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ABSTRACT
This article applies General System Theory to the formalization of the Cognitive Affective Personality System (CAPS). A model is developed as means for understanding the relationships between widely studied constructs at the individual level of analysis: personality traits, affectivity, self-efficacy, intrinsic task complexity, and managerial empowerment, among others. The resulting theoretical framework is formalized within the setting of software development tasks, and qualitatively studied to show holistic emergent behavior. The discussion offers novel insights for future research and proposes quantitative analysis methods to unlock novel management strategies and productivity gains. [Article copies are available for purchase from InfoSci-on-Demand.com]

Keywords: Affectivity; Cognition; Self-Efficacy; Software Development; System

The systems approach will have to disturb typical mental processes and suggest some radical approaches to thinking. (Churchman, 1968, p. 12).

The use of systems theory to study organizational phenomena is extensively supported in the General Systems and the System Dynamics literatures (Ashby, 1956; Churchman, 1968; Ackoff, 1971; 1973; Wolstenholme & Coyle, 1983; Vancouver, 1996; Wolstenholme, 1999; Mora, Gelman, Cervantes, Mejia, & Weitzenfeld, 2002; among others). In this article the Systems Approach (Bertalanffy, 1951; Churchman, 1968) is used to characterize the cognitive processing of software developers as an open system, in interface with the organizational environment, namely: the interactions with the management, the environmental resources, and the characteristics of the tasks being pursued.

The purpose of this article is to propose a theoretical model capable of depicting the...
cognitive processing of a software development agent, as the interaction of several cognitive-affective, personality, and environmental constructs, and to offer a discussion on its validity and the managerial benefits derived from its formal study.

The value of system-theoretical approaches in psychological conceptualizations has been discussed since the formulation of the General Theory of Systems (Bertalanffy, 1971). Allport (1961, p. 109) has emphasized the systemic nature of the organisms' psychology: “whatever else personality might be, it has the properties of a system”. These ideas are formalized as a system of interacting personality and cognitive-affective components. By doing this the theoretical representation can be used to understand the complex response of software development agents to their environment.

A simplified model of the CAPS is shown in Figure 1. In this figure several environmental elements affect elements inside the CAPS, and the elements within the CAPS interact among themselves and affect other elements in the environment. The figure is an adaptation of the one included in Mischel & Shoda (1995, p. 254). The remainder of the article focuses on the characterization of the elements in the environment, the ones inside the CAPS, and the support of the links established among them in the model.

This research accepts the existence of systems as ontological constructions. We ascribe to the interpretation of the reality of human cognition to a Critical Realist (CR) philosophical perspective. As expressed by Mingers (2004a) in reference to the original ideas of Bashkar (1993), CR advocates for an ontological pluralism where the Real is conformed by “different kinds of entities with differing ontological properties and thereby differing epistemological possibilities: physical entities, ideas and concepts, feelings and reasons, languages, meanings, norms, practices and social structures” (Mingers, 2004a, p. 150). Their ontological existence, albeit they might not be observable, emerges from their potential participation on causal processes (Mingers, 2004a).

The social and cognitive construction of reality is embedded in the CR epistemology. Bhaskar (1993) models four types of social interactions: material transactions with nature; direct interactions with other people; relations

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**Figure 1.** Simplified model of the Cognitive-Affective Personality System in the environment. The continuous lines represent positive relations and the discontinued lines negative interactions.
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