

## Television Addiction Is No Mere Metaphor

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Perhaps the most ironic aspect of the struggle for survival is how easily organisms can be harmed by that which they desire. The trout is caught by the fisherman's lure, the mouse by cheese. But at least those creatures have the excuse that bait and cheese look like sustenance. Humans seldom have that consolation. The temptations that can disrupt their lives are often pure indulgences. No one has to drink alcohol, for example. Realizing when a diversion has gotten out of control is one of the great challenges of life.

Excessive cravings do not necessarily involve physical substances. Gambling can become compulsive; sex can become obsessive. One activity, however, stands out for its prominence and ubiquity -- the world's most popular leisure pastime, television. Most people admit to having a love-hate relationship with it. They complain about the "boob tube" and "couch potatoes," then they settle into their sofas and grab the remote control. Parents commonly fret about their children's viewing (if not their own). Even researchers who study TV for a living marvel at the medium's hold on them personally. Percy Tannenbaum of the University of California at Berkeley has written: "Among life's more embarrassing moments have been countless occasions when I am engaged in conversation in a room while a TV set is on, and I cannot for the life of me stop from periodically glancing over to the screen. This occurs not only during dull conversations but during reasonably interesting ones just as well."

Scientists have been studying the effects of television for decades, generally focusing on whether watching violence on TV correlates with being violent in real life [see "The Effects of Observing Violence," by Leonard Berkowitz; *Scientific American*, February 1964; and "Communication and Social Environment," by George Gerbner; September 1972]. Less attention has been paid to the basic allure of the small screen--the medium, as opposed to the message.

The term "TV addiction" is imprecise and laden with value judgments, but it captures the essence of a very real phenomenon. Psychologists and psychiatrists formally define substance dependence as a disorder characterized by criteria that include spending a great deal of time using the substance; using it more often than one intends; thinking about reducing use or making repeated unsuccessful efforts to reduce use; giving up important social, family or occupational activities to use it; and reporting withdrawal symptoms when one stops using it.

All these criteria can apply to people who watch a lot of television. That does not mean that watching television, per se, is problematic. Television can teach and amuse; it can reach aesthetic heights; it can provide much needed distraction and escape. The difficulty arises when people strongly sense that they ought not to watch as much as they do and yet find themselves strangely unable to reduce their viewing. Some knowledge of how the medium exerts its pull may help heavy viewers gain better control over their lives.

## A Body at Rest Tends to Stay at Rest

The amount of time people spend watching television is astonishing. On average, individuals in the industrialized world devote three hours a day to the pursuit--fully half of their leisure time,

and more than on any single activity save work and sleep. At this rate, someone who lives to 75 would spend nine years in front of the tube. To some commentators, this devotion means simply that people enjoy TV and make a conscious decision to watch it. But if that is the whole story, why do so many people experience misgivings about how much they view? In Gallup polls in 1992 and 1999, two out of five adult respondents and seven out of 10 teenagers said they spent too much time watching TV. Other surveys have consistently shown that roughly 10 percent of adults call themselves TV addicts.

To study people's reactions to TV, researchers have undertaken laboratory experiments in which they have monitored the brain waves (using an electroencephalograph, or EEG), skin resistance or heart rate of people watching television. To track behavior and emotion in the normal course of life, as opposed to the artificial conditions of the lab, we have used the Experience Sampling Method (ESM). Participants carried a beeper, and we signaled them six to eight times a day, at random, over the period of a week; whenever they heard the beep, they wrote down what they were doing and how they were feeling using a standardized scorecard.

As one might expect, people who were watching TV when we beeped them reported feeling relaxed and passive. The EEG studies similarly show less mental stimulation, as measured by alpha brain-wave production, during viewing than during reading.

What is more surprising is that the sense of relaxation ends when the set is turned off, but the feelings of passivity and lowered alertness continue. Survey participants commonly reflect that television has somehow absorbed or sucked out their energy, leaving them depleted. They say they have more difficulty concentrating after viewing than before. In contrast, they rarely indicate such difficulty after reading. After playing sports or engaging in hobbies, people report improvements in mood. After watching TV, people's moods are about the same or worse than before.

Within moments of sitting or lying down and pushing the "power" button, viewers report feeling more relaxed. Because the relaxation occurs quickly, people are conditioned to associate viewing with rest and lack of tension. The association is positively reinforced because viewers remain relaxed throughout viewing, and it is negatively reinforced via the stress and dysphoric rumination that occurs once the screen goes blank again.

Habit-forming drugs work in similar ways. A tranquilizer that leaves the body rapidly is much more likely to cause dependence than one that leaves the body slowly, precisely because the user is more aware that the drug's effects are wearing off. Similarly, viewers' vague learned sense that they will feel less relaxed if they stop viewing may be a significant factor in not turning the set off. Viewing begets more viewing.

Thus, the irony of TV: people watch a great deal longer than they plan to, even though prolonged viewing is less rewarding. In our ESM studies the longer people sat in front of the set, the less satisfaction they said they derived from it. When signaled, heavy viewers (those who consistently watch more than four hours a day) tended to report on their ESM sheets that they enjoy TV less than light viewers did (less than two hours a day). For some, a twinge of unease or guilt that they aren't doing something more productive may also accompany and depreciate the enjoyment of prolonged viewing. Researchers in Japan, the U.K. and the U.S. have found that this guilt occurs much more among middle-class viewers than among less affluent ones.

## Grabbing Your Attention

What is it about TV that has such a hold on us? In part, the attraction seems to spring from our biological "orienting response." First described by Ivan Pavlov in 1927, the orienting response is our instinctive visual or auditory reaction to any sudden or novel stimulus. It is part of our evolutionary heritage, a built-in sensitivity to movement and potential predatory threats. Typical orienting reactions include dilation of the blood vessels to the brain, slowing of the heart, and constriction of blood vessels to major muscle groups. Alpha waves are blocked for a few seconds before returning to their baseline level, which is determined by the general level of mental arousal. The brain focuses its attention on gathering more information while the rest of the body quiets.

In 1986 Byron Reeves of Stanford University, Esther Thorson of the University of Missouri and their colleagues began to study whether the simple formal features of television--cuts, edits, zooms, pans, sudden noises--activate the orienting response, thereby keeping attention on the screen. By watching how brain waves were affected by formal features, the researchers concluded that these stylistic tricks can indeed trigger involuntary responses and "derive their attentional value through the evolutionary significance of detecting movement.... It is the form, not the content, of television that is unique."

The orienting response may partly explain common viewer remarks such as: "If a television is on, I just can't keep my eyes off it," "I don't want to watch as much as I do, but I can't help it," and "I feel hypnotized when I watch television." In the years since Reeves and Thorson published their pioneering work, researchers have delved deeper. Annie Lang's research team at Indiana University has shown that heart rate decreases for four to six seconds after an orienting stimulus. In ads, action sequences and music videos, formal features frequently come at a rate of one per second, thus activating the orienting response continuously.

Lang and her colleagues have also investigated whether formal features affect people's memory of what they have seen. In one of their studies, participants watched a program and then filled out a score sheet. Increasing the frequency of edits --defined here as a change from one camera angle to another in the same visual scene--improved memory recognition, presumably because it focused attention on the screen. Increasing the frequency of cuts--changes to a new visual scene--had a similar effect but only up to a point. If the number of cuts exceeded 10 in two minutes, recognition dropped off sharply.

Producers of educational television for children have found that formal features can help learning. But increasing the rate of cuts and edits eventually overloads the brain. Music videos and commercials that use rapid intercutting of unrelated scenes are designed to hold attention more than they are to convey information. People may remember the name of the product or band, but the details of the ad itself float in one ear and out the other. The orienting response is overworked. Viewers still attend to the screen, but they feel tired and worn out, with little compensating psychological reward. Our ESM findings show much the same thing.

Sometimes the memory of the product is very subtle. Many ads today are deliberately oblique: they have an engaging story line, but it is hard to tell what they are trying to sell. Afterward you may not remember the product consciously. Yet advertisers believe that if they have gotten your attention, when you later go to the store you will feel better or more comfortable with a given product because you have a vague recollection of having heard of it.

The natural attraction to television's sound and light starts very early in life. Dafna Lemish of Tel Aviv University has described babies at six to eight weeks attending to television. We have observed slightly older infants who, when lying on their backs on the floor, crane their necks around 180 degrees to catch what light through yonder window breaks. This inclination suggests how deeply rooted the orienting response is.

### "TV Is Part of Them"

That said, we need to be careful about overreacting. Little evidence suggests that adults or children should stop watching TV altogether. The problems come from heavy or prolonged viewing.

The Experience Sampling Method permitted us to look closely at most every domain of everyday life: working, eating, reading, talking to friends, playing a sport, and so on. We wondered whether heavy viewers might experience life differently than light viewers do. Do they dislike being with people more? Are they more alienated from work? What we found nearly leaped off the page at us. Heavy viewers report feeling significantly more anxious and less happy than light viewers do in unstructured situations, such as doing nothing, daydreaming or waiting in line. The difference widens when the viewer is alone.

Subsequently, Robert D. McIlwraith of the University of Manitoba extensively studied those who called themselves TV addicts on surveys. On a measure called the Short Imaginal Processes Inventory (SIPI), he found that the self-described addicts are more easily bored and distracted and have poorer attentional control than the nonaddicts. The addicts said they used TV to distract themselves from unpleasant thoughts and to fill time. Other studies over the years have shown that heavy viewers are less likely to participate in community activities and sports and are more likely to be obese than moderate viewers or nonviewers.

The question that naturally arises is: In which direction does the correlation go? Do people turn to TV because of boredom and loneliness, or does TV viewing make people more susceptible to boredom and loneliness? We and most other researchers argue that the former is generally the case, but it is not a simple case of either/or. Jerome L. and Dorothy Singer of Yale University, among others, have suggested that more viewing may contribute to a shorter attention span, diminished self-restraint and less patience with the normal delays of daily life. More than 25 years ago psychologist Tannis M. MacBeth Williams of the University of British Columbia studied a mountain community that had no television until cable finally arrived. Over time, both adults and children in the town became less creative in problem solving, less able to persevere at tasks, and less tolerant of unstructured time.

To some researchers, the most convincing parallel between TV and addictive drugs is that people experience withdrawal symptoms when they cut back on viewing. Nearly 40 years ago Gary A. Steiner of the University of Chicago collected fascinating individual accounts of families whose set had broken--this back in the days when households generally had only one set: "The family walked around like a chicken without a head." "It was terrible. We did nothing--my husband and I talked." "Screamed constantly. Children bothered me, and my nerves were on edge. Tried to interest them in games, but impossible. TV is part of them."

In experiments, families have volunteered or been paid to stop viewing, typically for a week or a month. Many could not complete the period of abstinence. Some fought, verbally and physically. Anecdotal reports from some families that have tried the annual "TV turn-off" week in the U.S.

tell a similar story.

If a family has been spending the lion's share of its free time watching television, reconfiguring itself around a new set of activities is no easy task. Of course, that does not mean it cannot be done or that all families implode when deprived of their set. In a review of these cold-turkey studies, Charles Winick of the City University of New York concluded: "The first three or four days for most persons were the worst, even in many homes where viewing was minimal and where there were other ongoing activities. In over half of all the households, during these first few days of loss, the regular routines were disrupted, family members had difficulties in dealing with the newly available time, anxiety and aggressions were expressed.... People living alone tended to be bored and irritated.... By the second week, a move toward adaptation to the situation was common." Unfortunately, researchers have yet to flesh out these anecdotes; no one has systematically gathered statistics on the prevalence of these withdrawal symptoms.

Even though TV does seem to meet the criteria for substance dependence, not all researchers would go so far as to call TV addictive. McIlwraith said in 1998 that "displacement of other activities by television may be socially significant but still fall short of the clinical requirement of significant impairment." He argued that a new category of "TV addiction" may not be necessary if heavy viewing stems from conditions such as depression and social phobia. Nevertheless, whether or not we formally diagnose someone as TV-dependent, millions of people sense that they cannot readily control the amount of television they watch.

### Slave to the Computer Screen

Although much less research has been done on video games and computer use, the same principles often apply. The games offer escape and distraction; players quickly learn that they feel better when playing; and so a kind of reinforcement loop develops. The obvious difference from television, however, is the interactivity. Many video and computer games minutely increase in difficulty along with the increasing ability of the player. One can search for months to find another tennis or chess player of comparable ability, but programmed games can immediately provide a near-perfect match of challenge to skill. They offer the psychic pleasure--what one of us (Csikszentmihalyi) has called "flow"--that accompanies increased mastery of most any human endeavor. On the other hand, prolonged activation of the orienting response can wear players out. Kids report feeling tired, dizzy and nauseated after long sessions.

In 1997, in the most extreme medium-effects case on record, 700 Japanese children were rushed to the hospital, many suffering from "optically stimulated epileptic seizures" caused by viewing bright flashing lights in a Pokemon video game broadcast on Japanese TV. Seizures and other untoward effects of video games are significant enough that software companies and platform manufacturers now routinely include warnings in their instruction booklets. Parents have reported to us that rapid movement on the screen has caused motion sickness in their young children after just 15 minutes of play. Many youngsters, lacking self-control and experience (and often supervision), continue to play despite these symptoms.

Lang and Shyam Sundar of Pennsylvania State University have been studying how people respond to Web sites. Sundar has shown people multiple versions of the same Web page, identical except for the number of links. Users reported that more links conferred a greater sense of control and engagement. At some point, however, the number of links reached saturation, and adding more of them simply turned people off. As with video games,

the ability of Web sites to hold the user's attention seems to depend less on formal features than on interactivity.

For growing numbers of people, the life they lead online may often seem more important, more immediate and more intense than the life they lead face-to-face. Maintaining control over one's media habits is more of a challenge today than it has ever been. TV sets and computers are everywhere. But the small screen and the Internet need not interfere with the quality of the rest of one's life. In its easy provision of relaxation and escape, television can be beneficial in limited doses. Yet when the habit interferes with the ability to grow, to learn new things, to lead an active life, then it does constitute a kind of dependence and should be taken seriously.

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