

PAIN AND SUFFERING  
AS A FUNCTION OF  
DISSOCIATION LEVEL AND  
INSTRUCTIONAL SET

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### ABSTRACT

*The Dissociative Experiences Scale (DES) developed by Bernstein and Putnam is a frequently used measure of dissociation. This study is the first to validate the scale against a behavioral criterion by demonstrating differences between high and low dissociating female college students in their response to physical pain. Forty-eight female students who scored above 20 on the DES were selected for the high dissociating group, and 48 scoring below 20 on the DES were selected for the low dissociating group. Each subject underwent an ischemic pain procedure under one of three instruction conditions: Imaginal (imagine your arm becoming numb and insensitive); distraction (concentrate on your breathing); or, control (no instructions concerning pain reduction). During the procedure, at one minute intervals, subjects rated both their pain (sensory experience) and suffering (emotional experience); the procedure was terminated at the subject's request or after 20 minutes. Across all instruction conditions high dissociators tolerated the pain significantly longer than low dissociators. Analysis of pain and suffering ratings during the first seven minutes of the procedure revealed a difference between high and low dissociators in the imaginal condition: high dissociators reported significantly lower degrees of suffering than low dissociators, although they did not differ from low dissociators in their ratings of sensory pain. Across conditions, DES scores were negatively correlated with subjects' overall suffering ratings ( $r = -.20, p < .05$ ), but not with their overall pain ratings. These results are consistent with the view that dissociation is a coping mechanism enabling subjects to better tolerate pain; moreover, they suggest that imagination plays a role in this process.*

### INTRODUCTION

The most widely used measure of dissociation is Bernstein and Putnam's (1986) Dissociative Experiences Scale (DES). While reliability and discriminant validity have been established for the DES (Bernstein and Putnam, 1986; Ensink and Otterloo, 1989; Ross, Norton, and Anderson, 1988). There is presently no empirical evidence to show that the DES correlates with any particular given dissociative behavior. The principal aim of this study was to establish construct

validity for the DES by demonstrating its ability to predict responses to an experimental situation. The situation we chose was tolerance of physical pain, a capability specifically assessed by item 19 of the DES. Our study tested the prediction that high dissociators would be better able than low dissociators to separate pain from conscious awareness (Spiegel, 1986), and hence would exhibit greater tolerance.

In addition to measuring pain tolerance, we also evaluated two separate components of pain: sensory pain, which is simply the experience of the sensation; and suffering, which reflects the extent to which that sensation is bothersome or disturbing (Knox, Morgan, & Hilgard, 1974; Hilgard & Hilgard, 1975). Research examining pain reduction through hypnosis has found that highly hypnotizable subjects were able to reduce their suffering significantly more than their sensory pain, while less hypnotizable subjects experienced a similar reduction of both pain and suffering (Debeneditis, Panerai, & Villamira, 1989). We hypothesized that high dissociators, like subjects selected for high hypnotizability, would be capable of blocking suffering, while still continuing to experience the sensory component of pain. We predicted that high dissociators would report less suffering than low dissociators, and that there would be a greater discrepancy between their ratings of pain and their ratings of suffering.

Finally, our study evaluated the effect of instructions to use a particular pain reduction strategy on pain sensitivity in high and low dissociators. Research on hypnotizability has shown that a subject's ability to alleviate pain is moderated not only by his/her level of hypnotizability, but also by the nature of the analgesic instructions administered prior to the pain task (Miller & Bowers, 1986; Spanos, McNeal, Gwynn, & Stain, 1984; Spanos, Radtke-Bodorik, Fergusson, & Jones, 1979). Spanos and collaborators (1984) compared a distraction strategy with an imaginal strategy in high and low hypnotizable subjects and found that the highly hypnotizable subjects were able to reduce their pain more than low hypnotizables with the imaginal strategy, but did not differ from low hypnotizables when using the distraction strategy. In our study subjects were tested using imaginal, distraction, or control instructions. We predicted that the greatest difference between high and low dissociators would be found in the imaginal condition.

The subjects in our study were normal college students. In previous work with this population we have shown that a significant minority have high DES scores; moreover, we demonstrated a significant association between DES scores and reports of stressful or traumatic experiences in childhood or early adolescence (Sanders, McRoberts, & Tollefson,

1989). In that paper we proposed that in normals, as in clinical populations, dissociation develops, in part, as a defense against physical or psychological stress. The demonstration that high dissociators have a greater tolerance for physical pain than do low dissociators will provide additional data compatible with this view.

## METHOD

The subjects were 96 female undergraduates, ranging in age from 18 to 23, who were selected from a larger pool of 359 women based on their scores on the DES. Forty-eight women with scores greater than or equal to 20, as well as an endorsement equal to or exceeding 20 on the DES question which specifically asks if they are "able to ignore pain" (Item 19), were selected for the high dissociator group. Similarly, 48 women with scores less than 20 on the DES and item 19 comprised the low dissociation group. Only female subjects were selected because it was expected that men and women might adopt different criteria in a pain task, particularly when tested by a female experimenter (all subjects were tested by MHG).

Prior to undergoing the ischemic procedure, which will be described below, subjects were given one of three instructions. Sixteen high dissociators and 16 low dissociators were tested in each instruction condition, and the experimenter was blind to both dissociation level and instruction group. The "imaginal" instruction suggested the use of a pain-reducing strategy which involves imagery. The instructions, adapted from Spanos et al. (1984), read as follows:

During the procedure I would like you to try to imagine your arm becoming numb and insensitive, like a piece of rubber. People who have done this found the procedure much easier to tolerate.

The distraction instruction encouraged a strategy which diverts the subject's attention away from the noxious stimulus. The instructions read as follows:

During the procedure I would like you to concentrate on your breathing. Don't try to control it or change it, just pay attention to it. Listen to it, watch it, and focus on it. People who have done this have found the procedure much easier to tolerate.

In the third condition subjects underwent the ischemic task with no prior instructions regarding pain reduction, and were designated "control" subjects.

Experimental pain was produced according to the sub-maximum effort tourniquet method developed as a model for clinical and post-operative pain (Smith, Egbert, Markowitz, Mosteller, & Beecher, 1966). Pain induced in this way mounts more slowly than other types of experimental pain and thus serves as a better analogue for chronic pain. It also allows subjects more time to make ratings of pain and suffering. The ischemic technique involved placing a blood

pressure cuff just above the elbow and inflating it to 200mmHg, after which the subject was then asked to squeeze an exercise sponge 20 times at a constant rate. The arm remained in the cuff until the subject requested removal, or until twenty minutes had elapsed. Pain tolerance was defined as the amount of time until the subject asked for removal of the cuff.

Beginning one minute after the exercise the subjects were given a form every minute on which they were to rate both the degree of sensory pain and the degree of suffering presently being experienced on a scale of one to ten, with 1 being defined as "no pain" and 10 being defined as "extreme pain." The subject was informed that the cuff would be removed when she rated either the pain or suffering as a 10, or verbally requested its removal.

## RESULTS

### *DES Scores of High and Low Dissociators*

The 48 low dissociators had DES scores which ranged from .64 to 19.4 with a mean of 6.3 (s.d.=3.2) and a median of 6.2. With the exception of an outlier of 19.4, this group represents the bottom 43% of the screening sample's distribution. The selected sample of high dissociators had DES scores ranging from 21.1 to 61.7 with a mean score of 33.8 (s.d.=10.5) and a median of 30.9. This group represents the top 26% of the distribution.

### *Pain Tolerance*

High dissociators tolerated the ischemic procedure for 9.8 minutes (591 seconds), while the low dissociators tolerated it for only 7.3 minutes (436 seconds). As shown in Table 1, the mean group difference between high and low dissociators was greatest in the imaginal condition, less pronounced in the control condition, and lowest in the distraction condition. In the distraction condition the group difference was actually reversed, with low dissociators showing slightly greater tolerance than high dissociators.

A DES x instruction ANOVA indicated the main effect of DES group was highly significant with high dissociators tolerating pain significantly longer than low dissociators ( $F=7.64$ ,  $df(1,95)$ ,  $p<.01$ ). The interaction between dissociation level and instruction condition on pain tolerance, however, did not reach significance ( $f=2.3$ ,  $df(2,57)$ ,  $p<.15$ ).

### *Development of Pain and Suffering*

The subjects varied in tolerance level from 37 seconds to twenty minutes. Forty-seven high dissociators and 44 low dissociators remained in the cuff for at least three minutes, however, the number of subjects who were able to tolerate the ischemia for at least seven minutes dropped to 32 high dissociators and 26 low dissociators. Only 15 subjects, 12 high and 3 low, remained longer than 13 minutes. As a result it was difficult to examine the development of pain and suffering over the twenty minutes.

Knox, Morgan, & Hilgard (1974) argue that since pain and suffering tend to mount similarly in the later minutes of ischemia, it is more useful to analyze a standard amount of time in the first portion of the procedure. For this rea-

son the present data were analyzed at the beginning of the ischemic procedure by calculating a mean pain and suffering score for each subject for the first seven minute block of time. A block of seven minutes was chosen so as to capture as much of the overall 20 minutes as possible, while at the same time retaining a relatively high number of subjects.

When suffering ratings were collapsed over the seven minutes, there was a significant interaction between dissociation level and instruction condition ( $F=4.9$ ,  $df(2,57)$ ,  $p<.01$ ). As shown in Table 2, the mean group difference between high and low dissociators was greatest in the imaginal condition, and lowest in the distraction condition.

Post-hoc tests indicated a significant difference in suffering between high and low dissociators in the imaginal condition ( $F=2.40$ ,  $df(5,52)$ ,  $p<.05$ ), but not in either the distraction or control conditions. The interaction between DES and instructions on pain ratings collapsed over the first seven minutes was not significant. Thus, the significant difference between high and low dissociators was in the suffering component, and not the sensory component.

A difference score was obtained by subtracting each subject's mean suffering rating from their mean pain rating (pain tended to be rated higher than suffering). Consistent with the previous analysis, an analysis of variance on these difference scores in the first seven minutes of the ischemic procedure also revealed a significant interaction between DES and instruction condition ( $F=3.8$ ,  $df(2,57)$ ,  $p<.05$ ), with the greatest difference between high and low dissociators occurring in the imaginal condition. Thus, high dissociators showed a greater discrepancy between pain and suffering ratings than low dissociators, particularly in the imaginal condition.

#### *Correlation of DES Scores with Pain and Suffering Ratings*

A Pearson correlation indicated that across both dissociation groups subjects' DES scores were negatively correlated with their mean suffering ratings ( $r=-.20$ ,  $p<.05$ ). DES scores were not, however, correlated with mean pain ratings ( $r=-.06$ ).

TABLE 1  
Mean Number of Seconds in the Cuff for High and Low Dissociators in the Three Instruction Conditions (Standard Deviations are Given in Parentheses)

Dissociation Level		Instruction Condition		
		Imaginal	Distraction	Control
High	mean	664	505	604
	s.d.	(321)	(295)	(310)
Low	mean	396	518	395
	s.d.	(186)	(234)	(275)

TABLE 2  
Mean Suffering Ratings for High and Low Dissociators in the Three Instruction Conditions During the First Seven Minutes of Ischemia (Standard Deviations are Given in Parentheses)

Dissociation Level		Instruction Condition		
		Imaginal	Distraction	Control
High	mean	2.9	5.6	4.8
	s.d.	(2.0)	(2.4)	(2.6)
Low	mean	6.3	5.6	5.9
	s.d.	(1.2)	(1.4)	(2.7)

## DISCUSSION

The principal finding of this study was that women with high DES scores are able to tolerate physical pain longer than those with lower DES scores. Their greater tolerance seems to stem from an ability to reduce suffering in the face of sensory pain. Across both groups of subjects, DES scores were negatively correlated with the suffering component of pain, but uncorrelated with the sensory aspect. The correlation was significant, albeit modest ( $r=-.20$ ): the higher the dissociation level, the less suffering reported during the ischemic procedure.

These findings are consistent with the developmental model of dissociation which states that abusive or traumat-

is childhoods teach the ability to "go away" from pain as a means of defense. This ability is presumed to then generalize and be used either spontaneously or intentionally in other situations of increasingly greater dissimilarity (Spiegel, 1986). The developmental model derives from clinical case history data (Coons, Bowman, & Milstein, 1986; Kluft, 1985; Putnam, Guroff, Silberman, Barban, & Post, 1986), as well as from studies which show correlations between dissociation level and retrospective reports of childhood experiences in normal and clinical populations (Sanders, McRoberts, & Tollefson, 1989; Sanders & Giolas, 1991). Those findings, along with the present data, support the view that negative childhood experiences teach the ability to split off the suffering engendered by physical or psychological pain.

The mechanism by which high dissociators render themselves less sensitive to the suffering component of pain is best addressed by a discussion of the link between imagination and dissociation. Although the DES x instruction interaction on pain tolerance did not reach statistical significance, high and low dissociators were maximally different in the imaginal condition, and there was no group differences in the distraction condition. In addition, it was only in the imaginal condition that ratings of suffering during the first seven minutes of the ischemic procedure were statistically lower for high dissociators. The interpretation of this finding, is that high dissociators are helped most in the imaginal condition because they have already had experience using that strategy to block suffering. The distraction condition, on the other hand, may be relatively ineffective for high dissociators because it interferes with their preferred mode of coping. Imagination and dissociation are closely linked. Indeed, several items on the DES would appear to tap imaginative ability (e.g., remembering past events vividly; becoming involved in fantasy or daydreams). The suggestion in the present study that women with high DES scores minimize suffering most effectively under imaginal instructions underscores the fact that such subjects may be most appropriately characterized as highly imaginative as well as highly dissociative.

Several recent studies of the DES have provided promising data regarding its reliability (Pitblado & Sanders, 1991) and discriminant validity (Schwartz, 1991). Very recently Frischholz et al. (1992) showed that the DES correlated with the Tellegen Absorption Scale and the Perceptual Alteration Scale, but not with the Jenkins Activity Schedule, a measure of Type A behavior. The present study is the first to establish a behavioral correlate for the DES, providing more direct evidence that the DES is effectively tapping dissociative behavior. ■

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