

# DISCOVERING AND EXPLORING HABITS OF MIND

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# CHANGING PERSPECTIVES ABOUT INTELLIGENCE

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*What is intelligence if not the ability to face problems in an unprogrammed (creative) manner? The notion that such a nebulous socially defined concept as intelligence might be identified as a “thing” with a locus in the brain and a definite degree of heritability—and that it might be measured as a single number thus permitting a unilinear ranking of people according to the amount they possess[—]is a principal error. . . [,] one that has reverberated throughout the country and has affected millions of lives.*

Stephen Jay Gould

The changing conception of intelligence is one of the most powerful, liberating forces ever to influence the restructuring of education, schools, and society. It also is a vital influence behind the development of the habits of mind, which are detailed more fully in the next chapter. To better understand those habits of mind, though, it is important to grasp how the concept of intelligence has changed over the last century. This chapter traces the evolution of conceptions of intelligence. It also considers how some of the significant researchers, educators, and psychologists influenced and transformed mental models of the intellect. This chapter goes on to show the relationship between the habits of mind and such other programs, theories, and trends in education as technology, multiple intelligences, and brain research.

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## INTELLIGENCE FOR A BYGONE ERA

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At the turn of the 19th century in the United States, society was undergoing great shifts. Masses of immigrants poured into the nation, moving inland from their ports of entry or staying in the large eastern cities to fill the needs of the job-hungry Industrial Revolution. In retrospect, it is easy to see that the society of that day was elitist, racist, and sexist, its actions fueled by a fear of diluting “Anglo-Saxon purity.” Employers of the time believed they needed a way to separate those who were educable and worthy of work from those who should be relegated to menial labor (or put back on the boat and shipped to their country of origin).

World War I contributed to homogenizing classes, races, and nationalities. Through military travels, enhanced communication, and industrialization, our population was becoming more cosmopolitan. A popular song of the time, “How Ya’ Gonna Keep ’Em Down on the Farm After They’ve Seen Patee?” alerted the aristocracy to the impending trend toward globalization. Metaphorically the song proclaimed that to protect the existing separation of the masses into their “rightful” places, there was a need to analyze, categorize, separate, distinguish, and label human beings who were “not like us.” Some means was necessary to measure individuals’ and groups’ “mental energies,” to determine who was “fit” and who was not (Gould, 1981; Perkins, 1995).

Thanks to a mentality ruled by ideas of mechanism, efficiency, and authority, many came to believe that everything in life needed to be measured. Lord Kelvin, a 19th century physicist and astronomer, stated: “If you cannot measure it, if you cannot express it in numbers, your knowledge is of a very meager and unsatisfactory kind.” Born in this era was Charles Spearman’s theory of general intelligence. His theory was based on the idea that intelligence is inherited through genes and chromosomes and that it can be measured by one’s ability to score sufficiently on Alfred Binet’s Stanford-Binet Intelligence Test, yielding a static and relatively stable IQ score (Perkins, 1995, p. 42).

Immersed in the “efficiency” theories of the day, educators strived for the *one* best system for curriculum, learning, and teaching. Into this scene of educational management entered Edward L. Thorndike from Columbia University. He went beyond theory to produce usable educational tools including textbooks, tests, curriculums, and teacher training. Thorndike continues to wield a tremendous influence on educational practice. His “associationist” theory suggests that knowledge is a collection of links between pairs of external stimuli and internal mental responses. In this

context, learning is thought to be a matter of increasing the strength of the “good,” or correct, bonds and decreasing the strength of the incorrect ones. Spearman’s and Thorndike’s theories still serve educators as a rationale for procedures such as tracking students according to high and low aptitude, the bell curve, drill and practice, competition, frequent testing, ability grouping, IQ scores as a basis for special education, task-analyzing learning into separate skills, and reinforcement of learning by rewards and external motivations (Resnick & Hall, 1998).

When people view their intelligence as a fixed and unchangeable entity, they strive to obtain positive evaluations of their ability and to avoid displaying evidence of inadequate ability. They believe their intelligence is demonstrated in task performance: They either have or lack ability. This negative self-concept influences effort. Effort and ability are negatively related in determining achievement, and having to expend great effort with a task is taken as a sign of low ability.

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### TOWARD A NEW VISION

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Clearly, something new is needed if schools are to break out of this traditional, aptitude-centered mentality and make it possible for young people to acquire the kinds of mental habits needed to lead productive, fulfilling lives. We need a definition of intelligence that is as attentive to robust habits of mind as it is to the specifics of thinking processes or knowledge structures. We need to develop learning goals that reflect the belief that ability is a continuously expandable repertoire of skills, and that through a person’s efforts, intelligence grows incrementally.

Incremental thinkers are likely to apply self-regulatory, metacognitive skills when they encounter task difficulties. They are likely to focus on analyzing the task and trying to generate and execute alternative strategies. They will try to garner internal and external resources for problem solving. When people think of their intelligence as something that grows incrementally, they are more likely to invest the energy to learn something new or to increase their understanding and mastery of tasks. They display continued high levels of task-related effort in response to difficulty. Learning goals are associated with the inference that effort and ability are positively related, so that greater efforts create and make evident more ability.

Children develop cognitive strategies and effort-based beliefs about their intelligence—the habits of mind associated with higher-order learning—when they continually are pressed to raise questions, accept challenges,

find solutions that are not immediately apparent, explain concepts, justify their reasoning, and seek information. When we hold children accountable for this kind of intelligent behavior, they take it as a signal that we think they are smart, and they come to accept this judgment. The paradox is that children become smart by being treated as if they already are intelligent (Resnick & Hall, 1998).

A body of research deals with factors that seem to shape these habits, factors that have to do with people's beliefs about the relation between effort and ability. The following discussion traces the historical pathways of influential theories that have led to this new vision of intelligent behavior (Fogarty, 1997).

#### INTELLIGENCE CAN BE TAUGHT

Ahead of his time, Arthur Whimbey (Whimbey, Whimbey, & Shaw, 1975) urged us to reconsider our basic concepts of intelligence and to question the assumption that genetically inherited capacities are immutable. Whimbey argued that intelligence could be taught, and he provided evidence that certain interventions enhance the cognitive functioning of students from preschool to college level. Through instruction in problem solving, metacognition, and strategic thinking, Whimbey's students not only increased their IQ scores but also displayed more effective approaches to their academic work.

Participants in such studies, however, ceased using the cognitive techniques as soon as the specific conditions of training were removed. They became capable of performing the skill that was taught, but they acquired no general *habit* of using it and no capacity to judge for themselves when it was useful (Resnick & Hall, 1998).

To accommodate new learning, the brain builds more synaptic connections between and among its cells. It has been found that IQ scores have increased over the years (Kotulak, 1997). These increases demonstrate that instead of being fixed and immutable, intelligence is flexible and subject to great changes, both up and down, depending on the kinds of stimulation the brain gets from its environment.

#### STRUCTURE OF THE INTELLECT

J. P. Guilford and R. Hoepfner (1971) discerned 120 factors of the intellect. They believed that all students have intelligence, but they defined it as "what kind" instead of "how much." Guilford and his associates believed that intelligence consists of 120 thinking abilities that are combinations