

EMPIRICAL RESOLUTION OF THE ALTERED STATE DEBATE

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Abstract

Kallio and Revonsuo (2003) correctly identify the central issue in the altered state debate as being whether trance state is needed to produce hypnotic experiences. Their suggested tests of that hypothesis are insufficient to answer that question. The data required for empirical resolution of the state debate are outlined here. In addition, the problems faced by state and nonstate theories are considered.

Key words: hallucinations, hypnosis, nonstate, posthypnotic suggestion, state

Empirical resolution of the altered state debate

Kallio and Revonsuo (2003) correctly identify the central issue in the altered state debate: ‘Is there a special hypnotic state (ASC) that serves as a background and gives rise to altered experiences produced by suggestion?’ (p.125), and there is no disagreement about the levels at which hypnotic phenomena need to be described and explained. That which is to be explained resides at the phenomenal level,¹ and a full explanation requires consideration of social-psychological, personal, cognitive, and neural influences and correlates of this explanandum (Kirsch and Lynn, 1995; Kirsch, 2001). State and nonstate theorists agree that hypnotic suggestions can produce altered states (i.e. the subjective experience of amnesia, analgesia, involuntariness, etc.). We disagree about whether these altered experiences depend on the prior induction of a trance state.

Kallio and Revonsuo postulate that true hypnosis is a rare phenomenon experienced only by hypnotic virtuosos who are capable of experiencing hallucinations without voluntary effort. Thus, they reject the altered state hypothesis for most hypnotic phenomena, including most clinical applications of hypnosis, which are by no means limited to hypnotic virtuosos. Their position is that social-cognitive concepts explain most hypnotic experiences (i.e. those which can be experienced by people who are not at the extreme upper end of hypnotic suggestibility), including those responses in which involuntariness is most characteristic (i.e. ideomotor responses, which can be obtained in 80% of the population). In this respect, their theory is very similar to that recently proposed by T. X. Barber (1999). Actually, Kallio and Revonsuo may be overly restrictive in their application of the altered state hypothesis. Hallucinatory responses and other cognitive alterations are not as rare as they suppose. Across three data sets in two different laboratories, 50% of college students passed the posthypnotic suggestion, 47% experienced a taste hallucination, 42% hallucinated a mosquito, and 25% displayed suggested amnesia (Kirsch, Silva, Comey and Reed, 1995).

Testing the altered state hypothesis

Kallio and Revonsuo propose two ‘ideal’ experimental designs ‘to test the ASC hypothesis’ (pp. 146 and 147). Neither of these alone really tests the altered state hypothesis, but the two of them combined (with some further elaboration) might.²

Assessing neutral hypnosis

In one of Kallio and Revonsuo’s (2003) ideal designs, neutral hypnosis is induced, with no suggestions (not even relaxation suggestions) other than the suggestion to enter the state of hypnosis. Changes in neural activity are assessed and interpreted as indications of a hypnotic trance state. There are two problems with this proposal. First, not all changes in consciousness qualify for the term altered state. According to Tart (1983: 19), an altered state involves ‘major alterations in both the content and pattern of functioning of consciousness. The major pattern connoted by “state” should not be trivialized by using the word “state” to refer to any change in condition.’ In other words, states such as focused attention, enhanced motivation and altered expectations are not altered states of consciousness. If this were all that the altered state hypothesis denoted, there would be no altered state debate. Nonstate proponents certainly believe that hypnotic inductions produce these mundane changes in consciousness and that they have neural correlates (Kirsch and Lynn, 1995).

A second problem with this ‘ideal’ design is that it does not address the critical issue of the causal role of the trance state in producing other suggested subjective experiences. Hypnotic inductions are suggestions to experience a trance state. For that reason, they should produce altered subjective states in many people, and these altered states should have neural substrates (Kirsch and Lynn, 1995). It is not clear that the experience and neural correlates of trance would be the same for all hypnotized subjects or even all virtuosos. Having different preconceptions about trance might lead to different subjective states and therefore to different neural substrates. In any case, the altered state hypothesis is not about the existence of these altered states, but rather about their hypothesized causal role in producing other hypnotic phenomena.

Assessing responses to suggested hallucinations

In Kallio and Revonsuo’s (2003) second ideal design, hypnotized subjects are given post-hypnotic suggestions to experience hallucinations in response to a specified cue. Their prediction is that ‘whenever the subject reports that they are consciously experiencing the hallucination, an increased level of activation, similar to that typically found for this type of phenomenal content, should be found in the appropriate areas’ (p. 147; but see Kirsch and Lynn, 1995, for a similar hypothesis from a nonstate perspective). Studies of this general type have been done (e.g. Kosslyn, Thompson, Costantini-Ferrando, Alpert, and Spiegel et al., 2000) and are very valuable. They substantiate self-reports of the subjective effect of the suggestion, but because they do not assess the causal role of trance, they do not test the altered state hypothesis.

The claim that this experimental design constitutes an ideal test of the altered state hypothesis rests on an unwarranted assumption. The assumption is that hallucinations are not possible without an altered background state of consciousness. Therefore, the presence of a hypnotic trance can be inferred from the verified presence of suggested hallucinations. The problem with this assumption is that it begs the question. The hypothesis that hallucinations and other exceptional phenomena can be elicited without a hypnotic trance state is precisely what nonstate theorists propose, and self-report data are consistent with that hypothesis. Subjects who have not been hypnotized report experi-

encing suggested hallucinations (Weitzenhoffer and Sjöberg, 1961; Barber and Glass, 1962; Hilgard and Tart, 1966; Braffman and Kirsch, 1999). If these subjects are not lying, one should be able to find corresponding increases in activation at the neural level, and these would suggest that a trance state is not a necessary causal factor.

Here is a real example of the pitfall of assuming that a hypnotically suggested effect indicates the effect of a hypnotic trance. Raz, Shapiro, Fan and Posner (2002) reported that a hypnotic suggestion to see words as if they were in a foreign language reduced Stroop interference in highly suggestible subjects. Because Stroop inhibition is widely regarded as automatic, one might interpret this as a major shift in information processing and hence as an altered state (although Raz et al., 2002 to their credit, did not make this claim). We have replicated these results with un hypnotized as well as hypnotized subjects (Pollard, Raz and Kirsch, 2003). Our data confirm that suggestion can modulate the Stroop effect in highly suggestible subjects, but they also indicate that this does not require the induction of hypnosis. Altered Stroop inhibition may be an altered state, but it is not necessarily a hypnotic state and does not reveal the presence of a trance.

Combining ideal experiments

Although neither 'ideal' experiment alone tests the altered state hypothesis, studies in which they are combined might well do so. One would have to induce hypnosis in exceptionally suggestible subjects, find neural changes indicating 'major alterations in both the content and pattern of functioning of consciousness' (Tart, 1983: 19), and then find subjective and neural changes specific to subsequently administered suggestions. If the altered state hypothesis is correct, these latter neural changes should not be possible without the preceding major alterations in consciousness. Note that this allows assessment of the 'slipping into hypnosis' hypothesis. Subjects who spontaneously slip into hypnosis without trance induction should show the same neural alterations as those in whom trance has been formally induced without any other suggestions being administered.

There are important pitfalls to avoid in studies like this. In particular, the holdback effect (Zamansky, Scharf and Brightbill, 1964) needs to be taken seriously. That means that at least some subjects have to be screened without a hypnotic induction (see Braffman and Kirsch, 1999, for an example of how to do this) and without any mention of hypnosis. Those scoring high in suggestibility and reporting the presence of the hypnotic phenomenon that will be assessed (e.g. the suggested hallucination) can be given the hallucination suggestion again, still without mention or induction of hypnosis, and the neurophysiological correlates of their reports can be compared to those obtained following an induction (either subsequently in the same subjects or in a separate group of subjects).

A second pitfall to avoid is changing the wording of the suggestion, in addition to varying whether hypnosis is induced. For example, one should not tell hypnotized subjects that they will see something, but tell nonhypnotized subjects to imagine something (e.g. Kosslyn et al., 2000). This confounds suggestion with induction and precludes any conclusions about the altered state hypothesis.

Problems that nonstate theories face

In delineating the problems that nonstate theories face, Kallio and Revonsuo focus almost exclusively on the inability of response expectancies to fully account for the hallucinations elicited by hypnotic (and nonhypnotic) suggestion. I too have noted the

incompleteness of expectancy as an explanation of hypnotic phenomena (e.g. Kirsch, 1991). Nevertheless, Kallio and Revonsuo underestimate the potential impact of response expectancy on experience. This may be related to their failure to clearly differentiate between stimulus expectancies and response expectancies. Stimulus expectancies are not ‘alterations in perception in association with ambiguous stimuli’ (Kallio and Revonsuo 2003: 131). Stimulus expectancies are beliefs about events that are external to the individual (e.g. that the car keys are on the kitchen table; Kirsch, 1985, 1991, 1999). I have not hypothesized these expectancies to be involved in responding to suggestion. In contrast, ‘response expectancies are anticipations of one’s own automatic reactions...Unlike stimulus expectancies, response expectancies are directly self-confirming’ (Kirsch, 1999: 4). These are the expectancies that are involved in the production of suggested responses.

Hypnotic response expectancies are expectancies of experiencing suggested phenomena in the absence of the stimulus events that might also cause these experiences. Highly suggestible people expect their arms to feel light even though they know there are no balloons pulling the arms up; they expect their arms to be drawn together ‘as if’ there were a powerful force acting on them; they expect to see a kitten on their lap even though they know it is not really there (Corney and Kirsch, 1999). They know that the external situation has not changed, even in those instances in which the suggestion wording implies that it has, because of their cultural understanding of hypnosis. They understand hypnosis as a situation in which people hear flies that are not there; not as a situation in which hypnotists subject them to real flies.

The role of response expectancies in hypnosis is similar to their role in generating placebo effects. A person who believes that medication is effective expects to experience medication-engendered responses that vary as a function of the type of medication, just as the hypnotized subject expects to experience whatever the hypnotist suggests. The expectation becomes specific only when the information about the supposed drug is provided or the specific hypnotic suggestion is given. Thus, the expectancy generated by a topical anaesthetic will be less pain in a specific location of the body, which is also the expectancy generated by a hypnotic suggestion for localized analgesia.

Problems that state theories face

Kallio and Revonsuo (2003) delineated some of the problems faced by state theories. In this section, I add two additional considerations to that list. These are the problems of accounting for posthypnotic suggestion and for the production of the trance state.

Posthypnotic suggestions are suggestions for the production of a hypnotic response (e.g. a hallucination) that will be triggered by a specified cue (e.g. a handclap) *after* trance has been terminated. This is often tested immediately after trance has been terminated, but sometimes a considerable amount of time (days or weeks) might intervene between the suggestion and its test. If a hypnotic trance is required for the response to a posthypnotic suggestion to occur, then people must be walking around in trance despite the suggestion to come out of trance. If hypnotic trance is not required, it is a suggestion that could be explained *only* by a nonstate theory. That is, if posthypnotic, rather than hypnotic, suggestions are used to induce hallucinations, as suggested by Kallio and Revonsuo (2003) in one of their ideal experiments, and if the performance of the posthypnotic suggestion takes place outside of the trance state, then trance is not directly involved in the production of the hallucination. The only alternative I can think of is to suppose that the cue produces an instant but temporary and spontaneously ending trance

state, thereby allowing the production of the post-hypnotic response. This is a rather extreme variant of the slip-into-hypnosis hypothesis, and it is comforting to note that no one has (as yet) proposed it.

This brings me to the second additional problem facing state theories. How is a hypnotic trance produced? Since trance is what we are trying to explain, it cannot be part of the explanation. This is not a problem for nonstate theories, even if they acknowledge the reality of suggested trance states (just as they acknowledge the reality of other suggested phenomena). Whatever causal principals they use to explain the production of suggested experiences such as subjective automaticity, cognitive and motor inhibitions, and hallucinations, they can also use to explain the production of trance. Expectancy is a case in point. It is well known that there are no specific procedures that are required for a hypnotic induction. Instead all that is needed is the subject's belief that the procedure is an adequate induction procedure (Sheehan and Perry, 1976). This lack of specific content seems enough to suggest that hypnotic inductions are placebos and that their effects can be considered expectancy effects.

Notes

- 1 The role of subjective automaticity in hypnotic responding needs some clarification. It is true that involuntariness has generally been considered a central characteristic of hypnotic responding, but this pertains more to ideomotor responses (which seem to be excluded from Kallio and Revonsuo's notion of 'true' hypnosis) and much less central to the more difficult cognitive suggestions, in which no overt behaviour is requested. Consider, for example, hypnotic pain control. If a patient reports a hypnotically-induced complete absence of pain during surgery, would you exclude this from being a truly hypnotic response if he or she reported having blocked the pain intentionally? Even with ideomotor suggestions, the requisite sense of automaticity pertains only to the overt behaviour and not to any intentional cognitive effort that is used to induce it. In fact, requests for intentional goal-directed fantasies are often included in ideomotor suggestions. On the Waterloo-Stanford scale (Bowers, 1998), for example, subjects are instructed to 'imagine that you are holding something heavy in your hand', 'think about a force acting on your hands to pull them together', and 'think of your arm becoming stiffer and stiffer'. Similar intentional generation of the response is explicitly requested in some of the cognitive suggestions as well (i.e. 'imagine that you have something sweet-tasting in your mouth, like a little sugar' and 'think about a pleasant time when you were in the fifth grade of school').
- 2 Note that the use of hypnotic virtuosos in testing the altered state hypothesis is not controversial. However, this comprises 5–15% of the population, thus enabling group studies, which are certainly preferable to the $n=1$ case studies advocated by Kallio and Revonsuo.

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