

On the Language of Pain

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The purpose of this study was to develop new approaches to the problem of describing and measuring pain in human subjects. Words used to describe pain were brought together and categorized, and an attempt was made to scale them on a common intensity dimension. The data show that: 1) there are many words in the English language to describe the varieties of pain experience; 2) there is a high level of agreement that the words fall into classes and subclasses that represent particular dimensions or properties of pain experience; 3) substantial portions of the words have approximately the same relative positions on a common intensity scale for people who have widely divergent backgrounds. The word lists provide a basis for a questionnaire to study the effects of anesthetic and analgesic agents on the experience of pain. (Key words: Pain; Computer diagnosis.)

THE DESCRIPTION OF PAIN is a daily concern to the practicing physician. Yet few studies have attempted to specify the dimensions of pain experience. The tools currently used to measure pain treat it as though it were a single, unique quality that varied in intensity only. Whether the investigator uses a psychophysical "dol" scale,¹ words such as "mild, moderate, and severe,"^{2,3} or numbers or fractions representing pain intensification or relief,⁴ only intensity is specified. To describe pain solely in terms of intensity, however, is like specifying the visual world in terms of light flux only, without regard to pattern, color, texture, and the many other dimensions of visual experience.

Clinical investigators have long recognized the varieties of pain. Descriptions of the burning qualities of causalgic pain,⁵ or the stabbing, cramping qualities of visceral pains⁶ frequently provide the key to diagnosis and may even suggest the course of therapy.^{6,7} The

layman is equally aware of the many qualities and dimensions of pain. An evening of radio television or newspaper commercials makes us aware of the splitting, pounding qualities of headaches, the gnawing, nagging pain of rheumatism and arthritis, the cramping, heavy qualities of menstrual pain, and the smarting, itching qualities apparently well-known to sufferers of piles. Despite the frequency of such descriptions, and the seemingly high agreement that such words are valid descriptors, there have been no studies of their use and meaning.

The emphasis on the measurement of overall intensity of pain, and the neglect of the qualities of pain, reflect the widespread acceptance of von Frey's theory of pain as a specific modality of cutaneous sensation.⁸ This theory implies a conceptual nervous system in which "pain impulses" are transmitted from specific pain receptors directly to a pain center in the brain, so that stimulation of the receptors must give rise to pain and pain only as though it comprised a single, specific quality of experience. The extension of von Frey's theory to include two groups of peripheral fibers⁹ that are presumed to carry two qualities of pain—pricking and burning—simply doubles the number of rigid, specific pain sensations, and still fails to open the road to new conceptualizations of pain phenomena.

Recent physiologic data describing sensor mechanisms of the skin suggest an alternative concept of pain mechanisms. There is convincing evidence⁸ that a multitude of nerve impulse patterns is transmitted centrally from the skin as a result of tactile, thermal, and chemical stimulation. The classification of these patterns into a smaller number of "modalities" is a function of the capacity of the central nervous system to select and abstract from the total information it receives.^{9,10} The word "pain," in this formulation, refers not to a specific sensation which can vary only in intensity, but to an endless variety of qualities that are categorized under a single linguistic

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label. There are the pains of a scalded hand, a stomach ulcer, a sprained ankle; there are headaches and toothaches. Each has unique qualities. The pain of a toothache is obviously different from that of a pin prick, just as the pain of a coronary occlusion is uniquely different from the pain of a broken leg.

The purpose of this study is to make a start toward the specification of the qualities of pain. Words used to describe pain have been brought together and categorized, and an attempt has been made to scale them on a common intensity dimension. These efforts are not meant to be definitive, but only a preliminary attempt to develop new approaches to the problem of describing and measuring pain.

Experiment I: Pain Descriptors and Classification

An analysis of the dimensions of pain must begin with guidelines for the range and scope of the descriptive words to be chosen, as well as the development of a list of words used to describe pain. On the basis of an introspectionist analysis of the qualities of tactual sensation, Titchener¹¹ derived what he believed to be four distinctive, qualitatively different categories of pure pain experience: prick, clear pain, quick pain, and ache. Dallenbach¹² later brought together a list of 44 words describing pain qualities, and classified some of the words into five groups characterizing: 1) the temporal course of the experience—*c.g.*, palpitating, throbbing; 2) its spatial distribution—*c.g.*, penetrating, radiating; 3) its fusion or integration with pressure—*c.g.*, heavy, pressing; 4) its affective coloring—*c.g.*, savage, ugly; 5) purely qualitative attributes—*c.g.*, achy, bright, clear, dull, itchy, pricking, and quick.

Starting with Dallenbach's words (some were considered inappropriate and omitted), additional words were obtained by examining the clinical literature relating to pain. The final list contained 102 words. In the course of bringing the words together, it was immediately apparent that the list, arranged in alphabetical order, provided a meaningless jumble. An attempt was made, therefore, to put the words into classes and subclasses describing different aspects of the experience of pain.

The first part of the study consisted of a

series of preliminary experiments aimed at classifying the words into smaller groups. On the basis of these data, the words were categorized into three major classes and 13 subclasses. The classes were: 1) words that describe *sensory qualities* in terms of temporal, spatial, pressure, thermal, and other properties; 2) words that describe *affective qualities* in terms of tension, fear, and autonomic properties that are part of the pain experience; 3) *evaluative* words that describe the subjective overall intensity of the total experience of pain. Each subclass, which was given a descriptive label, consisted of a group of words that appeared to be similar in kind. Some of these words are undoubtedly synonyms, others seem to be synonymous but vary in intensity while many provide subtle differences or nuances (despite their similarities) that may be important to a patient who is trying desperately to communicate with a physician. The final classification, then, appeared to represent the most parsimonious and meaningful set of subclasses without at the same time losing subclasses that represent important qualitative properties. The second part of the study was aimed at determining the validity of the final organization of the words.

Methods

A printed sheet containing the major classes and subclasses of words (see "Results" below) was presented to 20 subjects (14 men and six women) with a mean age of 29.9 years, all with university educations. The subjects were asked to read one subclass at a time and place a checkmark beside each word indicating whether they agreed or disagreed that it belonged in the subclass. After evaluation of the data, words that had less than 65 per cent agreement (arbitrarily chosen as a reasonable criterion) were presented in a second test. A forced-choice test was developed in which the critical words were at the top of a printed sheet, and the revised word list was at the bottom, with a number denoting each category. Each of 20 subjects (12 men and eight women, mean age 28.8 years, each with a university education; none had participated in the earlier studies) was then asked to assign each word to a category by writing the appropriate number next to it.

Results

The major classes and subclasses of words, with the percentage agreement next to each word, are:

SENSORY

Temporal: Beating (90%); flickering (70%); pounding (100%); pulsing (100%); quivering (70%); throbbing (100%); thumping (95%).
Spatial: Darting (85%); flashing (75%); jumping (65%); radiating (85%); shooting (90%); spreading (85%).

Punctate Pressure: Boring (70%); drilling (75%); lancinating (75%); penetrating (85%); piercing (100%); pricking (75%); stabbing (100%).
Incisive Pressure: Cutting (95%); lacerating (65%); sharp (80%); tearing (55%).

Constrictive Pressure: Binding (85%); biting (65%); cramping (100%); crushing (95%); gnawing (65%); gripping (85%); nipping (70%); pinching (80%); pressing (95%); squeezing (95%); taut (50%); tight (65%).

Traction Pressure: Grinding (30%); pulling (90%); tugging (90%); wrenching (85%).

Thermal: Burning (100%); hot (80%); scalding (90%); searing (80%).

Brightness: Itchy (55%); rasping (55%); smarting (90%); stinging (85%); tickling (80%); tingling (90%).

Dullness: Aching (95%); blinding (25%); blurred (95%); drawing (65%); dull (95%); heavy (80%); hurting (65%); numbing (95%); sore (75%); splitting (20%); steady (75%); tender (60%).

AFFECTIVE

Tension: Dragging (90%); exhausting (90%); fatiguing (100%); nagging (70%); tiring (100%).

Autonomic: Choking (85%); nauseating (95%); sickening (95%); suffocating (90%); wretched (40%).

Fear: Awful (30%); dreadful (75%); fearful (85%); frightful (95%); terrifying (95%).

Punishment: Cruel (65%); grueling (95%); killing (95%); punishing (85%); racking (85%); torturing (95%); vicious (85%); wicked (60%).

EVALUATIVE

Agonizing (90%); annoying (95%); bearable (85%); discomforting (80%); distracting (80%); distressing (85%); excruciating (75%); horrible (95%); intense (85%); intolerable (95%); mild (90%); miserable (90%); savage (70%); troublesome (90%); ugly (65%); unbearable (90%); violent (75%).

Eleven words had less than 65 per cent agreement, and were presented in the forced-choice test. The results showed significant agreement for only one word: 75 per cent of the subjects placed *itchy* in the "Brightness"

subclass. Although the remaining words were scattered throughout the list, a significant pattern nevertheless emerged: five words—rasping, splitting, taut, tearing, tender—were placed in the sensory rather than affective evaluative classes with agreements of 70, 85, 90, 95, and 65 per cent, respectively, thereby providing a "sensory: miscellaneous" subclass. One word—wicked—was categorized as an affective word by 85 per cent of subjects, while the remainder—awful, blinding, grinding, wretched—were categorized as sensory, affective or affective-evaluative. The five words, therefore, were placed in a second miscellaneous subclass. The final classification of the words is shown in table 1.

Experiment II: Intensity Relations within Subclasses

Even though the words represent distinctive properties of pain experience, it is important to know how much pain each word represents. For example, do subjects agree that stabbing pain is worse than pricking pain? Therefore, lists of words arranged in random order were presented to subjects who were asked to rate each word on a scale from least to most pain.

Methods

Three groups of subjects were tested: 140 introductory psychology students at the Massachusetts Institute of Technology, and 20 physicians and 20 patients living in the Montreal area.

The average age of the students (about 90 per cent men) was about 20 years, and they came from a variety of cultural backgrounds and socioeconomic levels. First, a group of 70 students was presented with a list of evaluative and affective words and asked to assign each word to a position on a seven-point scale in which 1 and 7 represented, respectively, the least and the worst pains they could imagine.

The data obtained from the students were analyzed using Thurstone's Categorical Judgment model¹² to obtain a scale value and discriminative dispersion value for each word. This procedure provides scale values on an interval scale referred to an arbitrary zero point set at the mean value of all the words. The scale values obtained varied from -2.5 to +2.5. The discriminative dispersion value is a measure comparable to the standard deviation and is

an index of amount of disagreement among subjects. The majority of these words are categorized in table 1 under the headings of "Evaluative" and "Affective." Seven words in the "Evaluative" list were found to have approximately equidistant distributions and relatively low D.D. values: mild, discomforting, distressing, miserable, horrible, savage, excruciating. These seven words were used as anchor words for the list of sensory words: *i.e.*, each number from 1 to 7 was designated by the word in the above order, and a second group of 70 student subjects was asked to assign the sensory words to one of the seven categories, thereby indicating the intensity of pain implied by the word. The data were analyzed in the same way as the evaluative and affective words, and the scale values and discriminial dispersion values for these words are also shown in table 1.

A pilot study carried out with ward and private patients at Massachusetts General Hospital showed that many patients were unable to discriminate pain intensity on a seven-point scale. They discriminated well at lower intensities, but above the midpoint had difficulty discriminating among levels 5, 6, and 7. Utilizing the scale values obtained in this pilot study, together with those for the students, five anchor words were chosen from the list of evaluative words. The mean scale values (in brackets) of the five words chosen from the student and patient data were approximately equally far apart: mild (-2.12), discomforting (-1.28), distressing (-0.12), horrible (+0.83), excruciating (+1.72). These five words were then used as the anchor words for a study with doctors and patients, in which each of the five words was assigned a value from 1 to 5 and the total list of words in table 1 was scaled on the five-point scale.

The doctors (12 men and eight women) had an average age of 26.5 years, were of multi-ethnic origin, including French-Canadians and a few Asians, and worked in predominantly English-speaking hospitals. Most had middle- and upper-class backgrounds. The patients (seven men and 13 women) had an average age of 30.7 years, and were white, English-speaking Protestants belonging to the lower-class income group. They attended a special poor-people's clinic set up in a Montreal slum area. All had incomes of less than

\$3,500 a year, and had had poor educations. The data obtained from patients and physicians were analyzed to provide a mean rating and standard deviation for each word for the two groups. The mean ratings and standard deviations for the doctors and patients are shown in table 1.

Results

In table 1, the words in each category are placed in rank order on the basis of the mean ratings or scale values for each set of words for each of the three groups. When this is done, it is apparent that several words within each subclass have the same relationship in all three sets. Thus, in the temporal subclass, pounding represents more pain than throbbing, which in turn represents more pain than flickering. Those words which fall in exactly the same order in all three sets within each subclass are capitalized. To illustrate the intensity relationships among the capitalized words for different subclasses, the intensity values of the word sets for the doctors and patients are shown in figure 1.

Discussion

The data show that: 1) there are many words in the English language to describe pain; 2) there is a high level of agreement that the words fall into classes and subclasses that represent particular dimensions or properties of pain; 3) substantial portions of the words have the same or approximately the same relative positions on a common intensity scale for people with widely divergent backgrounds.

The fact that there are so many words to describe the experience of pain lends support to the concept that the word "pain" is a label which represents a myriad of different experiences, and refutes the traditional concept that pain is a single modality which carries one or two qualities. If logic is to be maintained, then the investigator who contends that A_{delta} fibers carry pricking pain and C fibers carry burning pain⁹ must also find fibers for cramping, crushing or wrenching pains. If he contends that the different pains simply represent fusion with pressure fiber impulses, then he must find fibers for punctate, incisive, constrictive and traction pressures. It is far more likely that the varieties of pain experience are

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TABLE 1. Classes and Subclasses of Pain Descriptors as Rated by Doctors, Patients, and Students.
 (Within each category, capitalized words have the same rank order in all three groups of subjects.
 The absence of one or more words in several subclasses reflects minor variations in the lists during the course of the study.)

	Doctors			Patients			Students		
		Mean	SD		Mean	SD		Scale Value	Discriminative Dispersion Value
SENSORY Temporal	FLICKERING	1.40	.50	FLICKERING	1.89	.94	FLICKERING	-1.57	.91
	QUIVERING	1.60	.75	QUIVERING	2.50	.83	QUIVERING	-.74	.81
	PULSING	2.30	1.03	PULSING	2.56	.92	Thumping	-.52	.78
	THROBING	2.55	.94	Thumping	2.68	.67	PULSING	-.27	.84
	Thumping	2.55	.94	THROBING	2.68	1.00	THROBING	.09	.94
	BEATING	2.75	.97	BEATING	2.70	.98	BEATING	.19	.83
	POUNING	3.10	.97	POUNING	2.85	1.14	POUNING	.21	.91
Spatial	Spreading	1.80	.77	JUMPING	2.60	.75	JUMPING	-1.05	.93
	JUMPING	2.10	.79	FLASHING	2.75	.97	Radiating	-.68	1.13
	Radiating	2.30	.80	Spreading	3.30	.98	Darting	-.58	.76
	FLASHING	2.55	1.05	Radiating	3.28	1.15	Spreading	-.34	.95
SHOOTING	3.15	.74	SHOOTING	3.42	.90	FLASHING	-.17	1.11	
						SHOOTING	-.44	.92	
Punctate pressure	PRICKING	1.60	.68	PRICKING	1.94	1.11	PRICKING	-1.04	.99
	BORING	2.75	1.02	BORING	2.05	.83	BORING	-.34	1.18
	DRILLING	2.75	.79	DRILLING	2.75	1.37	Digging	.05	.90
	Penetrating	2.90	.64	STABBING	3.45	.89	Penetrating	.11	.92
	Piercing	3.30	.66	LANCINATING	3.50	.98	Piercing	.76	.86
	STABBING	3.40	.75	Penetrating	3.72	.89	STABBING	.95	.97
	LANCINATING	3.65	.67	Piercing	3.78	.58			
Incisive pressure	SHARP	2.70	.73	SHARP	2.95	.94	SHARP	.32	.90
	CUTTING	3.10	.55	CUTTING	3.20	.95	CUTTING	.35	.97
	LACERATING	3.50	1.02	LACERATING	3.64	1.16	LACERATING	.93	1.05
Constrictive pressure	PINCHING	1.55	.51	PINCHING	1.95	.82	Nipping	-1.10	.96
	Nipping	1.70	.66	Nipping	2.00	.94	Tight	-.73	.69
	Tight	1.70	.73	Tight	2.25	.91	PINCHING	-.70	.94
	PRESSING	1.90	.62	Squeezing	2.35	.81	PRESSING	-.05	.93
	GNAWING	2.05	.69	PRESSING	2.42	.90	Gripping	-.05	.81
	Binding	2.20	.77	Binding	2.50	.86	Biting	-.05	.73
	Gripping	2.25	.91	GNAWING	2.53	.77	GNAWING	.01	.82
	Biting	2.30	.57	Biting	2.70	1.08	CRAMPING	.36	1.01
	Squeezing	2.30	.80	CRAMPING	2.75	.79	CRUSHING	1.20	.83
	CRAMPING	2.50	.83	Gripping	3.10	.74			
CRUSHING	3.20	1.40	CRUSHING	3.58	1.02				
Traction pressure	TUGGING	1.70	.66	TUGGING	2.16	.90	TUGGING	-.84	.72
	PULLING	1.85	.74	PULLING	2.35	.59	PULLING	-.66	.80
	WRENCHING	2.70	.92	WRENCHING	3.47	.90	WRENCHING	-.69	.71
Thermal	HOT	2.30	.99	HOT	2.47	.85	HOT	-.26	.92
	BURNING	2.95	.76	BURNING	2.95	.85	BURNING	.89	1.02
	SCALDING	3.65	.67	SCALDING	3.50	.98	SEARING	1.40	1.00
	SEARING	3.95	.80	SEARING	3.88	.89			
Brightness	Tickling	1.10	.31	Tickling	1.55	.60	TINGLING	-1.79	.87
	TINGLING	1.20	.41	TINGLING	1.60	.68	Tickling	-1.71	.97
	ITCHY	1.35	.74	ITCHY	1.70	.80	ITCHING	-1.25	.71
	SMARTING	1.85	.59	SMARTING	2.00	.82	SMARTING	-.62	.91
	STINGING	2.05	.82	STINGING	2.25	.85	STINGING	-.35	.83
Dullness	DULL	1.55	.69	DULL	1.60	.68	DULL	-.97	1.04
	Blurred	1.67	.91	SORE	1.90	.64	SORE	-.86	.88
	SORE	1.80	.69	Numbing	2.10	.88	Drawing	-.71	1.15
	Drawing	2.10	.79	HURTING	2.45	1.14	Steady	-.56	1.05
	Numbing	2.15	.81	ACHING	2.50	1.28	HURTING	-.39	.71
	HURTING	2.20	.62	Drawing	2.53	.84	ACHING	-.34	.81
	ACHING	2.20	.89	Blurred	2.59	1.12	HEAVY	-.33	1.03
	HEAVY	2.40	.75	Steady	2.65	1.22	Numbing	-.26	1.09
	Steady	2.40	.60	HEAVY	2.95	.91	Blurred	1.12	.98

TABLE I. (Continued)

	Doctors		Patients		Students		Discrimination Value	Discrimination Value	
	Mean	SD	Mean	SD	Mean	SD			
Sensory: miscellaneous	TENDER	1.50	.69	TENDER	1.35	.59	TENDER	-1.49	.96
	TAUT	1.55	.81	TAUT	2.36	1.01	TAUT	-4.46	.93
	RASPING	2.50	.83	RASPING	2.61	.92	RASPING	-.06	.83
	Tearing	3.25	.79	SPLITTING	3.10	1.21	SPLITTING	-.83	.82
	SPLITTING	3.30	.66	Tearing	3.68	.93			
AFFECTIVE Tension	Nagging	1.95	.51	Nagging	2.25	.79	TIRING	-1.26	.66
	Dragging	2.16	.83	Fatiguing	2.35	.61	Fatiguing	-.99	.76
	TIRING	2.20	.62	TIRING	2.42	.69	EXHAUSTING	-.63	.76
	Fatiguing	2.40	.68	EXHAUSTING	2.63	.96	Nagging	-.50	.69
	EXHAUSTING	3.20	.77	Dragging	2.95	.78			
Autonomic	Nauseating	3.10	1.07	Nauseating	2.74	.93	SICKENING	-.24	1.00
	Choking	3.39	.73	SICKENING	2.75	.79	Nauseating	-.42	1.15
	SICKENING	3.37	.68	SUFFOCATING	3.45	1.14	Choking	-.65	.71
	SUFFOCATING	3.75	.85	Choking	3.55	1.10	SUFFOCATING	1.03	.87
Fear	FEARFUL	3.45	.89	FEARFUL	3.30	.92	FEARFUL	-.16	.69
	Dreadful	3.72	.85	FRIGHTFUL	3.53	.77	FRIGHTFUL	-.06	.70
	FRIGHTFUL	3.80	.70	TERRIFYING	3.95	1.08	Dreadful	.03	.65
	TERRIFYING	4.40	.68	Dreadful	4.11	.76			
Punishment	PUNISHING	3.45	.69	Racking	3.33	1.03	PUNISHING	-.07	.75
	GRUELLING	3.60	.75	PUNISHING	3.50	.79	GRUELLING	.17	.79
	Racking	3.70	.86	GRUELLING	3.73	.80	CRUEL	.22	.70
	CRUEL	3.95	.76	CRUEL	3.95	.89	VICIOUS	.71	.61
	VICIOUS	4.10	.72	VICIOUS	4.26	.99	Racking	.89	.91
	Torturing	4.45	.60	KILLING	4.50	.61	KILLING	.96	.81
	KILLING	4.45	.82	Torturing	4.53	.70			
Affective-evaluative-sensory: miscellaneous	Grinding	2.70	.80	Grinding	3.10	1.12	Awful	-.07	.71
	WRETCHED	3.30	1.22	WRETCHED	3.16	.83	WRETCHED	.02	.80
	Awful	3.35	.88	Awful	3.40	1.05	Wicked	.17	.76
	Wicked	3.75	.79	BLINDING	3.45	1.00	Grinding	.38	.90
	BLINDING	4.05	.82	Wicked	4.00	.74	BLINDING	1.67	1.01
EVALUATIVE	Distracting	1.60	.60	ANNOYING	1.89	.76	Mild	-2.03	.14
	ANNOYING	1.70	.57	Bearable	2.35	1.14	Bearable	-1.65	.72
	TROUBLESOME	1.85	.34	TROUBLESOME	2.42	.69	ANNOYING	-1.52	.63
	Bearable	2.15	.67	MISERABLE	2.85	.96	Distracting	-1.39	.73
	MISERABLE	2.95	.66	Distracting	2.89	.99	TROUBLESOME	-1.34	.56
	Ugly	3.00	1.00	Agonizing	3.20	1.67	Discomforting	-1.33	.50
	INTENSE	3.85	.59	Ugly	3.60	.99	Distressing	-.73	.69
	Violent	4.32	.48	INTENSE	3.75	1.12	Ugly	-.23	.79
	Agonizing	4.35	.59	Intolerable	4.18	.88	MISERABLE	-.21	.62
	Savage	4.58	1.65	UNBEARABLE	4.42	1.07	Horrible	.43	.86
	UNBEARABLE	4.63	.50	Savage	4.44	.98	INTENSE	.60	.80
	Intolerable	4.70	.47	Violent	4.53	.60	Agonizing	.93	.72
							Savage	.91	.74
							Violent	1.03	.78
							Intolerable	1.20	1.00
						UNBEARABLE	1.39	1.08	
						Exerciating	1.65	.84	

subscribed by different nerve impulse patterns from the periphery, modulated by central mechanisms. It has already been determined⁸ that the temporal and spatial patterning of the sensory input as a result of injury or other disease processes must be highly complex, and the resulting varieties of pain reflect this complexity. At the same time, the capacity of the

nervous system to abstract and select information from the total input is indicated by our linguistic labels for classes and subclasses of experience. However, this does not mean that our experiences are as restricted or narrow as our symbolic verbal categories.

It is obvious that many of the words have two meanings. "Burning," for example, can

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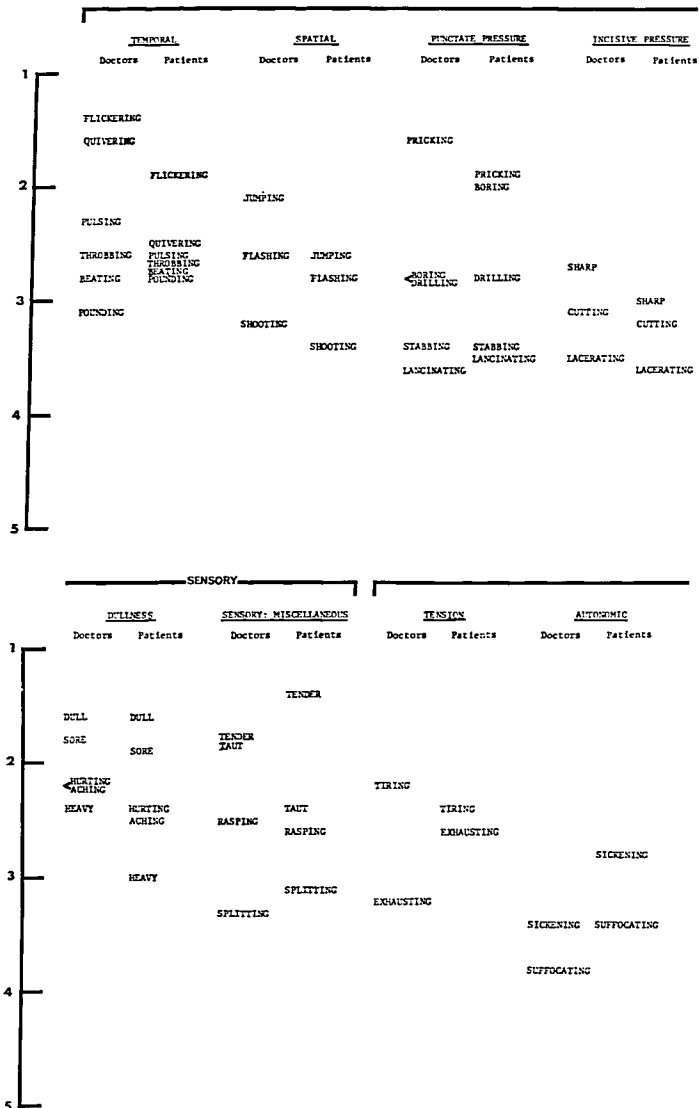


FIG. 1. Spatial display of pain descriptors which have the same rank order, on an intensity scale, for neceted by an arrowhead have the same mean scale value.

SENSORY

<u>CONSTRUCTIVE PRESSURE</u>		<u>TRACTION PRESSURE</u>		<u>THERMAL</u>		<u>BRIGHTNESS</u>	
Doctors	Patients	Doctors	Patients	Doctors	Patients	Doctors	Patients
						TINGLING	
						ITCHY	
PINCHING		TUGGING					TINGLING
PRESSING		PULLING					ITCHY
GRAWING	PINCHING					SMARTING	
		TUGGING				STINGING	SMARTING
				HOT			STINGING
CRAMPING	PRESSING	PULLING					
	GRAWING						
	CRAMPING	WRENCHING					
				BURNING	BURNING		
CRUSHING							
		WRENCHING					
	CRUSHING			SCALDING	SCALDING		
				SEARING	SEARING		

AFFECTIVE

EVALUATIVE

<u>FEAR</u>		<u>PUNISHMENT</u>		<u>AFF. EVAL. SENS. MISC.</u>		Anchor Words	
Doctors	Patients	Doctors	Patients	Doctors	Patients	Doctors	Patients
						MILD	
						DISCOMFORTING	ANNOYING
							TROUBLESOME
							MISERABLE
						DISTRESSING	MISERABLE
				WRETCHED	WRETCHED		
FEARFUL	FEARFUL	PUNISHING	PUNISHING		BLINDING		
	FRIGHTFUL	GRUELLING	GRUELLING				
						INTENSE	INTENSE
FRIGHTFUL							
	TERRIFYING	CRUEL	CRUEL	BLINDING		HORRIBLE	
		VICIOUS					
TERRIFYING		KILLING	KILLING				UNBEARABLE
							UNBEARABLE
						EXCRUCIATING	

doctors and patients. The scale values range from 1 (mild) to 5 (excruciating). Two words con-

be used to refer to the sensation evoked when the skin is actually being burned. It can also be used by causalgic patients to describe their pain in the absence of any stimulus-evoked input. The word, in this case, has an analogy (or "as if") meaning. The skin feels *as if* it were being burned, and the use of the word is not "stimulus error." Rather, it indicates that we tend to use words that have familiar, common meanings. A splitting headache, then, does not mean the head is being split open. It obviously represents a figure of speech, meant to convey some property of the total pain experience—that the pain feels *as if* the head were being split open.

The fact that there is substantial agreement that the words fall into particular categories or classes points the way toward the eventual determination of the dimensions of the experience of pain in the same way that many of the dimensions of visual and auditory experience have already been specified.^{14, 15} The classes shown in table 1 present one possible categorization of pain experience. The distinction between temporal and spatial properties is self-evident, though the spatial properties obviously occur in time. The various other subclasses may or may not be related to each other. Some may be highly correlated in experience even though they refer to different aspects of the pain experience. Others may represent subclasses that overlap in meaning, while some may be mutually exclusive. Detailed analysis of the structure of the experience of pain lies beyond the scope of this paper. The aim, rather, is to present an approach which, hopefully, will provide some guidelines for future studies using one or another of the newer, more elaborate multidimensional scaling or classification models.¹³

The distinction between the sensory and affective dimensions of pain is a matter of controversy and requires clarification. The motivational-affective properties of pain are brought clearly into focus by several clinical syndromes. Patients with frontal lobe lesions rarely complain about severe clinical pain or ask for medication. Since lobotomy does not disrupt sensory pathways (indeed, sensory thresholds may be lowered), its predominant effect appears to be on the motivational-affective dimension of the whole experience of pain. The aversive quality of the pain and the drive to seek relief both appear to be diminished.

Similarly, people reported to be congenitally insensitive to pain¹⁶ or to exhibit pain asymbolia¹⁷ appear to have no sensory loss and can feel pricking, warmth, cold, and pressure. They give accurate reports of increasing intensity of stimulation, but the input, even as intense, noxious levels, fails to well up into frank pain. The evidence, then, suggests a distinction between the sensory-discriminative and motivational-affective dimensions of pain. There is reason to believe,¹⁵ moreover, that both dimensions are influenced by neocortical or higher central nervous system processes such as attention, past experience, and the meaning of the situation.

This conceptualization of the experience of pain indicates why it has been difficult to achieve a satisfactory definition of pain. Pain is not a single quality of experience that can be specified in terms of defined stimulus conditions. It may be agreed that pain, like vision and hearing, is a complex perceptual experience. But the many, diverse causes of pain prevent the specification of a particular kind of environmental energy as the stimulus for pain, in the way that light is the adequate stimulus for vision and air pressure waves for hearing. The word "pain" represents a category of experiences, signifying a multitude of different, unique events having different causes and characterized by different qualities varying along a number of sensory and affective dimensions. Pain, therefore, is defined in terms of a multidimensional space comprising several sensory and affective dimensions. This space comprises those subjective experiences which have a somatic component and produce behavior aimed at stopping the conditions that produce them. If injury or any other noxious input fails to evoke aversive drive, the experience is not called pain. Conversely, anxiety or anguish without somatic input is not pain. The list of evaluative words reflects the capacity of the brain to evaluate the importance or urgency of the overall situation. These words represent a judgment based not only on sensory and affective qualities, but also on previous experiences, capacity to judge outcome, and the meaning of the situation. Thus, by reflecting the total circumstances at a given time, they serve to locate the position of the pain experience within the multidimensional space for the particular individual.

Perhaps the most remarkable feature of the

study is the high degree of agreement on the relative scale positions of many of the words among subjects who have very different cultural, socioeconomic, educational, and linguistic backgrounds. It is, of course, possible to find environmental references for some kinds of pain—for example, a child stabs himself with a knife or burns a finger on a hot stove, and the pain is associated with an environmental reference object. Thus, verbal labels such as “stabbing” and “burning” are easily acquired, and intensity connotations become associated with severity of injury. But headache, stomach ache, renal colic, and anginal pain have no outside references. Nevertheless, physicians find such a high degree of uniformity in the words used to describe these pains that they are employed as aids in diagnosis.¹⁹ The present study shows that there is also considerable agreement on how much pain each word represents to the patient.

The word lists in figure 1 can serve as the basis for a pain questionnaire, to determine the properties and nature of a particular kind of pain in individual patients. The words alone are insufficient. It is also important to determine: 1) the general anchor points in the patient's use of words (whether common aches and pains tend to be rated as having high or low intensity), which are determined partly by culture¹⁶; 2) the spatial distribution of pain on or in the body, which can be sketched on line drawings of the figure; 3) the temporal variation, which, as Lewis²⁰ and Keele² note, provides valuable information about the nature and course of the pain. Such a questionnaire would need to be validated by presenting it to patients with distinct pain syndromes (such as cardiac, renal, colon, or arthritic disease). Its reliability would also have to be determined. A study is under way with a preliminary questionnaire, which is available upon request from the senior author. Such a questionnaire may not only provide an aid in diagnosis and prognosis, but may also become a valuable experimental tool for studies of analgesic drugs. It is now evident that total relief of pain may not be feasible in certain conditions, and drugs may be effective simply by changing certain properties so that the pain becomes bearable. The selective effects of drugs on different properties of pain could be determined by the questionnaire. The fact that questionnaire data lend them-

selves to computer analysis also points toward incorporation of information about pain into quantitative studies of diagnosis and treatment in clinical medicine.

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