

Programming on the Right Side of the Brain

Michael Feathers

Object Mentor

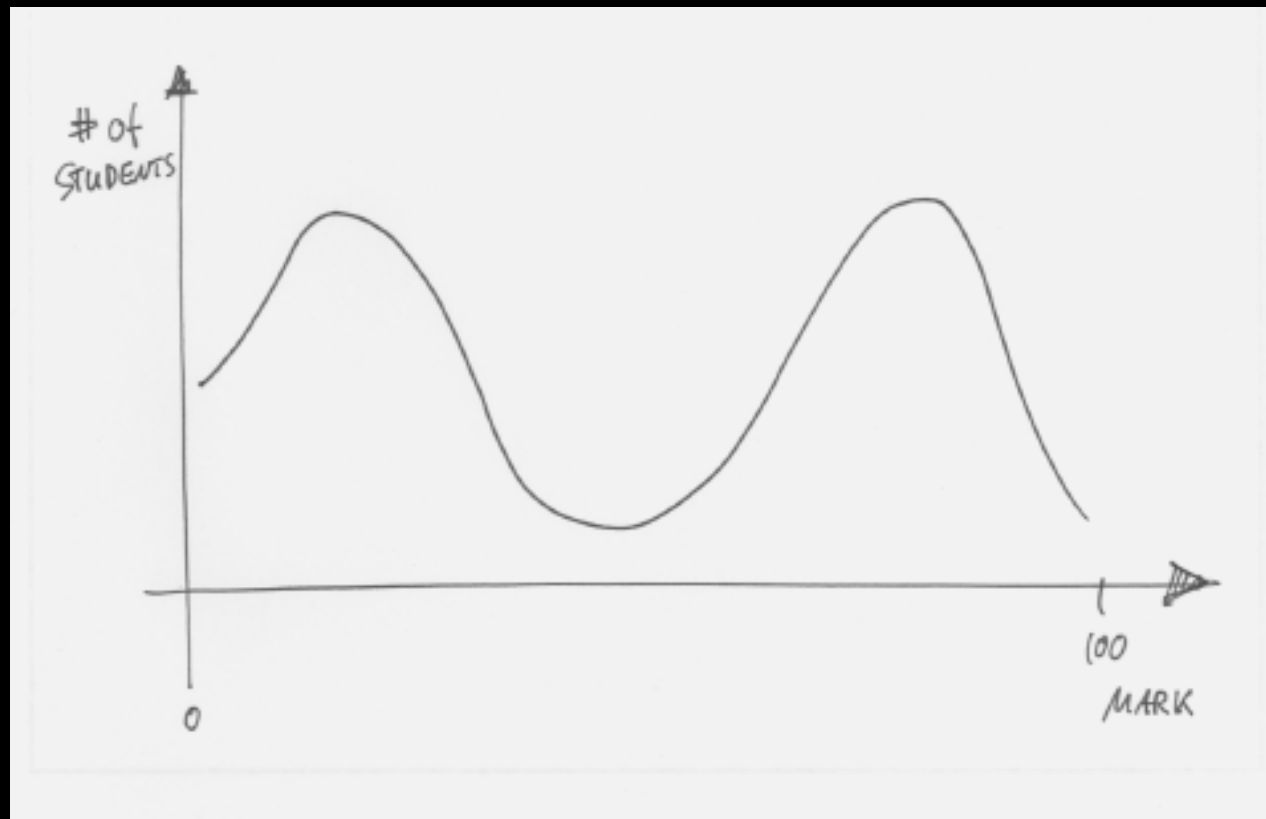
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10x Programmers

The original study that found huge variations in individual programming productivity was conducted in the late 1960s by Sackman, Erikson, and Grant (1968). They studied professional programmers with an average of 7 years' experience and found that the ratio of initial coding time between the best and worst programmers was about 20 to 1; the ratio of debugging times over 25 to 1; of program size 5 to 1; and of program execution speed about 10 to 1. They found no relationship between a programmer's amount of experience and code quality or productivity. - Steve McConnell

The Double Hump Problem



The Double Hump Problem

<p>1. Read the following statements and tick the correct answer in the front column.</p> <pre>int a = 10; int b = 20; a = b;</pre>	<p>The new values of a and b are:</p> <table><tr><td><input type="checkbox"/></td><td>a = 30</td><td>b = 0</td></tr><tr><td><input type="checkbox"/></td><td>a = 30</td><td>b = 20</td></tr><tr><td><input type="checkbox"/></td><td>a = 20</td><td>b = 0</td></tr><tr><td><input type="checkbox"/></td><td>a = 20</td><td>b = 20</td></tr><tr><td><input type="checkbox"/></td><td>a = 10</td><td>b = 10</td></tr><tr><td><input type="checkbox"/></td><td>a = 10</td><td>b = 20</td></tr><tr><td><input type="checkbox"/></td><td>a = 20</td><td>b = 10</td></tr><tr><td><input type="checkbox"/></td><td>a = 0</td><td>b = 10</td></tr><tr><td><input type="checkbox"/></td><td colspan="2">If none, give the correct values: a = b =</td></tr></table>	<input type="checkbox"/>	a = 30	b = 0	<input type="checkbox"/>	a = 30	b = 20	<input type="checkbox"/>	a = 20	b = 0	<input type="checkbox"/>	a = 20	b = 20	<input type="checkbox"/>	a = 10	b = 10	<input type="checkbox"/>	a = 10	b = 20	<input type="checkbox"/>	a = 20	b = 10	<input type="checkbox"/>	a = 0	b = 10	<input type="checkbox"/>	If none, give the correct values: a = b =	
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Figure 1: A sample test question

Saeed Dehnadi and Richard Bornat, Middlesex University

Meaninglessness

“To write a computer program you have to come to terms with this, to accept that whatever you might want the program to mean, the machine will blindly follow its meaningless rules and come to some meaningless conclusion. In the test the consistent group showed a pre-acceptance of this fact: they are capable of seeing mathematical calculation problems in terms of rules, and can follow those rules wheresoever they may lead. The inconsistent group, on the other hand, looks for meaning where it is not. The blank group knows that it is looking at meaninglessness, and refuses to deal with it.”

Abstraction is Subtraction

“**Abstraction** is the process or result of generalization by reducing the information content of a concept or an observable phenomenon, typically to retain only information which is relevant for a particular purpose.”

- Wikipedia

Monoids

A monoid is a set, M , together with an binary operation “ \bullet ” (which means that for all a, b in M , $a \bullet b$ is also an element of M) that satisfies the following two axioms:

Associativity

For all a, b and c in M , the equation $(a \bullet b) \bullet c = a \bullet (b \bullet c)$ holds.

Identity element

There exists an element e in M , such that for all elements a in M , the equation $e \bullet a = a \bullet e = a$ holds.

Monoids

Monoids can be viewed as a special class of categories. Indeed, the axioms required of a monoid operation are exactly those required of morphism composition when restricted to the set of all morphisms whose source and target is a given object. That is,

A monoid is, essentially, the same thing as a category with a single object.

More precisely, given a monoid $(M, *)$, one can construct a small category with only one object and whose morphisms are the elements of M . The composition of morphisms is given by the monoid operation $*$.

Monoids

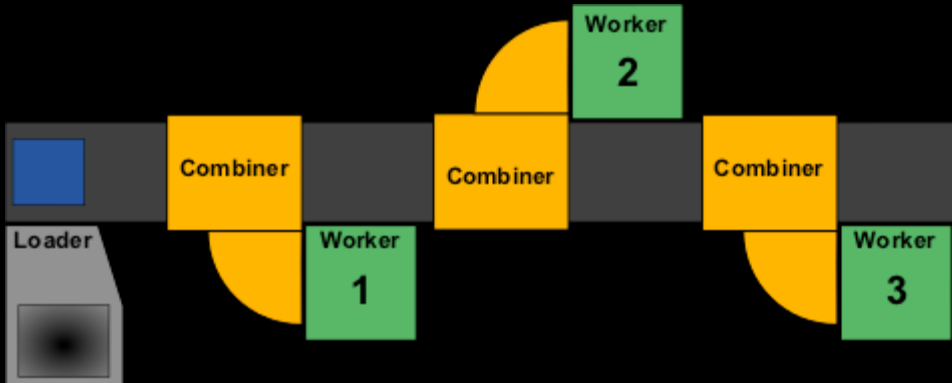


Brian Beckman - 'Monads, Monoids, and Mort'

Monads

```
class Monad m where
  (>>=)      :: m a -> (a -> m b) -> m b
  (>>)       :: m a -> m b -> m b
  return     :: a -> m a
```

A Physical Analogy for Monads



1. Trays that hold work products as they move along the conveyor belt.
2. Loader machines that can put any object into a tray.
3. Combiner machines that can take a tray with an object and produce a tray with a new object. These combiner machines are attached to worker machines that actually produce the new objects.

http://www.haskell.org/all_about_monads/html/analogy.html

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The New

Drawing on the Right Side of the Brain

A course
in enhancing
creativity
and artistic
confidence

Betty Edwards

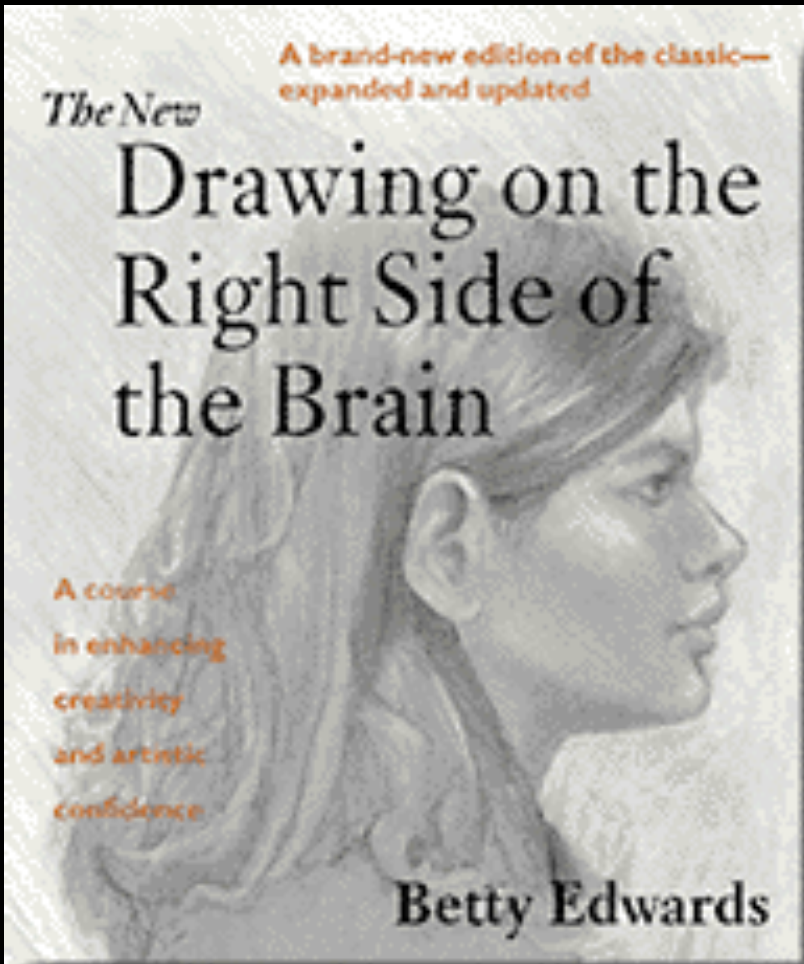




Fig. 4-7. Pablo Picasso (1881-1973), *Portrait of Igor Stravinsky*, Paris, May 21,

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blink

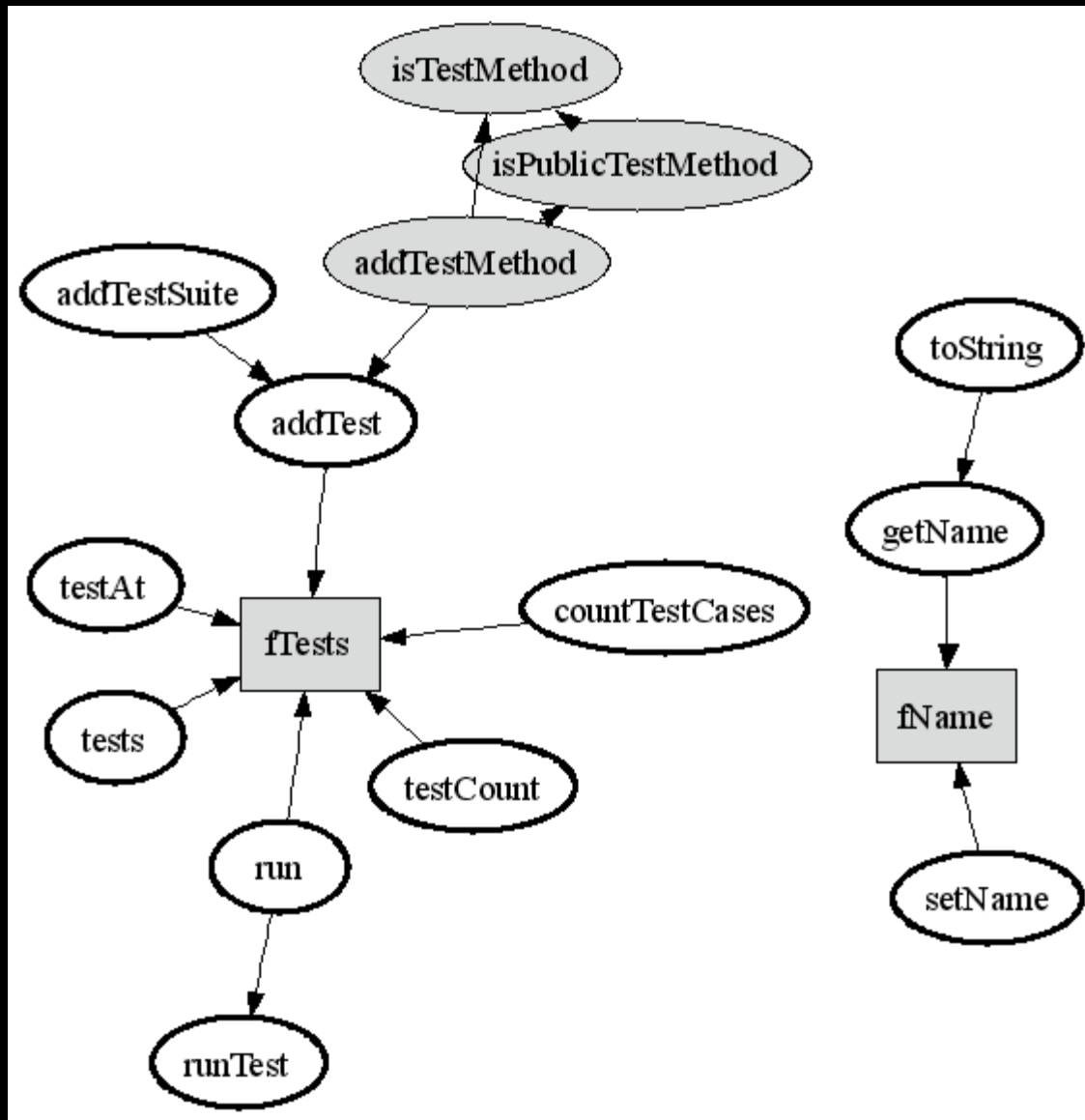
By the author of THE TIPPING POINT

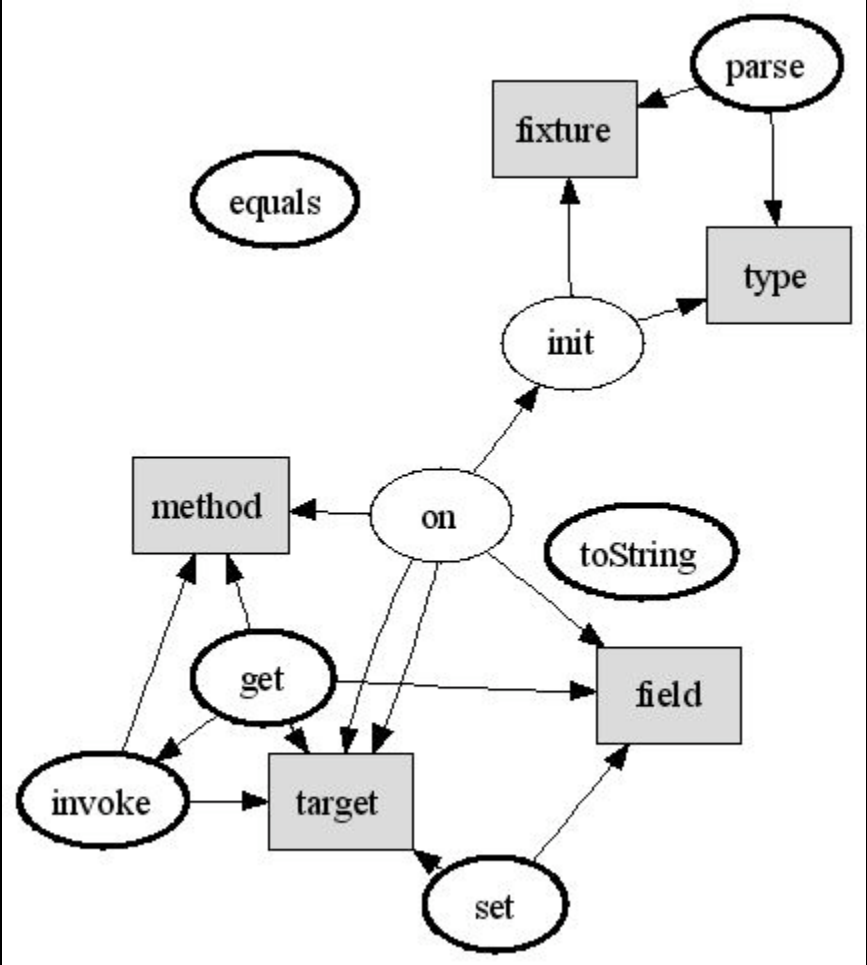


The Power of Thinking
Without Thinking

Malcolm Gladwell

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The
Pragmatic
Programmers

Pragmatic & Thinking & Learning

Refactor
Your Wetware



Andy Hunt

Neural Saturation



```
public class Formatter {
    private String text = "";
    private String indentation = "";

    public void newLine() {
        newLine("");
    }

    public void newLine(String lineText) {
        newText("\n" + indentation + lineText);
    }

    public void newText(String newText) {
        text += newText;
    }

    public void indent() {
        indentation += " ";
    }

    public void outdent() {
        assert indentation.length() > 0;
        indentation = indentation.substring(1);
    }

    public String getText() {
        return text;
    }
}
```

Wabi Sabi



Taste

"All of us had been trained by Kelly Johnson and believed fanatically in his insistence that an airplane that looked beautiful would fly the same way."

- Ben Rich, *Skunk Works (on the SR-71)*



Taste

*I was talking recently to a friend who teaches at MIT. His field is hot now and every year he is inundated by applications from would-be graduate students. "A lot of them seem smart," he said. "What I can't tell is whether they have any kind of taste."
- Paul Graham*

Good design is simple.
Good design is timeless.
Good design solves the right problem.
Good design is suggestive.
Good design is often slightly funny.
Good design is hard.
Good design looks easy.
Good design uses symmetry.
Good design resembles nature.
Good design is redesign.
Good design can copy.
Good design happens in chunks.
Good design is often daring.

10,000 Hours

Ten thousand hours is equivalent to roughly three hours a day, or 20 hours a week, of practice over 10 years... No one has yet found a case in which true world-class expertise was accomplished in less time. It seems that it takes the brain this long to assimilate all that it needs to know to achieve true mastery. - Malcolm Gladwell



Passion overlap

Reading Habits

“Hackers often have a reading range that astonishes liberal arts people but tend not to talk about it as much. Many hackers spend as much of their spare time reading as the average American burns up watching TV, and often keep shelves and shelves of well-thumbed books in their homes.” - The Hacker’s Dictionary

Ambiguity Tolerance

Ambiguity tolerance is the ability to perceive ambiguity in information and behavior in a neutral and open way.

Ambiguity tolerance is an important issue in personality development and education. In psychology and in management, levels of tolerance of ambiguity are correlated with creativity,^[1] risk aversion, psychological resilience, lifestyle,^[2] orientation towards diversity (cross-cultural communication, intercultural competence), and leadership style.^[3]

The converse, **ambiguity intolerance**,^{[4][5]} which was introduced in *The Authoritarian Personality* in 1950,^[6] was defined in 1975 as a “tendency to perceive or interpret information marked by vague, incomplete, fragmented, multiple, probable, unstructured, uncertain, inconsistent, contrary, contradictory, or unclear meanings as actual or potential sources of psychological discomfort or threat.”