Living in a Dream World

Daydreaming can help solve problems, trigger creativity, and inspire great works of art and science. When it becomes compulsive, however, the consequences can be dire

By Josie Glausiusz

When Rachel Stein (not her real name) was a small child, she would pace around in a circle shaking a string for hours at a time, mentally spinning intricate alternative plots for her favorite television shows. Usually she was the star—the imaginary seventh child in *The Brady Bunch*, for example. “Around the age of eight or nine, my older brother said, ‘You’re doing this on the front lawn, and the neighbors are looking at you. You just can’t do it anymore,’” Stein recalls. So she retreated to her bedroom, reveling in her elaborate reveries alone. As she grew older, the television shows changed—first *General Hospital*, then *The West Wing*—but her intense need to immerse herself in her imaginary world did not.

“There were periods in my life when daydreaming just took over everything,” she recalls. “I was not in control.” She would retreat into fantasy “any waking moment when I could get away with it. It was the first thing I wanted to do when I woke up in the morning. When I woke up in the night to go to the bathroom, it would be bad if I got caught up in a story, because then I couldn’t go back to sleep.” By the time she was 17, Stein was exhausted. “I love the daydreams, but I just felt it was consuming my real life. I went to parties with friends, but I just couldn’t wait to get home. There was nothing else that I wanted to do as much as daydreaming.”

Convinced that she was crazy, she consulted six different therapists, none of whom could find anything wrong with her. The seventh prescribed Prozac, which had no effect. Eventually Stein began tak-
Most people spend about 30 percent of their waking hours spacing out, drifting off, lost in thought, woolgathering—or, as one scientist put it, “watching your own mental videos.”

The scientific study of people such as Stein is helping researchers better understand the role of daydreaming in normal consciousness—and what can happen when this process becomes unhealthy. For most of us, daydreaming is a virtual world where we can rehearse the future, explore fearful scenarios or imagine new adventures without risk. It can help us devise creative solutions to problems or prompt us, while immersed in one task, with reminders of other important goals. For others, however, the draw of an alternative reality borders on addiction, choking off other aspects of everyday life, including relationships and work. Starring as idealized versions of themselves—as royalty, raconteurs and saviors in a complex, ever changing cast of characters—addictive daydreamers may feel enhanced confidence and validation. Their fantasies may be followed by feelings of dread and shame, and they may compare the habit to a drug or describe an experience akin to drowning in honey.

The recent discovery of a network in the brain dedicated to autobiographical mental imagery is helping researchers understand the multiple purposes that daydreaming serves in our lives. They have dubbed this web of neurons “the default network,” because when we are not absorbed in more focused tasks, the network fires up. The default network appears to be essential to generating our sense of self, suggesting that daydreaming plays a crucial role in who we are and how we integrate the outside world into our inner lives. Cognitive psychologists are now also examining how brain disease may impair our ability to meander mentally and what the consequences are when we just spend too much time, well, out to lunch.

Videos in the Mind’s Eye
Most people spend about 30 percent of their waking hours spacing out, drifting off, lost in thought, woolgathering, saving the planet from alien invasion. In a 2009 study that may include everything from pondering ingredients for a dinner recipe to wandering in daily life. In a 2009 study that may include everything from pondering ingredients for a dinner recipe to saving the planet from alien invasion. Most of the time when people fall into mind wandering, they are thinking about everyday concerns, such as recent encounters and items on their to-do list. More exotic daydreams in the style of James Thurber’s grandiose fictional fantasist Walter Mitty—such as Mitty’s dream of piloting an eight-engine hydroplane through a hurricane—are rare.

Humdrum concerns figured prominently in one study that rigorously measured how much time we spend mind wandering. In a 2009 study Kane and his colleague Jennifer McVay asked 72 U.N.C. students to carry PalPilots that beeped at random intervals eight times a day for a week. The subjects then recorded their thoughts at that moment on a questionnaire. About

© 2011 Scientific American
30 percent of the beeps coincided with thoughts unrelated to the task at hand. Mind wandering increased with stress, boredom or sleepiness or in chaotic environments and decreased with enjoyable tasks. That may be because enjoyable activities tend to grab our attention.

Intense focus on our problems may not always lead to immediate solutions. Instead allowing the mind to float freely can enable us to access unconscious ideas hovering beneath the surface—a process that can lead to creative insight, according to psychologist Jonathan Schooler of the University of California, Santa Barbara.

We may not even be aware that we are daydreaming. We have all had the experiencing of “reading” a book yet absorbing nothing—moving our eyes over the words on a page as our attention wanders and the text turns into gibberish. “People oftentimes don’t realize that they’re daydreaming while they’re daydreaming; they lack what I call ‘meta-awareness,’ consciousness of what is currently going on in their minds,” he says. Aimless rambling across the moors of our imaginings may allow us to stumble on ideas and associations that we may never find if we strive to seek them.

A Key to Creativity

Artists and scientists are well acquainted with such playful fantasizing. Orhan Pamuk, the Turkish novelist who won the Nobel Prize in Literature in 2006, imagined “another world,” to which he retreated as a child, where he was “someone else, somewhere else ... in my grandmother’s sitting room, I’d pretend to be inside a submarine.” Albert Einstein pictured himself running along a light wave—a reverie that led to his theory of special relativity. Filmmaker Tim Burton daydreamed his way to Hollywood success, spending his childhood holed up in his bedroom, creating posters for an imaginary horror film series.

Why should daydreaming aid creativity? It may be in part because the waking brain is never really at rest. As psychologist Eric Klinger of the University of Minnesota explains, floating in unfocused mental space serves an evolutionary purpose: when we are engaged with one task, mind wandering can trigger reminders of other, concurrent goals so that we do not lose sight of them. Some researchers believe that increasing the amount of imaginative daydreaming we do or replaying variants of the millions of events we store in our brains can be beneficial. A painful procedure in a doctor’s office, for example, can be made less distressing by visualizations of soothing scenes from childhood.

Yet to enhance creativity, it is important to pay attention to daydreams. Schooler calls this “tuning out” or deliberate “off-task thinking.” In an as yet unpublished study, he and his colleague Jonathan Smallwood asked 122 undergraduates at the University of British Columbia to read a children’s story and press a button each time they caught themselves tuning out. The researchers also periodi-
scientically interrupted the students as they were reading and asked them if they were “zoning out” or drifting off without being aware of it. “What we find is that the people who regularly catch themselves—who notice when they’re doing it—seem to be the most creative,” Schooler says. They score higher on a standard test of creativity, in which they are asked to describe all the uses of a common object such as a brick; high scorers compile a longer and more creative list. “You need to have the mind-wandering process,” Schooler explains, “but you also need to have meta-awareness to say, ‘That’s a creative idea that popped into my mind.’”

The mind’s freedom to wander during a period of deliberate tuning out could also explain the flash of insight that may pop into a person’s head when he or she takes a break from an unsolved problem. Ut Na Sio and Thomas Ormerod, two researchers at the University of Lancaster in England, conducted a recent meta-analysis of studies of these brief reveries. They found that people who engaged in a mildly demanding task, such as reading, during a break from, say, a visual assignment, such as the hat-rack problem—in which participants have to construct a sturdy hat rack using two boards and a clamp—did better on that problem than those who did nothing at all. They also scored higher than those engaged in a highly demanding task—such as mentally rotating shapes—during the interval. Allowing our minds to ramble during a moderately challenging task, it seems, enables us to access ideas not easily available to our conscious minds or to combine these insights in original ways. Our ability to do so is now known to depend on the normal functioning of a dedicated daydreaming network deep in our brain.

The Mental Matrix of Fantasy

Like Facebook for the brain, the default network is a bustling web of memories and streaming movies, starring ourselves. “When we daydream, we’re at the center of the universe,” says neurologist Marcus Raichle of Washington University in St. Louis, who first described the network in 2001. It consists of three main regions: the medial prefrontal cortex, the posterior cingulate cortex and the parietal cortex. The medial prefrontal cortex helps us imagine ourselves and the thoughts and feelings of others; the posterior cingulate cortex draws personal memories from the brain; and the parietal cortex has major connections with the hippocampus, which stores episodic memories—what we ate for breakfast, say—but not impersonal facts, such as the capital of Kyrgyzstan. “The default mode network is critical to the establishment of a sense of self,” Raichle says.

It was not until 2007, however, that cognitive psychologist Malia Fox Mason, now at Columbia University, discovered that the default network—which lights up when people switch from an attention-demanding activity to drifting reveries— thereby facilitating a flash of insight that may lead them in the right direction.

If you are faced with a difficult decision, try not to think about the problem for a while. Instead do something else while letting your mind ramble. You may get a flash of insight from your subconscious that will lead you in the right direction.
with no specific goal—becomes more active when people engage in a monotonous verbal task, when they are more likely to mind wander. In an experiment, participants were shown a string of four letters such as R H V X for one second, which was then replaced by an arrow pointing either left or right, to indicate whether the sequence should be read forwards or backwards. When one of the characters in the string appeared, subjects were asked to indicate its position (first, second, third or last, depending on the direction of the arrow). The more the participants practiced on each of the four original letter strings, the better they performed. They were then given a novel task, consisting of letter sequences they had not seen before. Activity in the default network went down during the novel version of the test. Subjects who daydreamed more in everyday life—as determined by a questionnaire—also showed greater activity in the default network during the monotonous original task.

Mason did not directly measure mind wandering during the scans, however, so she could not determine exactly when subjects were “on task” and when they were daydreaming. In 2009 Smallwood, Schoolder and Kalina Christoff of the University of British Columbia published the first study to directly link mind wandering with increased activity in the default network. The researchers scanned the brains of 15 U.B.C. students while they performed a simple task in which they were shown random numbers from zero to nine. Each was asked to push a button when he or she saw any number except three. In the seconds before making an error—a key sign that an individual’s attention had drifted—defects in the default network may also impair our ability to daydream. A range of disorders—including schizophrenia and depression—have been linked to malfunctions in the default network in recent years. In a 2007 study neuroscientist Peter Williamson of the University of Western Ontario found that people with schizophrenia have deficits in the medial prefrontal cortex, which is associated with self-reflection. In patients experiencing hallucinations, the medial prefrontal cortex dropped out of the network altogether. Although the patients were thinking, they could not be sure where the thoughts were coming from. People with schizophrenia daydream normally most of the time, but when they are ill, “they often complain that someone is reading their mind or that someone is putting thoughts in their head,” Williamson says.

On the other hand, those who ruminate obsessively—rehashing past events, repetitively analyzing their causes and consequences, or worrying about all the ways things could go wrong in the future—are well aware that their thoughts are their own, but they have intense dif-

“What we find is that the people who regularly catch themselves [daydreaming]—who notice when they’re doing it—seem to be the most creative,” one psychologist says.

Daydreaming can serve as a useful distraction. For example, conjuring up soothing scenes from the past could make a visit to the doctor more bearable.
such as a truckload of watermelons. They may spend hours going over some past incident, asking themselves how it could have happened and why they did not react differently and end up feeling overwhelmed instead of searching for solutions. Experimental studies have shown that positive distraction—for example, exercise and social activities—can help ruminators reappraise their situation, as can techniques for cultivating mindfulness that teach individuals to pay precise attention to activities such as breathing or walking, rather than to thoughts. Yet people who daydream excessively may have the same problems ignoring their thoughts once they get going. Indeed, extreme daydreamers find their private world so difficult to escape that they describe it as an addiction—one as enslaving as heroin.

**When Daydreaming Becomes a Drug**

“I’m like an alcoholic with an unlimited supply of booze everywhere I go,” says Cordelia Amethyste Rose. A 30-year-old computer science student in Oregon, she started an online forum called Wild Minds (http://wildminds.ning.com) for people who simply cannot stop daydreaming. Since childhood, Rose has conjured up countless imaginary characters in ever changing plots. “They’ve grown right along with me, had children; some have died,” she says. The deeper she delved into her virtual world, though, the more distressed she became. “I couldn’t pay attention for more than a split second. I would look at a book and zone out after every word.” Even so, she found her invented companions more compelling than anyone real.

Rose says that she has no friends, but on Wild Minds she has found her peers. Many people posting to the site express relief that they have found others like themselves, emerging from a cocoon of loneliness and shame to share their experiences: misdiagnoses, lack of understanding from families and therapists, and rituals like the one described by a quiet girl who spends “endless hours” swaying in a rocking chair listening to music, daydreaming her life away. “It’s like a drug, poisoning and destroying your life,” says one anonymous fantasist, who admits to bingeing for days on a story line. “It’s even worse, because an addict can put a drug down and walk away. You can’t put down your mind and walk away from it.”

Yet few of the members of the Wild Minds community would abandon their mental creations, even if they could. One hardworking nurse revels in imagined adventures starring a fictional medieval Queen Eleanor of Scotland, a skilled horsewoman with four concurrent husbands, who practices a made-up religion and is “a genius in both state and battle-craft…trained in martial arts and is always inventing marvelous things.” Like Thurber’s fictional fantasist, Queen Eleanor’s creator spends a lot of time mentally rescuing disaster victims from burning buildings or “abseiling over cliffs, being winched in and out of helicopters with casualties.”

She has also documented her preposterous plots for independent biopsychological researcher Cynthia Schupak, a woman with a single-minded mission to understand compulsive daydreamers, who treated Rachel Stein and described her ordeal in a journal article published

A pleasant reverie about a successful acting career might motivate you to work hard for a desired outcome, but it could be detrimental if you become oblivious to pickpockets or vehicular traffic.
in 2009, Schupak is convinced that compulsive daydreaming is a unique disorder, characterized by an inability to control it and the deep distress over the condition. “Everyday escapist fantasy is fine and dandy, but this syndrome is different,” she says. Schupak has enrolled 85 subjects—garnered mostly from Web postings—for an in-depth study of the syndrome. Respondents to her questionnaires devote between 12 and 90 percent of their waking hours to daydreaming—often while pacing, twirling or waving a string. Nearly all believe that everyday activities pale by comparison with their vivid inner worlds, and some often drift in and out of their alternative reality in the midst of conversation. Typically they report that their daydreams made them feel comforted or confident, “because it’s me, just magnified,” as one subject put it. Nevertheless, 93 percent say they feel anguish over the amount of time they spend fantasizing, admitting that their habit has prevented them from forming relationships, studying or holding down any but the dullest jobs.

Schupak believes the syndrome could be a psychiatric illness, but is it? Singer, for example, believes it is nothing new: he says that he encountered many similar cases in his years of research and practice. Yet some evidence suggests that maladaptive daydreaming could be a distinctive disorder. Eight years ago clinical psychologist Eli Somer of the University of Haifa in Israel recounted cases of six people consumed by fantasy lives packed with sadism and bloodshed. All had suffered some form of childhood trauma. One had been sexually molested by her grandfather. Another described his father as a brutal man who humiliated and physically abused family members.

Somer believes that this mental activity emerged as a coping mechanism to help his patients deal with intolerable or inescapable realities. When their enhanced ability to conjure up vivid imagery is under control and does not interfere with social or academic success, “the phenomenon should probably be classified as a talent rather than a disorder,” he says. Attitude may also be important.

“I’m like an alcoholic with an unlimited supply of booze wherever I go,” says Cordellia Amethyste Rose, who started an online forum for people who cannot stop daydreaming.

Singer, who grew up during the Great Depression and had no formal musical training, he says, entertained himself through childhood and adolescence with the imaginary achievements of “Singer the Composer,” an alter ego who wrote a complete repertoire of classical music, including operas and an unfinished Seventh Symphony. He does not consider his inner adventures harmful but rather sees them as a boredom-banishing sport—one that likely helped to propel him into his profession.

Is Your Mind Wandering Out of Control?

How do you know when you have tipped over from useful and creative daydreaming into the netherworld of compulsive fantasizing? First, notice whether you are deriving any useful insights from your fantasies. “The proof is in the pudding,” Schooler says. “Creative individuals—artists, scientists, and so on—oftentimes report ideas that have occurred to them during daydreams.” Second, it is important to take stock of the content of your daydreams. To distinguish between beneficial and pathological imaginings, he adds, “Ask yourself if this is something useful, helpful, valuable, pleasant, or am I just rehashing the same old perseverative thoughts over and over again?” And if daydreaming feels out of control,

(Further Reading)