(1) fluid intelligence and (2) crystallized intelligence. Fluid intelligence refers to abilities independent of acquired knowledge, such as abstract reasoning, logical problem solving, and the speed of information processing. They defined crystallized intelligence as accumulated knowledge and verbal and numerical skills. This theory has interested researchers focused on aging because crystallized intelligence increases with experience and formal education and grows as we age, whereas fluid intelligence is not influenced by these factors and actually declines with age. A recent large-scale study, however, revealed that this differentiation may be too simplistic and that various cognitive abilities that make up intelligence peak at different ages (Hartshorne & Germaine, 2015). We will return to this theory in Chapter 7 when we consider how intelligence changes across the life span.

All of the theories we have discussed thus far focus on definitions of intelligence as mental abilities that can be assessed by standard intelligence tests such as the Stanford-Binet and WAIS. Three major contemporary theories by Howard Gardner (1983, 1993, 1999), Robert Sternberg (1985, 1988, 1999), and Keith Stanovich (2009a,b) extend this definition to include other types of abilities. We'll consider Gardner's first. According to Gardner's theory of multiple intelligences, there are eight independent intelligences—linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, intrapersonal, interpersonal, and naturalistic. Brief descriptions of each of these intelligences are given in Table 6.1. The linguistic and logical-mathematical intelligences seem to fit with other definitions of intelligence in terms of mental abilities, but the other six are controversial; many psychologists see these as talents or skills instead of types of intelligence. In addition, many of these intelligences are difficult to quantify (such as intrapersonal intelligence) and present measurement problems.

According to Sternberg's triarchic theory of intelligence, there are three types of intelligence—analytical, practical, and creative. Analytical intelligence is essentially what is measured by standard intelligence tests, the skills necessary for good academic performance. However, the other two types of intelligence are

Table 6.1 Brief Descriptions of Gardner's Eight Intelligences

Linguistic	Language ability as in reading, writing, and speaking
Logical-mathematical	Mathematical problem solving and scientific analysis
Spatial	Reasoning about visual-spatial relationships
Musical	Musical skills such as the ability to compose and understand music
Bodily-kinesthetic	Skill in body movement and handling objects
Intrapersonal	Understanding oneself
Interpersonal	Understanding other people
Naturalist	Ability to discern patterns in nature

not really measured by standard intelligence tests. Practical intelligence could be equated with good common sense or "street smarts." Creative intelligence is concerned with the ability to solve novel problems and deal with unusual situations. Sternberg's intelligences are all types of mental ability, but the inclusion of practical and creative intelligences broadens our conception of intelligence by including mental abilities that seem to have more applicability in the nonacademic world.

Cognitive researcher Keith Stanovich (2009a,b) argues that intelligence is a meaningful, useful construct and, unlike Gardner and Sternberg, is not interested in expanding the definition of intelligence. Rather he argues that intelligence is only one component of good thinking and thus by itself is not sufficient to explain such thinking. The other critical component is our ability to think and act rationally, which is not assessed by standard intelligence tests. Furthermore, these two components are independent, so you can be intelligent and not act rationally and vice versa. This is why smart people sometimes do foolish things. Stanovich coined the term "dysrationalia" to describe this failure to think and behave rationally despite having adequate intelligence.

One cause of dysrationalia is that we tend to be cognitive misers, using System 1 (fast, nonreflective processing) too much. This is the reason we have developed a whole set of heuristics and biases (many, such as the anchoring and adjustment heuristic, the representativeness heuristic, and confirmation bias, were discussed earlier in this chapter) to limit the amount of reflective, analytical thinking that we need to engage in. As we have learned, these shortcut strategies provide rough-and-ready answers that are sometimes right but often wrong. Another source of dysrationalia is what Stanovich calls the mindware gap, which occurs when we haven't learned the appropriate mindware (specific knowledge, such as an understanding of probability, and cognitive rules and strategies, such as scientific thinking, that are necessary to think rationally). According to Stanovich, many intelligent people never acquire the appropriate mindware. Finally, given such causes, Stanovich thinks that rational thinking and behavior can be taught and that they ought to be taught at every stage of the educational system. Richard Nisbett, in his 2015 book *Mindware: Tools for Smart Thinking*, provides a guide to the most essential mindware tools and how to frame common problems so that these tools can be applied to them.

The six theories of intelligence that we have discussed are briefly summarized in Table 6.2. Next we will consider the controversial nature–nurture debate on the basis of intelligence.

Nature versus nurture. Not only do psychologists disagree on the definition of intelligence, they also argue about its origins—the nature–nurture debate that we discussed earlier. This debate was popularized by Galton, a strong proponent of the nature side of the argument, over a century ago. Most contemporary psychologists, however, believe that both heredity (nature) and environmental experiences (nurture) are important. The disagreement now is over the relative contribution