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The science of monsters

Why do we love scary stories? Matt Kaplan looks at the science behind monsters old and new, and our perverse love of a good fright.

By Matt Kaplan

In the darkness it came. There was no way out. Cornered and helpless, all who found themselves in this dreaded place knew their fate. Relentlessly, the half-human, half-bull fiend found its quarry and tore them to pieces. Scrambling and searching for an exit was pointless. Even if any did miraculously find a way out, the natives of the island were against them. They would simply throw escapees back in the blackness of the depths. Whether their deaths were quick or drawn out remains a mystery, for in the labyrinth of legend on the island of Crete, one of those forced in were ever heard from again.

To those who feel the Minotaur is too ancient to be relevant anymore, consider the fate of the mining vessel *Nostromo* in Ridley Scott's *Alien*. Stalked relentlessly by a carnivorous beast, one by one the crew are ripped apart and consumed. It is impossible to find on the shadowy ship, and it makes its attacks almost entirely unseen. Computers, bullets, and flamethrowers are useless. The alien sprays acidic blood when cut that disintegrates armor, burns flesh, and melts bone. There is no escape and no rescue on the way, because "in space, no one can hear you scream."

Defined as horrible to behold and a threat to all who cross them, monsters are creatures we run from and beasts we warn our children about. Yet something about them is enticing, mesmerising, and addictive.

Terrible as they might be, we cannot help looking ever closer, parting the fingers that are covering our eyes. There is no getting around it: Something deep inside monsters fascinates us.

What it is about monsters that is so alluring is hard to say. Seeing them makes the heart pump faster, hairs stand on end, and sweat pour down our face. All of these are signs of stress and are often experienced over and over again through nightmares. Even so, children clamor for ghost stories around the campfire and adults line up in droves to see films featuring vampires and werewolves. They terrify, yet we cannot get enough of them.

And this is nothing new. The Minotaur, Sphinx, and Medusa were created long ago, and based upon their representation in myths, poems, art and plays, it seems that they drew attention from ancient audiences that was very much like the attention drawn by modern monsters.

This hints that monsters have been with us for quite a long time and raises a perplexing question: Why have monster stories, which have the effect of scaring people, persisted so relentlessly throughout the ages?



Red dragon: Illustrating the Book of Revelation might have given William Blake nightmares, but did he enjoy the thrill as well? (Source: William Blake/)

The masochism tango

As bizarre as it sounds, one answer to this question lies with research on why people like spicy foods. Dishes from Mexico and India are tongue-searingly hot. They make your eyes burn and can soak you with sweat. A lot of people avoid them, but many love them precisely because they are so fiery.

It defies logic that food responsible for such a seemingly painful experience should be so popular, but recent work is beginning to provide an explanation. Fascinated and befuddled by the common human desire to eat mouth-burning foods, psychologist Paul Rozin and a team of colleagues at the University of Pennsylvania wondered whether it was the negative experience of being burned that spicy-food lovers liked or if it was their body's physiological reactions to these foods that they were enjoying.

The team asked 135 female and 108 male university students to rate on a scale of 0 to 100 how much they liked different things, with 0 indicating "not liking at all" and 100 indicating "considerable liking." When the students were asked, among other things, how much they liked spicy foods, the average score was 55.5, which runs roughly along with the perception that around half of the population enjoys this sort of cuisine. However, far more interesting was that when the participants were asked to rate how much they enjoyed mouth burns, sweating, and tearing eyes, those who rated their love of spicy food at over 50 also tended to rate these typically unpleasant experiences more highly. This suggested they were actually enjoying their body's own negative response to the food.

The reason for this masochism is not known, but Rozin, along with many others in his field, have a theory that there is pleasure for the mind in watching the body react negatively while knowing perfectly well that nothing bad is actually going to happen. The enjoyment, they suggest, comes from a sense of mental mastery over the body that is responding in a knee-jerk reaction.

Rozin's study did not limit itself to an exploration of spicy cuisine. It also asked participants to rate how much they enjoyed thrill rides, frightening movies, gory movies, and even a pounding heart. Again, a connection was found. Those who enjoyed getting the crap scared out of them in movies also tended to like gore, thrill rides, and a pounding heart. Mental mastery might be behind this too.

Just as the brain is able to identify that screaming taste buds are screaming about nothing serious, the brain is capable of realising that a frightening story is not real. Researchers propose that in this realisation there is a sense of mastery of mind over body that is, in itself, enjoyable.

So where does all of this place monsters? Well, they are by their very nature frightening. For some, like Medusa, the fear factor is in their physical nature; they literally are scary to look upon (just think about the number of people who are petrified by snakes). For others, like the vampire, it is their activities, like the sucking of blood from living victims, that engender feelings of fear. And then there are those, like the Minotaur and the alien, that elicit a feeling of dread by forcing us back into the ancient position of being prey as our ancestors once were.

For these reasons it is possible that simply thinking about monsters reassures us we are above other animals in control of fate much as chilli peppers remind us that we, and not our taste buds, are in control of what we eat. True, none of the psychological research has specifically looked at monster movies or stories, but the connection seems logical. Even so, there is probably more that draws people to be fascinated by monsters than just pleasure. Monsters likely also serve a practical purpose.

Playing in the sandbox

At their most basic level, monsters represent fears held by society, fears associated with dangers perceived in the surrounding world. These fears have a powerful evolutionary history by encouraging people to flee instead of fighting suicidal battles.

When ancient hunters encountered a saber-toothed tiger by accident, they ran. When the human ancestor *Homo erectus* caught angry cave bears by surprise, it ran. When chimpanzees and bonobos, the nearest genetic relatives to modern humans, encounter large predators in the wild, they run.

While Hollywood heroes have made running away distinctly unpopular on the silver screen, every single actor who has ever portrayed a hero who stood his or her ground against some abominable terror comes from a long genetic lineage of cowards who fled in the face of danger. That is why they are here to act today. If their ancestors had fought against monsters far more powerful than themselves, as Hollywood heroes do all the time, their lineage would have been destroyed by predators long ago. Fear, in short, keeps people alive. But fear can also go too far.

Recent work in animal behavior has revealed something fascinating: There are personality types in animals. Among fish in a single species, there are adventurous individuals, ready and willing to take risks, and there are more cautious and timid individuals, fearful of doing anything that could put them in danger.

Similar variations in personality are starting to be found in birds and mammals too. A recent study led by Kathryn Arnold at the University of York revealed that when greenfinches were presented with brightly coloured objects in their food, there was considerable variation in how long it took each bird to eat. When intriguing objects were attached to the birds' perches, a similar variation was found. Some birds quickly flew to explore the new toy while others stayed away.

Being courageous or curious undoubtedly presents serious dangers. Ongoing studies indicate that fish with more daring personalities are more likely to nibble on bait on the end of a hook and risk-taking rodents more commonly end up in traps set by researchers. (As it happens, this has really screwed up lots of biological research. We have spent decades "thinking" we could get a reasonable sense of what animals are like by setting traps in the wild and then studying the animals that get caught. But if the animals that get caught are only the most daring individuals - or the most foolish - in a population, they are hardly giving us a reasonable sense of how a species behaves!)

Yet having a personality that predisposes an animal to take risks can yield rewards. Courage can lead an animal to investigate previously unexplored locations where food is present, or it can lead to the discovery of well-hidden nesting areas that have yet to be found by any other members of the species. Such discoveries can lead to better health and better breeding opportunities for the courageous animal that allow for its courageous genes to be passed along more readily to the next generation.

Whether some humans are genetically predisposed to be more adventurous than others remains to be determined, but there clearly are some people who ultimately are more willing to take risks.

Make no mistake, the instinct to flee from danger is still deeply rooted in every person's brain, but some of us are more willing than others to go to places associated with danger.

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Risk takers

Just as with daring animals that find resources by taking risks, it is logical to assume that more adventurous humans have historically made the same sorts of gains. For this reason, monsters may be serving a valuable purpose in society.

By representing key fears and allowing these to be discussed and explored in a safe environment, monsters might be making it feasible for these fears to be more effectively prepared for and ultimately faced, so the benefits of being a courageous individual can be more readily reaped. Like lion cubs play-fighting in the safety of their den, monsters may be allowing threats to be toyed with in the safe sandbox of the imagination.

So if monsters are present in society for both pleasure and mental practice for future frightening interactions, what happens when our fears are overcome? What then?

To a certain extent, danger should function as the life essence of monsters. Once a perceived danger is dispelled, this essence is destroyed and the beast becomes extinct. It may continue to live on in fiction as a fossil of its former self or as a mere creature of interest, but not as a monster with all of the terror that comes with such status.

Fears have changed a lot since the dawn of humanity, and with these changes have come alterations in the pantheon of monsters that lurk in our world.

The Minotaur is no longer with us, but aliens are. In a sense, monsters, while strictly the stuff of fantasy, experience evolution at a rate that is in stride with the pace of human understanding of the surrounding world.

Science, the empirical testing and exploration of the world, which is about as seemingly unrelated to monsters as can be, is both responsible for their birth by discovering new environments where they might be living and the cause of their destruction through the ultimate revelation that they cannot possibly be real.

That many monsters have risen and fallen throughout the ages is clear. What is less clear is which specific fears these monsters stood for and how long these fears actually lasted. An exploration of fear's mask, the mask of the monster, seems an excellent way to find out.

About the author: **Matt Kaplan** is an American science writer and author. This is an extract from his recent book *The Science of Monsters* published by Scribner (US) and Constable & Robinson (UK).

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