Commentary

Using hypnosis to gain insights into healthy and pathological cognitive functioning

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1. Introduction

The study by Raz and Campbell (this issue) adds to a growing number of recent papers employing hypnotic suggestion as a tool to explore the cognitive and biological substrates underlying normal and impaired psychological functions (for reviews see: Oakley, 2008; Oakley & Halligan, 2009, in press). The findings constitute a replication and extension of earlier studies by Raz and colleagues that collectively provide compelling evidence that post-hypnotic suggestion recruits control processes in a top-down manner to reduce, and in some cases eliminate, the well established word/colour Stroop effect in highly hypnotizable individuals. This replication of the Stroop inhibition effect by hypnotic suggestion is particularly welcome as several researchers reported difficulty in reproducing it consistently. More significantly, Raz and Campbell raise further operational and theoretical questions, relating in this case to the use of hypnotic, post-hypnotic and non-hypnotic suggestion and the utility of existing measures of hypnotizability.

2. Hypnosis and automaticity

Given the scepticism that hypnotic research still attracts it is significant that Raz and Campbell’s (this issue) findings provide a convincing demonstration of the ability of hypnotic suggestion to overcome highly overlearned and automatic skills. Moreover, their findings are consistent with similar studies describing the suppression of other putatively automatic attentional processes by hypnotic suggestion, notably the flanker compatibility effect (Iani, Ricci, Gherri, & Rubichi, 2006) and Simon interference task (Iani, Ricci, Baroni, & Rubichi, 2009). Future research needs to target other well established ‘automatic’
processes using specific hypnotic suggestions to selectively modulate phenomena such as perceptual implicit memory (as opposed to explicit memory), attentional blink, latent inhibition, repetition blindness, sensory gating and conceptual and perceptual priming. The use of hypnotic clinical analogues (virtual patients) assumes not only a match between the features of the clinical and hypnotic conditions but more crucially a putative common link to the underlying neurocognitive processes. A research agenda for future studies would be to reveal the relevant cognitive systems using experimental paradigms that provide for functional imaging.

3. Hypnosis and attention

The idea of describing hypnotic phenomena in terms of attentional abilities is not new and was developed by Gruzelier (1998) as part of a neuropsychological model of hypnosis that also emphasised hemisphere differences (Naish, in press). In a similar vein Raz and Campbell (this issue) rightly attribute their striking top-down modulation of lexical processing to the manipulation of attention (Raz & Buhle, 2006). An important aim for future studies of hypnotically induced inhibition of the word/colour Stroop effect will be to discover at what stage in the reading process the assumed attentionally mediated effect (the suggested deficit) produced its impact, in particular, whether the attentional disruption arises early or late in cognitive processing. According to Behrmann, Moscovitch, Black, and Mozer (1990) “early disruption suggests that the impairment occurs before stimulus identification, that is, where low-level representations are degraded”. By contrast, “late disruption would imply that the attentional impairment played a role once the stimulus has been processed to a high level and has been identified as a specific category or type” (Pashler & Badgio, 1987).

4. Hypnosis and clinical analogues

From a more clinical perspective the Raz and Campbell (this issue) paper highlights the broader instrumental utility of hypnotic analogues. The critical selective suppression of word meaning they demonstrated using hypnotic suggestion represents an apparently reliable, experimentally induced form of dyslexia. This is consistent with a rich and growing literature demonstrating the feasibility of generating clinically informative, subjectively compelling hypnotic analogues for established psychological and psychiatric conditions such as conversion disorder (paralysis, blindness, amnesia etc.), chronic pain and disturbances of voluntary motor control, particularly where these are thought to be functional in origin (Oakley & Halligan, 2009). Hypnotically suggested blindness, for example, is a striking phenomenon with a long history that provides evidence of congruence with its functional clinical equivalent in conversion disorder (Bryant & McConkey, 1989; McConkey & Barmier, 2004). There is also recent converging evidence that brain activity related to the hypnotically generated changes in experience and behaviour in these analogue conditions is similar to that encountered in the corresponding clinical conditions, notably in the case of conversion disorder paralysis (Cojan, Waber, Carruzzo, & Vuilleumier, in press; Cojan, Waber, Schwartz et al., 2009; Halligan, Athwal, Oakley, & Frackowiak, 2000), functional pain (Derbyshire, Whalley, & Oakley, 2009; Derbyshire, Whalley, Stenger, & Oakley, 2004; Raj, Numminen, Narvanen, Hiltunen, & Hari, 2005) and involuntary movements analogous to those seen in schizophrenia and other conditions (Blakemore, Oakley, & Frith, 2003). We have recently argued that this approach could be extended profitably to a whole range of developmental and acquired conditions and have provided preliminary evidence for this in the case of hemianopia, contralateral visual neglect and proposagnosia (see Oakley and Halligan (2009) and the supplementary material accompanying it).

5. Practical issues in using hypnosis as a research tool

5.1. Post-hypnotic suggestion

From a methodological perspective the technique used by Raz and Campbell (this issue) is interesting in that it involves the use of post-hypnotic suggestion. That is, a suggestion is given in hypnosis that on the presentation of a signal (in their case a hand clap) when the participant is no longer hypnotised a particular effect will be experienced (printed letters become meaningless). One apparent attraction of this strategy is that the experimental condition can be carried out with the participants in a ‘normal’ not hypnotised state. This however begs the question of whether what the authors refer to as ‘only a meaningless). One apparent attraction of this strategy is that the experimental condition can be carried out with the participants in a ‘normal’ not hypnotised state. This however begs the question of whether what the authors refer to as ‘only a

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suggesting with other forms of suggestion such as placebo effects, under conditions in which the suggested effect is similar (e.g. analgesia).

5.2. Hypnotic vs. non-hypnotic suggestion

Interestingly, Raz’s group have previously shown that it is possible to use the same Stroop cued suggestion paradigm successfully without the use of a hypnosis induction procedure (Raz, Kirsch, Pollard, & Nitkin-Kaner, 2006) indicating that it is compliance with the specific suggestion rather than any effect of hypnosis that is responsible for the reduced Stroop effect. However, as the participants involved in the Raz et al. (2006) study were all classed as being highly hypnotizable there remains the possibility that they spontaneously entered a hypnosis-like state during the delivery of the suggestion and/or the execution of the suggested effect even in the absence of a formal hypnotic induction (Barabasz & Barabasz, 2008). Again resolution of this question depends on discovering a unique and reliable marker for a hypnotic state. Irrespective of any possible role of spontaneous hypnosis, however, there is evidence that the effects of suggestion, especially at the level of brain activation, are greater when an individual is given a suggestion using a formal hypnotic induction than when the same suggestion is given without hypnosis (Derbyshire et al., 2009). At a practical level therefore there is a case to be made for continuing to deliver the target suggestions in hypnosis – especially if a focus of the studies is on concurrent brain activity.

5.3. Hypnotizability: suggestibility and hypnotic susceptibility

It is noticeable that Raz and Campbell (this issue) refer throughout their report to the two experimental groups as consisting of either highly suggestible individuals (HSIs) or less suggestible individuals (LSIs). As the suggestibility of their participants was measured by standard hypnotic susceptibility scales involving a hypnotic induction procedure the two groups would traditionally have been described as ‘high hypnotizables’ or ‘low hypnotizables’, and this is the sense in which the term ‘hypnotizable’ was used in preceding sections. In fact when describing their procedure for selecting participants Raz and Campbell (this issue) say ‘we screened volunteers for hypnotic suggestibility’. This reflects the more recent terminology advocated by Braffman and Kirsch (1999) who distinguish suggestibility tested in this way following a hypnotic induction procedure as ‘hypnotic suggestibility’ and as ‘imaginative suggestibility’ when the same suggestibility scales are administered without hypnosis. (Imaginative suggestibility is the equivalent to what has in the past been inaccurately referred to as ‘waking suggestibility’.) The two groups in Raz & Campbell’s (this issue) study could have been even more accurately described as being of ‘high hypnotic suggestibility’ and ‘low hypnotic suggestibility’. In fact an individual’s imaginative suggestibility score, along with response expectancy, is a very strong predictor of their hypnotic suggestibility score, which is consistent with both being measures of the same trait of suggestibility taken under different conditions. Braffman and Kirsch (1999) argue that the term ’hypnotizability’ should be reserved to describe any difference in suggestibility that is found between the two measures in the same individual. That is, it is a measure of any effect the hypnotic induction procedure has on imaginative suggestibility. A more direct measure of hypnotizability perhaps would be a reflection of how easily an individual enters into an independently defined hypnotic state but once more this will only be feasible when we have unequivocal markers for such a state. It might be helpful to readers unfamiliar with the hypnosis literature in the meantime to be aware that when reference is made to high and low hypnotizability or to high and low hypnotizable individuals what is being referred to is typically their ‘hypnotic suggestibility’ scores rather than any independently identifiable trait of ‘hypnotizability’.

References


