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Impulsivity, self-control, and hypnotic suggestibility

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ABSTRACT

Hypnotic responding might be due to attenuated frontal lobe functioning after the hypnotic induction. Little is known about whether personality traits linked with frontal functioning are associated with responsiveness to hypnotic suggestions. We assessed whether hypnotic suggestibility is related to the traits of self-control and impulsivity in 154 participants who completed the Brief Self-Control Scale, the Self-Regulation Scale, the Barratt Impulsiveness Scale (BIS-11), and the Harvard Group Scale of Hypnotic Susceptibility (HGSHS:A). BIS-11 non-planning impulsivity correlated positively with HGSHS:A (Bonferroni-corrected). Furthermore, in the best model emerging from a stepwise multiple regression, both non-planning impulsivity and self-control positively predicted hypnotic suggestibility, and there was an interaction of BIS-11 motor impulsivity with gender. For men only, motor impulsivity tended to predict hypnotic suggestibility. Hypnotic suggestibility is associated with personality traits linked with frontal functioning, and hypnotic responding in men and women might differ.

1. Introduction

1.1. Research question

During hypnosis, the hypnotised individual allows his or her own body and thoughts to follow the suggestions of the hypnotist. Upon suggestion a hypnotised person may move body parts without consciously intending to do so (Blakemore, Oakley, & Frith, 2003), be unable to carry out ordinary movements (Cojan et al., 2009; Halligan, Athwal, Oakley, & Frackowiak, 2000), experience amnesia (Mendelsohn, Chalamish, Solomonovich, & Dudai, 2008), or have auditory hallucinations (Szechtman, Woody, Bowers, & Nahmias, 1998). Responses to hypnotic suggestions typically feel involuntary, as if they were happening on their own or guided by an external force (Weitzenhoffer, 1980). Individuals differ in their propensity to respond to suggestions given during hypnosis, which is termed hypnotic suggestibility (see Kirsch & Braffman, 2001).

From an observer's perspective, it may seem as if hypnotic responding involves voluntarily giving up self-control and passing control to the hypnotist (although hypnotised individuals are in fact still able to control their own actions; Coe, Kobayashi, & Howard, 1973). Moreover, hypnotic responding might be described as impulsive in the sense that some of

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the actions or experiences during hypnosis appear to be directly triggered by suggestions rather than by conscious control or thought processes. It is therefore conceivable that individuals who tend to exhibit less self-control in general and who act more impulsively in everyday life might respond better to hypnotic suggestions than those who exhibit greater control and are less impulsive. This hypothesis was tested in the current study.

1.2. Self-control, impulsivity, and the frontal lobe

Self-control refers to a set of processes by which individuals control their own responses, states, or thoughts, typically in the pursuit of long-term goals. Self-control may involve overriding impulsive behaviours and unwanted thoughts, breaking habits, resisting temptations, making oneself persist and concentrate on a task, and deliberately changing one's own moods or emotions (Tangney, Baumeister, & Boone, 2004). There are some behavioural tasks that measure individual differences in the ability or propensity to apply self-control. For example, in the delay-of-gratification paradigm, participants can choose either to receive an immediate small reward (e.g., one marshmallow) or to wait for a larger reward (e.g., two marshmallows; Mischel, Shoda, & Rodriguez, 1989). Moreover, questionnaires have been developed, including the Brief Self-Control Scale by Tangney et al. (2004) and the Self-Regulation Scale by Schwarzer, Diehl, & Schmitz (1999). Questionnaires assessing self-control have, for example, been shown to predict academic success, quality of relationships, wealth, health and success in weight loss (Moffitt et al., 2011; Tangney et al., 2004; Will Crescioni et al., 2011).

Impulsivity, on the other hand, can broadly be defined as the propensity to act on arising impulses without engaging in much thinking. However, going beyond such a simple definition, research has shown that impulsivity is a much more complex, multifaceted construct (Evenden, 1999). For example, Patton, Stanford, and Barratt (1995) identified three subtraits of impulsivity in a factor analysis on a commonly used scale, the Barratt Impulsiveness Scale. These subtraits included *attentional impulsivity* (the difficulty to focus on tasks, having racing or intrusive thoughts), *motor impulsivity* (acting without thinking and inconsistency of lifestyle), and *non-planning impulsivity* (being present-focussed rather than future-oriented, not enjoying challenging mental tasks). Research often focuses on the negative consequences of being impulsive. Higher scores on questionnaires measuring impulsivity have, for example, been associated with alcohol consumption, aggression and risky driving (Dahlen, Martin, Ragan, & Kuhlman, 2005; Hair & Hampson, 2006; Stanford, Greve, Boudreaux, Mathias, & Brumbelow, 1996). However, impulsive behaviour can also be useful, for example when quick decisions for action are needed (e.g., see Dickman, 1990; Gullo & Dawe, 2008).

Self-control and impulsivity are often considered to be opposites of each other (Duckworth & Kern, 2011; Evenden, 1999; Kalenscher, Ohmann, & Güntürkün, 2006). However, this is likely not entirely true, at least in the way these concepts are currently measured. For example, Friese and Hofmann (2009) reported correlations of around $r = -.60$ between trait self-control and trait impulsivity, corresponding to 36% shared variance (see also Nebioglu, Konuk, Akbaba, & Eroglu, 2012). Thus, although high impulsivity and low self-control overlap in large parts, these two concepts are not redundant.

The frontal lobe has been shown to be important for self-control abilities (Casey et al., 2011), while attenuated frontal functioning might be related to impulsivity (Chen et al., 2007; Crews & Boettiger, 2009; Spinella, 2004). Patients with frontal lobe damage may, for example, have difficulties suppressing habitual responses (Perret, 1974), and/or their actions may be highly influenced by environmental stimuli (Lhermitte, 1986). In general, regions in the lateral part of the frontal lobe are important for *executive functions* (Miyake et al., 2000; Norman & Shallice, 1986). These include planning, problem solving, inhibition, attention, switching between tasks or monitoring actions (Chan, Shum, Toulopoulou, & Chen, 2008). In a meta-anaysis, Duckworth and Kern (2011) found that self-report measures assessing self-control (or low impulsivity) correlate weakly but significantly with performance on tasks of executive functioning. Weak correlations between questionnaires and behavioural tasks are relatively common in psychology (Meyer et al., 2001), and it has been argued that questionnaires and tasks, at least in part, measure different things (Dougherty, Mathias, Marsh, & Jagar, 2005; Reynolds, Ortengren, Richards, & de Wit, 2006; Stanford et al., 2009). That is, behavioural tasks assess particular abilities or preferences in specific contexts (e.g., the ability to focus on a visual target while distractors are presented in the periphery), and performance may depend to a substantial degree on participants' mental state (e.g., mood, fatigue). In contrast, questionnaires assess how participants rate their own behaviour and preferences over a broad range of situations over a long time span.

1.3. Hypnosis and the frontal lobe

As discussed above, impulsivity and low self-control have been related to diminished frontal lobe functioning (Casey et al., 2011; Chen et al., 2007; Crews & Boettiger, 2009). The frontal lobe also plays a key role in many theories of hypnotic responding. In the dissociated-control theory, Woody and Bowers (1994) propose that hypnotic responding is associated with dissociated or attenuated frontal lobe functions in responsive individuals (see also Bowers, 1992; Woody & Sadler, 1998, 2008). Similarly, the neurophysiological theory of hypnosis by Gruzelier (1998) posits that hypnotic responding results from the exhaustion of frontal lobe functions after an induction. Neo-dissociation theory (see Hilgard, 1991) also highlights a role for altered executive functioning in hypnotic responding. It states that during hypnosis, a part of the executive ego controls behaviour while another part is unaware of this. Finally, in the cold control theory, Dienes and Perner (2007) propose that hypnotised participants form inaccurate higher order thoughts (HOTs, Rosenthal, 2005) about their intentions. That is, this theory states that hypnotised participants are not aware of their intention to – for example – carry out a certain