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,

By Josie Glausiusz
Photoillustration by Aaron Goodman

LIVING IN AN IMAGINARY 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

FAST FACTS

INNER WORLD

Daydreams are an inner world where we can rehearse the future and imagine new adventures without risk. Allowing the mind to roam freely can aid creativity—but only if we pay attention to the content of our daydreams.

Neuroscientists have identified the “default network”—a web of brain regions that become active when we mentally drift away from the task at hand into our own reveries.

When daydreaming turns addictive and compulsive, it can overwhelm normal functioning, impeding relationships and work.
of whom could find anything wrong with her. The seventh prescribed Prozac, which had no effect. Eventually Stein began taking another antidepressant, Luvox, which, like Prozac, is also a selective serotonin reuptake inhibitor but is usually prescribed for obsessive-compulsive disorder. Gradually she brought her daydreaming under control. Now age 39, she is a successful lawyer, still nervously guarding her secret world.

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 relationships and work. Star choking off other aspects of everyday life, to some degree.

Videos in the Mind’s Eye

Most people spend between 30 and 47 percent of their waking hours spacing out, drifting off, lost in thought, woolgathering—or, as one scientist put it, “WATCHING YOUR OWN MENTAL VIDEOS.”

They’re daydreaming while they’re daydreaming. They lack what I call ‘meta-awareness,’ consciousness of what is currently going on in their mind,” Schooler says. Aimless rambling across the moors they’re daydreaming while they’re daydreaming; they lack what I call ‘meta-awareness,’ consciousness of what is currently going on in their mind,” Schooler says. Aimless rambling across the moors they’re daydreaming while they’re daydreaming; they lack what I call ‘meta-awareness,’ consciousness of what is currently going on in their mind,” Schooler says. Aimless rambling across the moors they’re daydreaming while they’re daydreaming; they lack what I call ‘meta-awareness,’ consciousness of what is currently going on in their mind,” Schooler says. Aimless rambling across the moors they’re daydreaming while they’re daydreaming; they lack what I call ‘meta-awareness,’ consciousness of what is currently going on in their mind,” Schooler says. Aimless rambling across the moors they’re daydreaming while they’re daydreaming; they lack what I call ‘meta-awareness,’ consciousness of what is currently going on in their mind,” Schooler says. ,

The researchers also periodically interrupted the students as they reviewed their notes. They were “put to the test” or drifted off without being aware of it. “We find that the people who regularly catch themselves—who notice when they’re doing it—seem to be the most creative,” Schooler says. Such yet to enhance creativity, it is important to pay attention to daydreams. Schooler calls this “tuning out” or deliberating on-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 periodically interrupted the students as they were reading and asked them if they were “tuning 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. Such yet to enhance creativity, it is important to pay attention to daydreams. Schooler calls this “tuning out” or deliberating on-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 periodically interrupted the students as they were reading and asked them if they were “tuning 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. Such yet to enhance creativity, it is important to pay attention to daydreams. Schooler calls this “tuning out” or deliberating on-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 periodically interrupted the students as they were reading and asked them if they were “tuning 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. Such yet to enhance creativity, it is important to pay attention to daydreams. Schooler calls this “tuning out” or deliberating on-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 periodically interrupted the students as they were reading and asked them if they were “tuning 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.
The mind’s freedom to wander during a period of deliberate turning 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. Utt Na So 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 letter shapes—during the interval. Allowing our mind to ramble during a moderately challenging task, it seems, enables us to access ideas not easily available to our conscious mind 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 are 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 are 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 reverses 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 either left or right, to indicate whether the sequence should be read forward or backward. When one of the characters in the string appeared upside down, 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 string, 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, Schooler 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 were performing 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—default network activity shot up. Periodically the investigators also interrupted the subjects and asked them if they had zoned out. Again, activity in the default network was higher in the seconds before the moment they were caught in the act. Notably, activity was strongest when people were unaware that they had lost their focus. “The more complex your mind-wandering episode is, the more of your mind it’s going to consume,” Smallwood says.

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 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 difficulty turning them off. The late Yale psychologist Susan Nolen-Hoeksema did not believe that rumination is a form of daydreaming, which she defined as “imagining situations in the future that are largely positive in tone.” Nevertheless, she had found that in obsessive ruminators, who are at greater risk of depression, the same
reappraise their situation, as can tech-
niques for cultivating mindfulness that
Duch 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 day-
dreamers 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 un-
limited supply of booze everywhere I
go,” says Cordelia Amethyste Rose. A
33-year-old woman in Oregon, she
started an online forum called Wild
Minds (http://wildminds.ning.com) for
people who simply cannot stop day-
dreaming. Since childhood, Rose has
conjured up countless imaginary char-
acters in ever changing plots. “They’ve
grown right along with me, had chil-
dren—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. “I’ve
learned to socialize internally with far-
sighted characters I get along with,” she
says. Could they engage them in intellec-
tual debate, whereas “socializing with
outside people frustrates me. They all
want to talk about the silliest things.” Rose
says that she has no friends, but

on Wild Minds she has found her peers.
Many people posting to the site express
a desire to find others who meet their likes
as themselves, emerging from a cocoon of
loneliness and shame to share their expe-
riences: misdiagnoses, lack of under-
standing from families and therapists,
and rituals like the one described by a qui-
et girl who spends “endless hours” sway-
ing 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 binging 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 forum consider their daydreaming
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 hus-
bands, who practices a made-up religion
and is “a genius in both state and battle-
craft…trained in martial arts and is al-
ways inventing marvelous things.” Like
Thurber’s fictional fantasist, Queen El-
eanor’s creator spends a lot of time men-
tally rescuing disaster victims from
burning buildings or “abseiling over
cliffs, being winched in and out of heli-
copters with casualness, 189 percent
cert said they anguished over the amount
of time spent fantasizing, even though
most were gainfully employed or stu-
dents. Nine percent had no friends or
meaningful relationships, and 82 percent
kept their daydreaming habit hidden from
almost everyone.

Some evidence suggests that mal-
adaptive daydreaming could be a distinct-
tive disorder. Eleven 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 suf-
f ered some form of childhood trauma.
One had been sexually molested by her
grandfather. Another described his father
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ernescent experience 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 binging 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 forum consider their daydreaming 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 battlecraft...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 casualness, 189 percent.”

“Some evidence suggests that maladaptive daydreaming could be a distinctive disorder. Eleven 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 inevitable realities. When their enhanced ability to conjure up vivid imaginings escaped reality, they faced distress or over and over again? And if daydreaming feels out of control, then says, “I’m like an alcoholic with an unlimited supply of booze wherever I go,” says Cordelia Amethyste Rose, who started an online forum for people who cannot stop daydreaming.

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 pipeducks or vehicular traffic.

FURTHER READING