

Toward a Biopsychosocial Understanding of the Patient–Physician Relationship: An Emerging Dialogue

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Complexity theory has been used to view the patient–physician relationship as constituted by complex responsive processes of relating. It describes an emergent, psychosocial relational process through which patients and physicians continually and reciprocally influence each other's behavior and experience. As psychosocial responses are necessarily biopsychosocial responses, patients and physicians must likewise be influencing each other's psychobiology. This mutual influence may be subjectively experienced as empathy, and may be skillfully employed by the clinician to directly improve the patient's psychobiology.

KEY WORDS: patient–physician relationship; biopsychosocial; interpersonal neurobiology.

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“By far the most frequently used drug in general practice was the doctor himself.”¹

“The secret of the care of the patient is in caring for the patient.”²

INTRODUCTION

Suchman³ has argued persuasively for viewing the patient–physician relationship as constituted by complex responsive psychosocial processes of relating. Accordingly, the interaction of physician and patient can be viewed as an emergent, self-organizing process. It is established and maintained by reciprocal, iterative psychosocial responses through which each mutually influences and co-regulates the other's interdependent behavior and personal experience. Psychosocial responses have biological concomitants⁴ likewise making patient–physician interactions emergent, self-organizing feedback loops comprised of mutually regulatory biopsychosocial responses. This may be labeled a complex biopsychosocial relational process. In the interest of brevity, I will refer to this throughout the paper as the biopsychosocial relational process or just the relational process.

This approach to the patient–physician relationship shifts our focus from the relationship as a context for the delivery of medical treatment to the relationship itself as a medical treatment. It also redirects our view of the function of the physician—from a *provider* of treatment to a *co-participant* in

treatment, with emergent consequences for both patient and physician. Three features are highlighted:

1. As cocreators of a complex self-organizing relationship, patients and physicians are engaged in a moment-to-moment mutual regulation of each other's biopsychosocial states.
2. The introduction by either patient or physician of even small changes in their interactive process can lead to large changes in their biopsychosocial outcomes.
3. The emergence of empathy in the patient and physician may be viewed as a biopsychosocial relational process indicator and may also serve as a guide toward desired outcomes.

EMPIRICAL EVIDENCE

Overview

Empirical research has demonstrated that contingent interpersonal responses are accompanied by contingent neurobiological responses. Depending on the social context, such responses have been variously labeled *sociophysiology* between therapists and patients,^{5,6} and among nonhuman mammals⁷; *interpersonal neurobiology* in child development⁸; *affect attunement* between caregivers and infants⁹; and *physiological linkage* between empathic spouses.¹⁰ More recently, neuroscientists have discovered a *mirror neuronal system* that contributes to this attuned responsiveness, with special relevance to empathy.^{11–13}

Sociophysiology

Starting in the mid-1950s with investigations of the psychiatric interview, researchers described an “interpersonal physiology,” which referred to a correlation of selected physiologic indicators of autonomic activity—heart rate,⁵ heart lability, skin temperature,¹⁴ and muscle tension¹⁵—that varied together between psychotherapists and patients. It was speculated that this similarity of patterning was a “physiological identification” between therapist and patient and might turn out to be an objective measurement of rapport.¹⁴ These findings were confirmed by other researchers,⁶ and it was also demonstrated that the physiologic correlation was the result of empathy rather than a common reaction to the same events.^{16,17} Aside from studies of the “physiological linkage”¹⁸ between empathic spouses, few other clinical explorations of sociophysiology were performed.¹⁰

Animal ethologists applied sociophysiological research strategies to look at how mutually regulatory physiologic feedback

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loops establish and maintain nonhuman mammalian social organizations.^{7,19,20} This was demonstrated at a number of levels of mammalian social organization: the mother–offspring bond,²¹ conspecific (peer) relationships,²² the adult pair-bond,²³ hierarchical relationships,^{24,25} sexual development,^{26,27} and sexual reproduction.^{28,29}

Subsequently, Gardner used the term *sociophysiology* to refer to the hypothesis that current psychopathology is a consequence of evolutionarily selected characteristics of brain physiology.³⁰ My use of the term preserves its original meaning as an interpersonal physiological engagement, occurring in real time and having continuous here-and-now physiologic consequences. As applied to the patient–physician relationship, sociophysiology encompasses two overlapping processes. First, *intrapsychically*, anticipated, planned, and remembered social experiences are inseparable from their concomitant physiology. Second, *interpersonally*, social relationships influence physiology and vice versa. For humans, these two processes may be hardly distinguishable because even when alone, people are usually in the company of imagined others,³¹ and their physiology will reflect this. So, even between medical encounters, and years later, the biopsychosocial relational process can continue.

Interpersonal Neurobiology

The unfolding neural circuitry of the developing brain is configured by social interaction, variously described as interpersonal neurobiology³² and the social construction of the human brain.³³ Throughout the lifespan, social interaction continues to modify neural structures^{34,35} and maintain the integrated functioning of neural circuits.⁴ Consistent with complexity theory, reciprocal, modifiable neurobiological, and neuroendocrine patterns of response affect and are affected by social attachment.^{36–38} The propensity for the kind of self-organizing physiological attunement that regulates the mother–infant relationship may continue into adult interpersonal relationships and may serve a similar physiologic regulatory function.^{39,40} The physiologic consequences of bereavement in adults are very similar to those of maternal separation in infants and may be partially accounted for by the loss of an external physiologic regulator.⁴¹

Affect Attunement—The Regulation of Physiology and Attachment

Studies by infancy researchers have demonstrated the precisely calibrated feedback loop through which caregivers modulate infants' physiological responses by a nuanced combination of stimulation and soothing.^{42–46} Stern has labeled this interactive regulatory process "affect attunement."⁹ Through this self-organizing developmental process,⁴⁷ caregiver and infant co-operate the neurobiological responses that establish and maintain their attachment.

This "dance of attunement"⁴⁸ creates a secure, affectional bond⁴⁹ that synchronizes the level of autonomic arousal in both infant and caregiver,⁴⁸ is usually experienced by the caregiver as deeply satisfying, and tends to have a calming effect on the infant. To this end, caregivers report being guided in their attuned responses by an empathic feeling with the infant.⁵⁰ Because much of this mutual responsiveness occurs

too instantaneously to be under conscious control, it had been anticipated that innate imitative neural circuits would be discovered.⁵¹ Neuroscience has now provided such a candidate neural mechanism.^{11,52}

The Mirror Neuronal System

Neuroscience research, first in monkeys^{53,54} and then in humans,^{55,56} has discovered a mirror neuronal system that can account for a cognitively unmediated responsive feedback loop underlying interpersonal communication. Mirror neurons discharge when a specific motor action is performed and when an individual observes another individual performing a similar motor action.^{57,58} Because the mirror neuronal system in both humans and monkeys^{59,60} is connected to parts of the brain that are critical for the recognition of facial expressions and emotional behaviors,^{12,59} the observation of emotions can influence the emotional experience of the observer. In this way, the mirror neuronal system may provide a neurobiological grounding for interpersonal empathy.^{12,13,61–63}

Empathy as Interpersonal Neurobiology

Further support for the view that empathy is a neurobiological response has been provided by the use of positron emission tomography (PET) to demonstrate that accurate empathy of distress is correlated with the activation of specific neural networks.⁶⁴ Accordingly, empathy can be thought of as the neurobiological experience of *what we know and how we know it*.^{17,61,65}

In a study of empathy in marital couples, those spouses who exhibited the most accurate empathy regarding each other's negative feelings had the most synchronous patterns of autonomic activation—described as a "physiological linkage."¹⁷ In another study, the degree of physiological synchrony between spouses on four measures (heart rate, pulse transmission time to finger, skin conductance level, and general somatic activity) was shown to correlate with both their emotional synchrony and marital satisfaction.⁶⁶

Summary

Both complexity theory and empirical evidence support the proposition that the empathy in the patient–physician relationship is constituted by the reciprocal, emergent biopsychosocial responses of each party.

THE CLINICAL APPLICATION OF EMPATHY IN THE PATIENT–PHYSICIAN RELATIONSHIP

Empathy includes both the subjective *perception* of attuned interpersonal neurobiology and the moment-to-moment *process* of this attunement—the more accurate the reciprocal responses, the more synchronous the attunement. Importantly, even small changes introduced by either patient or physician can cascade into large neurobiological changes. Herein lies the therapeutic potential of *clinical empathy*, defined as the physician's use of the empathic process to directly affect the patient's psychobiology. Whether clinical

empathy is conceptualized as a primarily cognitive process⁶⁷ that makes patients feel understood or as a primarily affective process⁶⁸ that makes them “feel felt,”³² it is an emergent neurobiological process.

Clinical Empathy as a Clinical Procedure

While biopsychosocial responsiveness between patients and physicians is reciprocal and mutual, it is not symmetrical because patients and society grant clinicians the responsibility to focus attention and treat biological and psychological aspects of a patient’s disease. Treatment includes: prescribing medication, providing information, and performing clinical procedures. The physician’s use of empathy, warrants consideration as a clinical procedure because it uses “emotional resonance”⁶⁹ to achieve skilled “communicative attunement”⁷⁰ that produces a neurobiological intervention.

Three additional features of clinical empathy support its consideration as a clinical procedure: (1) it has a medical indication; (2) it is a skilled, interpersonal performance requiring “emotional labor”;⁷¹ and (3) it attempts to achieve a specific outcome—an improvement in the patient’s psychobiology.

Beginning with the indication, the distress of sickness can result in both an activation of the hypothalamic–pituitary–adrenal axis and an ensuing need to seek psychobiological relief through the formation of a secure attachment bond with a caregiver.⁷² At this vulnerable point in the patient’s life, the effect of clinical empathy on the patient’s psychobiology is likely to be enhanced.^{73,74} With regard to performance, clinical empathy is a skilled interpersonal intervention that uses an asymmetrical *affect attunement* to modify the patient’s psychobiology. This attunement may be facilitated⁷¹ by inserting a collaborative comment or question at the right moment during the history—“Let me see if I have this right”⁷⁵—or by making a permissive request at the seeming conclusion—“Was there anything else?”—that can bridge the synapses between and within patients and physicians. With regard to outcome, the process of self-organizing attunement is also its product.⁷⁶ Clinicians’ active co-participation in their patients’ state of autonomic arousal may shift it toward homeostasis^{77,78} and decrease their allostatic load—the physiologic burden of adjusting to stressors.⁷⁹ Such an interactive physiologic regulation may even reestablish the patient’s positive psychobiological state.⁸⁰

Clinicians can learn much about the process and therapeutic potential of interpersonal neurobiology from studies of caregiver–infant interaction. Almost immediately postpartum, both caregiver and infant engage in a feedback loop of contingent, responsive, matching behaviors, primarily those conveying emotions.^{51,81} Through such communications, caregiver and infant mutually regulate each other’s psychobiology, but not to an equal degree, because the caregiver’s self-regulatory capacity acts as an external organizer of the infant’s biobehavior.^{82,83} When successful, they self-organize a unique relationship⁸⁰ that is both their process of attunement and its product—a more stable infant neurobiology on its way to resilience and self-regulation.⁸⁴

I am proposing that the empathic clinician may similarly use the relational process to effect a direct biological treatment. This clinical procedure is guided by the subjective experience of empathy and is operationalized by saying the

right words in the right way at the right time. The intended clinical outcome is an improvement in the patient’s psychobiology, perhaps just for the duration of the medical encounter, perhaps for much longer.

TWO ILLUSTRATIVE CLINICAL EXAMPLES

Effective Empathy

Matthews and colleagues have described the feelings attendant to “connexional moments” in the medical encounter as “the culmination of effective empathy.”⁸⁵ In essence, they argue that *effective empathy* is the subjective experience of a salutary attunement in a biopsychosocial relational process.

One of the authors (Suchman),⁸⁵ describes a patient under his care, an often-hospitalized asthmatic woman with a “borderline personality,” who was, once again, admitted for extreme dyspnea. Her respiratory distress could not be accounted for by her physical findings. Suchman encouraged the patient to talk about what she was experiencing during her latest episode. As he listened earnestly to her story, he found himself palpably experiencing the void she must have been experiencing. He conveyed this by saying, “I’m beginning to understand how hard it is to be you.” Then, he recounted, “Her eyes welled up, and she nodded slowly. Seeing how much it meant to her to have someone grasp even momentarily the private hell she had to endure, I found my eyes welling up, too, and I felt a chill in my neck and spine. For a moment, it felt like we were joined, both parts of some larger whole; it was very peaceful and reassuring, even loving. A feeling of calm and joy was with me for the rest of the day. R seemed peaceful, too. She went home the next day, and although she is certainly not ‘cured’ of her personality disorder, she has not been admitted again in the 5 years since.”⁸⁵

This vignette illustrates how clinical empathy was used as a clinical procedure.

The clinical indication was a problem with R’s psychobiology that had not responded very well to her previous medical care. The clinical procedure began with Suchman’s recognition that his dysphoric feelings about R were empathic indicators of what she was probably feeling. His statement, “I’m beginning to understand how hard it is to be you,” could only have been convincing because it was accompanied by emotional expressions that R perceived as authentic and attuned to her predicament.⁷¹ This attuned empathic communication joined Suchman and R as co-participants in an emergent interpersonal neurobiology. Their co-participation was evidenced by the responsive welling up of R’s eyes leading to a reciprocal autonomic response in Suchman. Their emergent relationship was evidenced by their apparently shared feelings of joy and calmness.

The clinical outcome of this encounter may be gauged by the ensuing feelings of mutual satisfaction, understood as subjective indicators of at least two overlapping psychobiological effects. The experience of a secure attachment has a nonspecific stress-buffering effect.⁸⁶ In addition, this clinical procedure may have had a transformative effect that changed how R and Suchman felt about themselves and how they felt about each other. Other clinical outcomes were a decrease in hospital admissions for R and a decrease in the risk of burnout^{87,88} for Suchman.

The mutually salutary effects in the case of Suchman and R apparently continued long after the medical encounter. The effectiveness of that clinical procedure is very likely renewed at relevant moments by the recollections each party has given to the other.

Effective Attitude

Clinicians may employ their affect attunement to improve patients' attitudes toward their personhood, now threatened by a medical problem. The successful conveyance of a salutary attitude can change the meaning of the experience along with its psychobiologic consequences.

One of my patients reported the lifelong consequences of a change in attitude that occurred during a medical encounter. She will always remember an off-hand response that rescued her from self-defeating despair. When she was 20 and single, her gynecologist diagnosed genital herpes during a pelvic examination. The patient felt like a pariah. "No one will ever want me," she remembers sobbing. "Can I ever have an honest sex life?" The gynecologist matter-of-factly replied, "I don't know why not." He then followed up with information about herpes, recommended a helpful book, and informed her of an internet dating service for people with herpes. He also pointed out that now she had another good reason to establish trusting relationships before sexual relations. In the telling of this story, now 10 years later, the patient triumphantly reenacted the casual hand gesture, shrug, and bemused expression that accompanied the physician's words. That attitude with its concomitant psychobiology was no longer just his; it had become hers. The patient recalled that she had immediately felt herself transformed from a disdained miscreant to a person with a manageable problem. She also recalled that what mainly repaired her self-image was seeing herself reflected by her physician's expression. This deftly performed interpersonal clinical procedure, which entailed one phrase, a few expressive gestures, and medical information, revitalized her psychobiology—then and now. While I do not know this physician, the biopsychosocial relational process suggests that his psychobiology likewise benefited from this attuned self-organizing process because the feedback loop was now infused with the patient's appreciation.⁸⁹

THE ISSUE OF CLINICAL SIGNIFICANCE

An empathic patient–physician relationship has been found to improve patients' adherence to and satisfaction with their treatment.⁹⁰ Patients' satisfaction can be considered an indicator of a salutary psychobiology.^{4,91} As adherence and satisfaction contribute both indirectly and directly to health outcomes,⁹² the clinical significance of clinical empathy is strongly supported. Even if the criterion for clinical significance is more narrowly defined as the kind of direct biological effects attributable to a pharmacologic agent, there is still strong supporting evidence from three levels of psychosocial research. At the macro level, epidemiologic studies have long demonstrated that social support, a major component of which is emotional support, influences biological variables that affect the development and course of a wide range of biomedical diseases.^{93,94} At the micro level, psychosocial influences have been demonstrated to exert similar effects on relevant biolog-

ical variables with similar biomedical consequences.^{95,96} Less work has been done at the dyadic level of relationships, but studies have demonstrated that marital conflict can result in deleterious alterations in cellular immune regulation and endocrine function, while harmonious relationships can enhance these physiological systems.^{97,98}

One caution about the biomedical consequences of psychosocial interventions is that while the changes in relevant biological variables are statistically significant and in the right direction, they may be too small to be clinically significant. Nevertheless, biological changes reported as lacking clinical significance in short-term studies may later be found by long-term studies to be biomedical risk factors. Many years separate sun exposure and melanoma, head injury and Alzheimer's disease, influenza and Parkinsonism. According to complexity theory, even small statistically significant changes in relevant biological variables like glycohemoglobin, blood pressure, and cholesterol levels may eventually have clinical consequences. By analogy, even though the psychobiological effects of a change of attitude may be too small to be clinically significant during the medical encounter, they may have large biomedical effects over time.

FUTURE DIRECTIONS

Empirical studies of clinical empathy might proceed in three steps. The first would be to establish the presence of interpersonal neurobiological and empathic responses during the medical encounter. This could be done during the medical encounter by performing neuroimaging and physiologic studies that have been used to monitor the process of psychotherapy,^{99,100} and immediately afterward by administering an empathy scale, such as the Relationship Inventory,¹⁰¹ to both patients and physicians. Second, researchers could demonstrate subsequent changes in biological variables that are plausibly relevant to disease, employing the methodology used to study the psychoneuroendocrine effects of conflict and resolution in spouses.^{97,102} The third and final step would be to explore the strategies and techniques⁷¹ that an empathic physician can use with the patient¹⁰³ in a way that maximizes the therapeutic potential of the biopsychosocial relational process.

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