The Pokémon Panic of 1997

In 1997, an episode of the cartoon Pokémon *allegedly induced seizures and other ailments in thousands of Japanese children. Though popularly attributed to photosensitive epilepsy, the episode has many of the hallmarks of mass hysteria.*

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Pokémon is everywhere; more than a game, more than a movie, even more than a merchandising juggernaut, it is a phenomenon. It has spawned countless video games, comic books, Web sites, video tapes, magazines, clubs, music CDs, books, trading cards, three films, and, of course, an animated television series. It became such a cultural phenomenon that *Time* magazine featured Pokémon on the cover of its November 22, 1999, issue.

For kids it's an engaging pastime; for Nintendo, it's a multibillion-dollar moneymaker, possibly the largest marketing effort in the history of toys. (The theme song's refrain contains a catchy ode to merchandising, "Gotta catch 'em all!") Pokémon creator Satoshi Tajiri spent six years

developing the game and world of Pokémon. Pokémon (a shortening of "Pocket Monsters," from the original Japanese name *Poketto Monsuta*) began as a video game for the hand-held Nintendo Game Boy system.

The television series centers on young boys and girls who wander the world of Pokémon looking for small creatures (called Pokémon) to capture, befriend, and train for battle against other trainers (and their Pokémon) in the Pokémon League. The ultimate goal is for the kids to collect one of every species and become Pokémon Masters. There are currently more than 150 different Pokémon (with more on the way), and each creature has special powers and individual personalities. The most popular Pokémon, Pikachu, looks something like a yellow rat with a lightning-bolt tail and has the ability to shock its opponents with electricity.

Although it is largely forgotten and rarely mentioned in current news accounts of "Pokemania," *Pokémon* wasn't always the benign cartoon whose worst threat was emptying bank accounts. In December 1997, up to 12,000 Japanese children reported illnesses ranging from nausea to seizures after watching an episode of *Pokémon*.

The Episode and the Attacks

On Tuesday night, December 16, 1997, *Pokémon* episode number 38, *Dennou Senshi Porigon* (Computer Warrior Polygon) aired in Japan at 6:30. The program, broadcast over thirty-seven TV stations, was already very popular in Japan, and held the highest ratings for its time slot.

In the episode, Pikachu and its human friends Satoshi, Kasumi, and Takeshi, have an adventure that leads inside a computer. About twenty minutes into the program, the gang encounters a fighter named Polygon. A battle ensues, during which Pikachu uses his electricity powers to stop a "virus bomb." The animators depict Pikachu's electric attack with a quick series of flashing lights.

In all, millions watched the program. In one section of Japan, Aichi Prefecture, an estimated 70 percent of the 24,000 elementary school students and 35 percent of the 13,000 junior high school students watched the program, for a total of more than 21,000 in Aichi alone (*Japan Times* 1997). In Tokyo, the local board of education investigated all public kindergartens, primary and middle schools in the area and found that 50,714 students, or 55 percent of the whole, watched the episode (*Yomiuri Shimbun* 1997c).

At about 6:51, the flashing lights filled the screens. By 7:30, according to the Fire-Defense agency, 618 children had been taken to hospitals complaining of various symptoms.

News of the attacks shot through Japan, and it was the subject of media reports later that evening. During the coverage, several stations replayed the flashing sequence, whereupon even *more* children fell ill and sought medical attention. The number affected by this "second wave" is unknown.

Doctors said that children "went into a trance-like state, similar to hypnosis, complaining of shortness of breath, nausea, and bad vision . . ." (Snyder 1997). According to the *Yomiuri Shimbun* newspaper, "Victim's families reported that children passed out during the broadcast, went into convulsions, and vomited" (*Yomiuri Shimbun* 1997b). Yet another account gives a slightly different set of ailments: "Most children reportedly said they felt sick and had vision problems . . ."(Next generation.com 1997).

The victims themselves described their attacks thusly: Ten-year-old Takuya Sato said "Toward the end of the program there was an explosion, and I had to close my eyes because of an enormous yellow light like a camera flash" (MSNBC 1997); a fifteen-year-old girl from Nagoya reported, "As I was watching blue and red lights flashing on the screen, I felt my body becoming tense. I do not remember what happened afterward" (*Asahi Shimbun* 1997a).

Information regarding exactly how many children became sick (and when) and how many were taken to hospitals is piecemeal and at times contradictory, but, as with many aspects of this case, specific figures are known for certain areas. One hospital in western Tokyo started to receive children shortly after 7 P.M. A *Yomiuri Shimbun* newspaper story states that "A total of six children aged between 9 and 15 were taken to the hospital Tuesday night. . . . After treatment there, all six returned home before midnight, a hospital employee said" (*Yomiuri Shimbun* 1997d).

Although many news accounts simply state that around 12,000 children were sickened and 700 had seizures and/or were hospitalized, the truth is somewhat more complex.

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The Aftermath

The story of thousands of children made sick by their favorite cartoon raced through Japan. The following day TV Tokyo issued an apology, suspended the program, and said it would investigate the cause of the seizures. Officers from Atago Police Station, acting on orders from the National Police Agency, questioned the program's producers about the cartoon's contents and production process. The Health and Welfare Ministry held an emergency meeting, discussing the case with experts and gathering information from hospitals. Video retailers across the country pulled the series from their rental shelves.

Outraged mothers accused TV Tokyo of ignoring their children's health in the race for ratings, while other parents called for the implementation of an electronic screening device similar to the American V-chip that would block intense animation. Even Prime Minister Ryutaro Hashimoto weighed in, with a comment of dubious relevance: "Rays and lasers have been considered for use as weapons. Their effects have not been fully determined." Although a spokesman from Nintendo rushed to explain that the only link between its game and the cartoon was the characters, the company's shares dropped nearly five percent on the Tokyo stock market.

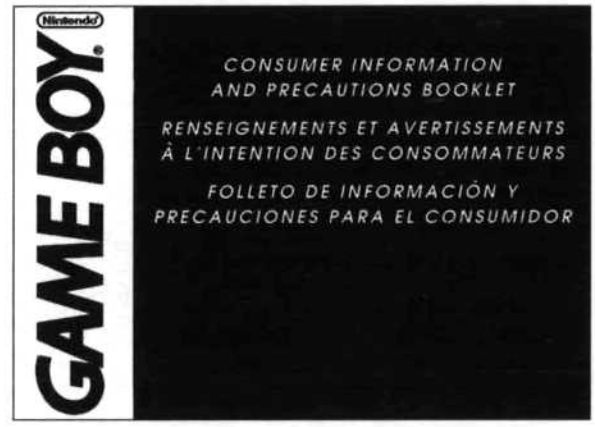
TV Tokyo put warning labels on all future and past *Pokémon* episodes. Despite the scare, both kids and adults soon missed *Pokémon*. It was back on the air by April, along with the new release of spring shows, and promptly climbed up to third in the ratings.

Searching for Answers

Several reasons were put forth to explain why the episode might have caused the problems it did. That bright flashing lights can trigger seizures in people with photosensitive epilepsy (PSE) is fairly well established. There seems little doubt that at least some children did in fact experience seizures and other afflictions from watching *Pokémon*. Researchers believe the technique of flashing lights caused the problem, perhaps made worse by the red/blue color pattern. And Dr. Akinori Hoshika, a neurologist at Tokyo Medical College, confirmed that optical stimulation can produce some of the symptoms found in the *Pokémon* victims (Sullivan 1997).

In 1994, British commercial television ads and programs were limited to a rate of three flashes per second. The limit followed a 1993 incident in which an ad for noodles featuring fast-moving graphics and bright flashes sparked three seizures.

In 1991, an American woman named Dianne Neale suffered seizures from hearing *Entertainment Tonight* co-host Mary Hart's eerily perky voice. Her doctors said Hart's electronically transmitted voice triggered Neale's epilepsy by creating abnormal electrical charges in her brain (MSNBC 1997).



EPILEPSY WARNING

⚠WARNING

READ THIS NOTICE BEFORE YOU OR YOUR CHILD USE ANY VIDEO GAME

A very small portion of the population have a condition which may cause them to experience epileptic seizures or have momentary loss of consciousness when viewing certain kinds of flashing lights or patterns that are commonly present in our daily environment. These persons may experience seizures while watching some kinds of television pictures or playing certain video games. Players who have not had any previous seizures may nonetheless have an undetected epileptic condition.

If you or anyone in your family has experienced symptoms linked to an epileptic condition (e.g. a seizure or loss of awareness), immediately consult your physician before using any video games.

We recommend that parents observe their children while they play video games. If you or your child experience any of the following symptoms: dizziness, altered vision, eye or muscle twitching, involuntary movements, loss of awareness, disorientation, or convulsions, **DISCONTINUE USE IMMEDIATELY** and consult your physician.

FOLLOW THESE PRECAUTIONS WHENEVER USING VIDEO GAMES:

- When using your NES®, Super NES® or Nintendo® 64 do not sit or stand too close to the television screen. Play as far back from the screen as possible.
- Play video games on the smallest available television screen.
- Do not play if you are tired or need sleep.
- Always play in a well lit room.
- Be sure to take a 10 to 15 minute break every hour while playing.

REPETITIVE STRAIN WARNING

⚠WARNING

Some people may experience fatigue or discomfort after playing for a long time. Regardless of how you feel, you should ALWAYS take a 10 to 15 minute break every hour while playing. If your hands or arms become tired or uncomfortable while playing, stop and rest. If you continue to experience soreness or discomfort during or after play, listen to the signals your body is giving you. Stop playing and consult a doctor. Failure to do so could result in long term injury.

If your hands, wrist or arms have been injured or strained in other activities, use of your system could aggravate the condition. Before playing, consult a doctor.

Figure 1. Epilepsy warning on video game booklet.

After several teens suffered seizures while playing Nintendo video games, the company began including warning labels on much of its software (see figure 1). The notice told users that the games' graphics and animation could cause a *shigeki*, a strong stimulation resulting in unconsciousness or seizures.

In the *Pokémon* case, though, there appeared to be few leads to go on. Although the bright flashes seemed to be the likely culprit, the flashes had been used hundreds of times before without incident. The technique, called *paka-paka*, uses different-colored lights flashing alternately to create tension. It is common in *anime*, the distinctive Japanese animation technique used in *Pokémon* (and many other popular cartoons, such as *Voltron*, *Sailor Moon*, and *Speed Racer*).

There was apparently very little difference between episode 38 and the other *Pokémon* episodes. The best guess was that the sheer number of flashes or length of the segment (reported as five to eight seconds, depending on the source) made the difference. Producer Takemoto Mori had used virtually identical *paka-paka* in most of the previous episodes, with slight variations in color and background combinations. "During editing, that particular portion didn't call my attention or bother me," he said. All *Pokémon* episodes were pre-screened before airing, and no problems were reported.

Despite all the furor and theories, a clear genesis of the Pokémon panic was elusive. After four months Nintendo

announced that it could find no clear cause for the outbreak, and *Pokémon* returned to the airwaves. Further research was left to doctors later that year. To date there have been only a handful of accounts and analyses of the *Pokémon* episode in scientific journals, three of them published in the *Annals of Neurology* (one by Takashi Hayashi et al., another by Yushiro Yamashita et al., and a much more in-depth piece by Shozo Tobimatsu et al.).

Hayashi et al. (1998) surveyed patients in the Yamaguchi prefecture (population 1,550,000) and found twelve affected children with no history of epilepsy. During the program, two had fainted and ten had tonic-clonic convulsions (in which the victims lose consciousness, usually with a stiffening of the body and forceful expiration of air, along with muscle contractions and other symptoms). Eleven of the twelve had "epileptic EEG abnormalities or photosensitivity." The researchers concluded that the children had latent photosensitive conditions that became seizures when induced by the flashing lights. They further estimated the incidence of seizures triggered by *Pokémon* was greater than 1.5 per 10,000, ten times the incidence found by British researchers (Quirk et al. 1995).

Yamashita et al. (1998) investigated all the children in eighty elementary schools in an area with a population of 470,807. Out of the 32,083 students, only one child had a convulsion, but 1,002 reported minor symptoms. As half of all boys and girls saw the program, Yamashita et al. suggest that 6.25 percent of the children were affected. This is similar to the percentage of children in the general population who show photosensitivity (8.9 percent).

Tobimatsu et al. (1999) studied four children who had been affected by *Pokémon*. The authors write that "The probable cause [of the attacks] was PSE [photosensitive epilepsy] because a tremendous number of children developed similar symptoms at exactly the same time in a similar situation. . . . However it is not clear as to why so many children without any previous seizures [75%] were also affected or exactly which components of the cartoon [caused the attack]."

None of the children had a previous history of convulsions before the *Pokémon* episode, and all were found to be more sensitive to rapid color changes than monochromatic ones. All were considered to have PSE. The researchers suggest that "the rapid color changes in the cartoon thus provoked the seizures." The researchers believe that the children's sensitivity to color—in particular rapid changes between red and blue—played an important role in triggering the seizures (Tobimatsu et al. 1999). Four children, however, represent a very small sample, and the results found may not be applicable to the general population.

The childrens' viewing habits and the physical setup of Japanese homes exacerbated the effect. In a country with more than 126 million people in an area the size of Montana and a population density of 865 per square mile, Japanese homes are typically quite small. Big-screen televisions are the norm, and most living rooms could aptly be described as small theaters. Many children sit very close to the television as well; one 14-year-old boy sitting three feet from his big-screen television was struck unconscious.

Doubting Doctors and the Hysteria Hypothesis

Yet several doctors expressed skepticism at the reported breadth of the outbreak. Dr. Yashudi Maeda, of a Fukuoka children's hospital, suspected that "the cases [regarding video game seizures] were most likely epileptic fits due to hypersensitivity to light, but I am not sure about the cases in which children just felt sick."

ABC News reporter Mark Bloch (1997) also found some scientists skeptical:

> In fact, epilepsy experts interviewed by ABCNews.com were skeptical the seizures experienced by hundreds of viewers were triggered by an epilepsy-like syndrome. "I've never heard anything like it," said Dr. Jeffrey Cohen, director of the Epilepsy Program at the Clinical Neuro-Physiology Laboratory at New York's Beth Israel Medical Center. He said it's possible that a few of the children watching may have experienced photosensitive-induced seizures. "But it's hard to conceive that 700 did." The director of New York University's Epilepsy Center agrees. "I think there were maybe two or three or ten that went to emergency rooms, then the media picked up the story and that in turn produced a wave of anxiety-based reactions," Dr. Orrin Devinsky said. The reaction could just as likely have been produced by anxiety and hyperventilation, he said.

Rika Kayama, psychologist and author of a book on video games and health, told Kyodo news that the illnesses might have been caused by photosensitive epilepsy or "group hysterics" (Snyder 1997).

To understand why the Pokémon episode may qualify as a case of mass hysteria, a little background is necessary. Mass hysteria (or mass sociogenic illness, as it is also called) begins when individuals under stress unwittingly convert that stress into physical ills. Peers, family members, or friends may also begin exhibiting the symptoms through contagion, in which the suggestion of a threat can be enough to create symptoms. Outbreaks are most common in closed social units (such as schools, hospitals, or workplaces) and where afflicted individuals are under social pressure and stress (Bartholomew and Sirois 1996).

The victims are firmly convinced their illness is "real," although extensive tests and investigations fail to identify a cause for the symptoms. Victims are usually very reluctant to accept the diagnosis, however, and remain convinced of the legitimacy of their illness (Stewart 1991).

It should be understood that the illness complaints are real and verifiable; the victims are not imagining their problems. Episodes of mass hysteria can last anywhere from a couple of hours to a few weeks, with many averaging about a week. The cases usually arise quickly, peak, and then subside just as quickly. Media reports and publicity help fuel the hysteria as news of the affliction spreads, planting the idea or concern in the community while reinforcing and validating the veracity of the illness for the initial victims.

Many aspects of the Pokémon panic lend itself to a diagnosis of mass hysteria:

• Many of the *Pokémon*-induced symptoms reported (e.g., headaches, dizziness, vomiting) are less typical of seizures than of mass hysteria. Conversely, symptoms that are associated with

seizures (e.g., drooling, stiffness, tongue biting) were not found in *Pokémon* victims. Three other symptoms (convulsions, fainting, and nausea) that were common to *Pokémon* victims are associated with both seizures and mass hysteria (see table 1).

(It is important to distinguish seizures from epilepsy. A seizure is a *symptom* of epilepsy, which in turn is a general term for an underlying tendency of the brain to produce a variety of electrical energy that disrupts brain function. Seizures can be brought about through various ways [e.g., a lack of oxygen, brain injury, high fever], and one seizure does not in itself establish epilepsy. There are several types of seizures; research by Tobimatsu et al. found that the *Pokémon* victims they studied all had generalized tonic-clonic seizures, so that is the type I have used for comparison.)

• The incidence of photosensitive epilepsy is estimated at 1 in 5,000 (Cohen 1999). Such an incidence (0.02 percent of the population) comes nowhere near explaining the sheer number of children affected (in some cases nearly 7 percent of the viewers). This is not to say that some children did not endure seizures, but clearly the vast majority of children did not.

• Stress frequently plays an important role in cases of mass hysteria, and Japanese youth are under tremendous academic and social pressures to achieve. Japanese schools in particular are known as high stress-generating institutions, and students with low (or even mediocre) grades have been known to kill themselves. The week the episode aired, many Japanese youths were preparing for high school entrance exams and therefore already under added pressure (*Asahi Shimbun* 1997a). Extraordinary stress by itself cannot and does not trigger epidemic hysteria. Another aspect of Japanese culture, however, may contribute to mass hysteria—the compulsion to conform.

Seizures, Symptoms, and Hysteria

symptom	*gran mal seizure*	*Pokémon attack*	*mass hysteria*
convulsions/ muscle spasm	yes	yes	yes
fainting/loss of consciousness	yes	yes	yes
nausea	yes	yes	yes
drooling/frothing	yes	no	yes
loss of bladder control	yes	no	no
bluish skin	yes	no	no
rigidity/stiffness	yes	no	no
sudden cry	yes	no	no
biting tongue	yes	no	no
headaches	no	yes	yes
bad/blurry vision	no	yes	yes
dizziness	no	yes	yes
vomiting	no	yes	yes
shortness of breath	no	yes	yes

Table 1: A comparison of symptoms typical of gran mal (tonic-clonic) seizures, the Pokémon attacks, and mass hysterias. Aside from the first three symptoms shared by all three afflictions, the symptoms reported by the Pokémon victims more closely match those of mass hysteria than seizures.

Bob Riel (1996), manager at a Boston-based cross-cultural training firm, puts it this way: "One of the most important traits of the Japanese mindset is its collective nature. In Japan, *we* comes before *I*— a concept that's taught early on. Unlike Western children, who are taught to be independent self-thinkers, Japanese children are educated in a way that stresses interdependence, and reliance on others. Many Japanese habits and customs stem from this desire to maintain the group." This type of collective social order makes a fertile ground for contagion.

In addition, some facets of Japanese culture may lend itself toward acting out. When Japanese rock star "Hide" Matsumoto hanged himself in May 1998, three people tried to follow him in suicide; one fourteen-year-old girl hanged herself using a towel, the same method Matsumoto used. A rash of Japanese youth suicides also followed the death of singer Yutaka Ozaki in 1992 (Watanabe 1998).

The Missing Link

While several facets of the incident suggested mass hysteria, there was one large problem with that hypothesis: Most of the children were separated in their own homes. There was little opportunity for contagion, no way for a few real "index" cases to influence other children. With no plausible vehicle for independent children to see or hear others having seizures or symptoms, there could be no mass hysteria. So how did it happen?

The answer is that the *Pokémon* seizures didn't occur just at one time. The phenomenon unfolded in stages, and the chronology of events is crucial. The jump in reported cases (see the timeline) is strong evidence for the role the media played in the panic. According to news accounts of the time, the number of children said to be affected stays around 700 the evening of the *Pokémon* episode (Tuesday night) and the next day. The next morning "Television and newspaper headlines were dominated by the reports. 'Pokémon panic,' screamed national newspaper Mainichi" (MSNBC 1997). Japanese children who hadn't heard about their peers from the news or their parents learned of it that morning, when the seizures "were the talk of the schoolyards" (*Yomiuri Shimbun* 1997b).

Once the children had a chance to hear panicky accounts of what had happened through the media, their friends, and their schools, the number of kids reported the next day to have been affected—*two days before*, Tuesday night—shot up a staggering 12,000 cases. The first accounts of thousands of students being affected appear only after extensive media coverage and the opportunity for contagion in the schools. And schools are among the most common places for outbreaks of mass hysteria to begin (Stewart 1991; Bartholomew and Sirois 1996).

Interesting and possibly similar incidents occurred in the seventeenth and eighteenth centuries in parts of the southern United States during certain religious revival meetings. Fervent participants at the nighttime rallies would ". . . with a piercing scream, fall like a log on the floor, earth, or mud,

Pokémon Panic Timeline

Tuesday December 16, 1997 6:30 P.M.
Pokémon Episode 38 (Computer Warrior Polygon) airs; the flashing lights segment begins at about 6:50; the Fire-Defense agency claims that between 6:50 and 7:30, 618 children were rushed to hospitals with convulsions, headaches, and vision problems.

Tuesday December 16, 1997 (later that night)
Evening news reports that hundreds of children were taken to hospitals from Pokémon fits; some news shows then rebroadcast the scene suspected of causing the seizures. A second wave of children (number unknown) is affected upon hearing the news.

Wednesday December 17, 1997
Pokémon attacks are "the talk of the schoolyards"; "Television and newspaper headlines Wednesday morning were dominated by the reports." The number of victims reported in the media ranges from over 600 to over 700.

Thursday December 18, 1997
Yomiuri Shimbun newspaper reports that nearly 13,000 children had "at least minor symptoms," with 685 taken to hospitals.

Friday December 19, 1997
Yomiuri Shimbun reports on completed investigations by the newspaper and local boards of education, finding the number of children reported to have experienced "fits, nausea, and other symptoms" to be 11,870.

and appear as dead." The limbs and head of those afflicted would jerk and twitch. The episodes often ended with the person collapsing, though sustaining little actual harm from the episode. Neurologist E. Wayne Massey and his colleagues at the National Naval Medical Center examined first-hand accounts of this phenomenon (called "the jerks") and suggested that the wild and apparently involuntary actions may have been triggered by epilepsy which was then imitated by other highly suggestible group members. Massey et al. (1981) write that among the participants "there were perhaps some who had epilepsy. Some meetings were held during the evening with only light from torches flickering in the night. Did this trigger any seizures? Did those few with epilepsy set the stage by example to trigger mass hysterial response from others?"

Conclusion

Although widely regarded either as a mystery or as a simple case of mass epileptic seizures, the 1997 Pokémon panic is much more complex than that. With very few exceptions, much of the media overlooked the possibility of, and contributing factors to, mass hysteria.

Several researchers have noted that mass hysterias are probably more common than currently recognized (see, for example, Jones 2000). Victims are frequently reluctant to accept a verdict of mass hysteria, and Japanese victims are likely to be even more so because of the importance of "saving face" in Japanese culture. But there is no shame in being a victim of mass hysteria, if that is in fact what occurred in December 1997 in Japan.

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Note

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