

## Chapter 2

# Critical Thinking and Intellectual Style

**Abstract** The aim of this second chapter is to present a review of literature on critical thinking and on intellectual styles in order to point out the potential intersections between critical thinking and intellect. These pages are directed toward an integration of intellectual ability, learning style, personality and achievement motivation as predictors of the decision-making process. We point out the main factors affecting decision processes in the current complex scenario recalling some concepts illustrated in “Decision Making in the Social Sciences”. Far from the normative approach, we present insights on the adaptive nature of the decision-making process in our complex society: people adapt according the age, the experience, the contexts, and the role we play.

While research into judgments based on similarities and/or comparisons reveal that both the actual stimulus and the individual’s thinking style are influential in determining when and what people focus their attention on (Corcoran et al. 2011), there is a sparse amount of literature devoted to the study of thinking style and ethical decision making (Groves et al. 2008). This chapter therefore seeks to create some connections between adaptive decision making and the role of both critical thinking and intellectual style. This chapter contains three sections, and commences with an introduction to decision making, including an exploration of the role of critical thinking and its accompanying skills (including the ability to challenge assumptions, adopt multiple perspectives, and ask questions). Next, the chapter provides an overview of the various theoretical perspectives encompassing the field of intellectual style, paying particular attention to how individuals prefer to think and feel in a range of situations. Finally, the chapter provides some synthesis to the three constructs of decision making, critical thinking, and intellectual style as a foundation for introducing the cross-cultural comparative case studies that follow in [Chap. 3](#).

## 2.1 Review of the Decision-Making Literature

De Acedo Lizarraga et al. (2009) provide some historical context to the evolution of decision-making research. In the past, research tended to focus on normative models whereby indications were given as to how people should make decisions and the likely success of those decisions in both laboratory examples and in their application to the real world. However, these models were limited as they failed to account for the real and dynamic environments in which those decisions were being made. That is, they failed to take into account the adaptive nature of our real environments. More recently, descriptive naturalistic models have been devised which emphasize the context of a decision, including the impact of both experience and personal competence in the decision-making process (de Acedo Lizarraga et al. 2009). Possessing knowledge about the variables that impact upon decision making is therefore important. To this end, de Acedo Lizarraga et al. (2009) espouse three types of influential variables: task demands, subject demands, and context demands.

- *Task demands* are inherent to the decision itself, involving uncertainty associated with alternatives, pressures of time and money, quantity and quality of information, goals, and possible consequences of the decision.
- *Subject demands* are also known as decision-maker characteristics and include motivation, self-regulation, information processing, expertise, and emotions. Emotions are discussed in more detail later in the chapter, but it is important to acknowledge here that emotions are not merely by-products of our decisions, but are instead influential inputs applied in real-time that impact upon the decision-making process (Andrews et al. 2010).
- *Context demands* are the environmental characteristics of the decision-making situation and can include social influences, work influences, and other distracting events (p. 358).

According to Lee (2008), there are two distinguishing features inherent to social decision making: first, behavior is routinely altered in response to changes that occur in the physical and social environment, meaning that outcomes involving multiple decision makers can be hard to predict. Second, decisions may be altered as a result of their likely consequences (that is, whether the well-being of others will be improved or reduced). Chapter 1 highlighted the way that social norms and individual tendencies toward either competition or cooperation can impact upon how decision-making processes and outcomes are viewed by other social actors. Indeed, research into social cognition has found that individuals unconsciously make many different types of social judgments (Ham and van den Bos 2010). It can therefore be said that decision making is socially interactive and dynamic, and as such, it requires some ability to predict the decisions of other social actors (Lee 2008). In short, humans are social beings who typically seek to maximize their self-interest which in turn affects their decision making.<sup>1</sup>

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<sup>1</sup> This type of decision making is seen in economic Game Theory, whereby strategies are implemented by players who seek to maximize their own profits in a monetary game of heads/tails.

### ***2.1.1 Types of Decisions***

In the same way that individuals may display different thinking and learning styles, research has also shown that there can be different decision-making styles. In an effort to empirically test for four different decision-making styles (directive, behavioral, analytic, and conceptual), Rowe and Mason devised a decision style inventory (Groves et al. 2008). Under the model, the directive style emphasizes attention to rules and policies; the behavioral style emphasizes the use of feelings and emotions; while the analytical and conceptual styles are deemed to be more cognitively complex due to the individual's ability to handle greater ambiguity, explore a greater number of alternatives, to apply a range of information sources, and to take ethics and values into account (Groves et al. 2008).

Given that there is a vast range of decision-making types and complexities (Resulaj et al. 2009), it can also be useful to distinguish between routine choices and nonroutine decisions. At this point, and before progressing further, it is important to distinguish between the concepts of choice and decision, as although the words are often used interchangeably, they actually represent different constructs. “The term *choice* should be used to encompass the sorting out of options, whether conscious or unconscious. Deliberate choices are to be referred to as *decisions*” (Etzioni 1988, p. 150). A decision is therefore defined as “a commitment to a proposition or plan of action based on evidence and the expected costs and benefits associated with the outcome” (Resulaj et al. 2009). Tallman and Gray (1990) label routine choices as the selection of a breakfast food or electing a particular travel route to work, while nonroutine decisions are those situations featuring risk or uncertainty (such as getting married or establishing how to avoid an outbreak of deadly disease). Typically, individuals cannot rely on past experiences to assist them in making non-routine decisions, and they need to use educated guesses as to the success or failure of their chosen course of action.

### ***2.1.2 Factors Influencing Our Decision-Making Processes***

There are a wide range of factors that impact upon our ability to make—or not make—a decision. This section aims to introduce a number of these factors ranging from perceptions of fairness to opportunities for learning, context, time pressure, unconscious processing, and experience.

### ***2.1.3 Fairness and Learning***

Chapter 1 introduced the concept of ‘fairness’ as an influential factor involved in some decision-making situations. The notion of what is considered ‘fair’ is largely dependent on a number of contextual factors including a decision maker’s sense

of ‘entitlement’ and the need for competition among other social actors. Beyond fairness, learning is also an important aspect of decision making, and it is possible for adaptive decision-making strategies to emerge that are based on the observed outcomes of previous choices (Lee 2008). Indeed, when thinking about our decisions in order to reverse or reaffirm them, the brain tends to exploit both used and unused information that it already possessed during the initial decision-making process (Resulaj et al. 2009). Research has demonstrated the impact of both learning and fairness upon decision-making processes. For example, it has been found that they are both important factors involved in the social decision making of humans, while the effect of reward has also been found to be influential—though to a lesser extent (Lee 2008).

### ***2.1.4 Context and Individual Capacity***

Context is another important factor involved in human decision making. No decision can be made which is totally free of the contextual influences of historical events, situational demands, or individual capacity, yet rarely are these cumulative influential factors consciously included in decision-making processes (Tallman and Gray 1990). One example of individual capacity considered within the literature is that of creativity. In their literature review, Haller and Courvoisier (2010) note that while psychologists have compared creativity with problem solving, many practitioners from the cognitive paradigm conclude that creativity may be more dependent on problem *finding* rather than problem *solving*. Another example of individual capacity is the finding by de Acedo Lizarraga et al. (2009) that older, retired people tend to exhibit greater levels of uncertainty, doubt, and fear of making a mistake in their decision making than youths and adults. As a further example of individual capacity, experienced decision makers have been found to have both a larger body of knowledge to draw upon, and to apply deliberate problem-solving strategies, than novice decision makers (Helsdingen et al. 2010).

### ***2.1.5 Emotion, Time Pressures, and Complex Situations***

Another influencing factor could also be the role of emotions, with research conducted by Andrews et al. (2010) categorizing people according to whether their decision making in times of risk involved a lot of emotion (high affect), a lot of thought (high cognition), or was some combination of the two (high affect/high cognition). The study found that decision makers who used a lot of emotion (affect) in their decision-making processes were less likely to take a risk than those decision makers using less emotion. These findings may have to do with emotional intelligence, with some theories suggesting that people who have an enhanced awareness and understanding of their emotional states, alongside a

developed understanding of the reasons for their emotional reactions to certain situations, are able to use this information to solve problems more effectively (Murphy and Janeke 2009). This means that emotionally intelligent people may actually be more adaptable in their ability to solve complex problem-solving tasks as well as being more adaptable in their social and interpersonal situations (Murphy and Janeke 2009).

Time pressures are another influencing factor. In their review of the literature, Tallman and Gray (1990) note that time pressures can affect the quality of decision making by forcing social actors to simplify their decision tasks and overemphasize negative information which in turn can lead to more cautious decisions being made. Groves et al. (2008) observe that there are increasing levels of complexity involved in managerial decision making. It is therefore possible that the presence of a particular intellectual style profile may be of assistance to managers exposed to complex decision-making situations. For example, Groves et al. (2008) found that managers who displayed a balanced intellectual style (both linear and nonlinear) were significantly more likely to make ethical decisions than managers displaying a predominantly linear intellectual style.

It is also possible that the increasing pressure of complex situations may force people to make—or not make—particular decisions. According to Phillips and Burrell (2009), a bad decision can occur simply by not making a decision (that is, no decision is made in a situation requiring attention or action). This situation is often found in organizations where blame, punishment, and responsibility are determined in light of a decision or action proving unsuccessful. Interestingly, the same outcomes of blame, punishment, and responsibility are rarely laid on individuals who refrain from taking a risk and do not make a decision (Phillips and Burrell 2009).

### ***2.1.6 Self-Reflection and Unconscious Processing***

Self-reflection is said to be a very important skill in decision making (Phillips and Burrell 2009), and it is possible that this reflective process can occur both consciously and unconsciously. Indeed, research has shown that there can be benefit (in certain situations) to the unconscious social-cognitive processes that occur within the human mind. For example, when dealing with a situation requiring complex judgment, it is not uncommon for an individual's initial thought/reaction to be conscious, yet for a transition from indecision to a preference for action to occur at a later time as a result of unconscious processing (Ham and van den Bos 2010). Indeed, in reviewing the literature, Ham and van den Bos (2010) demonstrate how unconscious thinkers have been found to engage in more elaborate decision-making processes than those individuals who are deemed 'conscious thinkers' or 'immediate decision makers'. A possible factor in this finding could be an individual's initial approach or 'reading' of the situation, as the study conducted by Byrnes and Torney-Purta (1995) showed that the way in which an individual

initially diagnoses a problem at hand is instrumental in that person's process of decision making and problem solving.

### ***2.1.7 Experience***

Finally, the role of experience is considered influential in decision-making processes, and longevity in a particular profession can help professionals call upon established skills and proven ways of doing things. Indeed, it has been found that risk-based decision making requires the application of many technical skills, and these must often be applied alongside subjective elements of judgment (Garvey and Buckley 2011), with one type of subjective judgment being the application of intuition and gut feelings. In their review of the literature, Easen and Wilcockson (1996) found that experienced nurses often cite their 'gut feelings' when asked to list the different components that they use to make professional decisions. Groves and Vance (2009) found that those individuals possessing a nonlinear intellectual style (featuring a preference for internal feelings) will primarily follow their gut reaction whenever their analysis and intuitions are in conflict. Yet, while 'intuition' may be viewed as a technical skill acquired over time and through experience, it can also be used as an excuse for a professional judgment or decision that appears impetuous or difficult to justify, and in some cases, the use of intuition may even be considered an 'unprofessional' form of decision making (Easen and Wilcockson 1996). The reason for this view is the seemingly intangible aspect of intuition, as it cannot be seen or necessarily measured by others in a manner that allows decisions to be transparent, readily justified, or easily understood.

Experience therefore comes in many forms, and through their review of the literature, Helsdingen et al. (2010) were able to show that experienced decision makers tend to collect and critically evaluate available evidence, seek consistency, and test underlying assumptions whenever they are faced with a complex and nonroutine problem. Each of these skills are actually inherent to critical thinking, thus it is timely to now consider the role that critical thinking plays in adaptive decision making, before introducing the concept of intellectual style.

## **2.2 The Role of Critical Thinking**

In the Preface, adaptation was defined as an ability to be simultaneously conservative and open-minded, while ensuring responsiveness to feedback and being able to identify information from multiple sources. All of these traits are inherent to critical thinking, thus it is important to explore the concept of critical thinking in order to fully understand the influential impact of decision making on our everyday lives. The previous section explored decision making by reviewing some of the many influential personal, contextual, and situational factors that impinge upon

decision-making processes. In this section, critical thinking skills are explored and it becomes apparent that these skills are a necessary component of adaptive decision-making processes.

### 2.2.1 Definition

So what exactly is critical thinking, and how can we acquire it as a means of enhancing our skills in adaptive decision making and thus maximizing the potential of our intellectual style? According to Phillips and Burrell (2009), effective critical thinkers are said to be those individuals who “engage in comprehensive, flexible thinking...” [that is, those individuals whose thinking is adaptive] “... to generate good alternatives, design something new and successfully plan and implement” (p. 146). Further, individuals should be able to create multiple solutions to problems, examine their decision-making preferences and practices while also becoming self-aware about the types of practices that may hamper the effectiveness of their decision making, including the presence of biases, false assumptions, myths, and faulty paradigms (Phillips and Burrell 2009).

The application of critical thinking strategies can therefore result in individuals developing new ways of thinking, applying, transferring, and evaluating their knowledge while also developing new ways of reaching decisions (Arend 2007). Critical thinking is also a form of higher order thinking, and it is said to empower the use of strategic intelligence (Phillips and Burrell 2009). In its simplest form, decision making is a sound example of higher order thinking, because the very act of making a decision using a set body of knowledge requires information to be interpreted, analyzed, and manipulated in nonroutine ways (Byrnes and Torney-Purta 1995).

Critical thinking leads to higher order thinking due to the deeper level of engagement and comprehension that is required. For example, by incorporating critical thinking instruction into a learning setting, the learner is required to focus on *both* their superficial observations *and* on the underlying structures and causes of the given situation, thus leading to a deeper understanding of the information being acquired (Helsdingen et al. 2010). Further, critical thinking assists humans to be adaptive as they acquire skills in dealing with ambiguity, multiple sources of information, and changing contexts. In their review of the literature, Byrnes and Torney-Purta (1995) note that higher order thinking becomes apparent in tasks that demand an understanding of causal connections between ideas, and that require the application of skills such as interpretation, analysis, and the manipulation of information. These demands are often faced by university students, but they also arise in many professions. It is therefore not surprising that a number of studies have explored critical thinking as it pertains to particular populations, including law enforcement personnel (Phillips and Burrell 2009), nurses (Ali et al. 2005), university students (Berzins and Sofo 2008; Schmeck and Ribich 1978; White et al. 2011), professional administrators (Borlandoe 2005), engineers

(Volpentesta et al. 2012), and pharmacists (Streetman et al. 2006). Inherent to each of these roles and professions is an obvious need for the social actor to make decisions and remain an ability of being adaptive to changing contextual environments.

For many, the acquisition—or application—of these wide ranging skills may seem overwhelming, and it is acknowledged that it is difficult to engage in higher order thinking in some situations as a result of pre-existing institutional or intellectual obstacles (Byrnes and Torney-Purta 1995). However, it has been suggested that with practice and guidance, critical thinking skills can be learned and thinkers can become empowered to be truly innovative in their thought processes (Phillips and Burrell 2009).

### ***2.2.2 The Role of Critical Thinking in Effective Decision Making***

In linking critical thinking to decision making, Helsdingen et al. (2010) found that critical thinking did have a statistically significant effect on decision outcomes, with participants who were exposed to critical thinking instruction and critical thinking processes attaining higher grades in their work. Students exposed to critical thinking instruction were also better able to transfer their learning away from the educational setting. However, no significant effects were found on the actual decision-making processes. As a result of this study, the authors observe that critical thinking is not necessarily useful or beneficial to decision-making *processes*, but can certainly be of benefit to the *outcome* of a decision. In drawing a distinction between process and outcome, thought must be given to the role of intellectual style and the influence this may have over the cognitive skills and traits of an individual.

## **2.3 Overview of Intellectual Styles**

The Preface highlights the need for individuals to possess adaptive mindsets, and for organizations to exemplify adaptive cultures. It has been demonstrated how influential critical thinking can be within human decision-making processes, and it is now time to consider the role of intellectual style as the constantly changing professional environment now requires practitioners to be adaptive in not just their decision making, but also in their ability to think. As noted by Groves and Vance (2009),

today's organizations operate in an increasingly uncertain and tumultuous global market economy that requires managers to demonstrate complex and multidimensional thinking, requiring traditional analytic or linear thinking skills, as well as more nonlinear modes such as intuition, insight, emotional assessments, creative thinking and perceptual flexibility (p. 344).



### 2.3.1 Definition

A number of words are often used interchangeably, including thinking style, cognitive style, and intellectual style. Thinking style—and from herein intellectual style—has been defined as “one’s preferred manner of using mental ability to govern daily activities, including understanding and solving problems and challenges” (Groves et al. 2008, p. 308–309). Intellectual style is further defined as a specific reasoning and problem-solving strategy that goes some way toward explaining why individuals respond differently to problems that need to be solved (Murphy and Janeke 2009). Thinking styles are further defined as preferences that provide an alternative perspective to performance and ability. As intelligence tests are not strong predictors of individual functioning (Sternberg 1997), intellectual styles are said to be better predictors of academic variables, employment variables, and self-rated abilities (Grigorenko and Sternberg, 1997).

It has been suggested that theories on intellectual styles have been developed in order to create a link between personality trait theory and cognitive ability (Murphy and Janeke 2009), and most styles appear to be classifiable into three categories:

1. *Type I styles* involving the generation of creativity which allows for novelty (Zhu and Zhang 2011), the use of higher levels of cognitive complexity (Murphy and Janeke 2009), and the development of creative strategies;
2. *Type II styles* which tend to give more importance to knowledge and include styles that are reliant on structured knowledge (Zhu and Zhang 2011) and which tend to be norm-favoring and simplistic (Murphy and Janeke 2009), and
3. *Type III styles* which are context-dependent and influenced by the environment (Zhu and Zhang 2011), and which tend to utilize characteristics of both Type I and Type II depending on the requirements and demands of the situation (Murphy and Janeke 2009).

The issue of creativity (found within Type I styles) is an interesting one. Research into the traits displayed by so-called ‘creative’ individuals (namely artists and musicians) reveals a tendency toward styles that display tolerance for ambiguity, autonomy, intrinsic motivation, and an openness to experience (Haller and Courvoisier 2010)—all of which are synonymous with the types of traits displayed by individuals with a developed ability to think critically. However, the assessment of creativity as a form or type of intellectual style has only been attempted by a few academics (see for example Sofo 2002 who dedicates one entire construct of his Thinking Style Inventory to a *creative style*). One reason for this paucity may be the difficulties inherent to testing creativity via a standardized test. As noted by Haller and Courvoisier (2010), “assessing creativity with divergent thinking tests is unfairly limited since there is much more to creativity than the cognitive process of creativity” (p. 150).

### ***2.3.2 Theories of Intellectual Style***

There are numerous models of intellectual style, thus it is necessary to limit this section to a review of three: (a) Sternberg theory of mental self-government (b) Sofo theory of reality construction, and (c) linear/nonlinear thinking style profile.

### ***2.3.3 Theory of Mental Self-Government***

Sternberg's Theory of Mental Self-Government compares a person's mental functioning to the government of a society. Sternberg's (1997) theory uses forms of government that fall along five dimensions: (a) branch (being the executive, legislative, and judicial branches), (b) forms of mental self-government (being hierarchical, monarchical, oligarchic, and anarchic); (c) levels of mental self-government (local or global); (d) scope (internal or external); and (e) leaning (either liberal or conservative). The theory defines the concept of 'style' as a preference rather than as an ability, and by doing so, a unifying framework is provided for the integration of different thinking styles.

### ***2.3.4 Theory of Reality Construction***

Tallman and Gray (1990) note that social actors tend to behave according to their own interpretations of reality because they perceive that the adoption of alternative courses of action may result in costly outcomes. This observation aligns with the theory of reality construction devised by Sofo (2005). The theory of reality construction takes a metacognitive perspective where people actively construct their reality from their social interactions, which are based on personally preferred ways of thinking. The cocreation of a personal reality is based on a profile of five different styles of thinking: conditional, inquiring, exploring, independent, and creative. The basic assumption of the theory is that people have preferences and different degrees of confidence and control in how they use their knowledge, attitudes, and mental skills in building their reality and in dealing with information, people, tasks, and daily situations through their thought processes. The theory of reality construction therefore under-emphasizes the principles of societal or mental self-government and instead focuses on dimensions of dependence, inquiry, multiple perspectives, autonomy, and imagery (Volpentesta et al. 2012).

### ***2.3.5 Linear/Nonlinear Thinking***

The linear/nonlinear thinking style profile was put forward by Vance et al. (2007). This theory divides thinking style preferences along two dimensions: linear and

nonlinear. The linear dimension features individuals who prefer to attend to external, tangible data and facts, and who process information using conscious logic and rational thinking as a means of forming knowledge and understanding, or of reaching a decision to guide future action. Linear thinkers are ones who primarily rely on logic as well as objective and verifiable information, and who use a process of deduction in formulating a decision. The nonlinear dimension features individuals who prefer to attend to internal feelings, impressions, and sensations and who prefer to process information using intuition, creativity, and insight (Groves and Vance 2009; Groves et al. 2008).

### ***2.3.6 Empirical Inventories and Questionnaires***

Accompanying the various theories on intellectual style are a plethora of empirical inventories and questionnaires. Indeed, Follman et al. (1997) list more than 65 different instruments that are available for use and which have been specifically designed to assess certain types of thinking skills. While this number is obviously too many to review in detail in this chapter, following are summaries of the key aspects of two of the more recently devised tests and list other tests commonly used.

### ***2.3.7 Linear/Nonlinear Thinking Style Profile***

This instrument tests for a multifaceted construct of thinking style based on two primary dimensions: (a) linear thinking (featuring rationality, logic, and analytical thinking), and (b) nonlinear thinking (featuring intuition, insight, and creativity).

### ***2.3.8 Thinking Style Inventory***

The Thinking Styles Inventory (TSI) was first published in English (Sofu 2002) and has since been translated into Chinese, Italian, Finnish, Bahasa Indonesian, French, and Arabic. The TSI emanates from a theory of how people create their reality through their thinking and measures reported preferences for stylistic aspects of intellectual functioning. The TSI is the empirical instrument relevant to the Theory of Reality Construction. In the TSI, five different styles of thinking are measured. First, the *conditional* style where individuals strongly rely on, and accept, what others think and say without questioning as a means of creating their own personal reality. Second, the *inquiring* style of thinking sees people preferring to ask questions, including questioning their own feelings and solutions. By asking questions, social actors are forced to look at the source of their information and contemplate its validity and quality, and decision makers are forced to challenge

their assumptions and their preconceived notions (Phillips and Burrell 2009). Third, the *exploring style* of thinking where people explore feelings and seek multiple perspectives which they then use to construct their own reality. Fourth, the *independent style* of thinking where individuals allocate priority to their own thinking, while also relying on their own feelings, solutions, and opinions. Finally, the *creative style* of thinking indicates a preference for thinking in pictures including the use of visualization and imagery to get a holistic sense of reality.

### ***2.3.9 Other Available Instruments***

Other instruments appearing in the literature include the inventory of learning processes (Schmeck and Ribich 1978), the Watson–Glaser critical thinking appraisal (Hassan and Madhum 2007), the assessment of critical thinking ability survey (White et al. 2011), the reflective thinking tendency scale (Semerci 2007), and two unnamed instruments: one to evaluate critical thinking skills among nursing students (Ali et al. 2005) and the other to assess reflective thinking among health science students (Kember and Leung 2000). Of course it should be remembered that one limitation of any self-report measure such as a questionnaire or inventory is the risk of reporting bias as an individual's perception of their ability is being measured rather than the actual concrete measurement of those abilities (Murphy and Janeke 2009).

### ***2.3.10 Factors Impacting Upon, or Emerging from, Intellectual Style***

There is a wide range of factors that impacts upon an individual's intellectual style, and this section aims to introduce a number of these factors including context, emotions, emotional intelligence, freedom, and culture. When considering the range of influential factors that may affect an individual's ability to be adaptive and to cope and succeed in the modern work environment, Groves and Vance (2009) suggest that organizations place emphasis on building competence in areas related to intellectual style. A similar recommendation is made by Bishop and Foster (2011) regarding the adaptiveness of university students, and it is recommended that all intellectual style profiles be considered in the design of instructional systems in order to ensure that student learning is maximized.

### ***2.3.11 Similarities Despite Individual Difference***

While much of intellectual style is likely learned (Groves et al. 2008), there are some similarities between the dimensions displayed by different individuals. For

example, intellectual styles tend to represent a preferred way of processing information, resulting in intellectual styles having both cognitive and affective dimensions. The cognitive dimension arises through manifestations of reasoning and problem-solving strategies acquired through life experience, while the affective dimension arises through an individual's attitude, interest, and general 'feeling' toward a task (Murphy and Janeke 2009).

### 2.3.12 Context

Sternberg (1997) asserts that thinking styles are different from abilities and that they lie at the interface between cognition and personality. Exactly where they lie is unclear, since it appears that some styles may be closer to being abilities (monarchic or hierarchic; local, or global) while others may be closer to being personality characteristics (introversion and extraversion). People may not have one static style of thinking since they can actually vary across tasks, situations, and personalities. In short, "when your profile of thinking styles is a good match to an environment, you thrive. When it is a bad match, you suffer" (Sternberg 1997, p. x). Intellectual styles are therefore only considered effective or ineffective depending on their fit with a given situation, and research seems to indicate that people have a profile of styles that varies contextually rather than over the course of their lifespan (Tang 2003).

### 2.3.13 Emotions and Emotional Competence

Similar to the role played in decision making, emotions can also impact upon an individual's intellectual style. As noted by Groves and Vance (2009), "managers exercising effective emotional regulation are keenly aware that emotions provide important meaning and focus on appropriate areas, yet they also can interfere with information processing when unmanaged or ignored" (p. 347–348). Emotional intelligence,<sup>2</sup> as a distinct construct from emotions, has been defined as a "trait or skill that assists people in adjusting and adapting successfully to their environments that allows them to interpret, manage and use their emotions and the emotions of others effectively to solve problems in a productive manner" (Murphy and Janeke 2009, p. 358). This definition is useful, as it demonstrates how emotional competence is vital to an individual's ability to be adaptive and apply their

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<sup>2</sup> It should be noted that despite the plethora of literature examining emotional intelligence, Schalk (2012) has indicated the need to distinguish between emotional *intelligence* and emotional *competence*, suggesting that the former refers to *accuracy* in recognizing and understanding others' emotions, while the latter refers more to the *effectiveness* in using emotional information.

intellectual style to their decision-making processes. As noted by Murphy and Janeke (2009), there is “increasing demand for theories that integrate intelligence, personality and the processing of emotional factors to yield an understanding of successful adaptation in occupational environments” (p. 357).

The study by Murphy and Janeke (2009) revealed significant relationships between intellectual style and emotional intelligence to the point where intellectual style was able to predict emotional intelligence. Interestingly, Groves and Vance (2009) made the same finding in reverse, with their research showing that the balanced use of intellectual style was a predictor of overall emotional intelligence. Further, the research indicated that those people with high emotional intelligence were generally people who can juggle multiple tasks without losing sight of priorities, while also being able to solve problems and apply new and creative ways of dealing with complex situations.

### ***2.3.14 Freedom***

Freedom is the ability to act both with confidence and the full knowledge of uncertainty (Schwartz 1991). Humans have limited cognitive resources, thus those resources must be used efficiently. Indeed, to preserve cognitive resources it has been found that humans utilized efficient information-processing strategies such as applying stereotypes or using judgmental heuristics (Corcoran et al. 2011). Freedom therefore results from our confidence and knowing, and intellectual freedom enables us to recognize that while we may be agents of change, our existence is also contingent upon a number of elements including our rational self-consciousness. Intellectual freedom does not come easily, and it is somewhat determined by a paradox: an individual can be persuaded to openness only if he or she is open to persuasion.

### ***2.3.15 Culture***

Murphy and Janeke (2009) note how intellectual styles can change with both time and life demands, and as a result of being socialized, they are even modified by the environment. Further, individuals tend to choose styles of managing themselves which makes them feel most comfortable in their everyday interactions. Sofo (2005) raises the question of whether cultural differences presuppose different thinking styles, while Groves and Vance (2009) explicitly observe that the “predominant thinking style of those in Western society...is greatly predisposed to a rationalist tradition in which any system is composed of divisible parts that can be analyzed, understood separately and added together to form a predictable whole system” (p. 345). Given the limitations of these observations to only Western society, it is implicitly assumed that there are differences to other societies. Studies

on intellectual styles conducted in China tend to be laden with perspectives originating from the West, notably Sternberg's (1997) theory of thinking style (Cheng et al. 2002). One consequence has been the importation of Western theories to Chinese settings with unproven appropriateness, and it is not possible to say if such approaches have been successful in the non-Western setting. Cross-cultural understanding in the emerging globalized world is therefore increasingly imperative and any theories or practices used as the foundation for investigation should be aligned with the specific contextual factors.

With regard to cultural differences, these have been found between the preferred intellectual styles of Chinese and Australian citizens with research showing that China's social values and structures are different from Western ones. For example, Sofo et al. (2008) found that Chinese university students had a significantly different profile of intellectual style compared to Italian and Australian university students. Further, Sofo (2005) has shown how Chinese leaders have strong preferences for 'executive', 'judicial', and 'legislative' styles of thinking, as well as high preferences for independent and exploring styles which contrasts against the profiles of leaders from other countries.

Beyond differences in societal culture are the comparative differences between occupational cultures, and it has been demonstrated how intellectual style can differentiate between individuals who are drawn to different professional domains. In their study, Haller and Courvoisier (2010) compared the personality and thinking styles of visual art, music, and psychology students. They found that the visual art and music students were significantly more heuristically oriented (that is, prone to unconventional ideas and risk-taking) than the psychology students who preferred algorithmic thinking (that is, they liked to follow well-defined steps). When considering the types of work that these professionals will do once their university studies are complete, it becomes possible to start considering the nexus that arises when the three constructs of decision making, critical thinking and intellectual style converge.

## 2.4 Synthesis of the Three Constructs

Social decision making is an incredibly complex behavior, and it requires individuals to recognize the intentions of other social actors and to adjust (that is, to adapt) their behavioral strategies accordingly (Lee 2008). Inherent to such social and cognitive action are the constructs of critical thinking and intellectual style, and all three of these constructs converge to form an influential, unique nexus for each individual. In their convergence, it becomes apparent that all three of the psychological constructs (decision making, critical thinking, and intellectual style) share a common trait in that they can all alter according to situational and/or contextual demands.

The common trait of being adaptable and capable of being altered according to situation or context has been widely reported in the literature—albeit as

individual observations rather than as a holistic observation that synthesizes the three constructs. For example, Andrews et al. (2010) note that when making a decision under conditions of risk or uncertainty, the same person might be more risk averse in some context than in others. Further, alterations in critical thinking are evident in the wide range of professions where studies have been done, ranging from nurses (Ali et al. 2005) to law enforcement officers (Phillips and Burrell 2009), engineers (Volpentesta et al. 2012), administrators (Borlandoe 2005), and pharmacists (Streetman et al. 2006). Finally, Sofo and Berzins (2009) demonstrate how different intellectual styles and profiles may be operationalized depending on goals, situational factors, personalities, and both social and political contexts. This book therefore aims to be one of the first detailed explorations of the link between adaptive decision making, critical thinking, and intellectual style.

Being adaptive means maintaining a certain amount of balance in intellectual style. As noted by Groves and Vance (2009),

optimal managerial performance depends on one's ability to maintain linear and nonlinear thinking balance. When there is thinking style imbalance or predominant use of one mode, managers are not addressing the above highly demanding activities [that is, clarifying objectives, uncovering hidden opportunities, reaching difficult decisions and creating solutions] with full strength and flexibility (p. 349).

Effective decision making involves the ability—and willingness—to apply intellectual style to problems requiring solutions (that is, for an individual to be an adaptive problem solver).

According to Tallman and Gray (1990), there are a minimum of three stages to problem solving: recognition, selection from alternative courses of action, and evaluation of the outcome. As solving a problem is a key outcome of some forms of decision making, it is important to see how it fits with critical thinking and intellectual style. The ability to problem-solve is inherent to critical thinking, and Halpern (1997) has shown that individuals who are taught critical thinking skills are less likely to make decision mistakes caused by typical occurrences such as confirmation bias. The way in which individuals think about a problem may therefore impact upon the decisions that they reach. For example, the research conducted by Ham and van den Bos (2010) showed that people who thought unconsciously about a moral dilemma were more willing to make utilitarian decisions than those people who thought consciously or who tried to make an immediate decision without taking the time for detailed contemplation.

Earlier in this chapter, ethical decision making was explored as a subset of the decision making literature. Unfortunately, very few studies have examined the empirical link between thinking styles and the components of ethical decision making (Groves et al. 2008). To fill this void, Groves et al. (2008) conducted a study and found that individuals possessing a balanced intellectual style are more likely to produce ethical decisions due to their willingness to consider a wider range of alternatives and their ability to rule out those alternatives which are justified solely on the outcome obtained. Each of these skills are evident in the descriptions and examples of critical thinking, thus demonstrating the link between



decision making and particular ways of thinking. Phillips and Burrell (2009) also provide examples, noting that the application of managerial critical thinking involves the psychological aspects of problem solving (including experience-based, team-based, and formal problem-solving methods). Thus,

critical thinking and effective problem-solving is an optimal process to reach well-thought-out decisions that not only develop strong remedies to organizational perplexities, but also create an ability to rank and assess how well the solution meets the overall goals and objectives (Phillips and Burrell 2009, p. 144).

## 2.5 Conclusion

At this point, it is clear that decision making is a complex task which is socially interactive, affected by the environment and linked to the individual characteristics. This is particularly true because we live in a world where crossing boundaries is routine. This chapter attempted to fill a gap in the literature showing the connections between adaptive decision making and the role of both critical thinking and intellectual style. Indeed, the core of the chapter is the third part which provides some synthesis to the three constructs. All these three constructs are adaptable and capable of being altered according to situation or context. This convergence results in a flexible problem solver.

Indeed, our starting point is the adaptive nature of decision making that is socially interactive and dynamic; as proven in game theory or in the strategic management literature, each actor has to decide its optimal response given the hypotheses on the behavior of all other social actors. In an economic perspective, we can indeed mention the reaction function specifying the choice of a strategic variable by one economic agent as a function of the choice of another agent. This is only one factor affecting the decision-making processes, that are also influenced by personal (decision making styles, emotional intelligence,...), contextual (historical events, situational demands, or individual capacity), and situational factors. However, in this process, the sparkle is the individual, thus his or her critical thinking skills are relevant in the individuation of alternatives or options. All individuals are different, in particular we can consider the relationship between culture and emotional expressions: there are many cultural differences in emotional expression, produced via at least two mechanisms. The first is via cultural differences in norms of expression management and regulation as a function of social circumstances and the second involves cultural differences in the kinds of events that trigger emotions (and thus expressions) in the first place.

Exploring the concept of emotional intelligence, which is the ability both to know one's own emotions and to read others' emotions as well, is relevant not only for individuals in the day-by-day living, but also if we consider business settings. Success in our global world requires the ability to understand, get along with, and appreciate people who are different from us in meaningful and concrete ways. In other words, a country's culture profoundly influences the behavior of

organizations as well as the behavior of people within organizations. Moreover, companies, too, have cultures, often very distinctive and within any large company there are sparring subcultures as well: a company is made up of accounting people, engineers, PR people, and lawyers, each department has a proper constellation of manners, meanings, histories, and values that requires to be adaptive and inclined to suspend judgment in order to think before acting.

Furthermore, a nation's specific cultural attributes play an important role in determining the selection of management and leadership style. This leads us to cultural intelligence that consists of specific knowledge about different cultures, as well as general knowledge about how cultures work. It also requires skills,—such as interpersonal, negotiation, listening, and cross-cultural—openness to new experiences and ideas, and the ability to keep learning.

This cross-cultural perspective will characterize [Chap. 3](#), where we focus on thinking styles and critical thinking reporting and also on some international experiments.

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