

Autonomy and Socialization
Abstract

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For quite some time it has been popular to study intelligence within the context of autonomous systems. When studying autonomous systems, the focus is often on the adaptive perceptual, behavioral and cognitive capabilities of an individual within some operational environment. However, if we look at the behavior of biological systems, we see dependency on other individuals as well as autonomy, and capabilities for coping as a member of a population as well as coping as an individual. Of course, there is enormous diversity in how frequently or in what manner the members of a given biological population interact.

In the past, many researchers, while they recognized the importance of animal populations and group behaviors, took the scientific strategy of focusing first on discovering the mechanisms for the individual's perception and behavior. They assumed that such behaviors were somehow more fundamental than group behavior. The strategy assumed that they could later tackle the additional capabilities needed for social, cooperative, or interactive behaviors. This paper presents the view that social behaviors are as fundamentally part of the construction of intelligent behavioral capabilities and as essential for survival as any individual's perceptual, cognitive or behavioral capabilities. This paper also presents our reasons for believing that some type of analogues of social capabilities are necessary to all autonomous constructed systems, such as "agents" or robots, if we want intelligent, independent behavior in real world environments. We will describe the types of capabilities necessary for adaptive behavior in both individual and social behavior. We will then discuss how social behaviors, cultures, and cooperative behaviors enhance the capabilities for individual autonomous behavior.