

## Original Article

**Potential Synergism between Hypnosis and Acupuncture—Is the Whole More Than the Sum of Its Parts?**Elad Schiff<sup>1,2</sup>, Steven Gurgevich<sup>2</sup> and Opher Caspi<sup>3</sup>

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Both hypnosis and acupuncture have gained credibility over the years in their effectiveness for treating various health conditions. Currently, each of these treatments is administered in distinct settings and separate times. That is, even if patients receive both treatments as part of a multidimensional therapeutic program, they would typically receive them separately rather than simultaneously at the same session. This separation however might be undesirable since, at least theoretically, hypnosis and acupuncture could potentially augment each other if administered concomitantly. In this article we outline the rationale for this hypothesis and discuss the potential ramifications of its implementation.

**Keywords:** Acupuncture – hypnosis – synergism

**Acupuncture—Theory and Practice**

According to traditional Chinese medicine (TCM) theory, certain points on the body are linked together in a network of channels called ‘meridians’ (1). The meridians conduct Qi, a vital force that animates all living things. Qi is believed to regulate spiritual, emotional, mental and physical balance. TCM theory asserts that a smooth and adequate flow of Qi defines health and suggests that the various characteristics of Qi are determined by a complex set of interactions between external and internal factors (e.g. genetic predisposition, nutrition, physical and emotional influences) (2). TCM practitioners believe that acupuncture may facilitate normal flow of Qi, thus maintaining or restoring health to the body and mind. Various forms and styles of acupuncture are used to that end. In the most traditional form, fine needles are inserted into well-defined anatomic locations (acupoints). A typical acupuncture session includes an initial assessment according to which acupoints are selected and needed. Patients usually lie with needles in place for 20–30 min.

The mechanisms by which acupuncture elicits its effects are believed to be the result of three factors (3):

- (i) ‘Specific’ physiological—effects that are believed to be directly related to the needling of particular acupoints;
- (ii) ‘Nonspecific’ physiological—effects that arise from the micro trauma resulting from piercing the skin, a procedure that has been shown to induce a variety of physiological responses involving the microcirculation, local immune function, and neurally mediated analgesia and
- (iii) ‘Nonspecific’ psychological—effects that arise concomitantly with the treatment and emanate from a variety of sources including, but not limited to, treatment environment, patient expectations, practitioner intention, patient-provider rapport, and the natural history of the condition (4).

**Hypnosis—Theory and Practice**

Medical hypnosis or hypnotherapy, on the other hand, is the clinical application of hypnosis to medical disorders and procedures. According to the American Psychological

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Association, a hypnotic procedure is used to encourage and evaluate responses to suggestions (5). Kihlstrom described hypnosis as ‘a set of procedures in which a person designated as the hypnoterapist suggests that another person (the patient or subject) experience various changes in sensation, perception, cognition, or control over behavior’ (6). Others, such as Kirsch and Lynn (7), simply described hypnosis as ‘a heightened state of relaxation or a state of focused attention’. More recently, the behavioral aspects of hypnosis have been emphasized (8). In that sense, many contemporary scholars consider hypnosis not as a therapeutic treatment modality per se, but rather as a set of behavioral techniques (9). Classifying hypnosis as a behavioral technique emphasizes its operational components and avoids perpetuation of the myth that hypnosis is a magical experience (10).

A hypnotic session is usually constructed to have an induction phase and an application phase. During the induction phase, the individual begins to enter a hypnotic state, at which time the conscious mind is believed to become less and less vigilant to the immediate surroundings. It is thought that during the hypnotic state there are few competing cognitive demands and less self-reflective thought (11). This allows suggestibility, which is defined as communication that is accepted uncritically (12). The hypnotic state can vary between and within sessions from very light to profound, and have different cognitive, emotional and motivational qualities. Hypnotized individuals can display a dissociation of content with complete absorption of attention to immediate narrow experience and temporary inaccessibility of peripheral consciousness, and/or a dissociation of context where the narrowing of attention and increased absorption temporarily suspends higher order reflective cognitive structures and processes (13).

Logistically, hypnosis can be done either as a live session with a hypnoterapist facilitating the process or it can be taught so that individuals can learn how to enter the hypnotic state on their own. To achieve this latter goal, sessions are commonly audiotaped for the client’s regular home practice (14). Whether facilitated by a hypnoterapist or done by the subjects themselves it is generally agreed that all hypnosis is, in fact, self-hypnosis.

Several mechanisms have been suggested as to how hypnosis exerts its effects. EEG studies of hypnotic state show very slow high-range theta waves (5–7 Hz), which are typically associated with loss of executive control and reflect massive cortical inhibition (15,16). On the other hand, when the hypnotic state involves specific stimulatory sensory or motor suggestions, the appropriate sensory and motor areas of the brain, respectively, may be activated even more so than during non-hypnotic condition (17). Recent research suggests that the sensory distortion that is often experienced during hypnosis is associated with altered amplitude of the event-related potentials to somatosensory or visual stimuli. Interestingly, when hypnotized individuals imagine that a stimulus is blocked, their cortical response to those stimuli is reduced (18).

## Acupuncture and Hypnosis—Is the Whole More Than the Sum of Its Parts?

One of the most important tenets of TCM is the unity between mind and body. The health of the mind, according to this viewpoint, is affected by the health of the body and vice versa, reflecting complex bi-directional interactive relationships. This non-duality between psyche and soma means that mental and emotional processes have somatic representations, while somatic processes have mental-emotional equivalents. Since acupuncture is said to manipulate Qi, it is possible that it can affect not only the health of the ‘physical’ body, but also more energetically subtle manifestations of Qi—those of the mind. Indeed, practitioners of TCM often contend that the mental/emotional processes are often the first aspects of Qi to be influenced by acupuncture (19).

From a conceptual point of view of TCM, mind/body interventions such as Qigong and meditation serve as adjuncts to herbal treatments, acupuncture, or other traditional forms of physical therapies, such as Tuina. The TCM mind/body practices are considered the ‘Internal elixir’ that complements the more physical treatments, the ‘External elixir’. The integration of both physical and mental practices in TCM was always considered superior to either practice alone. This viewpoint is illustrated well in one of the earliest TCM texts, The Nei Ching Su Wen (dated back to around the 3rd century BC): ‘In order to make acupuncture effective, one must first cure the mind’ (20). Of notice, hypnotic state phenomena were also discussed in ancient Chinese medical texts. The capacity to enter hypnotic states was attributed to the Hun (translated as the Ethereal Soul), which is one of the five aspects of the mind (21). However, to the best of our knowledge, the concomitant administration of acupuncture and mental practices such as Qigong was not discussed in TCM texts.

Could simultaneous administration of both hypnosis and acupuncture (i.e. hypno-acupuncture) augment each? In other words, could acupuncture boost mind-related healing process, and hypnosis enhance the effect of acupuncture? These are certainly intriguing questions, but what empirical evidence exists that supports the synergism hypothesis between hypnosis and acupuncture when administered simultaneously?

A comprehensive attempt to find empirical evidence that supports the synergism hypothesis between hypnosis and acupuncture in peer-reviewed journals in English resulted in the retrieval of only one uncontrolled study and a few case reports. Both Zeltzer *et al.* (22) and Waterhouse *et al.* (23) reported in two separate occasions on the same study that looked at the feasibility and acceptability of a hypno-acupuncture intervention for chronic pain in pediatric patients. They found that the combined package of hypno-acupuncture was highly acceptable and tolerable and that following treatment, there was significant improvement in pain with no side effects. Samuels described two case reports where both treatments were used together effectively: One showing how hypnosis can help in the treatment of painful acupoints, the other how the response to acupuncture may be augmented by

hypnosis in the treatment of headache (24). Eitner *et al.* (25) described in detail their experience with a patient having a severe gag reflex who was successfully treated by the hypno-acupuncture approach, after administration of each of the two modalities separately failed to achieve a desirable response. All other studies that we could identify through an extensive literature search only compared the effects of acupuncture to hypnosis, each administered alone, for a variety of symptomatic conditions (26–29). No other trials that we know of assessed yet the synergism hypothesis between acupuncture and hypnosis.

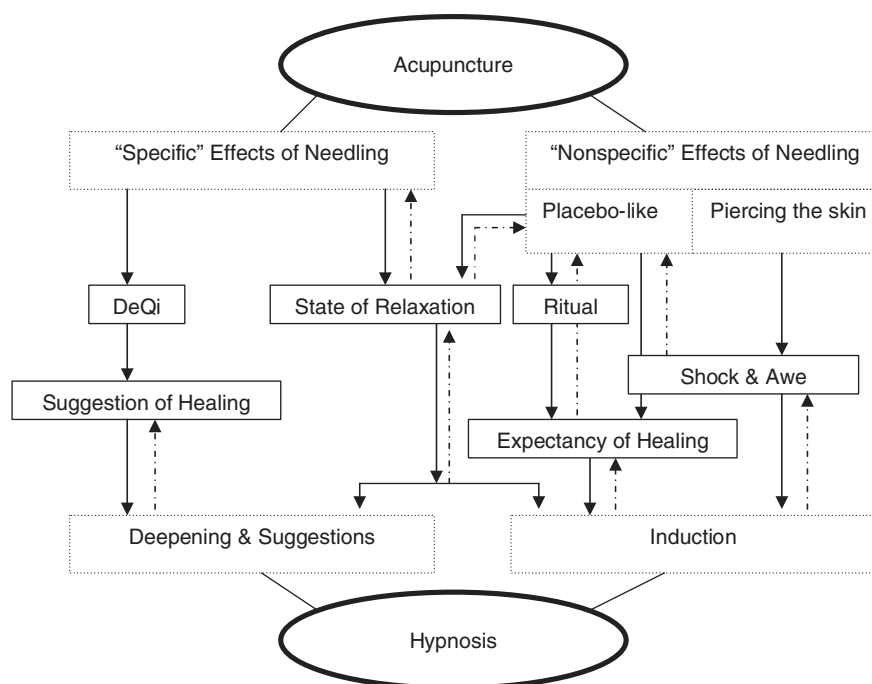
### Scientific Rationale for the Potential Synergism Hypothesis

In the absence of established empirical data from efficacy or explanatory research that either supports the synergism hypothesis or refutes it, we are charged with the task of postulating how, if indeed true, acupuncture and hypnosis may interact (Fig. 1).

- The roles of rituals—Numerous socioanthropological studies across many cultures and conditions have shown the power of rituals to affect healing (30). Hypnotic state phenomena may also occur in response to ceremonies or rituals. Although not a prerequisite for hypnotic state induction, rituals are accepted means to facilitate hypnotic state induction. They often set up the stage for healing to take place. Indeed, Frank and Frank postulated that all effective therapies are based, at least in part, on ‘a ritual or procedure that requires the active participation of both

patient and therapist, which is believed by both to be the means of restoring the patient’s health’ (31). In fact, it has been proposed that acupuncture may to some extent do exactly that (32). The importance of rituals in hypnosis has also been acknowledged (33). Thus, we hypothesize that hypno-acupuncture may provide a ‘double-dose priming’ effect as a result of which expectations of healing may be boosted and healing can take place more effectively. Indeed, there have been scattered discussions in the past of the possibility of a conditioned healing response that results from the combination of electro-acupuncture and guided imagery (34).

- Expectancy of healing—In a famous line of research, Bandura (35) demonstrated how self-efficacy and outcome expectations (common targets of hypnosis) affect healing, and Kirsch (36) showed how response expectancy shapes experience. Crow *et al.*’s systematic review of expectation effects in medicine proves that expectancy of healing is an important way by which treatments exert their effects (37). As mentioned above, hypnotized individuals can display a dissociation of context. In dissociation of context, the individual deems that ‘internal processes occur autonomously.’ It is believed that this phenomenon leads individuals to be more susceptible to hypnotic suggestions. Interestingly enough, acupuncturists commonly inform patients that the treatment exerts its effects by triggering internal healing processes. Creating the expectancy that acupuncture will activate internal, autonomous processes, may facilitate dissociation of context, enhance hypnotic susceptibility, and trigger healing (13). Increased



**Figure 1.** Some possible ways by which acupuncture and hypnosis may interact (see text for explanation).

expectancy of healing is a common confluence for both hypnosis and acupuncture, and one that may result in enhanced placebo effects through the meaning response (38). We believe it is possible that a synergistic effect of hypno-acupuncture, if it indeed exists, might be mediated to a large extent by this phenomenon. Indeed, Lu *et al.* (28) found that outcome of hypnosis or acupuncture was affected by patient's preferences, which reflect also expectations.

- 'Shock and awe'—When asked about any concerns they might have regarding acupuncture, many patients who are naïve to acupuncture report being anxious about the possibility of experiencing pain as a result of the needling. And yet, contrary to previous experience with other needles that are used in medicine, when acupuncture needles are inserted and left in place many of those patients report different or even opposite sensation (relaxation). The contrast between expectancy and experience is known to trigger an attentive state that is common to all hypnoidal phenomena (39). Furthermore, the confusing physical experience may be analogous to the confusional suggestions used during the induction phase of hypnosis. Shock and surprise may be used in hypnosis to facilitate creative moments or hypersuggestibility, and to direct the patient's attention to suggested goals (40). We postulate that the confusional experience with acupuncture may facilitate and augment the hypnotic state thus contributing to the synergistic effect of hypno-acupuncture.
- De Qi as a form of hypnotic state ratification—Hypnotic state ratification refers to the process in hypnosis of providing patients with a 'proof' that they are truly engaged in a different state of consciousness. This realization typically increases patients' sense of self-efficacy and confidence in their capacity to change. By removing skepticism, subjects become more open to hypnotic suggestions. We believe that acupuncture may have its own form of proof that something is happening in the form of the De Qi phenomenon. De Qi refers to sensations described as tingling, heaviness and/or dull ache at or around the area of needle insertion. Interestingly enough, acupuncturists often explain to patients that a De Qi sensation is a sign that their Qi is responding to needling. De Qi, thus, may serve as an acupuncture analogue of hypnotic state ratification. Experiencing the De Qi phenomenon may serve as confirmation that the unique healing processes, triggered by acupuncture, are truly taking place. As suggested above, enhancing patients' belief in the intervention increases their responsiveness to that intervention (8,31).
- State of relaxation—Following needle insertion, several characteristics associated with light (hypnoidal) hypnotic state such as slow, deeper breathing, progressive feelings of lethargy and relaxation are often observed (41). It has been postulated that even at this light level of hypnotic state and relaxation, suggestibility is already enhanced

(42). Thus, acupuncture may facilitate a process in which the hypnotic state experience may occur. This may be important for two practical reasons. First, in cases where patients subconsciously display resistance to hypnosis and have a hard time entering a hypnotic state (43), acupuncture may help to bypass that resistance by facilitating a state of relaxation. Second, it is generally agreed that the deeper the hypnotic state the more suggestible the subject is (44). Furthermore, certain hypnotic phenomena such as hypnoanalgesia are believed to occur primarily in a deeper hypnotic state (42). After overcoming the initial resistance and entering hypnotic state, it would be less difficult to deepen that state, for various applications, using the hypno-acupuncture combination. We suggest that the relaxation state that hypno-acupuncture induces may help patients reach and maintain a deep hypnotic state, which is needed for the hypnotic work.

- Complementary mechanisms—Although acupuncture is a mechanical technique and hypnosis is a psychological technique, the two modalities share conceptually much in common (as discussed above) and therefore should not be considered apples and oranges, but rather complementary (45). Furthermore, research suggests that the extent to which one responds to hypnosis does not correlate with responsiveness to acupuncture and vice versa (26,46). This distinct response pattern might reflect the fact that acupuncture and hypnosis rely on different mechanisms of action to execute their therapeutic effects. Whereas the effects of acupuncture are often reversed by the opiate antagonist naloxone, hypnosis is not. In an interesting study, Moret *et al.* (47) induced experimental pain by cold pressor test in volunteers in a prospective, cross-over study in order to test whether the mechanisms of analgesia induced by hypnosis and acupuncture are different. They measured the analgesic effect of hypnosis and acupuncture before and after double-blind administration of placebo or naloxone and found that pain intensity was significantly lower with hypnosis as compared with acupuncture, both with naloxone ( $P < 0.001$ ) and placebo ( $P < 0.001$ ). During acupuncture, but not during hypnosis however, pain scores were similar to control values when naloxone was given ( $P = 0.05$ ) but decreased significantly with placebo ( $P < 0.002$ ). Thus, it is possible that the combination of acupuncture and hypnosis may have superior effectiveness to either one alone due, in part, to complementary mechanisms.
- Complementary effectiveness—It has been suggested that acupuncture alone cannot always deal effectively with the major psychosocial aspects that are often associated with complex medical conditions. For example, in situations of severe pain, many patients experience a heightened state of sympathetic arousal (anxiety) and hypersuggestibility. Concurrent administration of hypnosis along with acupuncture in those situations has



the potential to decrease excitation level, provide effective means of relaxation and enhance self-efficacy. Eitner (25), for example, described how after initiation of hypno-acupuncture, root canal therapy could be completed successfully for the first time ever in a patient who previously feared the dentist, and Samuels (24) emphasized the potential role of hypnosis in improving the efficacy of acupuncture in needle-phobic patients. Thus, it seems that co-administration of the both hypnosis and acupuncture may at times not only make the impossible possible, but also may even result in a more robust effect than with either alone. Drawing analogy from pharmacotherapy, combining drugs that work through different mechanisms may improve efficacy and reduce side effects (48,49). Moreover, the combination of pharmacological and behavioral interventions often results in improved outcomes (50–52).

### From Theory to Practice—Practical Considerations of Hypno-acupuncture

In our experience, the idea of hypno-acupuncture may not only be scientifically plausible, but is also practically feasible. Once inserted, acupuncture needles are usually retained in place for ~20–30 min. It is mainly during that relative ‘downtime’ period that we suggest that patients would enjoy the hypnotic component of hypno-acupuncture. We propose that this time could be utilized to empower patients by providing them with hypnotic suggestions related to their disease condition, the healing power of both hypnosis and acupuncture, and the importance of health and well-being.

From a pragmatic point of view, three possibilities exist as to how to administer hypnosis simultaneously with acupuncture. Hypnosis could be administered live by either the acupuncturist himself (if also certified as a hypnotherapist) or by another certified hypnotherapist who would team up with the acupuncturist to deliver the combined package of care. Since both these options are likely to be too costly and require much logistic coordination on the part of the providers, we think that realistically the most efficient way to deliver hypno-acupuncture is through pre-recorded, individually tailored or generic tapes, or CDs. That is, we suggest that patients would meet individually with a hypnotherapist who would create a personal tape/CD for them to use during the acupuncture sessions and at home at their leisure (for treatment intensification), or that there would be a library of generic tapes/CDs addressing different topics from which patients and providers would be able to choose the most appropriate program. For example, a patient may choose a tape/CD according to her needs—ego strengthening, weight reduction, nausea and vomiting control or general healing suggestions. Libraries such as this one that have generic hypnotic suggestions for various health conditions are already available from various sources (53). In actually choosing a hypnotic tape/CD it is possible that patients would sense

a better fit with the overall strategy to their disease condition, be more satisfied and motivated, and most importantly—shift from having a relatively passive role in their care into a more active and empowered pursuit of health. Indeed, recent research into the decision-making processes that underlie patients use of complementary and alternative medicine suggests that matching between the patient and the modality, satisfaction, motivation, and tendency toward active participation in healthcare, are all important factors that shape not only patterns of healthcare utilization, but also patients outcomes (54).

### Hypno-acupuncture—Research Considerations

Synergism is defined as the ‘interaction of discrete agents (as drugs), or conditions such that the total effect is greater than the sum of the individual effects’ (55). Thus, synergism should be distinguished from ‘additivity’ that, briefly stated, means that each therapeutic constituent contributes to the total effect in accord with its own potency. A typical example of synergism is the deadly combination of alcohol and narcotics, which in most instances is clearly more harmful than either alone.

A classical study design that would set out to test whether acupuncture and hypnosis act synergistically, would follow evidence-based research guidelines, as stated by Chiappelli and colleagues (56,57) and include a parallel multi-arm randomized controlled trial (RCT) where hypno-acupuncture would be compared to both acupuncture and hypnosis, each administered alone, to the standard of care (often a drug), and, when ethically feasible, to no treatment (the counterfactual natural history). The dose-schedule-response relationships of hypno-acupuncture in such trials may be assessed by using standardized measures. An example of such a trial would be a multi-arm RCT of hypno-acupuncture compared to each alone for chemotherapy induced nausea and vomiting (CINV). A set of quantitative statistical analyses that are based on the assessment of interactions and main effects would then be set at the end of the trial to test the additivity/synergism hypothesis (58,59). Such analysis, when done appropriately (for example, when the study has enough statistical power to test for synergism), could reveal one of four possibilities:

- (i) That hypno-acupuncture is not superior (or even inferior) to either acupuncture and/or hypnosis, each administered alone;
- (ii) That the effect of hypno-acupuncture is equivalent to the combined effect of acupuncture and hypnosis, each administered alone (cf. additivity);
- (iii) That hypno-acupuncture is superior to acupuncture and/or hypnosis, each administered alone, across all administration protocols and all subjects; or
- (iv) That hypno-acupuncture is superior to acupuncture and/or hypnosis, each administered alone, under some conditions but not others.

The latter interpretation is especially important because the relative potency of either acupuncture or hypnosis when administered alone may not necessarily be constant at all effect levels. For example, different subjects may benefit from different protocols (in terms of dose and schedule) of the intervention, a concept known as aptitude  $\times$  treatment interaction (ATI) (60,61). If this is indeed true, then the interesting question is not just, 'Which of those treatments (acupuncture, hypnosis, or the combination of both) is the best?' but more importantly, 'Best or better for whom, when, and why?' The combination of ATI research and practical (or pragmatic) clinical trials (also known as PCT) (62), which are trials that focus on decision-making at the point of care, can provide robust means so as to maximize treatment safety, efficiency, and effectiveness. Furthermore, we advocate that all future hypno-acupuncture research would include a cost-effectiveness component so as to support therapeutic management decision-making at the policy level (63).

An important methodological challenge in all hypno-acupuncture research has to do with the choice of reference or control. In efficacy research, it would be important for both ethical and pragmatic reasons (e.g. recruitment capacity) to consider current standards of care. If, for example, one would want to assess the relative benefit of hypno-acupuncture for the prevention and control of CINV, where established guidelines exist as to what standard of care should be (64), the study would need to compare hypno-acupuncture in addition to, rather than in lieu of, antiemetic medications, to both acupuncture and hypnosis, each administered alone in addition to, rather than in lieu of, antiemetic medications—a complex design indeed from both a logistic standpoint and sample size needed. If, on the other hand, one would want to assess the relative benefit of hypno-acupuncture for the prevention and control of nausea and vomiting of pregnancy (NVP), where established guidelines as to what standard of care should be do not yet exist, the study would 'simply' compare hypno-acupuncture to both acupuncture and hypnosis, each administered alone, and to a natural history arm. In explanatory research, where the emphasis is on understanding how a treatment works, rather than on whether it works, the choice of control would have to take into consideration the many placebo-like mechanisms by which hypno-acupuncture might elicit its effects (see above).

## Conclusions and Future Directions

As much as we believe in the scientific plausibility and practical viability of hypno-acupuncture we would like to exercise caution and suggest a stepwise approach toward testing the synergism hypothesis. This is because there are a number of feasibility and developmental issues that need to be addressed first before a definitive study could be conducted. For example, in the absence of reliable data on the optimal intervention protocol and the exact procedures for hypno-acupuncture, there is a very real risk that a premature trial would result in either type I or type II errors, just as Block *et al.*

recently concluded (65). Hence, at the present time, more exploratory-developmental research is needed. Although this type of research will not immediately establish whether the combination of hypnosis and acupuncture is efficacious, it will provide the data necessary to optimally design and conduct efficacy, effectiveness and explanatory trials that would rigorously document the range of potential benefits and harm resulting from hypno-acupuncture.

Three important goals for this exploratory-developmental research would be as follows:

- (i) To establish a 'dose-response' curve for the hypno-acupuncture intervention;
- (ii) To determine whether this 'dose-response' curve differs across different individuals and disease conditions, as suggested by the ATI paradigm; and
- (iii) To examine the nature of the effect that the timing of the administration of acupuncture in relation to the timing of the administration of hypnosis may have on patients outcomes.

We believe that if and when definitive clinical trials lend support to the efficacy and effectiveness of hypno-acupuncture this unique package of care might be an important addition to the present armamentarium of care, which many consider suboptimal. For one, both hypnosis and acupuncture have an excellent safety profile (66,67). It is possible, therefore, that by using hypno-acupuncture, either instead of, or in addition to standard of care, some of the side effects associated with current treatments might be averted. Second, hypno-acupuncture may better match the therapeutic preferences of some patients (68), a phenomenon which may increase compliance and satisfaction with treatment. And lastly, both acupuncture and hypnosis are relatively inexpensive compared to many other treatments.

In conclusion, we present a new hypothesis that suggests synergism between two relatively safe and inexpensive modalities—hypnosis and acupuncture. We call for rigorous testing of that hypothesis through a new line of research that will inform clinical practice guidelines and health policy decision-making regarding the potential integration of hypno-acupuncture into healthcare.

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