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# Cognitive Agility

## Adapting to Real-time Decision Making at Work

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Change and complexity continue to increase within organizational contexts. Scholars and practitioners have increased support of leader development initiatives to meet these environmental demands. They have strongly advocated terms such as adaptability, flexibility, and resilience as skills and abilities required for success in the modern business world. While many leadership training and development practices aim to build aspects of adaptability, most focus on competency development and neglect how to manage the mind within dynamic conditions (Kimball & Holyoak, 2000). Learning to adapt within the dynamic current of a real-time task is important, as outside influences continue to transform seemingly static situations into complex environments. This article seeks to address such conditions by focusing on real-time adaptation within dynamic decision-making tasks. We suggest *cognitive agility*—the individual capacity to mindfully practice openness and focus, as a skill to meet these demands.

### Real-Time Adaptation

Adaptability is a skill of adjusting productively to change in the environment. In most cases scholars and practitioners examine adaptability by observing performance adjustments across tasks, over stretched periods of time. For instance, they often discuss adaptive performance in relation to a new role at work, the integration of a new technology, or changing business priorities (Pulakos, Arad, Plamondon, & Donovan, 2000). Yet with unprecedented

increases in change and information, even predictable tasks now change in real time.

Take Jacob for instance, a media director at a web-based advertising solutions company. He runs a weekly team meeting with his six account managers. In the meeting, each of these account managers are connected to external sources of information by wireless handheld devices, thus increasing the number of inputs and potential uncertainties. The account managers serve as representatives to an array of client systems, each under massive pressures in dynamic and uncertain markets. As a result, the complexity and constant access to real-time information impacts the course of the meeting. Jacob must make sense of all this while filtering it through the strategic lens of the organization. This requires him to explore new opportunities and drive existing strengths en route to improved customer service. So while it is true that Jacob must adapt to the turbulent environment of the new media marketplace, he must also adapt to the ongoing dynamism that exists in the meeting. He has to use available information while maintaining a coherent process. How does he do this? How does he become better at managing within such a context? This is just one of many daily scenarios that leaders at all levels confront. It presents a need to focus on real-time adaptation in a dynamic context.

### Dynamic Decision Making

Dynamic decision making (DDM) is a type of decision making that happens in

environments of increased uncertainty and information load. DDM is characterized by tasks that contain real-time continual change, ambiguity, interdependency, and time constraints, all resulting in a series of ongoing decisions (Brehmer, 1992) (see *Table 1*). When operating in such an environment, the information that impacts managerial decision-making tends to be more opaque due to hidden and contradictory information. In the example above, Jacob does not necessarily see all the information that is impacting the positions and concerns of his account managers.

Traditional decision making involves a single decision; DDMs involve continual decisions each with task-related tradeoffs. In this sense DDM is a completely distinct type of decision-making where every small choice is considered a decision.

While it is true that Jacob has decided the agenda for the meeting, he is also making a series of decisions that dictate the unfolding events of the meeting. This is based in part on where he places his attention, the questions he asks, and the incoming information he attends to or avoids. For instance, while Jacob is asking for updates from each of his account managers, he notices that one of his account managers, Natalie, is fidgeting in her seat. He scans the room and decides Natalie's behavior is distinct enough to inquire about. She is slightly uncomfortable but willing to share some important information that changes the perspective of the other account managers' reports. Jacob could easily miss or

ignore this data, which would also create a different course direction within the meeting. Every attention point shifts the environment.

In the past, scholars studied DDM contexts by examining fighter pilots, surgeons, firefighters and the like. However today's organizational landscape has become so complex that information and dynamism continue to creep into various task demands, making DDM a recurring reality of managerial life. While the intensity and/or danger levels in a typical organization obviously differ from these other professions, the basic characteristics are becoming more and more similar. Therefore understanding work contexts through a DDM lens is useful in order to help develop adaptable leaders.

DDM-related tasks present individuals with a series of continuous decisions. Due to the ongoing dynamism, each decision, however small, presents various task-related tradeoffs (Tversky, Sattath, & Slovic, 1988). From a cognitive perspective, when the mind pays attention to one aspect of the environment it is inherently giving up an alternative line of focus (Endsley, 1995). As a result, cognitive capacity becomes more limited in the face of growing complexity (Van de Ven & Poole, 1988). Additionally each action taken, no matter how small, alters the task environment. As Jacob asks one manager for an update, the information provided will impact his perception and behavior. Yet, given the rates of change and incoming data, the context is constantly shifting, regardless of what managers do. Subsequently, this becomes a classic learning paradox with no perfect choice. DDMs pressure managers to continually choose to let go or hold on – to be open or focused. Unfortunately these choices tend to happen automatically, at times sacrificing performance.

### Enter Cognitive Agility

Cognitive agility is a tool that helps leaders perform well in a DDM context. It represents an individual's capacity to

flexibly operate with openness and focused attention.

A dynamic, information-rich environment requires being able and willing to seek out new information. Yet continually paying attention to new information will eventually lead to distraction. Focused attention, on the other hand, is also vital, since depth of information can be critical to successful task accomplishment. Yet too much focus will lead to missing important information in a changing context. Gathering new information (i.e., openness) and sticking to a coherent cognitive thread (i.e., focus) are both essential for success in such an environment. Therefore, an individual must be able to flexibly use openness and focus according to the shifting needs of the environment. In fact research at Case Western Reserve University helps support this claim (Good, 2009). In a popular DDM simulation, individuals with higher levels of demonstrated cognitive agility performed significantly better than peers with lower levels of agility.<sup>1</sup>

There are three variables that form cognitive agility (see *Figure 1*). Each is necessary in order to carry out the smooth and frequent transition between looking for new information and staying focused. We categorize the first two variables, focused attention and openness, in terms of perceptual and conceptual attention (see *Table 2*). Perceptual attention is the degree to which people consider a wide range of stimuli in the environment (Posner, 1987), while conceptual attention is the extent to which people approach a wide range of concepts (Martindale, 1995).

Figure 1: Cognitive Agility

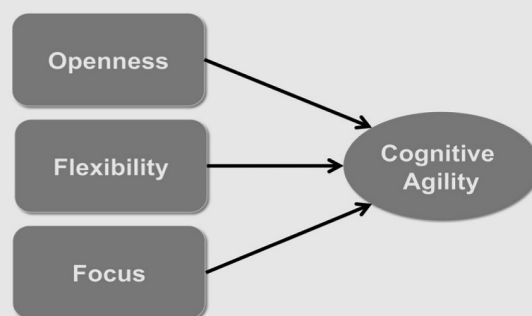


Table 1: Traditional vs. Dynamic Decision Making

TRADITIONAL	DYNAMIC
Single Decision	Ongoing Decisions
Independent	Interdependent
Static	Dynamic
No-time pressure	Real-time
Transparent	Opaque
Linear	Non-Linear
Simple	Complex

1. Cognitive agility using a composite score of tests for openness, focus, and flexibility demonstrated 11% unique variance in performance in a DDM beyond general intelligence

Table 2: Conceptual vs. Perceptual Attention Openness and Focus

Modality	Openness	Focus
Conceptual Attention	Diverse range of concepts	Narrow range of concepts
Perceptual Attention	Wide range of stimuli	Narrow range of stimuli

1. **Focused Attention** is the capacity to oppose incoming distraction. Focus is associated with narrow perceptual attention (e.g., focusing the 5 senses on a particular thing) and narrow conceptual attention (e.g., focusing on specific streams of information). For example, Jacob may keep his meeting on track by redirecting (focusing) the team's attention to the agenda.
2. **Openness** refers to noticing and searching for new information in the environment. It is associated with a wide breadth of perceptual attention and the willingness to follow new threads of data (conceptual attention). It brings together and synthesizes terms such as mindfulness, curiosity, creativity, and novelty seeking. For instance, while running the meeting, Jacob exercises openness to scan the room for various sources of information, which can be used to support the flow of the meeting.
3. **Cognitive Flexibility** describes the capacity to switch mental activity in favor of what is more appropriate. In DDM environments it is very easy to get stuck in the use of a single strategy. Most people tend to repeat what they are used to in the face of difficulty. This can be a particular challenge for experts, as they tend to become entrenched in how they approach familiar parts of a task (Dane, 2010). Flexibility is a necessary skill in order to quickly and effectively shuttle between being open and focused.

In the sections to follow, we suggest a road map for nurturing cognitive agility in a DDM. We stress bringing awareness to recurring DDM contexts at work, exploring the individual routines within them, and practicing intentional behaviors.

## Improving Cognitive Agility

### Step 1. Determine the DDM environment that you want to become more effective in

The first step is to identify a DDM context that is recurring at work (see *Figure 2*). It is useful to brainstorm major work initiatives/key projects that you are currently involved in and that will continue for the next few months. For each initiative/project, write down the major tasks associated with them. For instance, a major piece of consulting work may include research, interviews, focus groups, and an action plan. Of the tasks you list, which meet the general criteria of being high in dynamism/change and information? Which one(s) require a constant series of small decisions?

Next, select one recurring scenario within the project that you consider particularly complex and challenging. This is not a scenario that involves switching between

tasks (e.g., emails vs. phone calls). Rather it is a scenario that implicitly requires adapting to a series of real-time changes and making constant small decisions (e.g., how I hold my attention in meetings, in performance reviews, or interactions with clients etc...).

### Step 2. Current challenges to focus, openness, and flexibility within the particular DDM environment

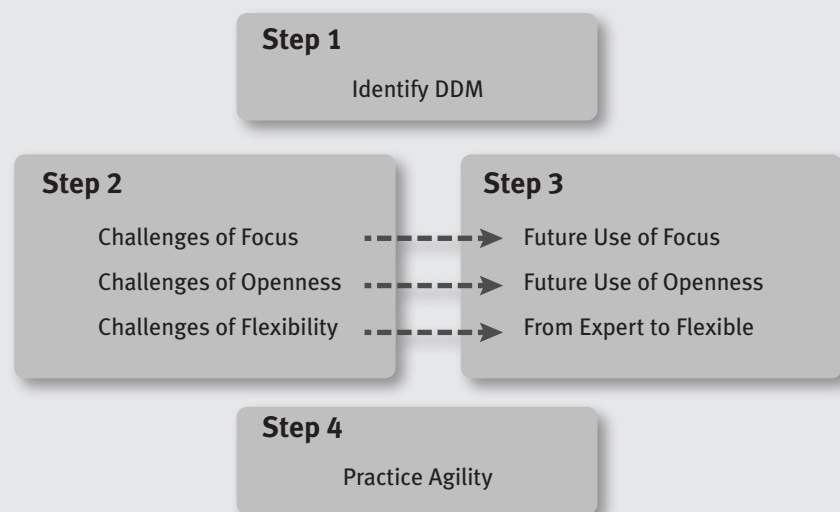
#### *Focused Attention Challenges*

Identify people, ideas, outside information, and the like, that tend to distract you from the original intent of the task. What often causes you to lose the consistent cognitive thread of what you are intending to do? These issues may pull you away from completing something or take you off track. Distractions may come from within you (ideas, emotions), or from the external environment such as other people, processes, information, and technology. Now which of these elements coalesce to become the most overwhelming?

#### *Openness Challenges*

For openness, think of moments in which tunnel vision takes over. These are times when you engage a hyper-vigilant, fixed focus, decreasing your ability to adapt to a

Figure 2: Improving Cognitive Agility



DDM. What information do you too often neglect and how?

### Flexibility Challenges

Regarding flexibility, try to think of ways in which you are an expert in this scenario. Often times when you are steeped in expertise, your routines are particularly hard to change. In what ways are you an *expert* in this situation? Expertise may not only come from legitimate position, it also grows from experience with a topic/context. In what ways are you a “mindless expert” - meaning you can operate without thinking about it?

### Step 3. Future use of focus, openness and flexibility within the particular DDM environment

It may help to think of this in terms of conceptual and perceptual attention (see *Tables 3 and 4*).

### Focused Attention

Moving forward, how would you like to focus your attention in this DDM? What information is most conceptually important based on what you already know? When considering the most overwhelming distractions, how will you intentionally shift your perceptual attention to something you desire to focus on (e.g., narrowing the scope of your visual and auditory attention to ignore new changes in the room)?

### Openness

In the future, how would you like to seek out new information? What are the potential sources of new conceptual information (e.g., ideas, concepts, variables) in this situation? What/who else may provide data, ideas, and/or new perspectives? Ask yourself how taking on the perspective of someone else may change the way the task is approached (e.g., how would someone in marketing look at this task and think about it?). In terms of perceptual attention, try widening the scope of your visual and auditory attention to notice new changes in the room.

### Flexibility

Moving forward, how will you compensate for your expertise, by softening the reins

Table 3: Behaviors to Practice Conceptual Openness and Focus

	Behaviors	
	OPEN	FOCUS
Conceptual Attention	Approaching new ideas	Avoiding new ideas
	Creating new associations	Supporting current associations
	Wide inquiry	Narrow advocacy
	What is new/different	What is same/certain
	Resisting intention	Revisiting intention

Table 4: Behaviors to Practice Perceptual Openness and Focus

	Behaviors	
	OPEN	FOCUS
Perceptual Attention	Raise eyebrows	Furrow brow
	Zoom out	Zoom in
	Visual scanning	Visual narrowing
	Listening to all	Listening to one person
	Listening for novelty	Listening for familiar

on rigid processes? How can you focus on the process of what is going on (e.g., how people are interacting, who behaves in which ways, how events are dealt with), and shift away from the content (e.g., the task subject)? How does letting go of your expertise provide more choices for a wider range of behaviors, some of which will improve your ability to adapt to DDM environments?

### Step 4. Practice Cognitive Agility

Because cognitive agility is about flexible shuttling between openness and focus, awareness is key. Therefore, it is most helpful to start with a mindfulness practice of anchoring in the moment through calm intentional breathing and engaging the five senses in order to disrupt an automatic routine (Yeganeh & Kolb, 2009). Next, practice both perceptual and conceptual shifting between openness and focus based on your analysis of specific behaviors that will best help you meet DDM demands.

Ask yourself and others if new information that you find is helpful or distracting. When distracting, remind yourself and others of your intent and narrow the focus.

Keep in mind that the more specific you can be in your behavioral goals within DDM environments, the more likely you are to practice them successfully. You will undoubtedly discover that adapting in the moment requires breaking from your plan at times. Such times are perfect opportunities to practice flexibility.

### Conclusion

Cognitive Agility is intentional shuttling between openness and focus in order to adapt to DDM environments. Realizing that this concept is abstract, it will clearly take some practice to reap the full benefits. DDM environments are sprouting up throughout organizations everywhere. Addressing them with an approach of cognitive agility puts the power back into the hands of people as active participants

**In the future, how would you like to seek out new information? What are the potential sources of new conceptual information (e.g., ideas, concepts, variables) in this situation? What/who else may provide data, ideas, and/or new perspectives? Ask yourself how taking on the perspective of someone else may change the way the task is approached (e.g., how would someone in marketing look at this task and think about it?). In terms of perceptual attention, try widening the scope of your visual and auditory attention to notice new changes in the room.**

rather than passive recipients of dynamic contexts. When work environments become complex and dynamic, people often feel limited in their decision-making options. However, upon revealing the vast number of choices in how attention can be directed, one cannot help but feel more empowered.

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