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Assessment of Acute Pain and Anxiety in Children and Adolescents by Self-Reports, Observer Reports, and a Behavior Checklist

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Children and adolescents with cancer are frequently subjected to painful medical procedures that often result in anxiety and resistance to treatment. In a primary study of procedure-related distress in children, a behavioral rating scale was developed to assess the presence of distress behaviors. In the present study, a checklist of distress behaviors was compared to patient and observer ratings of pain and anxiety. Similar to the findings of previous investigations, children showed greater evidence of behavioral distress than adolescents only during the actual medical procedure. However, additional behaviors were observed that suggested that the checklist was age biased and that the two age groups experienced an equal amount of stress. This assumption was supported by a measure of intensity and by observer reports and patient self-reports that showed no differences between the two age groups. None of the measures showed any significant differences for sex or ethnic origin. The present data did confirm earlier findings that younger patients have less physical control and more emotional outbursts than adolescents during a stressful procedure. Because investigations of the efficacy of behavioral interventions for painful procedures must rely on some form of assessment of children's distress, these results support our conclusion that clinical research on pain and anxiety should incorporate both self-report and observer data.

Children and adolescents with cancer are frequently subjected to multiple painful procedures that result in resistance to continued treatment for some children. In fact, as one study found (Zeltzer, Kellerman, Ellenberg, Dash, & Rigler, 1980), many of these patients report their treatments to be worse than the disease itself. The bone marrow aspiration (BMA) is considered by many clinicians to be the most painful of the procedures these patients must endure, a view supported by patient self-reports (Zeltzer & LeBaron, 1982). A BMA is a diagnostic procedure in which a needle is pushed through the periostium and into the iliac crest in order to extract bone marrow. The pain created during the moment of aspiration is described by many patients as excruciating and worse than the feeling of the needle pushing through the bone. Although it is a relatively brief pain (if the aspiration is successful on the first attempt), many patients learn to dread the procedure. Furthermore, there are no medications short of general anesthesia that can be counted on to adequately relieve the pain associated with this medical procedure.

Three systematic investigations have demonstrated that behavioral techniques, particularly hypnosis, can relieve the pain and anxiety for most of these children to at least a moderate extent (Hilgard & LeBaron, 1982; Kellerman, Zeltzer, Ellenberg, & Dash, 1983; Zeltzer & LeBaron, 1982). However, all three

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studies used different methods for assessing pain and anxiety. Katz, Kellerman, and Siegel (1980) described a Procedure Behavior Rating Scale (PBRS) for measuring observed patient distress during medical procedures. Using the PBRS, they found that (a) children younger than 6 years 6 months showed a significantly greater variety of distress-related behaviors prior to, during, and after the BMA than did children either aged 6 years 6 months to 10 years 0 months or adolescents; (b) the two older age groups showed a similar variety of distress behaviors before and after the BMA, but during the actual procedure the children aged 6 years 6 months to 10 years 0 months showed a greater variety of behaviors than adolescents; (c) there was a tendency for females to display a greater range of behaviors than males; and (d) the total number of observed behaviors was moderately correlated with observer ratings of patient anxiety. Sacham and Daut (1981) and Katz et al. (1980, 1981) noted that although this rating scale indicated the number of behaviors present for a given patient, it was difficult to infer whether any given behavior was more representative of anxiety, pain, or a combination of both at any point during the procedure. Furthermore, these same authors suggested that some measure of intensity might help to clarify the meaning of these variables during this highly stressful medical procedure. Another difficulty in the interpretation of data based only on observer reports is that the pain and anxiety constitute a complex, multidimensional experience that is not adequately represented by observable behaviors alone (Hilgard & LeBaron, 1982; Winer, 1982).

The data for the present study were gathered as part of a larger investigation of pain and anxiety related to medical procedures (Zeltzer & LeBaron, 1982). The overall goal of the present study was to compare the usefulness of self-reports, observer reports, and a behavior checklist for assessing acute pain and anxiety in pediatric oncology patients. There were five specific objectives: (a) to compare the frequency of stress-related behaviors between children and adolescents; (b) to compare the frequency of stress-related behaviors to observer ratings as Katz et al. (1980) did; (c) to compare the frequency of these behaviors to patient self-ratings; (d) to obtain separate ratings for pain and anxiety by both patients and observers to determine whether behaviors that occurred at different times during the procedure were more correlated with pain or anxiety; and (e) to estimate behavior intensity in order to determine whether the inclusion of this dimension would differentiate the behaviors of children and adolescents.

Method

Subjects

All patients between the ages of 6 and 18 years receiving BMAs in the Children's Cancer Treatment and Research Center, San Antonio, during a 2-year period were invited and gave written informed consent to participate (N = 67 patients) in a study of "the experience of children and adolescents during medical procedures." No patient or parent refused. Although self-reports were obtained on all 67 patients, observer ratings and behavior checklists were not obtained on 17 patients due to schedule conflicts. The study sample thus consisted of 50 patients and included 21 females and 29 males with each sex group equivalent for mean age (females, M = 10.1 years; range = 6–17 years; males, M = 10.8 years; range 6–17 years). The ethnic composition of the sample was 62% Hispanic, 34% white, and 4% black. The clinic population is representative of the cultural groups in the surrounding region. The sample was divided in a manner similar to that in Katz et al. (1980) using two age groups: 26 younger children between 6 years 2 months and 9 years 11 months and 24 older children between the ages of 10 years 0 months and 18 years 2 months. The mean time since diagnosis was 27 months, with no significant difference between age groups. Disease categories for the younger children included 20 cases of acute lymphoblastic leukemia (ALL) and 1 of acute myelogenous leukemia (AML); and in the older group 21 cases of ALL, 2 of AML, and 6 cases of other categories, including Non-Hodgkin's lymphoma and solid tumors. The stages of the BMA procedure are described by Katz et al. (1980) and were conducted in this clinic in a similar manner, with the exception that the BMA site in the San Antonio clinic was usually the anterior rather than the posterior iliac crest.

Observers

The primary observer used in this study was a masters-level specialist in education who was trained by both authors for approximately 1 month prior to gathering data for this investigation. Training included on-site observations of a variety of medical procedures, and practice ratings followed by discussions with the patient, clinic nurses, and the authors. The observer also reviewed a large series of videotapes of medical procedures performed in the same clinic, and she discussed these practice observations, ratings, and reactions regarding various aspects of the patient's behavior in detail with

Table 1
PBCL Items and Their Operational Definitions

Behavioral category	Definition
Muscle tension	Displays any of the following behaviors: eyes shut tight, clenched jaw, body stiffness, clenched fists, or gritted teeth (e.g., contraction of any observable body part)
Screaming	Raises voice or yells with sound or words
Crying	Displays tears or sobs
Restraint used	Has to be held down by someone or has heavy tape placed across legs onto table
Pain verbalized	Says "ow," "ouch," or comments about hurting (e.g., "you're hurting me")
Anxiety verbalized	Says "I'm scared" or "I'm afraid"
Verbal stalling	Expresses verbal delay ("stop . . . I'm not ready . . . I want to tell you something." etc.)
Physical resistance	Moves around, will not stay in position or tries to climb off table

Note. PBCL = Procedure Behavior Check List.

the authors. Observations were conducted in the same unobtrusive manner as described by Katz et al. (1980). In addition to completing the behavioral checklist, the observer also gathered information regarding date of birth, diagnosis, and time since diagnosis. In order to assess interrater reliability on the various measures, a pediatric registered nurse was present together with the primary observer during BMAs for a sample of 22 patients. This nurse had not worked previously with oncology patients and had not witnessed BMAs prior to the study. Her training period was much shorter than that of the principal observer, consisting of several hours observing bone marrow aspirations, making practice ratings, and reviewing some of the videotaped procedures together with the authors. Thus, although the nurse was accustomed to working in a medical setting, she was less experienced than the principal observer in assessing and rating behavior systematically. The interrater reliability when both observers have extensive training has been shown in the study by Katz et al. (1980) to be quite high.

Behavioral Checklist (PBCL)

On the basis of experience carrying out investigations of behavioral research on children receiving BMAs (Hilgard & LeBaron, 1982; Kellerman et al., 1983; Zeltzer & LeBaron, 1982) a list of 13 behaviors was compiled that was believed to be associated at least occasionally with pain and anxiety during those procedures. Similar to the experience of Katz et al. (1980), some behaviors were found to occur virtually never (e.g., vomiting). A final list of eight behaviors was compiled based on extensive observations and interviews of children regarding their experience. These behaviors, listed in Table 1, were operationally defined for the independent observers, and they constituted our Procedure Behavior Check List (PBCL). The intensity of each behavior was rated by the observer on a 1–5 scale (1 = *very mild,* 5 = *extremely intense*). All eight behaviors were identical or similar to items on the Procedure Behavior Rating Scale developed by Katz et al. (1980). Some of the behavioral definitions are partly overlapping; for example, physical resistance often includes muscle tension, whereas screaming often includes crying or verbalizations of pain or anxiety. Although these behaviors did occur together, they also frequently occurred independently of each other. For example, screaming often occurred as a brief, nonverbal shriek during the actual insertion of the bone marrow needle and during the aspiration.

In addition to these eight behaviors, the observers were instructed to record systematically the occurrence of any other patient behavior that appeared to express discomfort or anxiety. In particular, the five behaviors from the original list of 13 that had not been included in the PBCL because their occurrence had been relatively infrequent were nevertheless included in the observer training. These five additional behaviors were trembling, groaning, wincing, flinching, and complaints of nausea or a need to vomit. Although these behaviors were expected to occur infrequently, the observers were specifically instructed to note their occurrence throughout each procedure in addition to the eight behaviors of the PBCL.

The BMA was divided into three time periods and the behavioral checklist was completed once during each of the three times. Time 1 began when the child entered the treatment room and ended when the aspiration site was cleansed. Time 2 began when local anesthetic was administered and ended when the bone marrow needle was withdrawn. Time 3 began when postprocedure cleansing was performed and ended when the child left the treatment room.

Thus, Time 1 included any anticipatory anxiety and/or pain that children experienced during preparation; Time 2 included anxiety and/or pain experienced during the actual procedure; and Time 3 included anxiety and/or pain during the period following the procedure. During a typical BMA, Time 1 encompassed 4 to 6 min, Time 2 about 2 to 3 min, and Time 3 about 2 to 4 min.

The occurrence of each behavior on the PBCL was recorded during each of the three time periods. Thus, the total number of behavioral categories occurring during each time period yielded three subscores for each patient, and the total across the three times yielded a total PBCL score.

Figure 1. Faces presented together with numbers to assist patient in rating pain or anxiety.

Observer Ratings and Patient Self-Reports

In addition to completing the behavioral checklist immediately following the BMA procedure, the observer also rated patient anxiety and pain in relation to Times 1, 2, and 3. She then asked the patient to rate both pain and anxiety separately for each of the three time periods. Both the observer and patient ratings were based on a 5-point Likert scale (1 = *no pain or anxiety,* 5 = *extreme pain or anxiety*). For children less than 10 years of age and for any of the older children who had difficulty with the self-rating procedure, the numbers were presented together with faces showing increasing degrees of distress (see Figure 1). The observer asked the child to point to the face that best showed how "scared" or how much "hurting" he or she had felt. In each case, the observer also asked the patient to verbally describe how he or she had felt in order to determine whether the numerical self-ratings represented the patient's verbal descriptions.

Results

Interrater Reliability

Both observers made simultaneous independent ratings of pain and anxiety and completed the PBCL for 22 patients. Spearman interrater correlations are shown in Table 2. Correlations between the two observers were relatively low for Time 1 and were moderately strong during the other periods. Percentage of agreement on specific behaviors for these 22 patients was computed by dividing the total number of agreed upon ratings by the total number of ratings. The agreement between the two raters was as follows: at Time 1, 72%; at Time 2, 87%; at Time 3, 94%, and overall, 84%. A review of the PBCL responses by the two observers revealed that the observer with less training in behavioral assessment (the nurse) almost invariably noted fewer discrete behaviors. For example, when the experienced observer noted crying and complaints of anxiety with one patient, the less experienced observer only noted crying. Thus, most instances of disagreement appeared to represent a consistent failure of the nurse to note all the details of patient behavior.

Table 2
Interrater Correlations for PBCL Scores and Ratings of Pain and Anxiety (N = 22)

Time	PBCL	Patient anxiety	Patient pain
1	.64*	.67**	.16
2	.80**	.84**	.78**
3	.86**	.63*	.57*

Note. PBCL = Procedure Behavior Check List.
* $p < .01$. ** $p < .001$.

Table 3
Distribution of Total PBCL Scores (N = 50)

Score	% of sample
0	4
1–5	38
6–10	36
11–15	20
16–20	2

Note. PBCL = Procedure Behavior Check List.

PBCL Scores

The distribution of PBCL scores is presented in Table 3. The distribution was skewed toward the lower half of the range. PBCL scores for Times 1, 2, and 3 as well as total scores are presented by age groups in Table 4. The pattern of behaviors over time for these two age groups is similar to that reported by Katz et al. (1980): During Times 1 and 3 relatively fewer behaviors were observed for both older and younger patients than during Time 2, and the scores for these two age groups differed significantly ($p < .02$) only during the actual BMA procedure (Time 2). Katz et al. (1980) found a Pearson correlation of $-.60$ between age and total scores. A relatively lower correlation should have been found if their sample had not included the younger patients below the age of 6 years. Such was the case in the present sample where the correlation between age and total scores was $-.45$ (Pearson r, $p < .001$). Unlike the previous investigation, however, where few adolescents showed evidence of distress

before and after the BMA, some stress-related behavior was observed in the present study in a relatively large proportion of the older patients (see Table 4).

Younger patients were significantly more likely than adolescents to cry, scream, express verbal anxiety, and need restraint at some time during the procedure (see Table 5). Thus, the tendency for older adolescents to show physically greater self-control and fewer emotional outbursts, as Katz et al. (1980) reported, was replicated in this sample. The same eight behaviors rated by Katz et al. are shown in Table 5 with their respective frequencies for that sample.

What results would be obtained on the PBCL if items were added that occur more frequently in adolescents than in children?

Table 4
Comparison of Total Scores for Younger and Older Patients by Time Period

Time	Age		Mann-Whitney *U*
	Younger[b]	Older[c]	
1			
M	1.58	1.04	$Z = 1.20$ (*ns*)
Mdn	1.72	0.67	
SD	1.50	1.23	
%[a]	61.50	54.20	
2			
M	3.62	2.46	$Z = 2.47$, $p < .02$
Mdn	3.36	1.83	
SD	1.70	1.84	
%[a]	96.20	91.70	
3			
M	0.77	0.67	$Z = 0.20$ (*ns*)
Mdn	0.75	0.50	
SD	1.07	0.92	
%[a]	53.80	50.00	
Total			
M	5.96	4.17	$Z = 1.93$ (*ns*)
Mdn	6.50	2.50	
SD	3.40	3.54	
%[a]	96.20	91.70	

[a] Percentage of subjects in age group who had at least one behavior on the Procedure Behavior Check List (PBCL) during the observation period indicated.
[b] Age range = 6 years 6 months to 9 years 11 months. $n = 26$.
[c] Age range = 10 years 0 months to 18 years 2 months, $n = 24$.

Table 5
Proportion of Patients Who Exhibited Individual Behaviors at Least Once During BMA Procedures: Results of Two Samples

Item	Total sample	Age group		p[a]
		Younger	Older	
San Antonio sample				
Muscle tension	.84	.80	.88	*ns*
Crying	.60	.73	.46	<.05
Pain verbal	.56	.65	.46	*ns*
Screaming	.56	.77	.33	<.002
Restraint used	.38	.62	.12	<.001
Verbal stalling	.24	.27	.21	*ns*
Anxiety verbal	.14	.23	.04	=.05
Physical resistance	.10	.12	.08	*ns*
Los Angeles sample[b]				
Muscular rigidity	.57	.50	.64	*ns*
Cry	.52	.72	.33	<.001
Pain verbal	.78	.90	.67	<.02
Scream	.27	.50	.08	<.001
Restrain	.06	.13	.00	*ns*
Stall (verbal)	.16	.23	.10	*ns*
Fear verbal	.13	.10	.16	*ns*
Refusal position	.10	.18	.03	<.05

Note. BMA = bone marrow aspiration. Sample sizes for the total, younger, and older patients in the San Antonio sample were 50, 26, and 24, respectively; in the Los Angeles sample, they were 77, 38, and 39, respectively.
[a] Z test for significance of a difference between two proportions was used (younger vs. older).
[b] Adapted from "Behavioral Distress in Children With Cancer Undergoing Medical Procedures: Developmental Considerations" by E. R. Katz, J. Kellerman, and S. E. Siegel, 1980, *Journal of Consulting and Clinical Psychology, 48*, p. 361. Copyright 1980 by the American Psychological Association. Adapted by permission.

Our observer was able to identify two additional behaviors that are relatively subtle and that had apparently been overlooked in many of the patients in previous investigations. These behaviors, flinching and groaning, both occurred in a significantly larger proportion of adolescents compared to children (flinching—12% children, 54% adolescents, $p < .002$; groaning—19% children, 54% adolescents, $p < .01$[1]). Katz et al. (1980) reported that groaning had also been observed in their

[1] We used a Z test to determine the significance of a difference between proportions.

sample, but it was not included in their analysis because it did not discriminate between groups. For the 22 procedures rated by the two observers in the present study, the percentage of agreement on these two behaviors was calculated in the same manner as described previously. Percentage of interrater agreement during Times 1, 2, and 3, respectively, was 91%, 91%, and 100% for flinching and 91%, 82%, and 73% for groaning. If these two additional behaviors are added to the PBCL, then the significant age difference found during Time 2 does not exist. At the same time, inclusion of these two items in the checklist produces results that remain consistent with observations of Katz et al. (1980) and Hilgard and LeBaron (1982) that children tend to express distress in a more vocal, physically active manner than do adolescents.

These post hoc results suggest that the significant age difference found on the behavioral checklist for Time 2 and the comparable differences in the Katz et al. (1980) study simply reflect an age bias in the items of which it is composed. That is, if the checklist comprises mostly behaviors that children demonstrate more frequently than adolescents, such as crying or screaming, then children will score higher. However, this higher score is not necessarily equivalent to higher anxiety or pain.

Unlike the findings of previous investigators (Katz et al., 1980; Hilgard & LeBaron, 1982), no sex differences in types or amount of behavior were found in this sample. There was a small, nonsignificant tendency for girls to cry, scream, express verbal anxiety, stall verbally, and need more restraint than boys. In a larger sample, some of these differences would probably have been statistically significant but still small as previous research has shown (Katz et al., 1980; Hilgard & LeBaron, 1982).

PBCL Scores Compared to Patient and Observer Ratings of Pain and Anxiety

PBCL scores correlated significantly (Spearman rho) with independent observer ratings of pain and anxiety during Times 1, 2, and 3 (see Table 6). The PBCL scores correlated more strongly with observer ratings of anxiety than with observer ratings of pain during Time 1, and tended (nonsignificantly) to do so during Times 2 and 3. A similar pattern was found in the correlations between PBCL scores and patient self-ratings. The PBCL scores also correlated much more strongly with observer ratings than with patient self-reports and, for Time 3, PBCL scores were not significantly correlated with patient self-reports of either pain or anxiety. These correlations suggest that (a) behaviors on the PBCL express varying combinations of pain and anxiety depending on circumstances and the individual patient, but anxiety tends to be represented more consistently than pain; and (b) behaviors on the PBCL are related more strongly to observer than to patient ratings either because patients are less reliable reporters or because their self-ratings reflect the private experience of suffering, whereas observable behavior reflects a more interpersonal dimension of pain and anxiety.

Table 6
Spearman Correlations Between Total PBCL Score and Patient and Observer Ratings (N = 50)

	Correlation between PBCL and			
Time	Patient self-rating of anxiety	Patient self-rating of pain	Observer rating of anxiety	Observer rating of pain
1	.49**	.26*	.74**	.42**
2	.53**	.44**	.71**	.64**
3	.21	−.09	.59**	.45**

Note. PBCL = Procedure Behavior Check List.
* $p < .05$. ** $p < .001$.

Comparison of Observer and Patient Ratings of Pain and Anxiety

Correlations between patient and observer ratings of pain and anxiety (Spearman rho) indicated that there was consistently more agreement on ratings of anxiety than of pain (see Table 7). Comparison of Tables 6 and 7 shows that patient ratings of pain and anxiety tended to correlate more strongly with observer ratings than with the PBCL.

Table 7
Spearman Correlations for Patient and Observer Ratings (N = 50)

Time	Anxiety	Pain
1	.63**	.39*
2	.71**	.50**
3	.53**	.11

* $p < .01$. ** $p < .001$.

Other Comparisons

Mann-Whitney *U* analyses of both patient and observer ratings of pain and anxiety before, during, and after BMAs failed to reveal any significant differences between children and adolescents, nor were any differences found related to sex, ethnicity (white vs. Hispanic), disease category, or time since diagnosis.

Intensity of Behaviors

In a critique of Katz et al. (1980), Sacham and Daut (1981) pointed out that some type of intensity dimension for each behavior would enable investigators to assess responses not just in terms of presence versus absence but also in terms of the extent to which patients exhibited the behavior. For example, they reasoned that a few tears should not be represented by the same score as loud crying. The only behaviors in the present investigation that occurred frequently enough to permit meaningful comparisons in terms of intensity were tensing, crying, and screaming. No significant differences in intensity ratings were found between older and younger patients (see Table 8). The pattern of intensity ratings across time suggests that when these three behaviors occurred, they were almost as intense prior to the procedure as during it. Following the BMA, intensity ratings tended to diminish more markedly for children than for adolescents. Intensity ratings in the period after the BMA tended (nonsignificantly) to be higher for adolescents compared to children both for muscle tension ($p < .12$) and crying ($p < .06$).

Discussion

The present investigation only partially confirmed results reported by Katz et al. (1980). Using a similar list of behaviors, both investigations found that observers can achieve a relatively high rate of agreement with each other in rating behavior. Observer ratings in both studies also showed that children between the ages of 6 and 10 years were similar to adolescents in the number of dis-

Table 8
Mean Intensity Ratings for Muscle Tension, Crying, and Screaming

	Time periods					
	Time 1		Time 2		Time 3	
Behavior	Younger	Older	Younger	Older	Younger	Older
Muscle tension						
M	3.57	2.82	3.68	3.48	2.00	3.17
SD	1.27	1.13	1.16	1.16	1.15	0.98
n	7	11	19	21	4	6
Crying						
M	3.23	3.22	3.89	3.82	1.60	2.67
SD	1.01	1.20	0.99	1.33	0.70	1.50
n	13	9	19	11	10	9
Screaming						
M	3.60		3.60	3.60		5.0
SD	0.55		1.14	1.58		0.0
n	5	0	20	8	0	1

tress-related behaviors prior to and following a painful medical procedure. During the actual procedure, children in both studies showed a greater number of distress-related behaviors than adolescents, as measured by a list of eight behaviors that were common to both studies. However, observers in the present investigation reported that two additional behaviors, groaning and flinching, occurred in approximately half of the adolescents. Inclusion of these two behaviors in the assessment of patient "distress" resulted in no difference on the PBCL between children and adolescents during the medical procedure. Observer ratings and patient self-reports provided supportive evidence that children and adolescents did not differ significantly in their experience of pain and anxiety at any time during the medical procedure. Thus, it appears that both the PBRS (Katz et al., 1980) and the PBCL were age biased in their original versions. One developmental difference that was found both by Katz et al. (1980) and the present investigation was that children and adolescents differed in terms of the types of behavior they displayed, with adolescents showing greater physical self-control and fewer emotional outbursts.

Using detailed behavioral transcripts of BMAs, Hilgard and LeBaron (1982) found that independent judges tended to rate pain for adolescents lower than for children. They concluded that adolescents are more controlled than children in their expression of distress and that they may appear to be experiencing less pain and anxiety than they actually are. The observers in the present investigation based their ratings of pain and anxiety on direct observations of the BMA rather than on transcripts; thus, although they confirmed that adolescents are generally more restrained in expressing distress, they rated the adolescents' distress equal to that of children. In a review of literature on children's fears in a dental setting, Winer (1982) noted a similar pattern of results suggesting that with increasing age patients learn to control themselves more, although their anxiety does not diminish.

The investigator who wishes to be economical in gathering data may ask which method of assessment (i.e., patient self-report, observer ratings, or an observer checklist) is the best means of assessing the patient's experience. Some of the psychometric advantages and disadvantages of patient reports versus an observational approach have been described by McReynolds (1968) and Glennon and Weisz (1978). However, to choose one method or the other because it is "better" or "more valid" is to ignore the questions "Better for what?" and "More valid for what purpose?" The use of a behavior checklist such as the PBRS or the PBCL has two obvious advantages: (a) the target variables (behaviors) can be operationally defined and are quite reliably observable, and (b) assessment of overt patient behavior in the medical clinic provides a basis for assessment of what Wolf (1978) referred to as "social validity." That is, behavior such as crying, screaming, and physical resistance creates additional stress for parents and staff who work with these children and results in slowing down the clinic functioning, and measurement of these overt behaviors provides important data to help document the cost-effectiveness of intervention designed to reduce the behaviors.

Disadvantages of self-report data have been discussed by various authors (see Spielberger, 1972). A major disadvantage in children is the difficulty in obtaining an accurate description or rating of internal states such as anxiety or pain. On the other hand, the same idiosyncrasies that cause a few children to give reports that seem inconsistent and invalid also cause other children to report internal events that appear equally inconsistent but that are plausible and clinically meaningful. For example, one patient appeared calm yet reported experiencing relatively high pain and anxiety if he was interviewed in private; data from parents and additional observation revealed that this patient was a stoic individual who did not like to complain but who often experienced insomnia, nightmares, and increased irritability in anticipation of medical procedures. A number of other children and adolescents showed a reversal of this pattern, illustrated by one boy who cheerfully climbed up on the treatment table and asked the nurses to hold him tightly; he then became rigid, stared up at the ceiling, and proceeded to scream during the entire sterile wash and

completion of the bone marrow aspiration. In contrast to the observer's high ratings, the patient rated both his pain and anxiety as moderately low. He explained that his rigidity and screaming provided a distraction upon which he focused almost all of his attention and that, as a result, the BMA bothered him very little. His explanation seemed plausible, if one interprets his rating as "degree of suffering" rather than "sensation of pain." His claim that the BMAs did not bother him much was corroborated by parent reports and further observation that suggested that he experienced little anticipatory dread, no behavioral disturbances, and few sequelae. Additional illustrations of the ways in which patient and observer reports are mutually illuminating may be found in Hilgard and LeBaron (1984).

Possible sources of data to confirm the validity of apparently idiosyncratic reports of children are as follows: (a) observation of the child's behavior while waiting in the clinic, (b) interviews with the parents regarding possible behavior problems or changes in eating or sleeping patterns, and (c) assessment of the same patient longitudinally across repeated medical procedures. In research on dental anxiety in children, patient self-reports have provided useful data to supplement behavioral observations (Klorman, Ratner, Arata, King, & Sveen, 1978; Melamed, Yurcherson, Fleece, Hutcherson, & Hawes, 1978). Winer (1982) has pointed out that behavioral research in dentistry suggests that both behavioral and observational data be considered together.

The relation between "anxiety" and "sensory" components of pain, and the distinction between pain and suffering have been reviewed by Beecher (1956), Sternbach (1968), Hilgard and Hilgard (1975), and others. As Katz et al. (1981) and Sacham and Daut (1981) indicated previously, a distinction between anxiety and pain in clinical research is difficult, especially for children. However, our experience has been that few children had difficulty distinguishing between the concepts of being "scared" and "hurt"; thus, we believe that the largest difficulty in assessing these variables resides in their mutual interdependence more than in a cognitive inability or unwillingness of some patients to think carefully about the ratings. The fact that the PBCL tended to correlate more strongly with ratings of anxiety than with pain supports a view that older children and adolescents are capable of thinking about and assessing the anxiety and sensory components of pain somewhat separately. In summary, our study supports the recommendations of Winer (1982) that one should try to assess the anxiety and sensory components of pain separately and that both observational and self-report data should be used in order to more fully understand the patient's experience of suffering.

References

Beecher, H. K. (1956). Relationship of significance of wound to pain experienced. *Journal of the American Medical Association, 161,* 1609–1613.

Glennon, B., & Weisz, J. R. (1978). An observational approach to the assessment of anxiety in young children. *Journal of Consulting and Clinical Psychology, 46,* 1246–1257.

Hilgard, E. R., & Hilgard, J. R. (1975). *Hypnosis in the relief of pain.* Los Altos, CA: Kaufmann.

Hilgard, J. R., & LeBaron, S. (1982). Relief of anxiety and pain in children and adolescents with cancer: Quantitative measures and clinical observations. *International Journal of Clinical and Experimental Hypnosis, 30,* 417–442.

Hilgard, J. R., & LeBaron, S. (1984). *Hypnotherapy of pain in children with cancer.* Los Altos, CA: Kaufmann.

Katz, E. R., Kellerman, J., & Siegel, S. E. (1980). Behavioral distress in children with cancer undergoing medical procedures: Developmental considerations. *Journal of Consulting and Clinical Psychology, 48,* 356–365.

Katz, E. R., Kellerman, J., & Siegel, S. E. (1981). Anxiety as an affective focus in the clinical study of acute behavioral distress: A reply to Sacham and Daut. *Journal of Consulting and Clinical Psychology, 49,* 470–471.

Kellerman, J., Zeltzer, L., Ellenberg, L., & Dash, J. (1983). Adolescents with cancer: Hypnosis for the reduction of the acute pain and anxiety associated with medical procedures. *Journal of Adolescent Health Care, 4,* 85–90.

Klorman, R., Ratner, J., Arata, C. L., King, J. B., & Sveen, O. B. (1978). Predicting the child's uncooperativeness in dental treatment from maternal trait, state, and dental anxiety. *Journal of Dentistry for Children, 45,* 62–67.

McReynolds, P. (1968). The assessment of anxiety: A survey of available techniques. In P. McReynolds (Ed.), *Advances in psychological assessment* (Vol. 1, pp. 244–264). Palo Alto, CA: Science and Behavior Books.

Melamed, B. G., Yurcherson, R., Fleece, E. L., Hutcherson, S., & Hawes, R. (1978). Effects of film modeling on the reduction of anxiety-related behaviors in individuals varying in level of previous experience in the stress situation. *Journal of Consulting and Clinical Psychology, 46,* 1357–1367.

Sacham, S., & Daut, R. (1981). Anxiety or pain: What does the scale measure? *Journal of Consulting and Clinical Psychology, 49,* 468–469.

Spielberger, C. D. (1972). Anxiety as an emotional state. In C. D. Spielberger (Ed.), *Anxiety: Current trends in theory and research* (Vol. 1, pp. 23–49). New York: Academic Press.

Sternbach, R. A. (1968). *Pain: A psychophysiological analysis.* New York: Academic Press.

Winer, G. A. (1982). A review and analysis of children's fearful behavior in dental settings. *Child Development, 53,* 1111–1133.

Wolf, M. M. (1978). Social validity: The case for subjective measurement. *Journal of Applied Behavior Analysis, 11,* 203–214.

Zeltzer, L., Kellerman, J., Ellenberg, L., Dash, J., & Rigler, D. (1980). Psychological effects of illness in adolescence. II. Impact of illness in adolescents—crucial issues and coping styles. *Journal of Pediatrics, 97,* 132–138.

Zeltzer, L., & LeBaron, S. (1982). Hypnosis and nonhypnotic techniques for reduction of pain and anxiety during painful procedures in children and adolescents with cancer. *Journal of Pediatrics, 101,* 1032–1035.

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