

## Towards a More Meaningful Comparison of Meditation and Hypnosis

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In 2005, Pierre Rainville and I proposed that hypnosis be included in an early mechanistic model of meditation (Grant & Rainville, 2005) put forth by Newberg and Iversen (2003). The proposal was prompted by the substantial overlap we saw, experientially and in terms of associated brain networks, between the two phenomena. In the years that have followed a flurry of studies of meditation, from various research domains, have emerged. The articles in this special issue survey the current state of that proposal, offering clear points of convergence and divergence. Rather than providing an overview which would necessarily be more superficial

than the primary articles I will attempt to highlight several issues I think are important when contrasting meditation and hypnosis, in terms of the underlying mental/neural processes involved.

Beginning with a somewhat provocative question, I would like to ask whether a contrast between meditation and hypnosis is even meaningful. This may sound absurd at first but several conceptual and methodological issues arise which may call into question the validity of certain comparisons. While I believe the answer to the question is yes, that is, these phenomena can and should be compared, it is certainly not a simple and straightforward endeavor. In Fig. 1 an argument tree is presented which ends with the conclusion that there are many paths which could lead to invalid comparisons or erroneous interpretations. This is not meant to be an exhaustive list and is approached solely from a meditative perspective. I will work backwards through the tree to expand on these risks.

For any comparison of meditation and hypnosis, I think there is a substantial risk that the description of meditation, presented by the researchers, will not actually correspond to what is measured. This could occur for several reasons. First, ambiguity concerning the meditative practice/state being investigated could easily arise by conflating aspects of different meditation techniques into a single construct or qualitative description which, in actuality, does not exist. Meditation cannot be considered a solitary construct and while attempts have been made to meaningfully categorize the myriad

Risks Associated With Comparing Meditation and Hypnosis

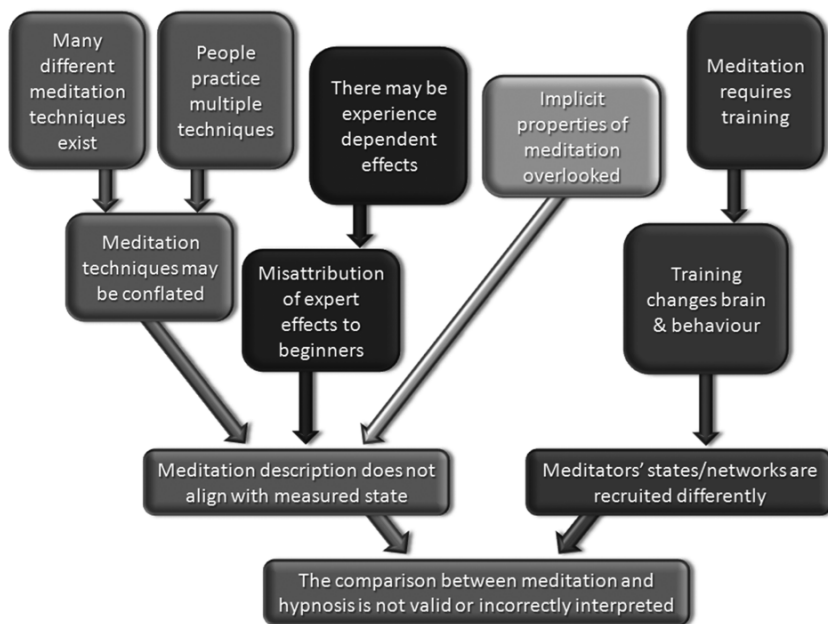


FIGURE 1. An argument tree summarizing several factors which could lead to an erroneous conclusion of similarity or dissimilarity when comparing meditation and hypnosis. Branches of the tree (variably shaded) represent different potential risks.

meditation techniques (most notably by Lutz et al. (2008)) many practices do not fit well within accepted taxonomies. Some practices may span several categories and others may not match any category. Different practices are intended to do different things and it follows that they will be associated with varying effects and experiential qualities. It would be wrong to assume for example, that all meditation practices lead to high levels of absorption. The likelihood of conflating one meditative technique with another is heightened by the fact that many people engage in multiple practices which likely influence one another and the abilities/qualities that arise from each practice.

A second route which may lead to an erroneous description of what was measured would arise if traits associated with expert meditators were mistakenly conferred to more novice practitioners. Traditional accounts of meditation, which are often cited as evidence for the association with certain mental states, are likely based on the experiences of monks who could be considered ‘career meditators’. Even if one correctly chose and measured a meditation practice which targeted mental absorption, to continue with that example, an individual may need to practice for years to see measurable increases. Thus, the state achieved by more novice practitioners may not involve the high levels of absorption the experimenters assume to be present.

The third path which may lead to an incorrect description of what is actually being compared to hypnosis relates to less obvious and possibly implicit aspects of meditation. One could argue that the two phenomena differ in terms of explicit suggestions, the motivation for the involvement and the relation to a guiding figure. I believe these differences are minimal.

While hypnosis involves explicit suggestions for some kind of effect which the recipient is motivated towards, meditation is often thought of as a ‘clearing of the mind’ and/or ‘letting go’. There may be seeds of truth to these descriptions of meditation but they certainly do not apply across the board and individuals do not simply begin meditation spontaneously. Likely, motivating

factors such as dissatisfaction, stress/anxiety or pain often lead an individual to seek out a coping strategy or means to remedy their ills. In seeking out such a remedy they will undoubtedly read books and articles, visit meditation centers and clinics and receive all kinds of ‘suggestions’ concerning the benefits and effects of meditative practice. While these may not be explicit suggestions made during the meditation session itself, as in hypnosis, they are undoubtedly embedded in the person’s desire to learn. Furthermore, meditators will often receive teachings (dharma talks) in between practice sessions. It may not be surprising that these talks are often delivered in a calm soothing voice by the guiding figure. Finally, somewhat closer to hypnosis, many meditations are guided. Certain exercises in the Mindfulness Based Stress Reduction (MBSR) fall under this category, which is arguably the most influential program in terms of the current scientific notion of meditation.

This brings up the final point in this category, the idea that the relationship between the client and hypnotist is a crucial difference when contrasting meditation and hypnosis. I would argue that a good meditation teacher is just as important to successful meditation as a hypnotist is to successful hypnosis, perhaps more so. In hypnosis trust or resonance is likely an important factor in the success of the state induction and outcomes. Owing to the fact that meditation is learned over a long period of time one must also trust that one’s teacher is adept, as this is a considerable investment. Further, meditation is not always as rosy and grey as it is often portrayed in the West. As one delves into the inner workings of the mind in an attempt to clear oneself of negative conditioned responses all sorts of personal crises may arise. It is in these times that a meditation teacher becomes of utmost importance, to guide and reassure the practitioner.

To summarize the first main branch of my argument tree, one must be careful to accurately describe the meditation state/practice they are attempting to contrast with hypnosis. Differences in technique, the number of practices an individual engages in, experience level within a technique and

less obvious aspects of meditation may all falsely lead to the conclusion that meditation and hypnosis are different, or conversely, similar.

The second major branch of the argument tree revolves around how one would go about contrasting meditation and hypnosis in a meaningful way. When conducting an experiment of emotional processing in healthy individuals one is sure to control for, and exclude, depressed participants as it is well established that this is a special population which is likely to show effects that are not applicable to everyone. For similar reasons it may not be appropriate, when contrasting states of hypnosis and meditation, to compare a group of people highly trained in meditation with a group of meditation naïve individuals undergoing hypnosis (i.e. between subject designs). There is abundant evidence now showing that meditation training alters many aspects of biological functioning including task-related and task-unrelated functional brain activation (Grant, Courtemanche, & Rainville, 2011; Taylor et al., 2012), brain structure including grey and white matter (Grant, Courtemanche, Duerden, Duncan, & Rainville, 2010; Luders, Clark, Narr, & Toga, 2011), behaviour and cardiovascular (Grant & Rainville, 2009), hormonal and immune (Pace et al., 2010) systems. Such evidence suggests that trained meditators are a special population and as such cannot reasonably be assumed to be comparable to a non-meditating sample. From a brain imaging perspective we may be able to conclude that states of meditation and hypnosis are different if the networks recruited during meditation differ from those recruited during hypnosis, all other things being equal. However, the evidence cited above suggests all other things are not equal. This raises many interesting questions. For example, is it reasonable to assume that meditators would have a similar activation pattern during hypnosis if they have pre-existing differences in the associated networks? Might meditation training change how one experiences hypnosis or the ability/susceptibility of the individual to induction and/or the suggestions? Perhaps a meditative state

in absolute beginners is more similar to a hypnotic state than a meditative state in advanced practitioners. An example from my own work with trained Zen meditators, in comparison to the work of a colleague with newly trained meditators (recently reviewed in (Zeidan, Grant, Brown, McHaffie, & Coghill, 2012)) suggests that meditation experience may make a big difference.

In a series of studies conducted in the lab of Pierre Rainville we were able to show that Zen meditators are less sensitive to pain and can modulate pain during mindful attention (Grant & Rainville, 2009). Further, they have thicker grey matter in pain-related regions (dorsal anterior cingulate for example) (Grant et al., 2010) and stronger functional activation of an overlapping set of regions during pain, in comparison to a control group (Grant et al., 2011). We did not observe any reductions in brain activation during the pain, in pain-related cortices, as has been observed during hypnosis (Rainville, Carrier, Hofbauer, Bushnell, & Duncan, 1999). On the other hand, Zeidan et al. (2011) observed even stronger pain reductions after training participants for a mere 4 days, which was associated with reduced activation of the primary sensory cortex, similar to hypnosis (Rainville et al., 1999). Thus, in some respects the meditative state in beginners, and the influence it had on pain and pain networks, resembled hypnosis more so than in long term practitioners. Of course this kind of comparison is exactly what I am trying to suggest is extremely limited.

Along with trying to illuminate possible pitfalls when contrasting meditation and hypnosis my aim was to suggest that a comparison of the extant literature will not provide much of an answer. Ultimately, the most fruitful way to compare meditation and hypnosis would be to do so within subjects and, if possible, with a longitudinal design. One could measure the influence of hypnosis and meditation (on pain perhaps) in meditation naïve individuals (a meaningful comparison in itself). This would be followed by a contrast of these same conditions, in the same individuals, after they have learned to meditate. Only then will

we be able to address questions of whether these two phenomena rely on the same brain networks and mechanisms. Smaller steps might cross sectionally contrast meditation naïve individuals in meditative and hypnotic states with trained meditators in the same conditions. Until such results are available I think there is insufficient evidence to conclude that meditation and hypnosis rely on the same or different neural mechanisms and we must be cautious when making our interpretations.

## REFERENCES

- Grant, J. A., Courtemanche, J., Duerden, E. G., Duncan, G. H., & Rainville, P. (2010). Cortical thickness and pain sensitivity in zen meditators. *Emotion, 10*(1), 43–53.
- Grant, J. A., Courtemanche, J., & Rainville, P. (2011). A non-elaborative mental stance and decoupling of executive and pain-related cortices predicts low pain sensitivity in Zen meditators. *Pain, 152*(1), 150–156.
- Grant, J. A., & Rainville, P. (2005). Hypnosis and meditation: Similar experiential changes and shared brain mechanisms. *Medical Hypotheses, 65*(3), 625–626.
- Grant, J. A., & Rainville, P. (2009). Pain sensitivity and analgesic effects of mindful states in Zen meditators: A cross-sectional study. *Psychosomatic Medicine, 71*(1), 106–114.
- Luders, E., Clark, K., Narr, K. L., & Toga, A. W. (2011). Enhanced brain connectivity in long-term meditation practitioners. *Neuroimage, 57*(4), 1308–1316.
- Lutz, A., Slagter, H. A., Dunne, J. D., & Davidson, R. J. (2008). Attention regulation and monitoring in meditation. *Trends in Cognitive Sciences, 12*(4), 163–169.
- Newberg, A. B., & Iversen, J. (2003). The neural basis of the complex mental task of meditation: Neurotransmitter and neurochemical considerations. *Medical Hypotheses, 61*(2), 282–291.
- Pace, T. W., Negi, L. T., Sivilli, T. I., Issa, M. J., Cole, S. P., Adame, D. D., & Raison, C. L. (2010). Innate immune, neuroendocrine and behavioral responses to psychosocial stress do not predict subsequent compassion meditation practice time. *Psychoneuroendocrinology, 35*(2), 310–315.
- Rainville, P., Carrier, B., Hofbauer, R. K., Bushnell, M. C., & Duncan, G. H. (1999). Dissociation of sensory and affective dimensions of pain using hypnotic modulation. *Pain, 82*(2), 159–171.
- Taylor, V. A., Daneault, V., Grant, J., Scavone, G., Breton, E., Roffe-Vidal, S., . . . Beaugard, M. (in press). Impact of meditation training on the default mode network during a restful state. *Social Cognitive and Affective Neuroscience*. doi: 10.1093/scan/nsr087
- Zeidan, F., Grant, J. A., Brown, C. A., McHaffie, J. G., & Coghill, R. C. (in press). Mindfulness meditation-related pain relief: Evidence for unique brain mechanisms in the regulation of pain. *Neuroscience Letters*. doi: 10.1016/j.neulet.2012.03.082
- Zeidan, F., Martucci, K. T., Kraft, R. A., Gordon, N. S., McHaffie, J. G., & Coghill, R. C. (2011). Brain mechanisms supporting the modulation of pain by mindfulness meditation. *Journal of Neuroscience, 31*(14), 5540–5548.