

**Applied Affect Science**  
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**Future of Emotion research**  
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In the 20<sup>th</sup> century West, people generally assume that couples should be romantically in love with whomever they choose to marry. In the mid-1960s, William Kephart asked more than 1,000 college students: "If a boy (girl) had all the other qualities you desired, would you marry this person if you were not in love with him (her)?" He found that in the 1960s, men and women had different ideas as to how important romantic love was in a marriage. Men thought that passion was essential (only 35% of them said they would marry someone they did not love). Women were more practical. They said the absence of love would not necessarily deter them from considering marriage (a full 76% of them said they would be willing to marry someone they did not love). Kephart suggested that while men might have the luxury of marrying for love, women did not. Women's status was dependent on their husband's; thus, they had to be practical and take a potential husband's family background, professional status, and income into account. Since the 1960s, sociologists have continued to ask young American men and women this question. They found that year by year, young American men and women have come to demand more and more love and passion in their marriages.

In recent research, 86% of American men and 91% of women answered the question - would you marry without love- a resounding "no!" Today, American men and women assume that romantic love is so important that they insist that if they fell out of love, they would not even *consider* staying married! Of course, with more experience they might find that they are willing to "settle" for less than they think they would. How do young men and women in other countries feel about this issue? Researchers have asked this question in a variety of countries- America, Australia, Brazil, England, Hong Kong, India, Japan, Mexico, Pakistan, Russia and the Philippines. To their surprise, they found that the insistence on "love matches" is now startlingly common worldwide.

The preceding studies, then, suggest that the large differences that may once have existed between Westernized, urban, modern, industrial societies and Eastern, modern, urban industrial societies are at the very least fast disappearing. Those interested in cross-cultural differences may only find them if they begin to explore some of the most underdeveloped, developing, and collectivist of societies- such as in Africa, or Latin America, in China or the Arab countries (Egypt, Kuwait, Lebanon, Libya, Saudi-Arabia, Iraq or the U.A.E.). However, there is some data that suggests that, even there, the winds of Westernization and change are blowing.

Passionate love seems to be not just an American or a Western phenomenon. It's becoming of increasing importance in a world linked together by movies, TV, MTV, Macintosh Powerbooks, rock 'n roll, and the World Wide Web. I would suggest that now, in this time of breathtaking change, passionate love may be of special interest to ISRE researchers concerned with the impact of culture and history on emotions.

*Elaine Hatfield, Ph.D. is a Professor of Psychology at the University of Hawaii at Manoa. She is a recipient of the Society of Experimental Social Psychology Distinguished Scientist Award, and the Society for the Scientific Study of Sex Distinguished Scientist and Alfred Kinsey Awards. She is author of Love, Sex, and Intimacy: Their Psychology, Physiology, and History (Harper/ Collin) and Love and Sex: Cross-cultural Perspectives (Allyn & Bacon).*

ship to 5 year mortality for men, and an inverse relationship to mortality for women. In other words less negative affect = higher mortality in women. A second set of data replicated this for a 20 year follow-up of mortality. In both data sets, negative affect and/or low levels of well being acted as suppressor variables, lowering the relationship of women's SAH to their mortality. Taken together these findings reinforce the view that emotion and health outcomes are context dependent. Depressed mood in coronary by-pass patients is an indicator of somatic depletion and risk. Depressed mood in community dwelling elderly men and women has different meaning, i.e., different indicator value. Our analyses show that depressed mood in older women is a sign of involvement with older, ill husbands. Thus, older married women are more depressed and live longer. Depressed mood in older men is more tied to their somatic status, i.e., whether or not they are ill. In each of these contexts depression should and will predict different health outcomes. Every affect is responsive to a broad range of events and will have different effects on health and behavior as a function of situational context. No emotion should have a consistent relationship to a specific health outcome for all persons across all situations, just as no emotion will have a consistent impact on overt, instrumental behavior for all persons across all situations. Emotion and illness share many properties. Studying one will illuminate the other, and some avenues for increasing our understanding of emotion may be more easily traversed in the health domain.



**ISRE Website**  
by R. Thomas Boone

The full ISRE membership directory is now posted on the ISRE Website. Please check the site to verify the accuracy of the information. Any member who has not done so should send me their information. This includes a 200 word statement about your research interests, a list of 5 representative publications, an email address, and a homepage (if the member has one). Directions for submitting this information is provided on the Webpage. If you have already provided this information but have not seen it posted on the Web, please contact me (tboone@assumption.edu). All information prior to June 15th, 1999 has been processed. A new section of the Membership Directory has been added to welcome this year's inductees. Stop by and check out ISRE's newest members. The Recent Publications section of the Webpage continues to be updated. Any members who would like to post their 1998-1999 publications should send me the appropriate information.

Finally, I would like to make another pitch for the currently under-utilized OPED/Funding section of the Webpage. Any information about job opportunities, grant funding, relevant conferences, etc., is welcome. The Internet is well on its way to becoming the medium of choice for such information and our Webpage is an excellent vehicle for ISRE members to keep apprised of professional development opportunities in their area of interest. If you have not had the chance to check out the Webpage recently, the Internet address is: <http://www.assumption.edu/HTML/Academic/users/tboone/ISRE/ISRE.html>.



# President's Column

by Bernard Rimé

At the ISRE 98 Conference in Wuerzburg, both the Executive Committee and the general membership expressed concern about the future interdisciplinarity of the society. When ISRE was founded some 15 years ago, one of its essential purposes was to promote interdisciplinary exchanges and discussions. The society drew philosophers, anthropologists, sociologists, biologists, neurologists and many others from a variety of disciplines. Despite this diversity, psychologists were over-represented in our membership, and this imbalance has only increased over time. There is a serious risk that ISRE will become just another society of specialists from a single discipline. This would be an immense loss, as emotion is interdisciplinary and multifaceted by nature. With this in mind, the members assembled in Wuerzburg delivered to me a special mandate: Institute initiatives that consolidate and support interdisciplinarity in our Society. To fulfill this momentous responsibility, I propose these actions:

First, we must disseminate general information about emotion research in all disciplines. It is essential for ISRE members to read about current 'hot issues' in emotion research from disciplines other than their own. I call upon our non-psychology colleagues to invest in sharing such information. One suggestion would be to write a reader-friendly overview to be published in the *Between Disciplines* series that has been running in the *Emotion Researcher*. Bob Solomon's "Why philosophy is important for emotions research"; Tom Scheff's "Social research on emotions" and Christine and Thomas Storm's "Linguistics of Emotion" are an excellent start. This example should be followed by every subdiscipline.

Second, this summer I will write a letter to ISRE members

from disciplines other than psychology, asking them to perform a service for our society: provide us with a list of scholars in your field who are currently making a significant contribution to emotion research. This will enable us to generate a roster of colleagues in each discipline who might be invited to become members of ISRE. The Executive Committee can then consider how best to move forward.

Third, I am asking the psychologists of ISRE to identify the non-psychology emotion researchers who you believe have made significant contributions and appear in your reading lists. If you know of non-psychologists who have contributed significantly to the field of emotion research, send me their names and information so that we can consider nominating them for ISRE membership.

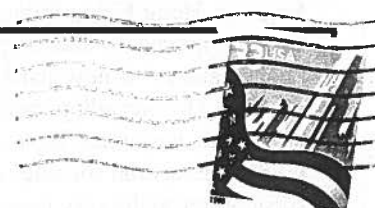
Fourth, the ISRE 2000 Conference will be held in Quebec City, and will focus special attention on interdisciplinarity. With this meeting in mind, we must find ways for members in all disciplines to contribute to the scientific program of this conference. When you are preparing your submissions (with symposia due by December 15<sup>th</sup> and posters accepted until April 15<sup>th</sup>, 2000), ask yourself: "How does my proposal contribute to the interdisciplinary character of ISRE? What could I add that would serve this important objective?"

I would like to close with a word of caution. Maintaining and fostering interdisciplinarity is not easy. I have heard disappointment expressed about past ISRE conferences, that symposia devoted to non-psychology disciplines were organized to promote interdisciplinary contacts. Non-members invited to contribute showed up, made their presentation, and then left without realizing that much more was expected from them. Initiating dialogue is never an easy task...

## *The Emotion Researcher*

c/o Tracy J. Mayne, Ph.D.

Bureau of Disease Intervention Research  
 New York City Department of Public Health  
 Room 315, Bx 6  
 125 Worth Street  
 New York, NY 10013



Elaine Hatfield, Ph.D., Professor  
 Department of Psychology  
 University of Hawaii at Manoa  
 2430 Campus Rd  
 Honolulu, HI 96822



## Applied Affect Science

by Elaine Hatfield

At one time, scientists assumed that passionate love was primarily a Western creation. Recently, however, theorists from a variety of disciplines - anthropologists, evolutionary theorists, cross-cultural psychologists, social psychologists and historians - have begun to speculate that passion may be a "cultural universal."

Kurt Fischer, Philip Shaver and their colleagues, for example, concluded there are five basic emotions - two positive emotions (joy and love) and three negative ones (anger, sadness and fear). They pointed out that "love" encompasses two kinds of emotions: passionate love (which they labeled *infatuation*) and companionate love (which they labeled *fondness*). Scientists find that most young people understand the difference between "being in love" with someone and "loving" them. When besotted lovers hear the dreaded mantra: "I love you...but I'm not *in love* with you," their hearts often sink. Men and women in a variety of nations, single or married, homosexual or heterosexual, appear to resonate to this distinction (see, for example, the work of Beverley Fehr). This commentary is concerned. With the first kind of love, passionate love.

How would we define passionate love? It is a "hot," intense emotion, commonly labeled a crush, lovesickness, infatuation, obsessive love, or being 'in love'. Passionate love has been defined as:

A state of intense longing for union with another. Passionate love is a complex functional whole including appraisals or appreciations, subjective feelings, expressions, patterned physiological processes, action tendencies, and instrumental behaviors. Reciprocated love (union with another) is associated with fulfillment and ecstasy. Unrequited love (separation) is associated with emptiness, anxiety, or despair (Hatfield & Rapson, 1993, p.5).

The *Passionate Love Scale* was designed to assess the cognitive, physiological, and behavioral incidents of such love (Hatfield & Sprecher, 1986). Psychologists have found that there are some cultural differences in men and women's definitions of passionate love. Passionate love has been defined as a bittersweet experience. Whether the emphasis is on the sweet or the bitter, however, seems to depend on one's culture. Recently, Shelley Wu and Philip Shaver interviewed young people in America, Italy, and the People's Republic of China about their romantic experiences. American and Italian subjects tended to equate passionate love with happiness. Chinese students had a darker view of love. They generally associated passionate love with such negative ideographs as infatuation, unrequited love, nostalgia, and sorrow-love.

### Anthropological and Evolutionary Perspectives

In earlier eras, cross-cultural psychologists and social anthropologists tended to assume that passionate love is a Western phenomenon (see, for example, the work of Godwin Chu, Francis Hsu, or L. Taleo Doi). Recently, however, anthropologists

concluded that passionate love and sexual desire are cultural universals, existing at all times and in all places. William Jankowiak and Edward Fischer, for example, looked for evidence of romantic love in a sampling of tribal societies included in the *Standard Cross-Cultural Sample*. They determined whether or not romantic love was present or absent on the basis of five indicators: (1) accounts depicting personal anguish and longing; (2) the existence of love songs or folklore that highlight the motivations behind romantic involvement; (3) elopement due to mutual affection; (4) native accounts affirming the existence of passionate love; and (5) the ethnographer's affirmation that romantic love was present. They found clear evidence of passionate love in at least 147 of the 166 tribal cultures they studied. In only one society did the ethnographers find no evidence of romantic love. The anthropologists acknowledged that there might well be cultural variability in how common such passionate feelings were, however.

### Historical Perspectives

Historians, too, now generally acknowledge that passionate love has existed in all times and in all places. The earliest Western literature abounds in stories of lovers caught up in a sea of passion and violence: Odysseus and Penelope, Orpheus and Eurydice, Abelard and Eloise, Dante and Beatrice, and Romeo and Juliet. For more than 4,000 years, China's history and arts have been filled with stories of passionate love and sexual longing. In the Song Dynasty (960-1279 AD) the Jade Goddess recounted stories of passionate young couples who defied their parents' wishes, challenged convention and eloped, only to fall into desperate straits.

Historians, however, tend to argue that cultural norms may well have the most profound impact on how people view love, who is considered to be a suitable love object, how easily and how deeply people fall in love, how they deal with these tumultuous feelings, and how their passionate affairs work out. Cultures have powerful "rules" on all these matters and the rules change with time and place.

### Cross-Cultural and Historical Data

Recent social psychological research tends to support cross-cultural theorists' contention that today, passionate love is a "cultural universal." Although early researchers assumed that romantic love would be most prevalent in modern, industrialized, countries such as America and Europe, the emerging evidence suggests that men and women in a variety of cultures (industrializing as well as industrial) are every bit as romantic as Americans. Some examples: When social psychologists asked men and women in a variety of cultures- the United States, Russia, Japan- as to whether or not they were in love "at the moment", and, if so, how intensely in love they were, researchers found that passion was more common worldwide than they had expected. Surveys of Mexican-American, Chinese-American, and Euro-American students have also found that in a variety of cross-national groups, young men and women show high rates of reporting being in love at the present time.

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## The Emotion Researcher

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Please address your comments and submission to:  
*The Emotion Researcher*  
c/o Tracy J. Mayne, Ph.D.  
Bureau of Disease Intervention Research  
New York City Department of Public Health  
Room 315, Bx 6  
125 Worth Street  
New York, NY 10013

Telephone: (212) 788-4637  
Fax: (212) 788-9810  
Email: TJMayne@aol.com

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## Editor's Column

by Tracy Mayne

Despite the apparent lull between ISRE's biannual meetings, members have been hard at work on a number of fronts. The Program Committee for ISRE 2000 has been busy assembling what is coming together as a diverse and exciting conference. I won't preempt announcements forthcoming in the next issue from James Laird and the committee, but I believe members will find the program extremely responsive to the interdisciplinary mandate voiced at the 1998 meeting. As you will see in the President's Column, Barnard Rimé has been responding to this mandate as well. He has called upon members of ISRE to actively seek out and recruit professionals in many disciplines to diversify the composition of our society. It now falls upon us, as individual members, to respond to that call. The future of ISRE is, quite literally, in our hands.

While on the issue of membership, the Membership Committee has reviewed 1999 applicants and inducted an impressive new class into ISRE. Their names and affiliations appear on the website. Let me suggest that we all reach out and offer a warm welcome to our newest members!

Tom Boone, as always, has been diligently working on the ISRE website. Given his efforts, it is truly disappointing that more members have not responded to his *numerous* requests for a biosketch. This website is an essential resource for anyone needing information on ISRE and the research of its members. On several occasions, I have referred press to this website to find researchers who can comment on specific studies and advances in the field. The WWW is increasingly becoming the *first* source of information for researchers and the public alike. It is unfortunate that ISRE cannot provide a more complete resource for those interested in emotions research!

I am indebted to those who have taken the time to write columns for this issue. Elaine Hatfield has written an informative (and delightful) article on love. While not precisely "applied" affect science - she does not induce love in subjects to increase their health and well-being - her work is among my favorites in the emotion field, and I invoke editorial privilege. The Storms have written an extremely interesting column of the linguistics of emotion for the *Between Disciplines* series. I need writers for this column, and would greatly welcome volunteers. Howard Leventhal has written a brilliant article for the *Future of Emotion Research* series. Given that Howard does applied research, it was hard to decide which column to ask him to write for. Given his tremendous contribution to the field, the *Future* series seemed the most appropriate place for his piece. Having put this issue to bed, I'd like to wish everyone a relaxing and productive summer!

### The 8th Congress of the International Society for the Empirical Study of Literature

Will be held at the University of Toronto, July 31-August 4, 2000. Send 3 copies of a 300 word abstract for an individual paper, symposium, or poster by January 1, 2000. Address inquiries to: Gerald C. Cupchik, President, University of Toronto at Scarborough, 1265 Military Trail, Scarborough, ON, Canada, M1C 1A4 (416-287-7467) <http://citd.scar.utoronto.ca/igel2000/index.html>.





# Between Disciplines: The Linguistics of Emotion



by Christine Storm and Thomas Storm

Language is often supposed to reflect the nature and structure of affect. It is sometimes supposed to construct the experience of affect. But whatever the relationship between language and affective experience, language, and in particular the everyday vocabulary of affect, is intimately involved in its investigation. In order to delineate the structure and variety of affective experience, people are asked to report on their affective state using the words of ordinary language. They are asked to label the emotion expressed (or the affective experience indicated) by facial, postural, vocal and other behaviors. Yet we have difficulty deciding what words will be understood by what people to refer to affective experience rather than behavior or dispositions or circumstances. What reliable distinctions correspond to different words? What associative or contextual connotations may distort the meaning of a word from what the investigator intends? What effect does our selection of words have on our findings when participants are not allowed to choose their own descriptors? Conversely, what effect do differences in vocabulary and idiosyncratic meanings have when participants choose their own words?

Researchers collect data about essentially private experience from people who are usually not in the habit of introspection and who are certainly not systematically practiced at it. Peoples' knowledge is limited to the resources their language provides for describing their experience, and the subtleties of their meanings and semantic relations. True psychologists are introspective by nature and it is sometimes exasperating to find that people we depend on to confirm, modify, or refute our intuitions are less aware either of their own experience and of the appropriate words to communicate it or both. We have found that a large number of the students at our reasonably selective undergraduate university had no idea what the word indignation meant- although we had seen some of the same students expressing it.

Our own research has focused on the semantic relations of synonymy, super/subordination, entailment, and antonymy among words for affect. We have also focused on the comparative semantic properties of these words- polysemy, breadth or inclusiveness, and particular features we believe to characterize affect (duration, intensity, cause, et al.) We ask our participants (in words as close to normal conversation as possible) questions about the meanings of words. Yet we know that they answer more often in terms of their experiences or beliefs about the feelings to which the words refer (and sometimes to the disposition toward those feelings rather than the feelings themselves.)

We have discussed the fact that super/subordination relations are not as asymmetric as they logically should be and that entailment may or may not be symmetrical depending on the types of affect words and their relative generality. Only a few affect words have lexical and therefore consensual antonyms. Participants asked for the opposite of other affect words provide clues to the salient features and the relative generality of those words. While a contrast of positive and negative is ubiquitous, moods, reactions, and attitudes differ in the type of contrast otherwise made.

Over the years we have collected (in psycholinguistic lab classes) definitions (What does X mean?) of affect words and compared them to definitions of words from other semantic fields

(animals, abstractions, traits, locations...). When these definitions follow the canonical form for nouns, affect words are most commonly defined as feelings and referred to a more common, but related word: e.g., "Joy is a feeling of great happiness." Compared to nouns referring to discrete objects, however, and like complex abstractions, the canonical form is much less frequent. The use of examples or a number of near synonyms (in an attempt to pinpoint a region in affective space?) is more common.

Our current view can be summarized as follows. The range of possible affective experience is universal and continuous in an N (at least 2)-dimensional space. The meaning of a primarily affective word is an affective experience or range of affective experiences. The point at which a specific word is most likely to be applied is at its prototypical reference. The same word is applied to adjacent points of affective space (more or less) proportionately to their distance. This generalization gradient is distorted by some natural but still fuzzy boundaries and focal points in the affective space. Common words, acquired early in language acquisition, tend to have these natural focal points as prototypes. Less common words are acquired later, and differentiate a narrower range of affective reference, and including varying degrees of overlap. Asymmetries in subjective entailment reflect differences in the size of the range of reference as well as focal location. Languages differ in the way they divide the common space, but all have terms referring to areas demarcated by "natural" affective boundaries.

Affective space and its relation to the affective lexicon is closely analogous to color space. Both are purely experiential in nature. Both have a natural structure imposed by perceptual mechanisms, and both are described by words that vary in both the portion of the relevant spectrum to which they refer and in their breadth of application. The semantic relations among words are not strictly categorical, but determined by various degrees of overlap. Both are attributes or states of entities rather than independent entities, and therefore both have strong associations. The objects characteristically have a particular hue, to the point where the name of an object may be used to specify a color experience, or circumstances, targets, or stimuli characteristically producing an affective experience. In neither case is the association necessary, only common enough to facilitate communication.

*Christine Storm is a Professor of Psychology at Mount Allison University. Her co-author and husband Thomas Storm is currently retired. Together, the Storms have published numerous articles and chapters on the structure of semantic fields, especially that of emotion - its origins and acquisition during development. Christine's current work involves a developmental study of definitions of emotion words varying in complexity, and a study of the application of emotion words to facial expressions and videotaped vignettes. Thomas' current interests include comparing the semantic relations among words within four domains: emotion, personality traits, color, and animals.*



# The Future of Emotion Research

by Howard Leventhal

Given the explosion in the emotion literature and my immersion in health research, it was with more than some trepidation that I agreed to prepare a brief commentary on the current state and perhaps future direction of emotion research. I will eschew the usual detailed citation of present and past papers and hope that my colleagues and readers will be tolerant of errors in representing their well thought out views.

## Old Issues in New Frames

Many issues have caused contention in the field of emotion research appear to be resolving, in most instances in ways that were reasonably clear when the heat of argument was most intense. I will briefly comment on two: the relationship of cognition to emotion; and the structure of emotion.

**Emotion and cognition** If memory serves, the Lazarus-Zajonc debate regarding the independence/relative priority of cognition and emotion began at a 1980 conference organized by Paul Ekman and Klaus Scherer (See Scherer & Ekman, 1984). Klaus and I attempted to resolve the argument by combining Scherer's model of stimulus checks with my hierarchical model of emotional processes (see Leventhal & Scherer, 1987). Our proposal was simple: The 5 stimulus checks operated at 3 levels of complexity. Processing at the base level for stimulus checks (such as novelty) involved responding to elementary stimuli such as unexpected, sudden, intense stimulation. Processing for the "coping potential" check involved an assessment of a feeling of "available energy."

The checks become more complex with the acquisition of emotion schemata. The novelty check is transformed into "familiarity and schema matching," coping potential to "body schemata." At the highest, conceptual level, cognition is propositional in form: The check for novelty becomes a check on "Expectations: cause/effect, probability estimates." The check on coping potential becomes a check on "Problem solving ability." Depending upon how one defined cognition (as a simple stimulus process versus more complex conceptual process), emotion and cognition were always "interdependent." However, they would appear more independent as the focus moved to the more complex, conceptual levels.

Although this model was a reasonable step, it overlooked at least three issues. First, the focus on priority/independence grossly oversimplified the interconnectedness of emotion and cognition. Episodes of emotional behavior evolve over time, with affective and cognitive processes stimulating and modulating one another (See Ellsworth, 1994). Second, the psychobiological mechanisms underlying emotion are complex and differ in many ways from the differentiations that are available to consciousness. In effect, affective experience is a summary of outputs from complex, psychobiological systems. The experience has functional utility. It facilitates adaptation and survival, and reflects both innate and acquired cognitive and behavioral reactions. Third, it is important to keep in mind that one may make seemingly inconsistent assertions about affective reactions when viewing them from an epidemiological versus a process perspective. As epidemiologists concerned with representative samples, we would surely argue that emotion is dependent upon prior, cognitive appraisals: a sequence that is by far the one most often found in the natural world. This perspective

is important because it focuses on the need to examine the functions of emotion in specific contexts. The cognitive checks process the stimuli that create affect in specific situations. As Marr would have it, knowing the purpose of the output is important for understanding process. But a focus on underlying mechanisms reveals a good deal of separation in the biological systems for emotion and cognition. Therefore, there is the potential for substantial independence of the psychological systems for processing cognition and emotion.

**Structure of emotion** Questions of the structure of emotion also appear to be resolving in ways that I believe were clear early on. Should positive and negative emotions be represented as opposite ends of a single dimension, or as two partially independent dimensions? The answer depends upon the level and type of analysis: psychological, neurophysiological, neuroanatomical, etc. The existence of separate neurobiological mechanisms for positive (approach) and negative (avoidance) affective-motivational systems was established by the late 1950s. Our understanding of the function, structure, and chemistry of these systems has been greatly expanded. We now know that the amygdala is involved in the processing of fear and general vigilance. We know much more about the neurochemistry and receptor sites of the dopaminergic system involved in addictions and positive reward.

The psychological structure of emotion, however, is still contested. Is it bipolar (positive vs negative)? Is it two unipolar dimensions of positive and negative affect (Watson, Wiese, Vaidya, & Tellegen, 1999)? How should the dimensions be labeled and assessed? Cacioppo and colleagues build on the clear distinction between two underlying neurophysiological mechanisms: negative and positive. They propose that, depending upon situational constraints, these two systems compute an affective response surface/structure that represents individual emotional predispositions. Computational approaches work well where methods are available for the precise assessment of the external object processed by the perceptual system. In other words, computational approaches work well when we can identify the source of stimulation - its size, shape and location in space. A computational approach becomes more difficult to instantiate when we have limited knowledge about what is being computed, which is the case when we are dealing with emotions which are less tightly tied to external stimuli than perceptions and images (Kosslyn, 1994). Whether a computational approach will work as well for emotion, "hot" or active emotion, as well as for emotional judgments, remains to be seen. That problem can be safely left for resolution by Cacioppo and his energetic colleagues. There is, however, a "qualitative" path that may advance our understanding of emotional episodes by defining new areas for study that complement the Cacioppo et al. computational approach.

## Shared and Distinctive Attributes of Illness and Emotion Representations and Processing

Our work on the illness cognition and the representation of illness episodes has proceeded within a framework of parallel and partially independent processing of cognitive and affective information (Leventhal, 1970). The model also postulates a series of "stages" in the processing sequence. First, illness and emotion must be represented in consciousness, then procedures for illness and emotion

management must be selected, rehearsed and performed. Third, response efficacy and outcomes are appraised. We believe that the cognitive and affective processing systems are hierarchical in structure, as proposed in papers outlining a model of affective processing (e.g., Leventhal, 1984).

Domains for emotional processing Ongoing research has expanded the Dual Process model in two important ways. First, research has elaborated the 5 content domains for the representation of illnesses. Second, it has reaffirmed the distinction between the experiential/perceptual level for each domain, and their conceptual/propositional representations. For example, illness has an *identity* that includes somatic experience (symptoms) and a label. Illness has a *time-line* that includes experienced time (how long it seemed to last) and conceptual (clock) time. Illness also has experienced and conceptual *cause, consequences, and controllability*. It is reasonable to suggest that emotional episodes have similar properties. They clearly have *identity* (subjective feelings and labels), *time-lines, causes* (a concrete event with a specific interpretation), and we have beliefs about their *consequences and controllability*.

Data are emerging on these domains for specific illnesses. Anxiety and distress are more intense for patients who represent their cancer as a chronic rather than acute. In contrast, little is known about their counterparts for emotional states. Indeed, we must examine and compare these parameters across different emotions, and assess their consequences for coping procedures and self appraisals. How *do* durations that exceed expectations (longer or shorter) affect self- and others' perceptions of us? How do these 5 relate to Scherer's stimulus checks? Are some of the domains equivalent to specific checks, i.e., old wine in new bottles?

For example, are consequences simply another way of talking about valence? Perhaps consequences define a wide range of concretely and abstractly anticipated outcomes that provide the meanings creating valence. Controllability clearly overlaps in part with Scherer's coping check. Cause maps onto the checks, while one might think of time-lines as a component of control. However, the overlap between the checks and the 5 domains should not obscure one important difference in emphasis. The stimulus checks speak more clearly to the onset of emotion. They are the processing units or micro procedures that operate within each of the domains (*identity; time-line; consequences; controllability; cause*). The domains, in turn, define sectors or areas of the emotional schemata that are compared or checked against external events. As the process continues, active representations of emotion (and illness) are generated, updated, and roam about in active memory. Finally, the domains define areas for computational theory. Each domain defines a "problem" or function for emotional responding.

Bi-directional effects One of the most important lessons of health research is that behavioral systems are basically control systems. The input affects the output and the output affects the input. The bidirectional nature of systems is visible in the most molecular processes, such as the interaction between the immune system and behavior (Maier, & Watkins, 1998). Emotional behaviors and experience impact immune function: Sympathetic activation jogs natural killer cells loose from their hiding places and puts them at the ready in the circulatory system. Sympathetic activation directly affects the immune system through adrenergic receptors on white blood cells. And the immune system has profound effects on behavior. Immune products (interlukens) act on the CNS to create fever, shaking, fatigue, and depressed mood. These illness

behaviors are so visible and well-known that they have only recently stimulated empirical research.

The bi-directional theme emphasizes the nature of the ongoing transactions in emotion systems, between emotion and cognition, and the physiological processes correlated with each. Whether cognition or emotion is "first" depends upon when and where one enters these behavioral control systems. The central issue is conceptualizing and mapping the afferent and efferent feedback loops that make up the cognitive and affective system, and understanding how these control mechanisms interact and regulate one another. The question as to who is on first and what is on second can be left to Abbott and Costello.

#### Function of Affect In Illness

Our immersion in health issues has highlighted two other facets of affective experience that merit attention: affects as information about the self, and the variation in meaning and therefore, of predictive power of specific affects.

Affects as information about and to the self Feelings of fear, depression, happiness, etc., provide us with information about our motivation and readiness for specific actions (Leventhal & Mosbach, 1983). One way of examining the self-informing nature of emotion is to examine the impact of negative/positive emotion on self assessments of health (SAH). Global SAH are powerful predictors of mortality and subsequent morbidity after controlling for other factors such as age, medical conditions and so forth (Idler & Benyamini, 1997; 1999). Negative affects lower SAH, positive affects do the opposite. The effects are substantial and they tell us that people regard moods as important indicators of their somatic resources. It is worth noting, however, that measures of function and mood typically account for more variance in SAH than do people's medical status. Our sense of health is highly dependent upon how well we perform our daily activities and to moods. These SAH are extremely good predictors of later, definitive outcomes.

Why should moods have so substantial an impact on SAH? Perhaps an important function of affect is to tell us when to "back off" and lay low. When we are sick and our very existence is threatened by infectious illness, there is little sense in remaining physically active and taking resources away from our immune system (Leventhal, Patrick-Miller, Leventhal, and Burns, 1997). Affective-mood states, including states such as fatigue and energy, have important functions as internal monitors of somatic resources.

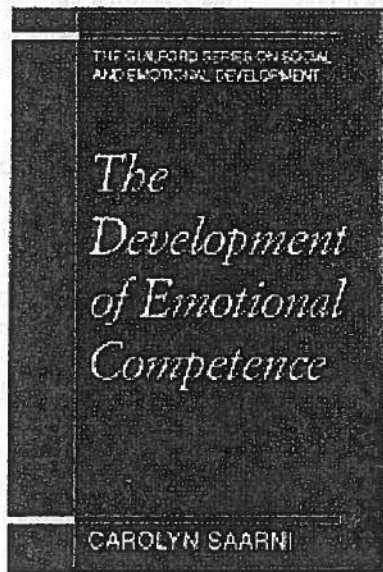
Variation in meaning and predictive power of affect states Measures of emotional states and traits may be important indicators of somatic status with or without their having a functional impact on physical health. For example, depression and fatigue have been found to predict occurrence of heart attack (Appels, Kop, Meesters, Markuse, et al., 1994) and recurrence of heart attack and death in patients undergoing coronary bypass surgery (Frasure-Smith, Lesperance, & Talajic, 1993). On the other hand, depression has failed to predict mortality in community samples, and measures of affect and personality traits do not predict health outcomes in persons over 65.

Our studies of SAH have led us to frame the relationship between depressed mood and health outcomes in a way that reflects the basic dynamics of the emotion system. Specifically, multiple studies find that poor SAH are better predictors of mortality in men than in women. Higher negative affect is associated with lower SAH for both men and women. But in one set of data, we found that higher levels of negative affect had a weak, positive relation-

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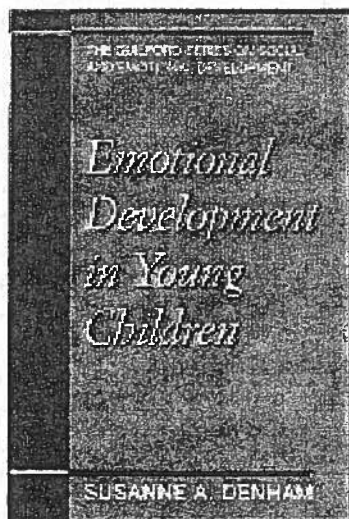
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