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Automatic goals and conscious regulation in social cognitive affective neuroscience

Chandra Sripada^{a,b}, John D. Swain^c, S. Shaun Ho^a, and James E. Swain^{a,d}

Chandra Sripada: sripada@umich.edu; John D. Swain: john.swain@cern.ch; S. Shaun Ho: hosh@med.umich.edu; James E. Swain: jamesswa@med.umich.edu

^aDepartment of Psychiatry, University of Michigan School of Medicine, Ann Arbor, MI 48109

^bDepartment of Philosophy, University of Michigan School of Medicine, Ann Arbor, MI 48109

^cDepartment of Physics, Northeastern University, Boston, MA 02115

^dDepartment of Psychiatry, Child Study Center, Yale University School of Medicine, New Haven, CT 06520

Abstract

The Selfish Goal model challenges traditional agentic models that place conscious systems at the helm of motivation. We highlight the need for ongoing supervision and intervention of automatic goals by higher-order conscious systems with examples from social cognitive affective neuroscience. We contend that interplay between automatic and supervisory systems is required for adaptive human behavior.

Huang & Bargh (H&B) challenge traditional agentic models that place conscious systems at the helm of motivation. Their Selfish Goal Theory sees an agent as a decentralized population of *goals* – mental representations of desired end-states that are automatically cued by environmental contexts. Importantly, on this picture, most motivated behavior arises from complex interactions between multitudes of goals that are constantly being activated and executed according to situation and context. Conscious systems by contrast are claimed to play a limited and peripheral role in our agentic lives.

We propose that automatic goals and conscious systems are more closely interlinked than Selfish Goal Theory portrays. Unconscious goals may very well be the proximate driver of behavior in most situations. But, in ways that we elaborate below, maladaptive goal pursuit is often avoided because of ongoing monitoring by higher-order systems and availability of conscious intervention for regulation of inappropriate motives.

The relationship between automatic goals and conscious supervisory control is vividly illustrated in cases of temptation. H&B discuss cases in which a person's goals are in conflict. For example, a person has the goal of losing weight, as well as the goal of eating an appealing dessert. More extreme instances are found in addiction, where a person has the long-standing and central goal of never again consuming the drug, as well as the suddenly active goal of getting high. H&B note that goal conflict of this kind can lead to regulation that occurs unconsciously, i.e., automatically and without conscious awareness. Although unconscious or other forms of automatic regulation are certainly real phenomena (Gross

2002; Phan & Sripada 2013), a common feature of temptation-involving situations are hardly discussed by H&B: Conscious, volitional self-regulation strategies are mobilized to inhibit the temptation-directed motives. More broadly, effortful top-down regulation of prepotent, automatic, or situation-cued motives is a ubiquitous phenomenon, and Selfish Goal Theory ought to make a place for it.

We propose a dual picture of motivation that recognizes dynamic interplay between automatic goal structures and supervisory conscious systems (Chaiken & Trope 1999; Hofmann et al. 2009; Sripada 2014). Monitoring systems play a critical role in adaptively linking the two systems. An example is the conflict detection system implemented in the anterior cingulate cortex (Botvinick et al. 2004). This brain regions fires in the presence of discrepant prepotent responses (Barch et al. 2001), performance errors (Carter et al. 1998), or competing goals or judgments (Greene et al. 2004; Seymour & McClure 2008). Activation of this region is thought to bring online supervisory systems, typically conscious, that bring additional cognitive resources to bear in conflict resolution (Botvinick et al. 2001).

Indeed, conscious supervisory systems are implicated in a range of regulatory control processes (Gross 2002). For example, roughly 50 neuroimaging studies have examined the phenomenon of volitional emotion regulation (Ochsner & Gross 2005; Ochsner et al. 2012; Phan & Sripada 2013; Swain 2011). In these studies, participants view or hear aversive stimuli while undertaking regulation strategies such as reappraisal and distancing in order to inhibit spontaneous negative responses. These studies confirm circuits linking prefrontal and superior parietal regions, responsible for planning and higher-order thought, with amygdala and striatum, which are responsible for producing spontaneous aversive and appetitive responses (Phan & Sripada 2013). In another specific example, new mothers exercise regulation in responding to the aversive stimulus of baby-cry, which is correlated with the behavioral construct, parental sensitivity construct (Kim et al. 2011), which in turn – based on key parental brain circuits and hormones that are activated by baby stimuli – facilitates the development of key social brain systems in the child (Mayes et al. 2005; Swain et al. 2004; 2011; Feldman et al. 2013).

Although H&B emphasize the automaticity of goals and unconscious regulation, we believe that conscious, volitional regulation processes such as these emotion regulation processes contribute importantly to resolution of goal competition, especially in the context of temptation-involving situations such as dieting and addiction (sect. 4., paras. 1 and 2).

These observations suggests an alternative picture in which automatic goal systems and conscious supervisory systems might be more interlinked more tightly than H&B suggest. Selfish Goal Theory might well be right that the preponderance of behavior emerges from automatic goal processes. But these processes are themselves at all times under constant monitoring by higher-order systems. In key contexts – goals are in serious conflict; goals of substantial significance are being undertaken; goals are pursued in contexts where error could lead to significant negative consequences – conscious supervisory systems are brought online for additional in-depth evaluation of priorities and for real-time adjustment and

control in order to fix errors and increase survival potential. The coordinated operation of both systems is required for an agent to produce adaptive behavior.

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