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TITLE

The Sociophysiology of Caring in the Doctor-Patient Relationship

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The Sociophysiology of Caring in the Doctor-Patient Relationship

In the beginning was the relationship. Martin Buber

Abstract
The emotional investment required to construct a caring doctor-patient relationship can be justified on humane grounds. Can it also be justified as a direct physiologic intervention? Two lines of evidence point in this direction. People in an empathic relationship exhibit a correlation of indicators of autonomic activity. This occurs between speakers and responsive listeners, members of a coherent group, and bonded pairs of higher social animals. Furthermore, the experience of feeling cared about in a relationship reduces the secretion of stress hormones and shifts the neuroendocrine system toward homeostasis. Because the social engagement of emotions is simultaneously the social engagement of the physiologic substrate of those emotions, the process has been labeled sociophysiology. This process can influence the health of both parties in the doctor-patient relationship, and may be relevant to third-parties.

From infancy onward, relationships are vital; no human survives birth and develops normally without the physical and emotional engagement of a caregiver. This engagement, incorporated in epidemiological studies as social support, continues to have vital consequences throughout the life cycle.1-3 Some of these health consequences flow from the fact that relationships are linked to emotions and emotions have a physiologic substrate. To the extent that we are emotionally responsive to someone, we are physiologically responsive to them. In consequence, people in an emotionally meaningful relationship share physiological responses associated with those emotions--what I will describe more fully as sociophysiology. The distressing emotions of fear and grief, that so frequently accompany patients' symptoms, impel them to seek relief through medical care, an important ingredient of which is the physician's affective caring.4, 5 The purpose of this essay is to look at medical caring as a mutual

physiologic engagement, a sociophysiologic process through which the doctor and patient can influence each other's health for better and worse.

Caring in the doctor-patient relationship can be expressed in a variety of ways, including instrumental help, cognitive help, and affective help. Since the value of making an accurate diagnosis and providing useful options for treatment are already adequately covered elsewhere, I will focus on the added value of a positive affective engagement. Like the mother-infant bond, the optimal expression of this engagement is an attunement of the caregiver to the experience of the other; its subjective indicator is "feeling felt."6 p. 149 That feeling can be generated if patients experience the doctor as really interested in what they have to say, so just the act of taking a history can relieve some of the patient's distress.7

Caring as responsive listening

Recently, a depressed patient took me step by step through the anguished hours he spent waiting and wondering about his daughter, who was overdue from a car trip. As he recounted his calls to the police, their report of an accident involving an unidentified woman, the dreaded confirmation of his daughter's death, and his poignant request that the policeman put a blanket on her body so she wouldn't be cold, I, too, felt the visceral progression of fear, vain hope, and the anguish of trying to bear the unbearable. As usually happens when I accompany a patient through a painful experience, he felt some relief from sharing it. "Sharing" is an accurate description because I felt the worse for the communal experience. And yet, it didn't feel like a zero-sum game in which his gain was my loss, because my discomfort was mitigated by the satisfaction I got from helping him. This trying but fulfilling engagement reminded me of a study that measured the physiologic effects of both telling about a traumatic experience and listening to its recounting. Shortt and Pennebaker8 videotaped interviews of Holocaust survivors and measured their skin conductance level and heart rate as they described their concentration camp experiences. Later, the researchers showed the videotapes to college students and measured these physiologic indicators of stress as the students watched and listened. When the researchers compared the physiologic measurements of the Holocaust survivors with those of the student listeners on a minute-by-minute basis, they found that the more the survivors talked about the horror, the greater the reduction they experienced in these stress indicators. The opposite was true for the listeners. Their stress indicators increased as they listened. It was as if engaging someone else's experience, albeit in imagination, shifted the physiology of the speaker and the physiology of the listener toward a convergence. A follow-up study 14 months later, revealed that the degree of disclosure during the interview was positively correlated with the subsequent health of the speaker.9 The belief that someone important is listening and cares appears to be healing for body and mind. Perhaps, such an engagement between speaker and listener can account to some degree for what has been claimed to be the healing power of prayer.10 Earlier healers and priests--they were customarily the same--enshrined the tradition of bearing witness, that is, abiding with someone through their suffering. When modern doctors have no specific biomedical remedies to offer, they can offer the patient themselves, a positive social bond which has been shown to improve well being in higher social animals11 as well as in humans12 by producing both acute and chronic reductions in the activity of the hypothalamic-pituitary-adrenal axis. This is one way of understanding the salutary effects of a compassionate bedside manner because the companionate mitigation of suffering can also be a physiologic remedy.

I witnessed an example of a companionate mitigation of suffering through the way a third-year family medicine resident told his patient that his biopsy showed malignancy. The resident, who had a long and caring relationship with the patient, spoke haltingly and with poignant concern about his efforts to recheck

the report--even looking at the biopsy slides himself to make sure that there was no error. The patient, a middle-aged man, was so moved by his doctor's discomfort that he replied reassuringly and affectionately, "That's all right, doctor. I've had a good life. Those things happen." What the resident had done, in essence, was volunteer to enlist in the patient's social support group. In so doing he was exposing himself to the risks and benefits of an empathic engagement. It was clear that by sharing the patient's pain, the resident felt a little worse and the patient felt a little better, but how might that affect their health? The social support literature tells us that this is healthy for the patient,13, 14 but how about the doctor's health? Isn't sharing a patient's bad feelings and concomitant physiology similar to exposure to a contagious disease? Is there a name for this process, and how can the exposure be made safe--better yet, healthy?

Sociophysiology

Let's start with the name. This sharing of physiology between people who are involved in a meaningful interaction was labeled "sociophysiology," a synthesis of psychophysiology and social interaction introduced as "a new interdisciplinary area for research, an area which demonstrates the concomitant relationship between physiology and social behavior."15p.4 This concomitant relationship was demonstrated by making simultaneous recordings of affective interactions and physiologic activity of both therapists and patients during psychotherapeutic interviews. The researchers found that selected physiologic indicators of autonomic activity--heart rate,15 heart lability, skin temperature,16 and muscle tension17 varied together between patient and psychotherapist. They recorded two kinds of relationships, concordant and discordant. A concordant relationship occurred when the selected measures of autonomic activity and interpersonal tension18 of the patient and the therapist varied together in the same direction. They called this similarity of patterning a "physiological identification" between therapist and patient and speculated that it might be an objective measurement of rapport.16 In the discordant relationship, these selected measurements varied together in opposite directions. This occurred when the patient was expressing anger at the therapist. Then, these indicators of autonomic activity in the patient decreased while the same indicators in the therapist increased.16

As originally described, sociophysiology denoted "interpersonal physiology," based on the finding that the interpersonal relationship between the therapist and the patient was also reflected in their physiological relationship.19 These findings were confirmed by other researchers.17, 20 Furthermore, this physiologic concordance between people in a relationship was determined to be the result of empathy rather than a common reaction to the same events.21, 22

Two other findings are relevant to the doctor-patient relationship. During a three month period when the therapist was in a "bad mood," as reported in a diary he kept, the patient had a substantially elevated heart rate during their meetings.17 In another phase of the original study, each of three subjects was interviewed by three different interviewers. An inspection of the patients' heart rate data revealed that one particular psychiatrist consistently produced a lower heart rate in all subjects, regardless of whether the affective interaction was positive, neutral, or negative, and regardless of the order in which this therapist interviewed the subjects.15 The reasons for this could not be explained by the data in the study.

Later investigators found that the influence of "interpersonal physiology" is broader than the dyad because members of multi-person groups also tend toward a coordination of some of their physiological reactions. Women in college dorms who are friends and roommates, but not women in randomly selected pairs, converge toward a synchronization of their menstrual cycles.23, 24 Likewise, men who were housed in groups of three and who were isolated from all external

social and environmental stimuli developed a within-group synchrony of their circadian cortisol rhythms, whereas there was no such synchrony between groups.25 Furthermore, when men were transferred to a new group, their circadian rhythms resynchronized to conform with the pattern of the other members of the new group.26 Groups of 5 to 6 men who worked together were found to have 17-hydroxycorticosteroid levels that clustered in a narrow range, both basally and during stress.27

Since these early studies, the field of sociophysiology has expanded from its original focus on the reciprocal physiological responses of face-to-face interactants to encompass physiological reactions to all social events. These have included physiological reactions to crowding, social status, conflict, and the mutual influence of physiology and social behavior on each other.28 However, the further exploration of sociophysiology as an "interpersonal physiology" has all but disappeared from the medical literature. Only Gardner29 continues to use the term, but not in its original sense of a reciprocal physiological engagement linked to empathy. Rather, he uses sociophysiology to explain how evolutionarily selected characteristics of brain physiology result in current behavioral pathology.29 Its informing principle is that psychopathological states are exaggerations or inappropriate expressions of behavioral modules encoded in the nervous system as normal adaptive features.30 By contrast, students of animal behavior use sociophysiology in its original sense of a mutually responsive physiologic engagement, and they emphasize its normative function in maintaining social cohesion and well-being in higher social animals.11, 31-34 This is the way I will be using sociophysiology to examine the physiological consequences of caring in the doctor-patient relationship. Its informing principle is that because people in a caring, i.e., empathic,35 relationship convey emotional experiences to each other, they also convey physiological experiences to each other, and this sociophysiologic linkage is relevant to understanding the direct physiologic consequences of caring in the doctor-patient relationship--for both parties. A corollary of this is that since caring relationships are mutual feedback loops, each party is cumulatively reacting to the reactions of each other, resulting in the ongoing negotiation of interdependent physiologic responses.

Since the only continuing studies of sociophysiology as reciprocal, interpersonal, physiology have been carried out on nonhuman social animals, especially primates, I will be drawing heavily on this literature. In so doing, I will be making the assumption that, while human relationships may be more differentiated than social bonding in nonhuman higher social animals, they are homologous, that is, they share both common functions and underlying evolutionary mechanisms.36, 37 In looking at the doctor-patient relationship from the perspective of social bonding, I will focus on the way the sociophysiology of caring functions to reduce physiologic arousal in the presence of stressors. This process may provide another way to understand how social support influences health.

The sociophysiology of relationships

To be a higher social animal is to be born with a psychobiological system that requires psychosocial and physiologic interdependence for its normal functioning.38-41 One manifestation of this is the organism's characteristic response to separation as a physiologic stressor42-44 and social bonding as its salutary antithesis.45, 46 In nonhuman social animals these effects occur whether the bonds are those of a sexual pair,41 parent-offspring,47 littermates,48, 49 or social companions.32 Evidence from the experience of humans with separation and reunion suggests that we experience similar physiologic interdependence.50, 51 At least one species of primates also relieves stress by attacking subordinates.52 This might be described in humans as a discordant15, 16 or scapegoating relationship.

Sociophysiology and the mutual health consequences of the doctor-patient relationship

The argument that sociophysiologic processes are likely to influence the health of people in a meaningful relationship is based on four related premises: 1. Empathy is a basic ingredient of a caring relationship. 2. A relationship is a mutual, reciprocal engagement, established and maintained by a feedback loop of reactions to reactions. 3. Empathy is simultaneously an affective experience and a physiologic state. 4. People who influence each others' physiologic state can influence each others' health.

McEwen's concepts of allostasis and the allostatic load[53] are useful for understanding the physiologic process by which stressors influence health. Allostasis--or "stability through change"[54]--describes the active neural, neuroendocrine, and neuroendocrine-immune mechanisms that are mobilized to maintain homeostasis in the face of stressful challenges. The allostatic load, or "the price of adaptation,"[55] is the physiologic cost incurred when the allostatic systems don't perform normally because they are over or under-responsive.[53] A high allostatic load is a risk factor for sickness,[55, 56] but some of its pathogenic consequences can be counteracted by supportive social relationships.[13, 57] The remedial function of social support is central to understanding the healing potential of the doctor-patient relationship because the same fearful emotions that increase patients' allostatic load and drive them to seek medical help, also magnify the power of caring in the doctor-patient relationship to reduce their allostatic load because need increases susceptibility to interpersonal influence.[58] Within the framework of "interpersonal physiology", one of the facilitators of that influence is an empathic engagement which couples the patient's physiology with that of the doctor's. Since a sociophysiologic feedback loop is maintained by reactions to reactions, this can lead to an escalation[59] or de-escalation[60] of distress. An escalation can occur in a concordant physiologic relationship if the doctor over-identifies with the patient's plight, as happens most characteristically between family members. Thus, many patients are reluctant to share their distress with loved ones both out of a concern for their loved ones and a concern for themselves. By contrast, the doctor can use the concordant relationship to de-escalate the sociophysiologic feedback loop by responding to the patient's distress with the combination of compassion and equanimity recommended by Osler: "No quality takes rank with imperturbability....calmness amid storm....without at the same time, hardening the human heart by which we live."[61p. 3-4] The doctor's compassion can engage the patient's feelings along with the accompanying physiology, so that the doctor's equanimity may shift the patient's physiology toward homeostasis.

One way of leavening compassion with equanimity would be to strive for the kind of empathy that Carl Rogers recommended for psychotherapists because it provides a useful combination of subjective and objective perspectives: "to sense the client's world as if it were your own, without ever losing the as if quality."[62 p. 95] The modulated distancing provided by the "as if" qualifier distinguishes the doctor-patient relationship, in fact, the professional relationship, from the personal relationship. We are not as immersed as loved ones in the patient's experience, but for that very reason, we are able to provide a contagious equanimity to the compassion that they need. A useful metaphor for this process would be hemodialysis. What the patient sends to the doctor is the anguish born of fear, isolation, and helplessness; what circulates back are ameliorated, co-processed affects,[63] mitigated by the doctor's compassionate equanimity.

Looking at the doctor-patient relationship as a sociophysiologic engagement also provides a way of understanding why and how clinical practice can be unhealthy for the doctor. In a concordant relationship, the doctor is exposed to an

allostatic risk because he or she is co-processing the patient's distress. In a discordant relationship, the doctor's physiology may have to bear the burden of an angry patient's effort to seek relief by scapegoating the doctor. This was demonstrated by the rise of the psychotherapist's autonomic stress indicators when the patient expressed antagonism.15, 16 It may be experienced by the doctor as a state of psychophysiological hyperarousal, with attendant risks for stress-related disorders,55, 64-66 an urge to scapegoat the patient, and/or the defensive emotional withdrawal labeled burnout.67

The burnout syndrome is characterized by emotional and physical exhaustion, feelings of detachment and cynicism, and a sense of personal failure.68 Risk factors for burnout include social isolation, feeling helpless, lacking in control, having conflicted loyalties, feeling overworked, and an effort-reward imbalance.69-72 Since meaningful relationships are mutual, it can be assumed that the patient is suffering equivalent consequences. The positive antithesis to burnout is a caring emotional engagement.68 This can take the form of sociophysiologically co-processing difficult experiences with colleagues via conversations, Balint groups,73, 74 grand rounds, and writing.75 Additional sources of social support can be provided by religion or spirituality, and, most relevantly, patient satisfaction.76 Since satisfaction in a relationship is a fundamental component of social support and since the health benefits of social support are well established,13 a caring doctor-patient relationship, assumed to be mutual, would be expected to improve the health of the doctor as well as the patient.77-81

A strategy for a healthful doctor-patient relationship

Without suggesting that this is the only strategy for a healthful doctor-patient relationship, there is much support for the proposition that a collaborative relationship is also a therapeutic alliance.82-85 In consequence, I start by crafting the doctor-patient relationship as one in which the patient and I are collaborative partners engaged in a common struggle against their malady. This approach can be summarized by the phrase, "How can we work together to relieve your discomfort and/or improve your function?" This form of engagement can reduce the allostatic load by decreasing the patient's sense of isolation,79, 86 along with that of the doctor. Furthermore, this collaboration can be used to create an informed partner who can make informed and shared decisions, mitigating the allostatic load for both patient and doctor by increasing the patient's autonomy.87

A respectful collaboration is facilitated by establishing an empathic bond35 which reduces the likelihood of a discordant relationship because it is harder to blame a compassionate partner than an impersonal professional. The empathic bond also facilitates a positive sociophysiologic co-processing of experience.63 This emotional/physiological engagement, subjectively experienced as caring, may be what Peabody was emphasizing when he declared that "the secret of the care of the patient is in caring for the patient."4 This may also be the secret to the care of the doctor because care-giving to a recipient with whom we empathize is also care-receiving.80 The satisfaction of helping someone we care about88 and who appreciates our help is the antidote to burnout68 because we are also vicariously healing ourselves.

However, since the sociophysiologic outcome can be pathogenic as well as salutary for the participants, how do we know if the sinking feeling we get when we share the patient's distress is shifting our responsive sociophysiologic reactions toward sickness or health, and how can we influence the outcome? As with most questions about relationships, our intuitions are fairly reliable guides because they reflect the implicit knowledge stored in both our central nervous system89, 90 and our enteric nervous system.91, 92 If we have the satisfying feeling that comes from reinforcing the bonds of intimacy--as in helping loved ones--then we are likely to be vicariously helping our own

physiology by helping theirs. The benevolent paradox of sharing feelings in a good relationship is that pain can be reduced and joy can be amplified. On the other hand, if we feel used, dumped on, resentful, overwhelmed, under-rewarded, and defensively distant, then we are probably engaged in a discordant relationship or negative sociophysiologic feedback loop that can lead to physiologic hyperarousal and/or burnout.69, 76

Perhaps sociophysiologic co-processing is a basic mechanism of the emotional component of social support, and perhaps other social animals help each other in the same way. We don't know what rats communicate to each other, but we know that when researchers put a litter mate into the cage of an isolated rat, its resistance to electric shocks that cause ulcers more than doubles.48 Patients in distress need us to "get into the cage" with them and use our compassionate equanimity to reduce their allostatic load. When skillfully managed, it can be good not only for the health of the patient, but for the health of the doctor.

The doctor-patient relationship in a wider context

The recruitment of the sociophysiologic component of the doctor-patient relationship for healing has both ordinary and extraordinary features. What is ordinary is that this therapeutic potential exists in every human relationship because positive social bonds can reduce stress-induced autonomic arousal.46 What is extraordinary about the doctor-patient relationship is the amplification of the sociophysiologic influence that results from the interaction between the patient's emotional vulnerability and the doctor's emotional availability. Conveying a compassionate equanimity may be the art of the doctor-patient relationship. It entails establishing the same kind of person-to-person attunement that is essential to the development of the newborn,93 and remains essential as the social support that is vital throughout the life span of higher social animals. But the doctor's emotional availability has limitations.

While the sociophysiologic engagement between doctor and patient can provide vital support at this critical juncture in the patient's life, it should not be the only or even main source of social support for the patient, or social satisfaction for the doctor. Both doctors and patients fare better if they have collateral sources. Furthermore, the medical care system is not set up to pay professionals--even mental health practitioners--to provide long-term social support. In consequence, the doctor should have two objectives regarding the patient's needs for sociophysiologic support. The first is to provide it during the critical time of medical need; the second is to help the patient recruit this kind of support from more reliable and accessible sources such as friends, family, community, and religion.

The economic benefits of caring in the doctor-patient relationship

While a caring doctor-patient relationship is justified on purely humane grounds, it could also be justified on economic grounds. If we reframe the doctor-patient relationship as a provider-consumer service contract, we find that the medical practice that provides caring also realizes economic benefits.94 A caring relationship creates a setting of patient comfort that is most likely to result in a more complete medical history,82 improved clinical judgment with regard to laboratory tests and procedures, more accurate diagnoses, more cost-effective prescribing,95, 96 a more satisfied patient who is more informed and adherent to the treatment plan,97, 98 and better treatment outcomes.99 In addition, patient satisfaction is likely to result in a decreased allostatic load57 which, in turn, improves the course of both disease and illness.14, 81 Furthermore, since continuing relationships embed all parties in a feedback loop, consumer satisfaction is also likely to result in greater provider satisfaction, with less provider absenteeism, treatment errors, burnout, and job turnover.94 The extra time spent on caring behaviors, estimated to be 5 to 7 additional minutes per encounter,94, 100 is a significant

increase, especially if the average time ordinarily set aside for the medical encounter is 15 minutes.94 However, once a caring relationship is established, it need not require extra time for each encounter, and the additional time can be justified by the reduced economic and emotional costs of defending against malpractice claims.94, 101, 102

Future research

Studies of the health consequences of a caring doctor-patient relationship characteristically focus on how it affects the patient through making a more accurate diagnosis, relieving suffering, and improving health behaviors, including adherence to treatment recommendations.82 However, from the perspective of sociophysiology, these are secondary, albeit important, consequences of a caring relationship. The immediate effect of a caring relationship flows from the physiologic consequences of feeling cared about because the neurobiology of such a relationship promotes an endocrine response pattern that favors homeostasis and is the antithesis to the fight-flight response.12, 103 We need to learn more about the sociophysiologic regulators in relationships104 and of relationships.105 What are the channels of communication--visual, auditory, olfactory, touch, body movement, physical distance--that mediate the quality of social interaction and convey "interpersonal physiology." Such general behaviors as being available and returning phone calls surely must be experienced as caring--or not. If a caring relationship is along the axis of a loving relationship, and if an animal model for human love is a social attachment bond,46 then we may have an investigable neuroendocrine substrate for the doctor-patient relationship. While there are species-typical endocrine effects on social attachment behavior, central neuropeptides, such as oxytocin and vasopressin, that reduce stress and promote homeostasis in bonded pairs of some nonhuman social animals, may act similarly in humans.41, 106

Considering the relationship between marital status and health, we should look more closely at the physiologic linkage in spousal interaction,22, 107 its clinical significance, sex-based differential physiologic responsiveness,108, 109 and what types of interaction tend to be healing or pathogenic.110 We should expand the number of interpersonally responsive physiologic systems measured, examine their relationship to empathy, refine our understanding of the role of empathy in social bonding,21, 111 and consider what the neuroendocrinology of social bonding has to tell us about how caring relationships can reduce physiologic arousal.12, 46, 112 Mothers seem to know this intuitively when they comfort a crying infant against their bosom--usually the left side in both right and left-handed mothers.113

We should reconsider the label we apply to these physiologic responses because the label suggests where we should be looking for problems and solutions. So, for example, even when studies regularly demonstrate physiologic responses to social interactions,114, 115 we promote an individual, psychological bias by describing them as psychophysiologic, psychobiologic, psychosomatic, and psychoneuroimmunology.116 The label is correct as far as it goes because it identifies the locus of investigation and measurement; but it smuggles in a misleading assumption that a proper understanding of physiologic responses to psychosocial stimuli, most of which are actual or imagined consequences of social interactions,117 can be achieved by examining only one member of a sociophysiologic feedback loop. Re-labeling it, where appropriate, as sociophysiologic, encourages inquiry about the physiologic responsiveness of the other members of the patient's network, who are reciprocally and cumulatively reacting to each other's reactions. It also provides another place to intervene in the etiology and treatment.

Of special clinical relevance is evidence that a therapeutic alliance can add a robust placebo response to pharmacotherapy.85 How can we facilitate such an

alliance? How do "the rules of engagement" affect the degree of engagement in the relationship? Is a provider-consumer contract that is negotiated and rescindable by a third party as likely to encourage the same sociophysiological investment as a mutually negotiated doctor-patient relationship? For the third-party payers as well as the practitioner, what is the cost-benefit of caring? In weighing the costs of a caring doctor-patient relationship we have to consider the costs--to all parties--of a non-caring relationship. When the need is great, as it is in the fearful patient, a non-caring relationship is not neutral; it may well be pathogenic, and not just for the patient. Given that a relationship is a reciprocal feedback loop, non-caring may manifest in the doctor as burnout,118in the patient as a poor outcome,98 and for third-parties as increased costs.95

Summary

Caring for and about the patient may not be just a humane adjunct to biomedical treatment, but may itself be a biomedical intervention that justifies further investigation. Caring as a sociophysiologic engagement may provide a unitary concept for understanding the health consequences of social support and the doctor-patient relationship for both doctor and patient.

References

1. House JS, Robins C, Metzner HL. The association of social relationships and activities with mortality: prospective evidence from the Tecumseh community health study. American Journal of Epidemiology. 1982;116(1):123-140.
2. Cobb S. Social support as a moderator of life stress. Psychosomatic Medicine. 1976;38(5):300-314.
3. Russek LG, Schwartz GE. Perceptions of parental caring predict health status in midlife: a 35-year follow-up of the Harvard Mastery of Stress Study. Psychosomatic Medicine. 1997;59(2):144-149.
4. Peabody F. The care of the patient. J Am Med Assoc. 1927;88:877-882.
5. Rabin P, Rabin D. The Care of the patient; Francis Peabody revisited. JAMA. 1984;252(6):819-820.
6. Siegel D. The Developing Mind. New York: Guilford Press; 1999.
7. Adler HM. The history of the present illness as treatment: who's listening, and why does it matter? The Journal of the American Board of Family Practice. 1997;10(1):28-35.
8. Shortt J, Pennebaker J. Talking versus hearing about Holocaust experiences. Basic and Applied Social Psychology. 1992;13:165-179.
9. Pennebaker J, Barger S, Tiebout J. Disclosure of traumas and health among Holocaust survivors. Psychosomatic Medicine. 1989;51(5):577-589.
10. Levin J. How prayer heals: a theoretical model. Alternative Therapies in Health & Medicine. 1996;2(1):66-73.
11. Mendoza S. Sociophysiology of well-being in nonhuman primates. Laboratory Animal Science. 1991;41(4):344-349.
12. Uvnas-Moberg K. Physiological and endocrine effects of social contact. Annals of the New York Academy of Science. 1997;807:146-163.
13. House JS, Landis KR, Umberson D. Social relationships and health. Science. 1988;241:540-545.
14. Uchino B, Cacioppo J, Kiecolt-Glaser J. The relationship between social support and physiological processes: a review with emphasis on underlying mechanisms and implications for health. Psychological Bulletin. 1996;119(3):488-531.
15. DiMascio A, Boyd R, Greenblatt M, Solomon H. The psychiatric interview: a sociophysiologic study. Diseases of the Nervous System. 1955;16:4-9.

16. DiMascio A, Boyd R, Greenblatt M. Physiological correlates of tension and antagonism during psychotherapy: a study of "interpersonal physiology." Psychosomatic Medicine. 1957;19:99-104.
17. Malmo R, Boag T, Smith A. The physiological study of personal interaction. Psychosomatic Medicine. 1957;19:105-119.
18. Bales R. Interaction Process Analysis. Cambridge, Mass: Addison-Wesley Press; 1951.
19. Coleman R, Greenblatt M, Solomon H. Physiological evidence of rapport during psychotherapeutic interviews. Dis. Nerv. System. 1956;17(2):2-8.
20. Gormly J. Social interactions and psychophysiology. In: Waid WM, ed. Sociophysiology. New York: Springer-Verlag; 1984:199-223.
21. Robinson J, Herman A, Kaplan B. Autonomic responses correlate with counselor-client empathy. Journal of Counseling Psychology. 1982;29:195-198.
22. Levenson R, Ruef A. Empathy, a physiological substrate. Journal of Personality and Social Psychology. 1992;63(2):234-246.
23. Mason J, Brady J. The sensitivity of psychoendocrine systems to social and physical environment. In: Leiderman P, Shapiro D, eds. Psychobiological Approaches to Social Behavior. Stanford, CA: Stanford University Press; 1964:4-23.
24. McClintock MK. Menstrual synchrony and suppression. Nature. 1971;229:244-245.
25. Vernikos-Danellis J. Adrenocortical responses of humans to group hierarchy, confinement, and social interaction. In: Levine S, Ursin H, eds. Coping and Health. New York: Plenum Press; 1980.
26. Vernikos-Danellis J, Winget C. The importance of light, postural and social cues in the regulation of the plasma cortical rhythms in man. In: Reinberg A, Halbert F, eds. Chronopharmacology. New York: Pergamon; 1979:101-106.
27. Mason J. Psychological influences on the pituitary adrenal-cortical system. Recent Prog Horm Res. 1959;15:345-389.
28. Waid WM. Origins of sociophysiology. In: Waid WM, ed. Sociophysiology. New York: Springer-Verlag; 1984:3-20.
29. Gardner RJ. Sociophysiology as the basic science of psychiatry. Theoretical Medicine. 1997;18(4):335-356.
30. Gardner R, Price J. Sociophysiology and depression. In: Joiner T, Coyne J, eds. The Interactional Nature of Depression: Advances In Interpersonal Approaches. Washington, DC: American Psychological Association; 1999:247-268.
31. Harlow H, Harlow M. The affectional systems. In: Schrier A, Harlow H, Stolnitz F, eds. Behavior of Nonhuman Primates. Vol 2. New York: Academic Press; 1965:287-334.
32. Mason W. Socially mediated reduction in emotional responses of young monkeys. J. Abnorm. Soc. Psychol. 1960;60:100-104.
33. Barchas P, Mendoza S. Preface: Social Cohesion: Essays Toward a Sociophysiological Perspective. In: Barchas P, Mendoza S, eds. Social Cohesion: Essays Toward a Sociophysiological Perspective. Westport, Connecticut: Greenwood Press; 1984:xi-xiv.
34. Saltzman W, Mendoza S, Mason W. Sociophysiology of relationships in squirrel monkeys. I. Formation of female dyads. Physiology & Behavior. 1991;50(2):271-280.
35. Gianakos D. Empathy revisited. Arch Int Med. 1996;135-136(2).
36. Reite M, Capitanio J. On the nature of social separation and social attachment. The Psychobiology of Attachment and Separation. Orlando: Academic Press; 1985.
37. Bowlby J. Attachment and Loss. Vol I Attachment. New York: Basic Books; 1969.

38. Mendoza S. The psychobiology of social relationships. In: Barchas P, Mendoza S, eds. Social Cohesion: Essays Toward a Sociophysiological Perspective. Westport, Connecticut: Greenwood Press; 1984:3-30.
39. Stern D. The Interpersonal World of the Infant. New York: Basic Books; 1985.
40. Hofer M. Relationships as regulators: a psychobiological perspective on bereavement. Psychosom Med. 1984;46:183-197.
41. Insel TR. A neurological basis of social attachment. Am J. Psychiatry. 1997;154:726-735.
42. Field T. The effects of mother's physical and emotional unavailability on emotion regulation. Monographs of the Society for Research in Child Development. 1994;59(2-3):208-227.
43. Coe C, Mendoza S, Smotherman W, Levine S. Mother-infant attachment in the Squirrel Monkey: Adrenal response to separation. Behav. Biol. 1978;22:256-263.
44. Gunnar M, Larson M, Hertsgaard L, Harris M, Brodersen L. The stressfulness of separation among nine-month-old infants: effects of social context variables and infant temperament. Child Development. 1992;63(2):290-303.
45. Simpson JA, Rholes WS. Stress and secure base relationships in adulthood. Advances in Personal Relationships. 1994;5:181-204.
46. Carter C. Neuroendocrine perspectives on social attachment and love. Psychoneuroendocrinology. 1998;23(8):779-818.
47. Hofer M. On the nature and consequences of early loss. Psychosomatic Medicine. 1996;58(6):570-581.
48. Conger JJ, Sawrey W, Turrell ES. The role of social experience in the production of gastric ulcers in Hooded Rats placed in a conflict situation. Journal of Abnormal Social Psychology. 1958;57:216.
49. Carden S, Tempel A, Hernandez N, Hofer M. Isolation alters striatal met-enkephalin immunoreactivity in rat pups. Physiology & Behavior. 1996;60(1):51-53.
50. Bowlby J. The making and breaking of affectional bonds. I. aetiology and psychopathology in the light of attachment theory. British Journal of Psychiatry. 1977;130:201-210.
51. Ainsworth M. Attachments beyond infancy. American Psychologist. 1989;44:709-716.
52. Virgin CJ, Sapolsky R. Styles of male social behavior and their endocrine correlates among low-ranking baboons. American Journal of Primatology. 1997;42(1):25-39.
53. McEwen B, Stellar E. Stress and the individual. Mechanisms leading to disease. Archives of Internal Medicine. 1993;153(18):2093-2101.
54. Sterling P, J E. Allostasis: a new paradigm to explain arousal pathology. In: Fisher S, Reason J, eds. Handbook of Life Stress, Cognition and Health. New York: John Wiley; 1988:629-649.
55. McEwen B. Stress, adaptation, and disease. Allostasis and allostatic load. Annals of the New York Academy of Sciences. 1998;840:33-44.
56. Nemeroff C. The persistent neurobiological consequences of early untoward life events: treatment implications. Paper presented at: 152nd Annual Meeting of American Psychiatric Association; October, 1999, 1999; Washington, DC.
57. McEwen B. Protective and damaging effects of stress mediators. The New England Journal of Medicine. 1998;338(3):171-179.
58. Adler HM, Hammett VO. The doctor-patient relationship revisited, an analysis of the placebo effect. Annals of Internal Medicine. 1973b;78:595-598.
59. Vanderpool J, Barratt E. Empathy: towards a psychophysiological definition. Diseases of the Nervous System. 1970;31(7):464-467.
60. Jordan J. The role of mutual empathy in relational/cultural therapy. Journal of Clinical Psychology. 2000;56(8):1005-1016.
61. Osler W. Aequanimitas with Other Addresses to Medical Students, Nurses, and Practitioners of Medicine, 3d ed. Philadelphia: Blakiston; 1932.

62. Rogers C. The necessary and sufficient conditions of therapeutic personality change. Journal of Consulting Psychology. 1957;21:95-103.
63. Adler HM. Toward a multimodal communication theory of psychotherapy: the vicarious coprocessing of experience. American Journal of Psychotherapy. 1997;51(1):54-66.
64. Miller A. Psychoneuroendocrinology: neuroendocrine and immune system interactions in stress and depression. Psychiatric Clinics of North America. Vol 21: W. B. Saunders Company; 1998:443-463.
65. Melamed S, Ugarten U, Shirom A, Kahana L, Lerman Y, Froom P. Chronic burnout, somatic arousal and elevated salivary cortisol levels. Journal of Psychosomatic Research. 1999;46(6):591-598.
66. Nakamura H, Nagase H, Yoshida M, Ogino K. Natural killer (NK) cell activity and NK cell subsets in workers with a tendency of burnout. Journal of Psychosomatic Research. 1999;46(6):569-578.
67. Burke RJ, Richardsen AM. Stress, burnout, and health. In: Cooper CL, ed. Handbook of Stress, Medicine, and Health. New York: CRC Press; 1996:101-117.
68. Maslach C, Schaufeli WB, Leiter MP. Job burnout. Annual Review of Psychology. 2001;52:397-422.
69. Bakker AB, Killmer CH, Siegrist J, Schaufeli WB. Effort-reward imbalance and burnout among nurses. Journal of Advanced Nursing. 2000;31(4):884-891.
70. Rainey DW, Hardy L. Sources of stress, burnout and intention to terminate among rugby union referees. Journal of Sports Sciences. 1999;17(10):797-806.
71. Pruessner JC, Hellhammer DH, Kirschbaum C. Burnout, perceived stress, and cortisol responses to awakening. Psychosomatic Medicine. 1999;61(2):197-204.
72. Sundin-Huard D, Fahy K. Moral distress, advocacy and burnout: theorizing the relationships. International Journal of Nursing Practice. 1999;5(1):8-13.
73. Balint M. The Doctor, His Patient, And The Illness. New York: International Universities Press; 1957.
74. Brock CD, Stock RD. A survey of Balint group activity in U.S. family residency programs. Family Medicine. 1987;22:33-37.
75. Smyth J, Stone A, Hurewitz A, Kaell A. Effects of writing about stressful experiences on symptom reduction in patients with asthma or rheumatoid arthritis. JAMA. 1999;281(14):1304-1309.
76. Gundersen L. Physician burnout. Annals of Internal Medicine. 2001;135(2):145-148.
77. DiMatteo M, Sherbourne C, Hays R, al. e. Physicians' characteristics influence patients' adherence to medical treatment: results from the Medical Outcomes Study. Health Psychol. 1993;12:93.
78. Kaplan S, Greenfield S, Ware JJ. Assessing the effects of physician-patient interactions on the outcomes of chronic disease. Medical Care. 1989;27((3 Suppl):S1):10-27.
79. Seeman T. Social ties and health: the benefits of social integration. Annals of Epidemiology. 1996;6(5):442-451.
80. Lee HS, Brennan PF, Daly BJ. Relationship of empathy to appraisal, depression, life satisfaction, and physical health in informal caregivers of older adults. Research in Nursing & Health. 2001;24(1):44-56.
81. Cape J. Patient-rated therapeutic relationship and outcome in general practitioner treatment of psychological problems. British Journal of Clinical Psychology. 2000;39(Pt 4):383-395.
82. Levinson W, Gorawara-Bhat R, Lamb J. A study of patient clues and physician responses in primary care and surgical settings. JAMA. 2000;284(8):1021-1027.
83. Barsky A, Borus J. Functional somatic syndromes. Annals of Internal Medicine. 1999;130(11):910-921.
84. Green J, Shellenberger R. The healing energy of love. Alternative Therapies in Health & Medicine. 1996;2(3):46-56.

85. Krupnic JL, Sotsky SM, Simmens S, et al. The Role of the therapeutic alliance in psychotherapy and pharmacotherapy outcome: findings in the National Institute of Mental Health Treatment of Depression Collaborative Research Program. Journal of Consulting and Clinical Psychology. 1996;64(3):532-539.
86. Cacioppo JT, Ernst JM, Burleson MH, et al. Lonely traits and concomitant physiological processes: the MacArthur social neuroscience studies. International Journal of Psychophysiology. 2000;35(2-3):143-154.
87. Bosma H, Marmot M, Hemingway H, Nicholson A, Brunner E, Stansfeld S. Low job control and risk of coronary heart disease in Whitehall II (prospective cohort) study. BMJ. 1997;314:558-565.
88. Grbich C, Parker D, Maddocks I. The emotions and coping strategies of caregivers of family members with a terminal cancer. Journal of Palliative Care. 2001;17(1):30-36.
89. Elliott R, Dolan R. Neural response during preference and memory judgments for subliminally presented stimuli: a functional neuroimaging study. Journal of Neuroscience. 1998;18(12):4697-4704.
90. Rugg M, Mark R, Walla P, Schloerscheidt A, Birch C, Allan K. Dissociation of the neural correlates of implicit and explicit memory. Nature. 1998;392(676):595-598.
91. Gershon M. The enteric nervous system: a second brain. Hospital Practice (Office Edition). 1999;34(7):35-38, 41-32 passim.
92. Wood JD, Alpers DH, Andrews PLR. Fundamentals of neurogastroenterology 1. Gut. 1999;45(Supplement No II):6-16.
93. Schore A. Affect Regulation and the Origin of the Self: The Neurobiology of Emotional Development. Hillside, N.J.: Lawrence Erlbaum; 1994.
94. Issel LM, Kahn D. The economic value of caring. Health Care Management Review. 1998;23(4):43-53.
95. Barsky AJ, Borus JF. Somatization and medicalization in the era of managed care. JAMA. 1995;274(24):1931-1934.
96. Smith G, Monson R, Ray D. Patients with multiple unexplained symptoms: their characteristics, functional health, and health care utilization. Arch Intern Med. 1986;146:69-72.
97. Donovan J, Blake D. Compliance with deviance or reasoned decision making. Social Science and Medicine. 1992;34:507-513.
98. Clark L. Improving compliance and increasing control of hypertension: needs of a special hypertensive population. American Heart Journal. 1991;121(2):664-669.
99. Hinds P. The relation of Nurses' caring behaviors with hopefulness and health care outcomes in adolescents. Archives of Psychiatric Nursing. 1988;2(1):21-29.
100. Hornberger J, Thom D, McCurdy T. Effects of a self-administered previsit questionnaire to enhance awareness of patient's concerns in primary care. Journal of General Internal Medicine. 1997;12:597-606.
101. Terry K. Telling patients more will save you time. Medical Economics. 1994;71(14):40-52.
102. Levinson W, Roter D, Mullooly J, Dull V, Frankel R. Physician-patient communication: the relationship with malpractice claims among primary care physicians and surgeons. JAMA. 1997;277:553-559.
103. Clark J, Rager D, Calpin J. Animal well-being II. Stress and distress. Laboratory Animal Science. 1997;47(6):571-579.
104. Kuhn C, Schanberg S. Responses to maternal separation: mechanisms and mediators. International Journal of Developmental Neuroscience. 1998;16(3-4):261-270.
105. Krebs JR, Davies NB. An Introduction to Behavioral Ecology. Third ed. London: Blackwell Science Ltd.; 1993.

106. DeVries A, DeVries M, Taymans S, Carter C. The effects of stress on social preferences are sexually dimorphic in prairie voles. Proceedings of the National Academy of Science. 1996.
107. Kiecolt-Glaser J, Newton T, Cacioppo J, MacCallum R, Glaser R, Malarkey W. Marital conflict and endocrine function: are men really more physiologically affected than women? Journal of Consulting & Clinical Psychology. 1996;64(2):324-332.
108. Levenson RW. The influence of age and gender on affect, physiology, and their interrelations: a study of long-term marriages. Journal of Personality & Social Psychology. 1994;67(1):56-68.
109. Smith TW, Gallo LC. Hostility and cardiovascular reactivity during marital interaction. Psychosomatic Medicine. 1999;61(4):436-445.
110. Lewis J. Repairing the bond in important relationships: a dynamic for personality maturation. Am J Psychiatry. 2000;157(9):1375-1378.
111. Lewis J. For better or worse: interpersonal relationships and individual outcome. Am J Psychiatry. 1998;155(5).
112. Uvnas-Moberg K. Oxytocin may mediate the benefits of positive social interaction and emotions. Psychoneuroendocrinology. 1998;23(8):819-835.
113. Salk L. The role of the heart beat in the relations between mother and infant. Sci. Am. 1973;228:24-29.
114. Knardahl S. Cardiovascular psychophysiology. Annals of Medicine. 2000;32(5):329-335.
115. Drossman D. Psychosocial factors in gastrointestinal disorders. In: Sleisenger, Fordtran, eds. Gastrointestinal and Liver Disease. Sixth ed. Philadelphia: W. B. Saunders Company; 1998:69-79.
116. Stoudemire A, McDaniel JS. History, classification, and current trends in psychosomatic medicine. In: Kaplan H, Saddock B, eds. Comprehensive Textbook of Psychiatry/VI. Vol VI. Baltimore: Williams and Wilkins; 1995:1463-1471.
117. Kemper TD. Toward a sociology of emotions: some problems and some solutions. American Sociologist. 1978;13(1):30-41.
118. Kasl SV. Theory of stress and health. In: Cooper CL, ed. Handbook of Stress, Medicine, and Health. New York: CRC Press; 1996:13-26.