Preface

ART SCHOOL AND ADVERTISING

This book grew out of things I learned in art school and in advertising, things which I only understood when I became a psychologist.

Psychology obviously is my second career. I would say teaching too except that when I was a group head, I taught cub copy writers. That career, the first one, was in advertising. I went to Pratt. I worked at J. Walter Thompson, Ted Bates, Jordan Case McGrath. I wrote on national accounts, primarily on package goods—things that come in packages and are sold on shelves. I worked on food (Wonder Bread, Good Seasons), toiletries (Arrid, Ponds), cosmetics (Avon, Maybelline, Helena Rubenstein).

It was terrific. I even got to work in Tokyo for three years. It was terrific for a long time, and then something terrible happened—I got bored. In a creative business, where I was successful, I got bored. (We'll get back to boredom as a catalyst).

To get un-bored, I went to back to school, to Columbia, for a PhD. I always wanted to be a doctor, a certified expert. Why psychology? I worked in the "creative department," where success meant solving the same problem, selling the same product, over and over in different ways. Psychologists studied creativity. I read a lot of what psychologists wrote. Much of it was about traits, talent, genius, stuff you have or don't have: not very useful in an advertising agency. The parts that were more pragmatic—training, steps, strategies—never came close to what goes on in a professional school like Pratt or an advertising agency like Bates. Let me tell you something about art school and advertising:

At Pratt, my instructor for life drawing was a sculptor named Calvin Albert. The class lasted three hours. Half that time we drew to solve the problem he set that day; the other half, we could draw any way we liked. One drawing problem I remember was "Pretend that the top half of the model's body is in shadow, and that the light gets harsher as you go from one sketch to the next." We had to imagine the shadow and its shifting source, put in shadow shapes where there were none, adjust the values. What fascinated me was that the drawings done to Albert's specifications were always more interesting, more creative, more compelling, than those we composed when left to our own devices.

At Thompson and Bates, television spots were increasingly original, pointed, and (most importantly) persuasive when written to an exactly worded promise. The promise was the single most important benefit the product could deliver to its consumer. Coming up with the promise was the big problem. Bates called these promises USPs, unique selling propositions. (We'll cover lots of these in chapter 7.)

Why do USPs work? You don't get writer's block when you have something to say. More specific promises make for easier execution. Think about selling a suntan lotion. What's the promise? A tan? All suntan lotions can promise that. A dark, sexy tan? Ban de Soléil owns that one. How about a "baby oil tan without baby oil burn"? That's the promise I wrote for Sea and Ski when I worked at Bates.

CONSTRAINTS AND THE CREATIVITY PROBLEM

What do these examples from art school and advertising have in common? They use constraints to promote creativity. (They exclude, of course, constraints that promote conformity, e.g., copy or calculate correctly.) As we'll see in chapters 4 and 7, the results in art and advertising are the same: The more constrained the solution paths, the more variable, the more creative, the problem solvers.

"But," someone always asks, "what about artistic freedom"? Free to do anything, most of us do what's worked best, what has succeeded most often in the past. This is, in fact, the definition of an operant: a behavior that increases in frequency because it has been successful. Successful solutions are reliable, not surprising; predictable, not novel; already accepted, not creative. Highly rewarded for their expertise, experts get stuck in successful solutions—that's why they get bored. So, the answer to the "freedom" question is this: Being completely free hinders solving what I call the creativity problem.

The creativity problem is *strategic* and *structural*. It involves selecting (the strategy part) paired constraints (the structure part) that preclude reliable, successful responses and promote novel, surprising ones. Constraints for creativity involve substitutions: new for old, exploratory for tried-and-true. However, "new" and "old" alone won't do—each one must be *specified*.

For example, at the start of the Impressionist movement, Monet's constraints *precluded* dark-light contrasts which, by extension, precluded both the illusion of depth and sharply outlined shapes (specific old ways of producing representational paintings). They simultaneously *promoted* contrasting closely-valued colors, which, in turn, promoted flat patterns with soft-edged shapes that shared brushstrokes and colors (specific new ways). Monet didn't come up with those constraints arbitrarily. They were *strategically chosen* to realize his new goal criterion—showing how light breaks up on surfaces.

Identifying Monet's constraint path allows us to re-create the *structure* of his solution. How does light break up on things? In "Regatta at Sainte-Addresse" (1867), in bright, clear, contrasting hues, in cream-colored sails casting Prussian blue shadows on a teal green sea.

PSYCHOLOGY

In chapter 4, a case study considers Monet's development constraint by constraint. Why so carefully? To answer a question that I keep finding new answers to: *What can we learn from Monet?* If we understand how Monet used constraints, we'll have learned some important things about solving the creativity problem. Case studies in other chapters ask the Monet question (*What can we learn from*?) of creators in different domains—art, advertising, architecture, fashion, literature, and music. Most are famous. A conversation with a practicing, proficient, but not-well-known person is included for each domain. This is purposeful. Its purpose is to demonstrate that, at all levels of expertise and influence, paired constraints are the most used and the most useful ways to solve the creativity problem. Interestingly, all my interviewees found it easy—and also revealing—to think and talk about their work in terms of constraints.

Before the case studies and conversations, problem solving, the creativity problem (chapter 1), and the kinds of constraints that structure it (chapter 2) are covered. One constraint provides the first choruses that novices master and one which experts improvise. "First chorus" is a musical term for an initially played melody that provides the notes, chords, and keys used in the variations or improvisations that follow. For example, Mozart used the traditional melody *Twinkle, Twinkle, Little Star* as the basis for 12 variations. First choruses in other domains also supply components to be recombined and changed. In painting Seurat and Signac used Monet's mosaic-shaped brush strokes as a first chorus for developing the dots of pure color that characterize Pointillism.

The next-to-last chapter details the constraint-driven developmental path from child to creator; the last serves as a recap. There are also Appendices. They include shorter sections called *Working With Constraints,* exercises that have helped students (mine at Columbia, a friend's at the School of the Art Institute in Chicago) recognize, choose, and practice using constraints. Two are domain-specific (e.g., *Writing in a different voice*). One is more general *(Charting your own constraints)* and is meant for experts of all kinds.

A caveat: despite the exercises, this is not meant to be a "self-help" book. There are no six or seven easy steps to jump-start creativity. There are only two and they're both difficult. The first step is mastering the constraints that define a domain (its first choruses); the second is devising novel constraints that expand it.

CHAPTER 1

The Creativity Problem

What can we learn from Braque? What can we learn from Picasso? What can we learn from Cubism?

Creativity happens when someone does something *new* that is also useful or generative or influential (Csikszentmihalyi, 1996; Simonton, 1999). *Useful* means that the new thing solves a problem. (A doodle becomes the solution for a composition problem in a design class.) *Generative* means that the new thing leads to other ideas or things. (A solution suggests further developments or variations or facilitates solving the next problem.) *Influential* means that the new thing changes the way people look at, or listen to, or think about, or do, things like it. (Automatic writing, a kind of doodling invented by the Surrealists, was adapted by the Abstract Expressionists.)

This chapter's example of influential creativity comes from early in the 20th century. The creators were collaborators, a pair of painters—Georges Braque and Pablo Picasso. Between 1906 and 1914, Braque and Picasso developed a novel way to represent the world (Cooper, 1971; Rubin, 1989). Their new something, called Cubism, changed how some people (critics, dealers, collectors) looked at and thought about representational painting, and it changed how some other people (artists) painted. In short, our collaborators expanded their domain for all subsequent representational paintings (i.e., other things like it).

CUBISM: LEARNING FROM ART HISTORY

In 1906, when Braque and Picasso began to paint together, accepted representational painting styles shared two related criteria that Cubism shattered. Artists painted *what they saw,* from a *single point of view.* Imagine three landscapes: the first by Manet, with outlined, simple, clearly modeled shapes; the second by Monet, with pale, muted blues, purples, and pinks reflected in water; the third by Matisse, with bright, saturated hues applied in a decorative pattern. The paintings differ radically in palette, brush stroke, and composition, but each shows what the artist saw. Manet, the naturalist, saw how objects look. Monet, the Impressionist, saw how light looks. Matisse, the Fauvist, saw how pure, undiluted color looks. All three looked into spaces of varying depth, but always straight ahead.

What Braque and Picasso attempted to paint was *what they knew,* from *multiple viewpoints,* and wound up with little, if any, depth.

How could they "see" a compote of fruit from the top and the side at the same time? It's very difficult, but we can try to approximate it by starting with separate views and then combining them. The left panel in Figure 1.1 shows a compote of fruit from the side. The right panel shows it on top of a checkered tablecloth, from above. What would be an acceptable combination? If we look closely at a Braque or Picasso, the answer seems to be, one with an overall pattern, a rhythm to move the eye around the surface of the painting. Exaggerating values (light and dark contrasts) helps this happen.

Figure 1.2 shows one possible combination. Braque it's not, but it does approximate a Cubist composition. We're looking down at the inside

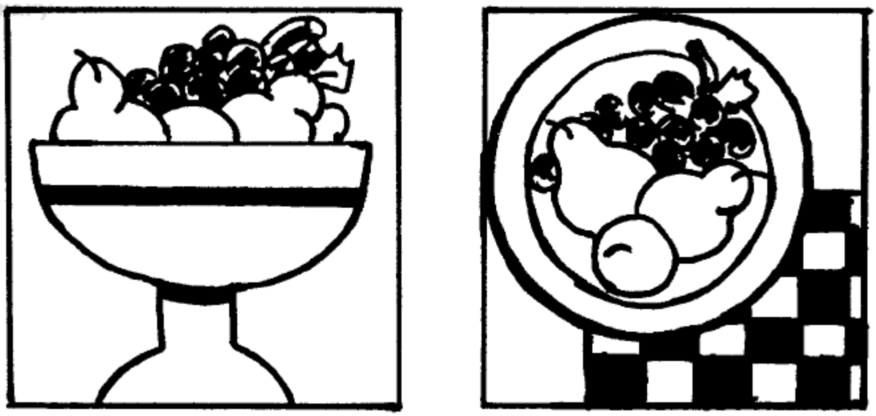

FIGURE 1.1. Two views of a fruit compote.

FIGURE 1.2. Combining the two drawings from Figure 1.1.

of the bowl and straight ahead at its foot. The checkered cloth is now inside the bowl and the whole picture has picked up its black-and-white pattern.

This exercise merely suggests the enormity of the problem Braque and Picasso were solving. If it was difficult for Braque and Picasso to "see" in the new Cubist way, imagine how hard it was for their audience. As you would expect, when they first showed their new paintings, most people thought they were plain crazy. To persist, their work had to be *generative*—that is, it had to provide a basis from which Braque and Picasso developed variations in their new Cubist style. To change the judgment from crazy to creative, the work had to be *influential*, and in two ways. One was changing how other artists saw and represented the world. The other was changing how dealers, critics, and collectors saw representational painting.

Cubism was creative according to all three of our definition's criteria. It was *useful* in solving the problem posed by Picasso and Braque. It was *generative* in leading to variations on that solution. It was *influential* in changing the way others saw, and made, paintings.

CUBISM: LEARNING FROM PSYCHOLOGY

Creating Cubism was a problem that took Braque and Picasso eight years (1906–1914) to solve. A partial answer to questions like "Why so long?" and "Why so difficult?" comes from a short primer on problem-solving.

Well- and Ill-Structured Problems

A problem is classified as well- or ill-structured depending on the information provided for its solution (Newell & Simon, 1972; Reitman, 1965; Simon, 1973; Voss & Post, 1988). Based on the information and on the solver's expertise, a problem space—a representation of the problem—is constructed. A problem space has an initial and a goal state, a set of operators (condition-action rules of the form, "If this condition, then this action") that are applied sequentially to move from the initial to the goal state, and a criterion for knowing when the goal is reached. Constraints help structure the solution path by limiting (precluding) and directing (promoting) search in a problem space.

In a *well-structured problem,* everything in the problem space is specified. In the domain of representational painting, painting-by-number is a well-structured problem. The initial state is a canvas with a numbered cartoon drawing printed on it. The canvas comes with a set of numbered paints. The goal criterion is matching the picture on the cover of the paint-by-number set. There is one operator, which is applied recursively: "If the number on the cartoon is N, fill the space with the paint marked N."

Table 1.1 illustrates the problem space for paint-by-number. Notice that in this and all well-structured problems there is little search and, importantly, a single correct goal state. This precludes creativity; creativity is only possible with ill-structured problems.

An *ill-structured problem* is incompletely specified. What is left out? The operators or the order in which they are applied may be unknown. More critical to creativity, there could be no clear goal criterion, which was the case with Cubism and was also why it took so long to develop as an art form.

TABLE 1.1. Problem Space for Paint-by-Number Problem

Initial State
- Canvas with numbered cartoon.
- Numbered set of paints.

Operators
1. If section is numbered "1," fill with paint numbered "1."
2. If section is numbered "2," fill with paint numbered "2."
3. Continue until all sections are filled.

Goal State
- Match picture on cover of paint-by-number set.

The initial state for Braque and Picasso was representational painting. In 1906, this included Monet's Impressionism, Matisse's Fauvism, and more traditional styles using *chiaroscuro,* dark-light contrasts that produced a convincing illusion of depth. The operators and the goal criterion evolved between 1906 and 1914. Table 1.2 oversimplifies the search space by including only three of these operations.

My attempt at a Cubist composition (Figure 1.2) was produced using the three operators from Figure 1.1: (1) The compote and its contents are fractured and shown from several viewpoints; (2) the hues are limited to black and white, and their values to very light and very dark; (3) the recombined parts are arranged in a checkerboard pattern.

The Creativity Problem: Strategy and Structure

The defining characteristics of what I call the creativity problem are three. First and obviously, it is initially ill-structured. Second, its solution depends on strategic specification of paired constraints. The specification is *strategic* because it is determined by the goal criterion. Third, the selected constraints *structure* the problem space to preclude (or limit search among) familiar, reliable responses and promote (or direct search among) novel, surprising ones. As we shall see, studying the development of constraint pairs in a particular work (or better, a body of work) can *re-create* its solution path.

Table 1.3 shows a revised problem space for Cubism, indicating the paired constraints and goal criterion that produced the operators in Table 1.2. Limiting the paired constraints to three again oversimplifies the process, in which constraints proliferate, "generated" as Reitman (1965) said, "from one transformation of the problem to the next" (p. 169).

For example, the promotion of multiple viewpoints tended to produce overly complex cartoons for coloring. This produced the second pair of

TABLE 1.2. Problem Space for Cubism Problem

Initial State
  Representational painting styles in 1906.

Operators
1. If representing an object, fracture and depict it from several viewpoints.
2. If adding color, limit the number of hues and the range of values.
3. If representing the relationships between fractured objects, compose a pattern of their parts.

Goal State
  Novel representational painting style, Cubism

TABLE 1.3. Paired Constraints for Cubism Problem

Initial State		
Goal constraint for representational painting in 1906: Paint what you see.		
Constraint Pairs		
Preclude		Promote
1. Single point of view	→	Multiple points of view
2. Local color	→	Monochromatic palette
3. Illusion of depth	→	Flat, patterned picture plane
Goal State		
Goal constraint for Cubism in 1914: Paint what you know.		

constraints which, by precluding local color (that is, the colors of the objects depicted) and promoting a palette of earth tones, solved the new simplification problem. The third constraint pair which produced rhythmically painted patterns led, in turn, to the inclusion of real patterned materials (newsprint, wallpaper) and the invention of collage.

As the cascade of constraints—all paired and strategically selected—continued, the novel goal criterion (paint what you know) was gradually specified.[1]

The constraints in Table 1.3 structure, in part, the solution path for Braque and Picasso's creativity problem. In cases of influential creativity such as this, a cascading constraint path will—over time—produce a product (painting, sonata, building, novel) that simultaneously defines and meets the new criterion.

In chapter 2, we consider the kinds of constraints involved in the cascade. One of them includes "first choruses."

[1]Notice that selection supposes that the decision-making process, the recognition and retention of generative constraints, is deliberate. It does not preclude the possibility that some things selected are discovered by accident or chance (Austin, 2003). See Appendix A: Learning to Take Chances.

CHAPTER 2

Constraints and First Choruses

What can we learn from Larry Rivers? What else can we learn from Picasso? What else can we learn from Braque?

CONSTRAINTS FOR CONFORMITY

Before describing the kinds of constraints involved in structuring a creativity problem, I want to point out the kind that does hinder novelty. Operators in well-structured problems with single correct solutions, like directions to memorize, calculate exactly, or copy correctly, do the opposite of constraints for creativity. They preclude the surprising and promote the expected, and should be called "constraints for conformity."

CONSTRAINTS FOR CREATIVITY

I like to think of constraints for creativity as *barriers that lead to breakthroughs*. One constraint *precludes* (or limits search among) low-variability, tried-and-true responses. It acts as a barrier which allows the other constraint to *promote* (or direct search among) high-variability, novel responses that could prove to be breakthroughs. The specific pairs are strategically chosen to realize a novel goal criterion (Stokes, 1999a, 2001a, 2001b; Stokes & Fisher, 2005; Stokes & Harrison, 2003).

In the case of Cubism, precluding a privileged viewpoint (the barrier) precipitated the multiplication of viewpoints within a single pictorial space (the breakthrough), allowing the artists to paint more things about their subjects (what they knew) than a single vantage point (what they saw) permitted.

Figure 2.1 shows the four kinds of constraints that we're interested in.

Domain Constraints: First Choruses

Learning and skill acquisition take place within domains, specialized areas of knowledge with agreed-upon performance criteria (Abuhamdeh & Csikzentmihalyi, 2004). The criteria are based on *goal, subject* and *task constraints;* goal constraints specify styles, like Impressionist painting or Baroque music. Subject constraints involve content, landscape and still life in paiting, or major and minor theme in music. Task constraints are concerned with materials and their use—for example, how paint is applied to the canvas, or how ornaments are added to individual notes.

Mastery means substituting knowledge for ignorance, skill for ineptness. When formally trained, novices master constraints in an order determined by others, teachers, coaches, critics. With mastery, a domain becomes what Larry Rivers (1987), a painter and musician, called the *first chorus.* For a representational painter like himself, the "first chorus"—what he improvises on, makes variations of—is the history of painting. In the art museums of any European capital you can watch students copying the masters, practicing their first choruses. In the Museu Picasso in Barcelona, you can see the progress of young Pablo doing the same. If you know what you're looking for, you can see the chromatic character of Titian as well as the palette of Bonnard in the paintings of Mark Rothko.

The transition from master to creator comes when experts impose novel constraints on their domains. As indicated in the Braque-Picasso ex-

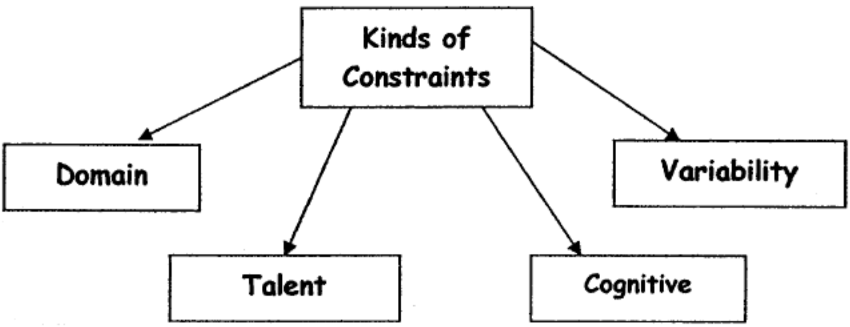

FIGURE 2.1. Kinds of constraints.

ample, the most radical change accompanies a new goal constraint. Substituting what they knew (multiple views/aspects of objects) for what they saw (a single point of view) produced fractured objects *and* a cascade of subsequent subject and task constraints. The prototypical early Cubist subject was a still life. Its contents (subject constraint) were a compote, grapes, pears, wine glasses, sometimes a guitar and sheet music. Task constraints limited colors to neutrals—black, white, browns—which, crossing over the multiplying facets, created surface patterns and restricted depth.

Interestingly, the simplifications following the fracturing reflect two other kinds of constraints—*cognitive* and *variability constraints.* Cognitive constraints, like domain constraints, limit the number of ways something can be done. Variability constraints stipulate how differently it should or must be done.

Cognitive Constraints

This kind of constraint reflects physiological limitations on how many things our brains can process at one time. According to standard memory models, the number of items that can be active in "working memory" at one time is seven plus or minus two. The way to get around that limit is to group or chunk items into larger units. Experts can do extremely complex thinking in their areas of specialization because their knowledge is organized into very large units. Braque and Picasso were already experts in painting when they began to work together on the creativity problem the solution of which was Cubism. This meant they could entertain many painterly ideas at one time, as well as execute many things automatically.

"Automatic" refers to skilled actions. For example, you don't have to think about how to sign your name. Picasso and Braque had the advantage of a huge "first chorus." Neither one had to think about how to draw, compose, or apply color. Braque had the additional advantage of possessing a related repertoire, an expanded first chorus. Having been a house painter, he was skilled in using wallpaper and wood combs. Wallpaper became *papier colles,* printed papers and/or newspapers pasted onto a painting and then drawn or painted over. Wood combs, dipped in one color paint and pulled through another, added the effect of wood grain to the surface.

During what is called the analytic stage of Cubism, when (despite limited contents, colors, and value ranges) the number of viewpoints became impossible to process and the objects depicted became indecipherable, the artists introduced the larger, simpler shapes that become the synthetic variant. Could this too have been due to *cognitive constraints?* Did Braque and

Picasso push the process to the point where even they couldn't work on it without simplification?

It's possible. There's another, based on the third kind of constraint, a *variability constraint.*

Variability Constraints

This kind of constraint specifies how differently something must or should be done. High-variability constraints preclude high-probability, repetitious responses and promote less frequent, even novel, ones in children and adults. Just praise a child for every instance of novelty in painting (a new shape or color mixture) or block–building (a new form) and watch novelty go up (Holman, Goetz, & Baer, 1977). At Barnard, we've even shown that when you acquire a new skill (say painting), you learn *how* to paint, and also *how differently* to continue doing it (Stokes, 1999b). How differently you learn to do something depends on *how difficult* it is to master the skill at hand. Very easy problems don't require trying many things to solve them. More difficult problems do. If early success in doing addition or swinging a bat depends on doing many things, a child will learn to be highly variable when doing math or playing baseball. High variability is important for two reasons. Children who are highly variable learn new things faster than those who are less variable. Adults who are highly variable are more likely to do new things and, as we shall soon see, to keep doing them.

The "how differently" we call *habitual* or *learned variability levels.* Evidence that the levels are learned is two-fold. First, they differ between individuals: Sam shifts among six strategies to solve addition problems; Sally repeatedly uses the same one. Second, they differ between domains for the same individual: Sally is far more variable in painting than in math.

It's easy to come up with your own evidence for learned variability levels. Imagine a situation where the variability requirements are *subjectively* too high. What do you feel?—the discomfort we label anxiety. Now imagine one where the requirements are *subjectively* too low. What do you experience?—the discomfort we call boredom. Importantly, anxiety and boredom motivate us to regain our habitual levels. Said another way, the flip side of a high-variability level is a low boredom threshold (Stokes, 1995).

To avoid boredom, potential creators maintain their habitually high levels of variability by doing many different things in their areas of expertise. In the case of Braque and Picasso, some of those things changed their domain. Both painters had experimented with radically different styles before working together. Braque was an accomplished Fauve, brushing brilliantly high-keyed landscapes in the south of France before teaming up with Picasso in Paris. Picasso was already known for the elongated, emotional, mannerist style portraits of his Blue period. Cubism went through several stages in their joint hands. Once separated, their work changed, but retained Cubist constraints. With Braque, this is more obvious: Shifts in scale and subject matter overpower shifts in style. However, while Picasso initially turned to heroically huge, neoclassical nudes, and produced sculpture, pottery, and prints as well as paintings, the bulk of his subsequent work was based on schematic, patterned, flattened, i.e., Cubist forms. This is not surprising; a great deal of their painting knowledge had become organized around, interconnected with, Cubism.

Talent Constraints

This kind of constraint is in a class of its own. Talents (or gifts) are genetic—you either have them or you don't. You can have them in different degrees; for example, you might be more talented in music and less talented (but still talented) in math. Like all constraints for creativity, talents are two-sided. They simultaneously *promote* and *preclude* interest and skill acquisition in different domains. How interested you are and how easily you acquire a specific skill depends on the brain you're born with.

Extremes are easiest to understand, so let's start with them. Think about the last birthday party you attended. How did the "Happy Birthday" chorus sound? Sort of in-time? Not entirely in-tune? If your answer is yes, your family and friends (like mine, like most) are sort of tone-deaf. They remember (recognize and recall and repeat) the words and the rhythm (the in-time part), but not the pitches (the in-tune part). The opposite of tone-deafness is perfect pitch, the ability to recognize, remember, and replicate exact tones. People with perfect pitch notice sounds, remember sounds, play around with sounds in their head. They're interested in making sounds, in playing instruments. When they take music lessons, they progress faster than other students. Why? For the same reason they were interested in the first place—a "pre-tuned" brain (Winner, 1996).

The same holds for color perception. If you're color blind, pigments—in nature, in art—can't grab your attention or hold your interest. No one studies "perfect hue" (recognizing and remembering and replicating color exactly), but it's something that colorists like Monet or Bonnard seem to have had from the start.

What About the Less-Gifted?

The not-so-good news is that it can take more time and more effort to master the task constraints in their domains. The good news is that, once mastery is achieved, it's difficult to tell an expert who was more gifted from the one who was less gifted (Ericcson, 1996; Sloboda, 1996).

The other good news is that variability levels are learned (Stokes, 2001a). You may be less musical (say, with relative rather than perfect pitch) or have less dexterity than a conservatory classmate. But if you're habitually more variable when composing or performing, you might have a better chance at solving a musical creativity problem.

Does Talent Guarantee Creativity?

No, and for two reasons. The first is tied to those learned variability levels. A high talent level and a low variability level can produce very skillful, very redundant products.

The second reason is that a talent may not be developed. This could happen if it's unrecognized or undervalued (in a family, a community, a culture). In some cases, it might be actively discouraged. Many talents fit in the category economists call "surplus." Too many people have them; too few other people need their products. Sadly, development is sometimes stymied because a talented individual places too much value on novelty. I once heard a student say, "I never read anyone else's verse. I have to find my own voice first." That's certainly a constraint, but eliminating a huge first chorus on which to improvise is *not* a constraint for creativity.

Some people have gifts or talents and not know it because they never had the tools to develop them. Matisse didn't know he had a talent for painting until he was in his twenties, recovering from an illness, and given a paintbox to occupy his time. (We'll talk more about late-bloomers like Matisse in chapters 9 and 10.)

DIFFERENT DOMAINS: DIFFERENT FIRST CHORUSES AND CONSTRAINTS

Each chapter after this one focuses on first choruses and constraints in a different domain. We'll see how several recognized creators precluded their domain's dominant (most rewarded, most recognized) solution (a first chorus) to promote a new one, how some then constrained their own novel solutions, how one pair of constraints leads to another, how the same constraints in different hands lead to different things. We'll also listen to and learn from conversations with less well-known creators whose works are still in progress.