We come ready to investigate, to search for coherence and meaning. Embedded in the process of satisfying our basic wants and needs are a lot of problem-solving skills – something I like to call “cephalic capabilities.” I use the word *cephalic*, an older word not much used in the neurosciences, because of its link to the brain in the context of the body. Our brains are not “a brain in a vat” – that is, a brain detached from action and divorced from the contours of adaptation; rather, a brain is part of a body in space and time that is the rare limiting factor for behavior and experience. This chapter deals with some of the foraging skills our cephalic capabilities allow.

We do not come into the world as a blank slate. Rather, diverse forms of cognitive capabilities permeate neuronal expression and structure at the very onset of life (Carey, 2009). These capabilities include the ability to think about numbers, food, space, time, detecting others and their beliefs, and so on. We also start out with a certain cephalic plasticity. Regions of the brain are modified by experience. While other animals have some plasticity, in humans it is vast: look at the diverse languages we can learn, the many forms of music we can express, the different inventions that we can generate, all of which expand our sense for seeing, hearing, and knowing.

Cephalic systems traverse the whole of sensory and information-gathering systems with which we sample the world and update our orientations. There is no separation of a mind from a body, but there are diverse forms of information sampling of the environment, both internal for what is to be sustained in viable ways and sampling external events for what is occurring.

This capability has been called many things, including “Descartes’ Error” (by the neurologist Damasio, 1994). For some, there is a
separation of bodily sensibility from larger scale rational assessment, but many thinkers never made this short-sighted mistake (e.g. Dewey, 1925; Merleau-Ponty 1968). The issue in cephalic functioning (and its evolution by adding on diverse forms of information processing and of sampling and appraising diverse terrains) is its adaptive value and applications.

In this chapter, I begin with a discussion of organized action, inferences about objects, and inquiry and learning in a context of foraging for coherence. Problem solving is a continuous function across the natural and cultural landscape as we look into our evolutionary past, neural systems, and present circumstances (Dewey, 1910).

Codified habits Codified habits are well-organized forms of action. Coherence requires continual appraisal amid codified habits, which was something Charles Sanders Peirce thought of metaphorically as “frozen cognition.” It is a misleading metaphor, perhaps, but it does undercut a mind/body distinction, suggesting information processing that is adaptive and functional for the discernment of predictive discomfort and disappointment (Peirce, 1889). Codified habits are the stuff of everyday action: all the many ways we function in the world. Normal functioning – for example, getting through doors, recognizing faces, deciding to cross at the crosswalk – are all codified habits of behavioral responses.

We also now know that regions of the brain, such as the basal ganglia, underlie codified structural habits (Graybiel, 1998). They are as diverse as the motor possibilities in our species. The systems are finite, but creative capabilities are inherently in cephalic systems, embedded in the “life world” (Schutz, 1932) of foraging for coherence. Noam Chomsky (1965) describes the many forms of linguistic expression available from a finite set of phonemes by the novel combination of events. Novel forms of syntactical expression also take root in diverse motor expression, orchestrated by the basal ganglia.

Syntax does not exist in a vacuum, however. It provides a context for adaptation, sampling, expanding for coherence, foraging, making sense, and problem solving. In a world that matters, survival, long-term reproduction, shorter-term social contact, and comfort are all at stake. Social comfort is no panacea for us. We survive because of our relationships. We were helpless at first, and we still need others to get through our entire lives.

But being alone is also a nontrivial part of who we are. Our capacity to master things on our own and to enjoy doing it is almost as essential to us as is social interaction. Jean-Jacques Rousseau, in Reveries of a Solitary