia. Conducted staff-training workshops for counselors and teachers of children with developmental disabilities.

Professional Societies:

Student member of:
American Psychological Association (APA), Division 37
Association for the Advancement of Behavior Therapy (AABT)

Honors:

Winner - APA (Division 37) Student Award (1991)
NIMH Fellow in Clinical Child Psychology (January to July, 1990)
Winner (honorable mention) - APA (Division 12) Student Research Award (1988)
Summa Cum Laude graduate, West Virginia University
Member of Pi Gamma Mu, a social science honor society
Dean's list - seven semesters, West Chester University

Editorial Activities:

Guest Reviewer, Clinical Psychology Review (June, 1988)

Research Experience:

Publications:

Finney, J. W., & Weist, M. D. (1988). Medical compliance with pediatric regimens: Matching health behavior and health outcome. Wellness Perspectives, 5, 17-20.

Hagopian, L. P., Weist, M. D., & Ollendick, T. H. (1990). Cognitive behavior therapy with an 11-year-old girl fearful of AIDS infection, other diseases, and poisoning: A case study. Journal of Anxiety Disorders, 4, 257-265.

Ollendick, T. H., Greene, R. W., Weist, M. D., & Oswald, D. P. (1990). Predictive validity of teacher nominations: A five-year follow-up. Journal of Abnormal Child Psychology, 6, 699-713.

Ollendick, T. H., Weist, M. D., Greene, R. W., & Borden, M. C. (in press). Sociometric classification: Predicting behavioral adjustment at five year follow-up. Journal of Consulting and Clinical Psychology.

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Weist, M. D., Ollendick, T. H., & Finney, J. W. (in press). Toward the empirical validation of treatment targets in children. Clinical Psychology Review.

Research in Progress:

Weist, M. D., Vanatta, K., Wayland, K., & Lochman, J. E. Providing social competency training to sexually abused girls. In progress.

Weist, M. D., Lochman, J. E., Fiore, C. E., & Finney, J. W. Promoting commitment to change in mental health center clients. In progress.

Weist, M. D., Vanatta, K., Lochman, J. E., & Curry, J. F. Assessing recall performance in depressed, anxious, and conduct disordered youth. In progress.

Finney, J. W., & Weist, M. D. Behavioral assessment of children and adolescents in pediatric primary care settings. Manuscript in preparation.

Finney, J. W., Weist, M. D., & Friman, P. C. Comparing audiovisual and written techniques to prevent testicular cancer in men. Manuscript in preparation.

Finney, J. W., Weist, M. D., & Ollendick, T. H. Training adolescents in early cancer detection: Comparison of elaborative and didactic teaching methods. Manuscript in preparation.

Weist, M. D., & Finney, J. W. Does training in early cancer detection cause anxiety? Manuscript in preparation.

Weist, M. D., Finney, J. W., Barnard, M. U., Ollendick, T. H., & Davis, C. Empirical validation of treatment targets for the management of diabetes in children. Manuscript in preparation.

Weist, M. D., Borden, M. C., Finney, J. W., & Ollendick, T. H. Training empirically derived social skills to boys with interpersonal problems. Manuscript submitted for publication.

Presentations:

Weist, M. D., Finney, J. W., Barnard, M. U., & Davis, C. (1991, April). Empirical identification of treatment targets for children in poor diabetic control. Paper presented at the Florida Conference on Child Health Psychology, Gainesville.

Weist, M.D., & Ollendick, T.H. (1990, November). Empirical validation: The case of assertiveness in children. Paper presented in a symposium at the meeting of the Association for the Advancement of Behavior Therapy, San Francisco.

Hagopian, L. P., Weist, M. D., & Ollendick, T. H. (1989, November). Cognitive behavior therapy with an 11 year-old girl fearful of AIDS and illness: A components analysis. A components analysis. Paper presented at the meeting of the Association for the Advancement of Behavior Therapy, Washington.

Oswald, D. P., Greene, R. W., Weist, M. D., & Ollendick, T. H. (1989, November). Predictive validity of teacher nominations: A five year follow-up. Paper presented at the meeting of the Association for the Advancement of Behavior Therapy, Washington.

Weist, M. D., Borden, M. C., Greene, R. W., & Ollendick, T. H. (1989, November). Sociometric classification: Predicting behavioral adjustment at 5 year follow-up. Paper presented at the meeting of the Association for the Advancement of Behavior Therapy, Washington.

Weist, M. D., Finney, J. W., Borden, M. C., & Ollendick, T. H. (1989, November). Training empirically validated social skills to boys with interpersonal problems. Paper presented at the meeting of the Association for the Advancement of Behavior Therapy, Washington.

Weist, M. D., & Ollendick, T. H. (1989, May). Empirical validation of social skills in boys. Paper presented at the meeting of the Association for Behavior Analysis, Milwaukee.

Finney, J. W., Weist, M. D., & Friman, P. C. (1989, August). Training adolescents in early cancer detection: Comparision of elaborative and didactic teaching methods. Paper presented at the meeting of the American Psychological Association, New Orleans.

Finney, J. W., Weist, M. D., & Friman, P. C. (1988, November). Early cancer detection in men: Comparing written and audiovisual teaching methods. Paper presented at the meeting of the Association for Advancement of Behavior Therapy, New York.

Ollendick, T. H., Hagopian, L. P., Huntzinger, R. M., & Weist, M. D. (1988, November). Cognitive behavior therapy with children: An initial analysis of the cognitive and behavioral components. Paper presented at the meeting of the Association for Advancement of Behavior Therapy, New York.

Oswald, D. P., Greene, R. W., Weist, M. D., & Ollendick, T. H. (1988, November). A comparison of cognitive and behavioral treatment for aggressive and withdrawn children. Paper presented at the meeting of the Association for Advancement of Behavior Therapy, New York.

Finney, J. W., & Weist, M. D. (1988, August). Improving the prediction of noncompliance: A template matching approach. Paper presented at the meeting of the American Psychological Association, Atlanta.

Weist, M. D., Crane, A. L., & Arnold. P. (1988, May). Enhancing the generalization of social skills training through second setting reinforcement. Paper presented at the meeting of the Association for Behavior Analysis, Philadelphia.

Cranfield, D., Darly, C., Shaughnessy, P., & Weist, M. D. (1988, May). Preparing youth in a residential treatment center for foster care: Teaching selective social skills. Paper presented at the meeting of the Association for Behavior Analysis, Philadelphia.

Shaugnessy, P., Crane, A. L., Wade, K., & Weist, M. D. (1988, May). Pre-exposure effect of discipline techniques to decrease chronic runaway. Paper presented at the meeting of the Association for Behavior Analysis, Philadelphia.

Weist, M. D., Moore, D. R., & Borden. M. C. (1988, March). Disorders of children in foster care: Sex, age and success differences. Paper presented at the meeting of the Southeastern Psychological Association, New Orleans.

Wade, K., Crane, A. L., Shaugnessy, P., & Weist, M. D. (1987, November). Exploring the parameters of punishment procedures to decrease chronic runaway behavior. Paper presented at the meeting of The Association for Advancement of Behavior Therapy, Boston.

Weist, M. D., & Crane, A. L. (1987, May). The behavior management system: Integrating therapeutic services from program entry to client discharge. Paper presented in a symposium at the meeting of the Association for Behavior Analysis, Nashville.

Crane, A. L., & Weist, M. D. (1987, May). Comprehensive staff training: Replacing "inner conflict" with clear behavioral goals and treatment methods. Paper presented in a symposium at the meeting of the Association for Behavior Analysis, Nashville.

Moore, D. R., Weist, M. D., Silas, C., & Crane, A. L. (1986, November). Enhancing the generalization of social skills training. Paper presented at the meeting of the Association for Advancement of Behavior Therapy, Chicago.

Weist, M. D., & Crane, A. L. (1986, November). "Cooling down": Decreasing adolescent aggression with a variant of time-out. Paper presented at the meeting of the Southeastern Association for Behavior Analysis, Savannah.

Weist, M. D., & Redmon, W. K. (1986, May). Skills-training adolescents

to refuse substances. Paper presented at the meeting of the Association for Behavior Analysis, Milwaukee.

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