



Developing the Sense of Agency Rating Scale (SOARS): An empirical measure of agency disruption in hypnosis

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ABSTRACT

Two experiments report on the construction of the Sense of Agency Rating Scale (SOARS), a new measure for quantifying alterations to agency. In Experiment 1, 370 participants completed a preliminary version of the scale following hypnosis. Factor analysis revealed two underlying factors: *Involuntariness* and *Effortlessness*. In Experiment 2, this two factor structure was confirmed in a sample of 113 low, medium and high hypnotisable participants. The two factors, *Involuntariness* and *Effortlessness*, correlated significantly with hypnotisability and pass rates for ideomotor, challenge and cognitive items. Twelve week test-retest correlations showed that *Involuntariness* was highly stable, but *Effortlessness* only moderately stable. Analysis of the combined datasets from Experiments 1 and 2 showed both SOARS scores were significantly related to the derived factors of Woody, Barnier, and McConkey's (2005) 4-factor model of hypnotisability. This scale clarifies conceptual confusion around agentive action and provides empirical support for a multifactorial account of sense of agency.

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1. Introduction

The experience of personal agency, the sense we have of controlling or initiating our actions, has been a topic of substantial research within cognitive science in recent years (e.g., Friston, 2012; Haggard, 2008; Pacherie, 2007). One domain in which marked alterations to sense of agency are regularly reported is that of hypnosis. One of the most striking aspects of hypnosis is the reduced sense of volition that high hypnotisable individuals experience when following suggestions (Hilgard, 1965; Kihlstrom, 1985; Lynn, 1997; Woody & McConkey, 2003). This change in feelings of control over one's actions in hypnosis has been called the 'classic suggestion effect' (Weitzenhoffer, 1974, p. 259) and is considered a defining characteristic of hypnotic behaviour. Kihlstrom (2008, p. 21) described the experiences of high hypnotisable people in hypnosis as involving "subjective conviction bordering on delusion, and involuntariness bordering on compulsion".

There are three challenges to understanding sense of agency in hypnosis. First, there is considerable theoretical disagreement among hypnosis researchers as to how and why hypnosis occurs and, in particular, the causes of alterations in the sense of agency. Second, there is no canonical method for assessing alterations to sense of agency in hypnosis. Third, across both theoretical and empirical research, labels and concepts have been applied inconsistently, leading to confusion over the terminology related to sense of agency.

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1.1. Theories of agency in hypnosis

Several competing theories purport to explain the phenomena of hypnosis and the associated shifts in sense of agency experienced by high hypnotisable individuals. Many of these theories distinguish between executive control and executive monitoring (Barnier & Oakley, 2009; Woody & Sadler, 2008). Executive control involves the voluntary initiation or termination of actions and thoughts. Executive monitoring involves the representation of perceptual and cognitive objects or events in conscious awareness. These processes interact to initiate and control self-generated actions. The various theories propose that hypnosis affects these cognitive systems in different ways.

One widely held view is that hypnosis affects executive monitoring processes while leaving executive control relatively intact (Hilgard, 1979; Kihlstrom, 2008). This position, known as dissociated experience theory (K. Bowers, 1990), claims that, during hypnosis, self-monitoring is impaired. Participants become unaware of particular aspects of their own cognition, including their intentions and volition. This leads to the impression that self-generated actions occur effortlessly although, in actuality, hypnotic responding does require cognitive effort. The involuntariness experienced in the hypnotic context, in this case, reflects a dissociation between experienced and actual levels of cognitive effort.

Social cognitive theories (Lynn, Kirsch, & Hallquist, 2008; Lynn, 1997; Spanos, 1986, 1991) provide another view of disruption to executive monitoring in hypnosis. These theories claim that the interaction of environmental factors (such as the setting in which hypnosis occurs), individual difference factors (such as the personality and motivation of the participant) and social factors (such as the expectations and attributions associated with the relationship between hypnotist and subject) leads to impairments in self-monitoring. Cognitive effort is required for hypnotic responding, but due to this impaired monitoring, the subjective experience of participants is that actions occur effortlessly. The involuntariness experienced in the hypnotic context, in this case, reflects a misattribution of the cause of self-generated actions.

A contrasting view is that hypnosis affects executive control while executive monitoring functions relatively normally (K. Bowers, 1992; Woody & Sadler, 1998, 2008). This position, known as dissociated control theory (Bowers & Davidson, 1991), claims that the hypnotic induction leads to a dissociation between executive control and lower level subsystems of action generation. Because of this dissociation, suggestions from the hypnotist directly activate participants' behaviour, bypassing the normal processes of effortful executive control. The involuntariness experienced in the hypnotic context, in this case, reflects genuinely low levels of cognitive effort. The positions outlined here do not represent a comprehensive account of theories of hypnosis. For other views see Jamieson (2007) and Barnier, Dienes, and Mitchell (2008).

For dissociated experience and social cognitive theories, reduced sense of agency is due to a disconnection between executive functioning and executive monitoring processes. For the dissociated control theory, a reduced sense of agency in hypnosis is due to a genuine reduction in the level of control individuals have over their actions. In all cases, however, the experience of (high hypnotisable) participants in hypnosis is marked by significant subjective alterations to sense of agency. To be able to differentiate between these accounts we need appropriate ways to index agency alteration.

1.2. Measures of agency in hypnosis

There has been no consensus over the best way to assess alterations to sense of agency in hypnosis and no canonical method has emerged. Despite the fact that agency alterations have been recognised as a central feature of hypnosis (Kihlstrom, 2008; Weitzenhoffer, 1974; Woody & McConkey, 2003), many researchers have focused on participants' subjective experiences more generally. Examples of detailed methodologies for assessing the phenomenology of hypnosis include the Experiential Analysis Technique (Sheehan & McConkey, 1982; EAT: Sheehan, 1992) and the Phenomenology of Consciousness Inventory (PCI: Pekala, 1991). Both of these methods provide a comprehensive overview of participants' experiences during hypnosis and include assessments of sense of agency. Unfortunately both of these techniques require considerable time to administer (the EAT is usually a 1 h interview whereas the PCI is a 53-item measure), and neither has been extensively used in hypnosis research. A more common method for assessing subjective experiences in hypnosis has been simply asking participants to make a single, retrospective, subjective rating of how a particular suggestion felt. These ratings have usually been administered as part of standardised measures of hypnotisability and typically have taken two forms: participants either have been asked to make numerical ratings of the degree to which they experienced involuntariness (or some related construct), or have been presented with several categorical descriptions of their subjective experience and asked to indicate which is the most accurate statement.

One difficulty with research involving numerical ratings is that participants have not always been asked to rate the same thing. The Carleton University Responsiveness to Suggestion Scale (Spanos, Radtke, Hodgins, Stam, & Bertrand, 1983) asks participants to rate the *intensity* with which they experience suggestions; the Creative Imagination Scale (Wilson & Barber, 1978) asks participants to rate the *similarity* of their experience of hypnotic suggestions to equivalent, non-hypnotic, events; adaptations to the Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C; Weitzenhoffer & Hilgard, 1962) proposed by K. Bowers (1981) and P. Bowers (1982) ask participants to rate feelings of involuntariness; and the 'Inner Subjective Experiences Scale' (Kirsch, Council, & Wickless, 1990) asks for composite ratings of both realness and involuntariness.

Although each of these measures taps some aspect of subjective experience in hypnosis, the constructs investigated (intensity, realness and involuntariness) are not equivalent and it is unclear how each relates to sense of agency. Research into the heterogeneity of hypnotic performance has shown that high hypnotisable participants ("highs") use several distinct response styles (Sheehan & McConkey, 1982). For some types of highs, differing aspects of subjective experience could be

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