

Bridging the Gap between Explicative and Treatment Research: A Model and Practical Implications

Ronald L. Blount,^{1,3} Victoria L. Bunke,² and Jonathan F. Zaff¹

The recent move toward the recognition of empirically supported treatments (ESTs) within numerous facets of the field of clinical psychology has been met with general enthusiasm. The EST movement would not have been possible without the efforts of earlier treatment researchers. Paradoxically, this is also a time when some of the leaders in clinical psychology are recognizing that there is a paucity of experimental treatment research being conducted today relative to the high volume of correlationally based, explicative research, which examines the associations among variables. In this paper we present numerous reasons for the relative excess of explicative research and the paucity of treatment outcome research. Clinical practice is used to exemplify how assessment-oriented, explicative activities and the design of treatment can be integrated. A research-based example in which explicative research is used directly to inform the design of the intervention in treatment outcome research is presented as one model for emulation. Specific recommendations are made to help guide professionals and students entering the field who wish to conduct treatment research. An expansion on some of the themes highlighted in this paper can be found in the chapter from which it was in part derived (Blount, Bunke, & Zaff, 1999).

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It was the best of times, it was the worst of times.

A Tale of Two Cities
Charles Dickens

In many ways the above statement represents the state of treatment research in clinical psychology today. The last few years has seen the formation of the Division of Clinical Psychology's (Division 12) Task Force on Promotion and Dissemination of Psychological Procedures and the American Psychological Association's Task Force on Psychological Intervention Guidelines. A number of therapeutic interventions in child and adolescent therapy, adult therapy, couple

and family therapy, as well as in select areas of health psychology were evaluated and determined to have met criteria for being considered Empirically Supported Treatments (EST) (Chambless & Hollon, 1998). Later, Division 12 President Gerald Koocher initiated an extension of the task force entitled, "Task Force on Effective Psychosocial Interventions: A Lifespan Perspective," which specifically focused on youth and geriatrics (Spirito, 1999). Committees were formed within two sections of Division 12, the Section on Clinical Child Psychology (now Division 53) and the Society of Pediatric Psychology (now Division 54), to identify treatment approaches within child and adolescent psychotherapy and pediatric psychology which merit the label of EST. These efforts resulted in special issues of the *Journal of Consulting and Clinical Psychology* (February 1998), the *Journal of Clinical Child Psychology* (Volume 27, Number 2), and a series of publications in 1999, and 2000 within different issues of Volumes 24 and 25 of the *Journal of Pediatric Psy-*

¹Department of Psychology, University of Georgia, Athens, Georgia 30602.

²Department of Educational Psychology, University of Georgia, Athens, Georgia 30602.

³To whom correspondence should be addressed; e-mail: rlblount@arches.uga.edu.

chology, devoted to reporting the methodology, findings, and some of the issues surrounding the move to determine what are the ESTs.

The general response from the professional community regarding the EST initiative has been very positive (e.g., Johnson, 1999). There are now guidelines for clinicians to use when selecting a specific therapeutic intervention from the various modalities available for many clinical disorders. Similarly, there is now a greater emphasis on graduate, internship, and postgraduate training in ESTs (Calhoun, Moras, Pilkonis, & Rehm, 1998). Further, since there is some consensus that the treatments are effective, there has been a greater effort to increase the transportability or dissemination of ESTs from research laboratories to applied clinical facilities (Blount, 1987; Kazdin & Kendall, 1998). The EST movement also represents a significant point of maturation in the field of clinical psychology. Not too many years ago the critical mass of treatment intervention studies simply was not there. The success of the EST initiative rests squarely on the efforts, products, and shoulders of earlier treatment outcome researchers.

However, simultaneous with Division 12, 53, and 54's efforts to establish ESTs, there has been a growing recognition in some circles that there is a deficit in the quantity of clinical treatment research currently being produced. Michael Roberts and his colleagues have been some of the principal signalers of this alarming and detrimental trend. At the end of and after his term as Editor of the *Journal of Pediatric Psychology (JPP)*, Roberts and his colleagues reported on the proportion of various kinds of empirical articles which appeared in *JPP* (Roberts, 1992; Roberts, McNeal, Randall, & Roberts, 1996). They categorized the published empirical research into four primary types: treatment, prevention, assessment, and explicative. Treatment research made up only about 10% of the total of empirical articles published during each interval examined. Prevention research was even less represented, with the percentages ranging from around 1.5% to about 4%. Assessment research, which is concerned with the development of assessment instruments, ranged from about 10% to 12% of the total. Explicative research, which is fundamentally correlational in nature, accounted for the vast majority of research publications, ranging from around 75% to 78% of the total empirical articles.

The purpose of explicative research is to discover associations among variables which may relate to the onset, severity, associated features, course, duration,

and adjustment to a particular clinical phenomenon. The findings of explicative research are often used to develop theoretical models and to refine our understanding of a disorder. More important for the EST movement, explicative research can also be used as a guide for developing treatment interventions. Unfortunately, based on the data and observations of Roberts and his colleagues, it seldom serves this function today. Roberts *et al.* (1996) note that this pattern was not characteristic of the early days of the field of pediatric psychology, nor, we suspect, of clinical psychology as a whole. At one time explicative and treatment research were more closely linked, and psychologists were more applied in their focus (e.g., Wright, 1967). Therefore, it appears that in the midst of great progress in the EST initiative, the current production of treatment research studies, relative to the abundance of explicative correlational research, is sorely lacking. It is our strong impression that this phenomenon is not isolated to the area of pediatric psychology, but is reflective of the whole of clinical psychology.

SOME REASONS FOR THE PREPONDERANCE OF EXPLICATIVE VERSUS TREATMENT RESEARCH

We believe there are a number of factors, both situational and personal, as to why there is a deficit in treatment research being conducted today and, conversely, why there is a relative excess in explicative research. Often, when conducting explicative research large data banks are gathered, and the researcher's attention is focused more on the relationships among variables than on how those variables might be changed in eventual clinical treatment research. From such large data banks, numerous publications are often generated, aided by peer reviewers' and journal editors' apparent affinity for theoretical and other forms of explicative research. This high productivity is reinforced through promotions, pay raises, and the approval of colleagues and granting agency officials. In addition, there is the practical issue of the ease of running additional analyses on an existing large data bank versus collecting and processing new data, as would be required with treatment research. Working with a large data bank can be professionally safe in that the probability that at least some research findings will be published does not depend on the uncertain outcome of a treatment intervention. In addition, the advent of sophisticated statistical techniques, such as LISREL and other variations of causal modeling procedures, further pro-

motes explicative research (see also Roberts *et al.*, 1996).

Training in the perspective that explicative research is superior to applied, pragmatic, treatment-oriented research begins early in the social scientist's career. In many graduate programs, a lack of theory building or theory testing for a thesis or dissertation often brings negative comments by some of the voting faculty members on committees. The threat of failure is enough to assure that most clinical students will attempt to design their study around theory development or testing. An additional reason for the preponderance of explicative research in graduate programs is the need for the student to finish the research in a short period of time. The existence of large data banks, which may already have been collected, promotes the student's design of time-efficient studies using those data. In that situation, analyses need only be conducted from the existing data, as opposed to the student having to select a new topic, review a host of additional literature, secure a possible research site, select measures, and run subjects. Each step in research takes time for someone who is seeking their degree in a timely manner. A popular maxim is that one of the best predictors of future behavior is past behavior. This is also true for the conduct of primarily explicative research by clinical psychology graduate students, who later become the next generation of researchers in the field (Blount, Frank, & Smith, 1993).

An additional factor which contributes to the lack of treatment research is that many graduate students have not been trained in conducting research in applied pediatric and child clinical settings, where treatment-related issues are very hard to deny. Indeed, if they have clinical experience in hospital and other applied settings, they often encounter psychologists who face extraordinary and ever-increasing demands for clinical services in order to justify their salaries. The barriers against conducting treatment research in health care settings can be formidable (Drotar, 1997). With the changes in health care in the United States, there are nationwide trends which threaten to push psychologists into either a clinical or research track. This clinician/researcher schism creates a dynamic whereby the quantity and quality of treatment research suffers: the heuristic and compelling aspects of clinical needs have little impact on those who conduct research.

Another reason for the bias of researchers toward conducting explicative research could be the relative unattractiveness of treatment research. Treatment research is harder to conduct and is more

personnel intensive than correlational research (D. L. Chambless, personal communication, April 16, 1999; La Greca & Varni, 1993). In addition to the risk that an intervention does not produce the desired clinically or statistically significant results, in our experience greater effort is usually required for fewer research publications when conducting treatment studies as compared to conducting explicative research. The payoff to the researcher's *vita* simply is not as likely or as frequent with treatment research. Also, in treatment research it is necessary to gain adequate control over the independent variable if the goodness of the treatment is to be assured (e.g., Kazdin & Kendall, 1998; La Greca & Varni, 1993). Explicative research requires only measurement of existing conditions, perhaps only on one occasion, not changing those conditions in ways that match the intended treatment manipulations. Since many treatments require multiple sessions, the risk of subject attrition is greater, more time and effort is required, and concerns increase about the proper utilization of the treatment, particularly if the client is to perform behaviors outside the clinic environment. Addressing the important issues of the maintenance and generalization of behavior change even further increases the effort.

Finding a well-spring of creative, effective, efficient approaches or combinations of approaches to the design of treatments then becomes the challenge. The most obvious source of treatment options, the findings from explicative research, is too seldom used. In part we believe this is due to the nature of the explicative research which has been conducted, with a primary focus on distal, trait-like variables, which contribute wonderfully to theory development, but which are not easily manipulated. The early days of behavioral psychology were unique in their focus on proximal, modifiable, situational variables. However, too much of modern-day behavioral psychology has become trait-focused. Historically, explicative research was integral to the process of treating clinical phenomena. It will be to the benefit of all involved to reintroduce the close link between explicative and treatment research.

CLINICAL PRACTICE AS A MODEL OF HOW CLINICAL RESEARCH COULD BE CONDUCTED: BACK TO THE FUTURE?

In clinical practice, understanding the factors which are related to, and seem to control, the occur-

rence of a behavior or disorder and the provision of treatment for that disorder are intimately related. For any patient with any problem, providing treatment without a proper understanding of the factors which control the problem is misguided at best, and potentially harmful and unethical (Blount, 1987; Roberts, 1992). The assessment phase of clinical work takes the form of a behavioral assessment funnel (e.g., Cone & Hawkins, 1977; Cronbach, 1970). It is so named because the assessment is initially broad, and with low resolution or focus on specific areas. This phase is equivalent to conducting the correlational analyses and associated conceptual or theory development phase which characterizes explicative research. Once the broad problem areas are ascertained, the emphasis narrows and becomes more focused on specific areas. This narrow phase of the funnel, with its high resolution on the target behaviors and the factors which control them, continues throughout treatment.

During the narrow phase of the funnel, the focus is on the antecedents and consequences of the behaviors of interest. These functional antecedents and consequences, which serve either to increase or decrease the likelihood of the behavior occurring, tend to occur in close temporal proximity to the target behavior. Following this process, referred to as a functional analysis of behavior, the selection of the best route of intervention is made. Assessment informs treatment, and treatment responsiveness or outcome informs additional assessment and possible theory or conceptual revisions. This latter phase is analogous to experimentally validating the results of explicative research.

It is our experience that the basic tenets of applied behavior analysis are not very much practiced by clinicians today, even in behavioral circles, and much less so outside of behavioral circles. However, we believe that some of the basic principles of applied behavior analysis, as described in this paper, could be employed in the conduct of explicative research, regardless of the theoretical paradigm of the researcher. Furthermore, this employment would go far to encourage the development of empirically derived treatment research.

ACUTE PROCEDURAL PAIN IN CHILDREN: A MODEL FOR THE INTEGRATION OF EXPLICATIVE AND TREATMENT RESEARCH

As an example of integrating explicative and treatment research, we will focus on our work with

acute procedural pain in pediatric patients. The process, and the thinking by the researcher which went on behind the pages of the published research, is what we wish to share.

Explicative Research: Begin with the End in Sight

While following the families on a consultation/liaison service, I (R.L.B.) had the opportunity to observe pediatric oncology patients, their parents, and the staff during the children's lumbar punctures (LP) and bone marrow aspirations (BMA). During these observations, it soon became apparent that some children displayed less distress and more coping behaviors than others. More importantly, in terms of therapeutic implications, the parents and medical staff interacted with the children in different ways. Some of these ways seemed to encourage coping, while others seemed to encourage distress.

My initial interest in children with cancer undergoing BMAs and LPs was clinical, with numerous preliminary observations being made. We asked frequent questions of the staff and examined the literature. From our clinical activities, we designed explicative research which was patterned after the functional analysis used in clinical service provision. We used the technique of sequential analysis, which allows for the determination of temporal antecedents and consequences of particular child and adult behaviors, to map the flow of the interactions which occurred in the treatment room. These temporal antecedents and consequences could have an important functional value. We audiotaped the children and others present prior to, during, and after the medical treatments. We later devised an assessment instrument for coding the interactions (Blount *et al.*, 1997). None of the children and parents had been trained in the use of coping strategies. Three investigations were conducted using the same data.

In our initial research in this area (Blount *et al.*, 1989), using the 35-code Child-Adult Medical Procedure Interaction Scale (CAMPIS), we determined those adult behaviors which typically preceded or followed children's distress and coping behaviors. We found that the child coping behaviors of nonprocedural talk and humor by the child (forms of distraction) were typically preceded and followed by nonprocedural talk and humor directed to the child by the medical staff and/or parents. Also, the child coping behavior of deep breathing seldom occurred unless it was preceded by adults repeatedly prompting

the children to breathe. This suggested that frequent adult prompts promoted the occurrence of the desired coping behaviors.

In contrast, child distress behaviors were typically preceded and/or followed by adult's reassuring comments, empathic comments, apologies, criticism, and giving the child control over the beginning of some aspect of the medical procedure. We termed these behaviors "distress promoting." Although counterintuitive, reassurance by parents and staff was the most commonly occurring of the behaviors to precede and follow child distress. While this finding did not indicate a causal relationship, it did suggest that reassurance, empathic comments, apologies, criticism, and giving control to the child were much more related to the occurrence of distress behavior than to coping behavior. The findings of this study had direct implications for the design of therapeutic programs. For example, in order to promote child coping, it would be necessary to train the children to use the coping behaviors indicated by the explicative findings, and train the adults to repeatedly prompt their occurrence using the appropriate cues.

Our subsequent analyses (Blount, Sturges, & Powers, 1990) indicated that there were phase variations in the coping behaviors which children used and, similarly, in the adults' prompts which facilitated those coping behaviors. During the anticipatory phase prior to the beginning of the painful aspects of the medical treatment, the most common coping behavior was nonprocedural talk and occasional humor by the child. Later, during the painful medical treatment, those coping behaviors seldom occurred and the child instead shifted to the use of deep breathing. These types of child coping behaviors were closely associated with the adults' use of nonprocedural talk and humor to the child and with coaching them to breathe, which occurred in the same phase-specific manner. In contrast, child distress and the associated adult behaviors were highly correlated within and across the anticipatory and the painful phases, suggesting that once a child started on a chain of distress behaviors, it was hard to break. These data refined the treatment implications of the previous study, suggesting that the particular phases had particular coping demands. In order to reproduce the coping pattern found in these untrained subjects, the findings indicated that children should be taught to use one type of coping behavior prior to the medical procedure and another during the painful aspects. Adult's prompts would have to vary similarly.

In the final analyses of the initial data (Blount,

Landolf-Fritsche, Powers, & Sturges, 1991), we ranked the children on the basis of their use of coping behaviors. We found that parental prompts varied as we expected, with the high-coping children being more likely to have parents and staff prompt them to cope while doing fewer of those behaviors previously found to be associated with distress. Also, the high-coping children were found to be more responsive to the coping-promoting prompts by parents and staff. However, for both the high- and low-coping children, the same adult-child behavioral relationships were found. Both high- and low-coping children were more likely to cope when coping-promoting prompts were present and to show distress when distress-promoting comments were present. This suggested generalizability of the findings from the previous analyses to children with different levels of coping. In addition, there were no differences found in children's reactions to various prompts from a parent versus from a staff member. Again this suggests generalizability of the interactional pattern of behavior between the child and either the parent or the medical staff member.

Another finding of considerable importance was the behavioral associations among the adults' behaviors in the previous studies, particularly the first study (Blount *et al.*, 1989). In that investigation, the most common behavior to precede and follow most of the adult behavioral categories was another adult behavioral category of the same type. What this suggested was that adults in the treatment room take many of their cues from each other as to how to behave toward each other, as well as toward the child. In terms of therapeutic implications, it suggests that it may not be necessary to change the behavior of all the people in the treatment room directly. Sufficient changes in the behavior of one of the participants in the medical treatment room may be adequate to change the behavior of some or all of the other participants.

Based on our explicative research and the work of others, we developed a working model or conceptualization of how various factors impact coping and distress behavior in children undergoing painful medical procedures. Called the Proximal-Distal Model of Children's Coping and Distress During Acute Painful Medical Procedures (Blount, Bunke, & Zaff, 1999; also Varni, Blount, Waldron, & Smith, 1995), there are primarily two categories of independent variables, those which are temporally and functionally proximal and those which are temporally and functionally distal to the behaviors of interest. The behaviors of interest are the coping and distress behaviors

of the child which occur before, during, and after the medical procedure. The proximal behaviors, which are more situational or statelike, are the parental and staff in-session behaviors which occur in the treatment room and exert a powerful influence on the child's reactions. For example, in a recent study of preschool children receiving immunizations who were not trained in coping behaviors, parent and staff in-session behavior accounted for 38% of the variance in child coping and 55% of the variance in child distress (Frank, Blount, Smith, Manimala, & Martin, 1995). The proximal variables tend to be the more easily changed of the two categories of variables, at least for the behaviors of child coping and distress. These proximal variables occur in the narrow-focus, high-resolution part of the behavioral assessment funnel described earlier.

In contrast to the proximal variables, distal variables occupy the broadband, low-resolution part of the behavioral assessment funnel. Some distal variables, such as the child's age, fear, and level of distress during past medical treatments, are significantly correlated with the child's distress (e.g., Blount, Davis, Powers, & Roberts, 1991; Dahlquist *et al.*, 1986; Frank *et al.*, 1995; Jay, Ozolins, Elliott, & Caldwell, 1983; Pate, Smith, Blount, & Cohen, 1996). However, these variables may be difficult or impossible to change, or, in the case of fear, may be changed in the process of teaching coping behaviors. The usefulness of these traitlike, distal variables seems to be as a screening mechanism for identifying those patients who may be in need of training, or for serving as a marker variable for the presence of potentially modifiable, functional, proximal variables.

Conducting Empirically Derived Treatment Research

Empirically derived treatment research provides a powerful test of the validity of explicative research findings. As such, it either validates, disproves, or almost always refines the original conceptualizations which were associated with the explicative research. The initial three treatment studies conducted by our group incorporated a matching-to-sample approach. The desired sample was the high-coping children and the adults who accompanied them, as well as the coping/coping-promoting, phase-specific interaction patterns, found in our explicative research. Our goal was to promote the type of adult-child interactions in our treatment studies which characterized the high-coping children during the various phases of the med-

ical procedure. The settings for both the original explicative research and the treatment research were pediatric oncology treatment centers, although at different hospitals, and the children in the explicative research were a few years older. In the first treatment study (Blount, Powers, Cotter, Swan, & Free, 1994), we were unable successfully to teach the children and parents to use the same nonprocedural talk or breathing behaviors at a comparable level that the children in the explicative research had used. In retrospect, in the setting in which the original explicative research was conducted, it is likely that one laboratory technician and one nurse present during the procedures were the driving forces behind the parents' and other medical staffs' use of so many prompts for the children to cope. We have never observed so much "naturally occurring" deep breathing or distraction by children undergoing any painful medical treatments in any other setting.

As a fallback technique, we kept the same concepts and used props to facilitate distraction and breathing by the children. In our experience, this type of flexibility is necessary when moving from explicative to treatment research. The props which facilitated adults' coaching and talking to the children were various toys which could be used before the medical procedures began. The prop which facilitated breathing in these young children was a party blower. Selecting this item for breathing promotion was based in large part on a conversation with Bill Redd, Sharon Manne, and Paul Jacobsen, who were then associated with Memorial Sloan-Kettering. The party blower also had a heavy distraction component, and its use was easily verifiable, thus assuring that the desired coping response was occurring. Training and booster training sessions incorporated role play, rehearsal, and feedback prior to each LP except the last one. In a multiple baseline across-subjects design, the treatment worked very well for two of the parent-child dyads. One of these dyads immediately adapted to the use of the desired coping behaviors. The other dyad, with a younger child, took several sessions before this child's level of blower usage was adequate. Therefore, the necessity of training until skill acquisition was apparent. The third parent/child dyad used distraction and book reading throughout the first treatment session, with little to no reliance on a blower during the LP. Distress was extremely low compared to baseline. However, in subsequent sessions, the child's distress was at or above baseline levels. Heightened family disruption between the first and subsequent treatment sessions was the suspected

culprit for this setback in coping and coping-promoting ability.

We successfully replicated this basic training procedure in another study using pediatric oncology patients undergoing IM and IV injections, again using a multiple baseline design (Powers, Blount, Bachanas, Cotter, & Swan, 1993). Based on parent and child preference, the use of parent-prompted counting replaced the party blower for some of the children in the study. Therapeutic effects were obtained and maintenance was found for these subjects.

In the final study in this series (Blount *et al.*, 1992), we took what we had learned from experimentally controlled single-subject designs with pediatric oncology patients who underwent repeated painful procedures and applied the basic training program to 4- to 6-year-old preschool children undergoing immunizations at a county health department. Due to the high volume of patients seen at the health department and the nonrecurring nature of this injection, the training period was shortened to 7–10 min. We eliminated the requirement to demonstrate the desired skills to proficiency prior to ending a training session, as was used in the first two studies. The investigators presented the training program using role play and encouraged the parent and child to practice while receiving feedback. This represented a move toward broader application of the training techniques used in the previous investigations. Training resulted in therapeutic gains and less distress on some, but not all, dependent variables. We also found that the untrained nurses also took their cues from the trained parents to coach the children to cope. This latter result also supported the findings from our explicative research, and indicated that not all people in the treatment room needed to be trained in order to assist in coping promoting efforts.

In one of the most easily used techniques we know for fostering children's coping (Cohen, Blount, & Panopoulos, 1997), we incorporated the concept of adult-prompted distraction of the children's attention from the fearful or painful aspects of the injection to highly appealing cartoons which were watched before, during, and after the injections. Three groups were used: attention control (AC), nurse-directed distraction (NDD), and nurse-directed distraction plus training children and parents condition (NDD+). This study was designed to determine whether costly and time-consuming training of each parent and child dyad was necessary, given the compelling distraction of appealing cartoons and nurse prompting to attend. Participants were 4- to

6-year-old children receiving immunizations at a health department. Upon the child's entrance into the immunization room, nurses offered treatment subjects a choice of viewing *Aladdin*, *Beauty and the Beast*, *Barney*, or *The Lion King*. At procedural junctures, such as cleaning for the injection and just before needle insertion, and at signs of distress, the nurse would direct the children in the treatment conditions to attend to the video. Results indicated that NDD with untrained children and parents was just as effective and less costly than NDD+. Both interventions were superior to the AC condition on all dependent variables. In addition, untrained parents joined in and prompted the child to attend to the cartoons, apparently taking their cues from the nurses as to how to interact with their children. This finding, in conjunction with similar results in the previous study, also supports the findings from our explicative research that adults take their cues from each other as to how to behave in the treatment room (Blount *et al.*, 1989). As in our previous research (Blount *et al.*, 1992), parents in the intervention conditions were also less distressed than those in the control group. NDD was also judged by the nurses to be easy to use. Because of its cost-effectiveness, and the nurses' indication of their intention to continue to use the intervention, this study could be viewed as a move toward treatment dissemination or transportability (e.g., Blount, 1987; Kazdin & Kendall, 1998).

Because of its effectiveness, we tested (Cohen, Blount, Cohen, Schaen, & Zaff, 1999) a variation of the nurse-directed videotape distraction procedure against the topical anaesthetic EMLA (Buckley & Benfield, 1993). The subjects were African-American fourth-grade children undergoing a series of three hepatitis B injections at a school health clinic. A within-subjects design was used with a counterbalanced order of conditions: distraction, EMLA, and typical medical care. Children in the distraction condition coped more and were somewhat less distressed than the children in the other conditions. Both the distraction and the EMLA conditions were preferred by the children over their typical medical care. Distraction was the most cost-effective of the two interventions.

We conducted one investigation in our laboratory in order to evaluate the presumed negative causal impact of reassurance on child distress (Manimala, Blount, & Cohen, in press). This study was conducted later because it related more to conceptual/theoretical issues than to practical clinical issues. In our treatment research we have never

taught parents or staff to engage in less reassurance. Instead, we have always taught them to engage in more distracting and coaching, believing that reassurance would decrease as distracting and coaching increased. However, in our explicative and conceptual work, we have described reassurance as a “distress-promoting” behavior (e.g., Blount *et al.*, 1997), thereby indicating causal associations. To test this supposed causal effect, three groups of preschool children undergoing immunizations at a health department served as subjects. There was a control, reassurance, and distraction/coping group. Due primarily to factors peculiar to that busy health department, it was more difficult to gain adequate control over the independent variables. However, all results which were significant were in the predicted direction, with the subjects in the reassurance condition showing more distress. Most striking, 40% of the children in the reassurance group required restraint, whereas only 15% of the children in the control and 10% of the children in the distraction group required restraint. This supports the findings from a different aspect of our explicative research.

HOW TO MAKE THE INTEGRATION WORK: SALIENT FEATURES AND ADDITIONAL THOUGHTS

We have described one example of the successful integration of explicative and treatment research. In this section we offer recommendations for how to emulate a successful integration and encourage the promotion of treatment research.

1. *Choose proximal, potentially modifiable variables for inclusion in explicative research.* Explicative research can be conducted in such a way that it is more likely to produce results which have potential to inform the design of treatment programs. But this requires the explicative researcher to choose his or her variables well for that purpose. From our presentation on conducting a functional analysis in clinical service provision and our review of the explicative research conducted in our laboratory, it is clear that those independent variables which are temporally and functionally proximal to the behaviors of interest are the ones which have the greatest likelihood of exerting an influence on the dependent variable. As noted throughout this paper, proximal variables also tend to be the ones which are more easily manipulated in a training program. However, the degree to which this recommendation can be applied probably varies with the discreteness of the dependent vari-

able, or perhaps more correctly, the discreteness with which it is operationally defined. In our area of research, coping and distress are specific behaviors which occur during a painful medical procedure. This medical procedure has an anticipatory, encounter, and recovery phase which starts and ends in a short period of time before and after the predictable event of the injection(s).

2. *It may be necessary to conduct a task analysis for more complex dependent variables.* Some situations are not so discrete, such as “adjustment” to chronic illness, hospitalization, or divorce. The stressors and the distress or coping responses in these cases tend to be more prolonged or chronic, and multicomponent. Going back to our model of clinical work, when the clinician encounters a multicomponent task or long-term situation which is causing the patient difficulty, one possible way to address the problem is to conduct a task analysis and break the complex situation down into more discrete component parts. For example, for hospitalization, stressful events may include checking in, putting on hospital clothes, answering strange questions, anesthesia induction, injections, and people coming in and out of the room to wake the patient so they can take a pain pill. Examples of successful “adaptation” to each of the more discrete situations could be ascertained, and the factors which seemed to promote adaptation could be determined. In clinical work, this would again be equivalent to conducting a functional analysis for each of the individual situations. It is possible that some overall coping or coping-promoting pattern could be found in this explicative investigation of adjustment to hospitalization. If so, there may be a need to train only one or a few coping or coping-promoting behaviors. After the explicative research, creative treatment solutions could be designed and instituted. Overall adjustment should still be assessed, but that is likely to be a product of successfully handling the numerous smaller situations. In fact, this hypothetical example is similar to the treatment approach used by Visintanier and Wolfer (1975) in their early studies employing stress-point nursing to help children and their families adjust to different aspects of hospitalization. A variation of the approach which guided stress-point nursing studies was used by Alexandra Quittner and her colleagues (e.g., DiGirolamo, Quittner, Ackerman, & Stevens, 1997; Quittner *et al.*, 1996) in their work with children with cystic fibrosis.

3. *Consider using a matching-to-sample approach to guide the design of the treatment.* Another

technique for using explicative data to inform the development of treatment is by the use of the matching-to-sample approach. This approach was used in our treatment research described earlier, and it has been used in social skills training, among other areas. Matching-to-sample involves teaching those who need treatment to do much the same thing as those who are dealing successfully with a situation. Matching-to-sample does not presume *a priori* that the researcher necessarily knows what the best treatment is, but lets the data be a primary guide for the design of the treatment. The more the people and situation to be trained resemble those who served as the sample, the more likely the treatment will be useful.

4. *Get to know your subjects and setting.* Because of between-group and cross-situational differences, trying to implement a treatment program without a good understanding of the problem, patient, and environment would probably be ineffective, or even counterproductive. In addition, some potentially effective treatment approaches may be more acceptable than others to the patients, their families, and staff (Cohen *et al.*, 1999; Drotar, 1997). Getting to know the subject population means talking to the patients, parents, spouses, medical staff, and other professionals involved, learning about the disease or psychological condition, learning about the medical event(s) or stressor(s), coming to know the setting and the routine in that setting, and conducting numerous observations. We believe direct observation is an extremely important method for understanding the population being studied.

5. *Consider using single-subject research designs, particularly in initial treatment studies.* The same philosophy of getting to know your subject matter and coming under the control of your data has also guided our transitions from explicative to treatment research. Our first two treatment studies following the explicative research employed experimentally controlled, multiple baseline designs. These low-number-of-subjects (*N*), high-resolution (focus), multiple-measurement designs are in contrast to the high-*N*, low-resolution, and often only one measurement occasion which characterizes group designs. The high degree of resolution on both the application of the independent variable (treatment) and the evaluation of the effects of that treatment allow the researcher to be more sure of how his or her treatment will work, or will need to be modified or perfected, when moving from explicative to treatment research. Single-subject designs are powerful experimental methods for evaluating the effects of treatment, not just

pilot work for group research, although they can function that way, too (La Greca & Varni, 1993). Unfortunately, certain single-subject designs are not applicable in all situations. For example, if the behavior happens only once, repeated measurement occasions are not an option.

6. *As an alternative, or later in the research program, conduct multisite investigations.* Multisite investigations have been proposed as a means of obtaining a sufficient number of subjects so that treatment research can be conducted with adequate statistical power to test the hypotheses (La Greca & Varni, 1993). Many clinical phenomenon, particularly those found in medical centers, have very low base rates. For example, La Greca and Varni note that the Diabetes Control and Complications Trial (DCCT Research Group, 1990) enrolled patients from 29 medical centers across the country in order to test a treatment for controlling diabetes. A similar multisite approach is often used successfully by the Pediatric Oncology Group.

7. *Begin with a fine-toothed comb.* Another theme which has characterized our research in acute pain is to start with a fine-toothed comb. In our work with acute distress, we started with a more involved, costly, and high-resolution approach, and later moved to less sustained involvement with our subjects, less cost, and lower resolution (Blount, 1987). For example, the CAMPIS is a 35-code system with the speaker being coded for every vocalization. This yields 111 possible speaker/content combinations which could occur during each of nine different phases (e.g., Blount *et al.*, 1990). Although coding data in this way involved much work, time, and effort, the researcher can always collapse code categories, but can never expand them without recoding.

Later, we revised our 35-code CAMPIS into the 6-code CAMPIS-R (Blount *et al.*, 1997). This combination was based on conceptual factors, other's research (e.g., Bush, Melamed, Sheras, & Greenbaum, 1986; Jay *et al.*, 1983; LaBaron & Zeltzer, 1984), and primarily our own earlier explicative research (Blount *et al.*, 1989). We are now converting the CAMPIS-R into a more easily used rating scale which still maintains the conceptual advantages of the CAMPIS-R over previous scales in this area.

8. *Cost-effectiveness is a goal, but first make sure it is effective.* Researchers can move prematurely to low-cost assessments and treatments, at the sacrifice of effectiveness (Blount, 1987). We believe that it is better to start with higher resolution and, if necessary, higher cost in assessment or treatment in order to

gain a thorough understanding of the subject matter and, in the case of treatment, to help assure effectiveness. Assessment instruments or treatments are not efficient if they are not effective, regardless of the low cost. Once we demonstrated the validity and effectiveness of our assessment instruments and our treatment approach, we revised them to make them into more cost-effective versions (e.g., Blount *et al.*, 1997; Cohen *et al.*, 1999; Cohen *et al.*, 1997). Another point related to efficiency, which is beyond the scope of this paper, is the dissemination of existing cost-effective therapeutic programs. The move to develop ESTs, of which our approach to the treatment of acute pediatric procedural pain is one (Blount, Schaen, & Cohen, 1999; Powers, 1999), should enhance efforts to transport treatments from the laboratory to the day-to-day applied world.

9. *There is a place for personal responsibility.* This paper has been about the process of moving from explicative to treatment research. However, this presupposes that the researcher has determined that conducting treatment research is worthwhile, and that preventing or reducing human suffering is the ultimate goal of psychological investigations. We are convinced that most clinical psychology researchers have a heart for doing good research that will help people. At times there are situational factors which may prevent this from happening. We also see instances in which the researchers seem disproportionately absorbed with the pursuit of grants, fame, recognition, and self-advancement which can come with high numbers of exclusively explicative research publications. Obviously not all of any active researcher's work is going to be in the service of alleviating suffering, and that is fine. Not everyone has to do it, but a sufficient number of us need to be involved in treatment research activities.

10. *Journal editors and reviewers, department heads, and granting agencies need to do their part to encourage treatment research.* The people who are the gatekeepers for the profession are in control of many of the reinforcers for conducting treatment research. Several editors have been very responsible in this regard. Journal editor Michael Roberts (1992) was one of the first to call attention to the lack of treatment research being produced. During Annette La Greca's term as editor of the *Journal of Pediatric Psychology*, she and Jim Varni (La Greca & Varni, 1993) and Associate Editor Dennis Drotar (1997) edited special issues of the journal dedicated to treatment research. Anne Kazak, the current editor of the journal and a producer of treatment research, is

continuing in the same vein. We applaud these editors' efforts and encourage the editors of other journals to also make treatment research a priority.

At the 1999 Florida Conference on Child Health Psychology some of the leaders in the field suggested consideration of a brief publication avenue for treatment studies which were not successful. While publishing null results is potentially problematic, this is an idea which merits consideration. Studies which show treatment failures can be as valuable as those which show success in that they provide information about potentially ineffective treatments for particular problems, thereby establishing the limits of the treatment's generalizability. In a similar way, direct replications of treatment studies could go far toward firmly establishing the goodness of a particular treatment for a particular problem and context.

Those who control raises and fund research, the department heads and personnel at granting agencies, could also encourage treatment research by their recognition of the value of treatment research in general, and the considerable scientific merit and clinical value of various research methodologies, including single-subject designs. However, tradition is very hard to change.

11. *Be creative, responsible, and keep working.* What we have proposed is only one way that researchers can move from explicative to treatment research. There are probably a number of variations on the theme we described (e.g., Quittner *et al.*, 1996), as well as novel approaches. This article, along with the chapter from which it was drawn (Blount, Bunke, & Zaff, 1999), was based on many subjective impressions, personal perspectives and experiences, and personal biases. Others may not even consider the approximate 7.5:1 ratio of explicative to treatment research in the *Journal of Pediatric Psychology* (e.g., Roberts *et al.*, 1996), and probably the field of clinical psychology and the social sciences as a whole, to be a problem. However, we and at least some others believe that the explicative to treatment research ratio can and should be reduced through various means, including following the guidelines proposed in this article. It is paradoxical that in the era of ESTs the conduct of treatment research has become a new frontier in clinical psychology (Drotar, 1997). Indeed, it does seem like both the best and the worst of times for treatment research in psychology. Whether the approaches suggested in this paper will be adopted will depend on individual researcher's decisions, as well as on the environment in graduate programs, journal editors' decisions, granting agen-

cies' funding priorities, the attachment of social scientists to theoretical versus pragmatic research, and department heads' commitment to the value of treatment research. One article clearly will not suffice to accomplish all of that, but it is a start, and one that needs to be made. We ask others to join in this effort and make it a priority for the field.

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