

The Science of Love

by David Kaiser

"Parental love, which is so touching and at bottom so childish, is nothing but parental narcissism born again..." Sigmund Freud, 1914

"Our assigned mission as psychologists is to analyze all facets of human and animal behavior into their component variables. So far as love or affection is concerned, psychologists have failed in this mission." Harry Harlow, 1958



For 200 years Western governments and charitable groups unknowingly sponsored infanticide. In 1800 the United States had seven institutions running where the elimination of unwanted children went on unabated. By the end of our Civil War, 600 institutions of death had sprouted up. In Europe the situation was no better. In one gruesome institution in Florence, the Hospital of the Innocents, 10,000 infants died before reaching their first birthday. For every three children who passed through the hospital doors, two left in a box. A survey of New York institutions of the time reported that every child in their care had died before the age of two, in all but one home. Philadelphia institutions did not have that exception: every admittant eventually died. Baltimore institutions fared slightly better: 90% died and 10% escaped death through adoption or return to relatives. These gruesome institutions of death were called orphanages.

So what was killing these innocent parentless children? Scientists -- Pasteur, Fleming, and Jenner -- had recently made the world aware of microscopic pathogens, but it was not microbes who threatened most children. It was humans, our response to microbial threat. Quarantine. Isolation. Ahh, there be the killing machine. To combat virulent pathogens, orphanages virulently isolated the children from one another, and from caregivers, lest infection spread through human contact. And in so doing, neglect was institutionalized throughout the modern world.

The experts of the time only made matters worse. At the turn of last century, Dr. Luther Holt, the Dr Spock of his day, insisted that parents should avoid closeness with their child. He railed against the "vicious practice" of rocking a child in a cradle, or picking them up when they cried or handling them too often. Affectionate contact was especially hazardous. He bitterly opposed the common practice of small children sharing the parent's bed or bedroom, a custom from the

beginning of time. Infants and small children should sleep in separate rooms. Good hygiene was good child care. Cleanliness was next to Godliness.

Unfortunately he was not alone in dishing out nonsensical yet respected child-care advice. John B Watson, president of the American Psychological Association (APA), and founder of behaviorism, led a crusade against the evils of affection. "Mother love is a dangerous instrument," he warned. Mothering warps the child. He envisioned a utopian future in which baby farms would raise children untouched by human hands, according to the most recent scientific principles. Affection was not only unnecessary, he argued, it was detrimental. We must purge the scourge of the "overkissed child." Although Aldous Huxley satirize these ideas in *Brave New World*, Watson was hailed for his efforts, a hero to many.

(Today, Watson is best known not for his child-rearing practices, thankfully, but for his ethically-challenged Little Albert study. Albert was an adventurous pudgy-faced 11-month-old boy who was fond of rats but frightened by loud noises. Watson used this information to condition the innocent child. He would place a friendly rat in the boy's lap, then bang a metal bar with a hammer, scaring the infant. He did this repeatedly. Soon Albert came to fear the rat, as well as anything furry, a hat even. It was the prototype for aversive conditioning and generalization as well.)

Rearing practices would likely have continued in a bleak Watsonian landscape had politics not intervened. World War II shook everyone's confidence in science, in human nature, and it brought forth a new phenomena, the refugee child. In England and elsewhere, parents sent their children away, to the countryside, to keep them safe from bombing. There, well-fed, well-cared-for, and ultimately heart-broken, many of these children became extremely withdrawn and depressed. Being separated from their parents pulled them apart, at some deeper level than most imagined. The nature of parent-child relations needed to be re-evaluated.

Harry Bakwin, a New York pediatrician, started the process. He noted how the absence of mothering -- for instance, when a child required an extensive hospital stay -- often devastated his or her emotional well-being. Startled by this effect, he began to document "hospitalism" or lonely-child syndrome. He changed hygienic signs in his local hospital from "Wash your hands twice before entering this ward" to "Do not enter this nursery without picking up a baby." At the time, parents were discouraged or even barred from visiting sick children during a hospital stay. Bakwin won approval for mothers to stay in the same room with their child, which he discovered led to a significant drop in fatal infections. The value of human contact was not lost on him, but he was years ahead of his time. His ward was an oasis in a sea of American behaviorism and hygiene. One-hour a week visit or less was the norm for most hospitals and these policies remained in place well into the 1970s.

Rene Spitz was another pioneer in the effort to document the value of human contact. In 1945 he compared two sets of children, one in a typical orphanage, the other in a chaotic prison nursery. In the former, cribs were separated from each other by hung sheets, a form of solitary confinement to stave off infection. In the latter, children shared a common room filled with noise and toys and germs. Mothers (convicts) were allowed to spend as much time with their children as possible, and most did. During Spitz' investigation, the orphanage cared for 88 children, 23 of

whom died from relentless infection. The prison nursery, on the other hand, cared for 90 children, and none died during his study. The perils of loneliness were quantifiable. Love, it seemed, was necessary for survival. Spitz went on to film a handful of children in the foundling home, much to the dismay of his audience. His film presented happy, precocious children transformed into emotionless zombies after mere weeks of isolation. He closed his film with a silent-movie cue card. It read: "The cure: Give Mother Back to Baby." The initial reaction to his work was not gratitude or remorse, but concentrated fury. Surely 50 years of psychiatry could not be so wrong!

Before Harlow, the mother-child relationship was thought to be based solely on sustenance. Whoever held the bottle held the child (i.e., emotionally). This idea originated with Freud, who was still alive when Harlow began his rhesus monkey research (Sigmund Freud died in 1939). Alive or dead, Freud continued to cast a powerful shadow on the field of psychology. According to Freud, the breast was the infant's first erotic object, the focus of his love. When the mammary relationship (if you will) was interrupted, a child's reaction would be fraught with sexuality, from fears of castration to rage against dominating parents. It was fiction dressed up as fact. But Freud was not alone in his misconceptions of childhood. The empty-headed infant model had come to the fore. At the time, it was believed by neuroscientists that babies can't see faces (1942), or are unaware of their environment (1948), or are a collection of reflexes only (1952) and cannot see color until age three (1964) and are functionally decorticated, that is, brainless (1964). But Harlow discovered that even an infant monkey was anything but empty-headed. She had incredible needs -- for touch, attachment, love, safety, security, exploration, excitement -- and incredible resources to satisfy these needs. And if they were not satisfied, the results were grim. "Learning to love, like learning to walk or talk, can't be put off too long without crippling effects," he wrote.

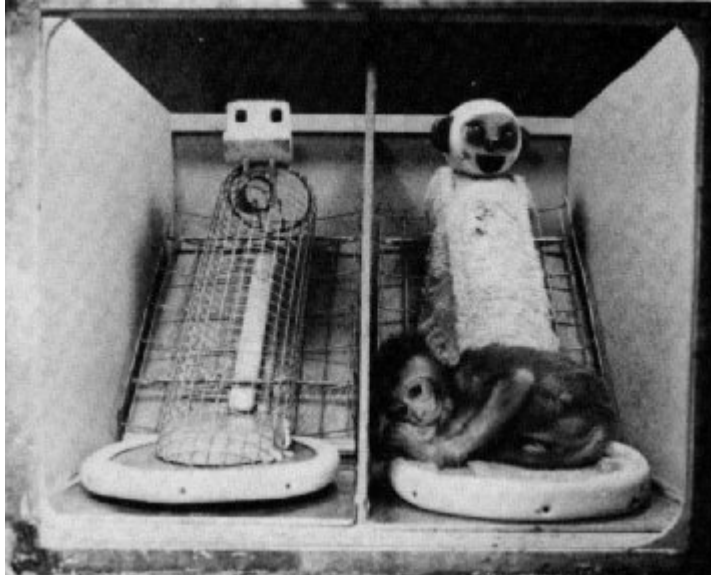
John Bowlby was the first to fully comprehend the crippling effects of neglect and abandonment. He refined his predecessors' observations and reflections into what we now call attachment theory. Raised by a nanny until eight, John was sent to boarding school like all upper class children of his day, and he hated the experience. From it the seeds of attachment theory would grow, but to convince the world of his ideas, he needed hard, unrefutable data; and that is where the young enterprising University of Wisconsin professor came in.

Harry Harlow (born Harry Israel) started out academic life as a rat researcher, as most psychologists of his day. His dissertation was on the feeding habits of baby rats and this effort would have a profound impact on his professional life: Harlow would never again want to work with vermin. At the time the American psychological community was knee-deep in behaviorism and there weren't enough rats on planet Earth to run through all the studies envisioned by these men (and a handful of women). Harlow opted for a different species to study, a smarter animal to test. Primates, he decided, and the cheapest primate at that, the abundant rhesus macaque.

Harlow initially focused on intelligence, and because monkeys were more expensive than rats, he didn't sacrifice the animal after an experiment was complete, as rat researchers habitually did. Instead, he fed them and kept them around for future projects. As such, economic constraints led him to one of his first discoveries: prior learning facilitated future learning. His monkeys got

quicker and quicker at solving his puzzles. And unlike rats, they often solved puzzles for no rewards at all, out of curiosity. This was a far more interesting animal to study than rats.

And what really interested Harlow was not intelligence, but love. Love in all its facets: acquisition, loss, and recovery. And he started at the beginning, when love is strongest, between a mother and her offspring.



The first surrogate mother study included a mere eight rhesus monkeys. In each cage were housed two mothers, one made of chicken wire, one of cloth. In four of these cages, the cloth mother held the feeding bottle; in the other four, the wire mother sported the milk. Harlow measured the time each infant spent with either surrogate. Monkeys fed on the cloth mother, he observed, clinged and climbed on her for 18 hours a day and spent little or no time with the wire mother. But the crucial test was the remaining four monkeys. Those fed by the wire mother, it turned out, spent 17 hours with the cloth mother and only one on her. In other

words, being fed formed no relationship. Harlow had proven Freud wrong.

Later research revealed the paradoxical nature of love. How there was a time to cling to mother, and a time to leave her to explore, and to hurry back to her safety when adventures turned rocky. She was the starting point for all relationships, peer as well as sexual. No single relationship, not even mother-child, was enough for healthy social development.

Harlow explored the darker side of love as well. He created monster mothers, mechanical devices that threw off their infants like angry bucking broncos. He devised such experiments to learn the effect on the infant. And what did these poor souls do? Did they run from "mother," hide from her, avoid her sudden jerks? No, they simply clung tighter, laying anchor in the only harbor they knew. Years later, when Harlow was criticized for his apparent lack of ethical concern for his subjects, he replied, "For every mistreated monkey there exists a million mistreated children." The brutal studies needed to produce unambiguous data in order to educate the world, to reduce the brutality of contemporary human practices.



Looking back it's easy to criticize much of his research. He devastated hundreds of animals' lives. But it is these same studies which moved our culture, forced us to that plateau of self-recognition where we now recognized the wrong inherent in social deprivation. But without his studies, without his rigorous examination of the deleterious effects of social isolation and emotional neglect, we might only now be reaching that plateau.

If there is any conclusion to Harlow's life's work, it might be the following: Love changes the young brain forever. And love is complicated. Love is the primary source of neuroplasticity. *Neuroplasticity* is the ability of the brain to rearrange itself in response to stimulation. When another helps facilitate these changes, when a more experienced individual such as a clinician, mentor, or educator guide us toward better habits, it might be called *guided neuroplasticity*. In this day and age the number of individuals who guide the neuroplasticity of each and every child or adult is humbling to consider. We may have left the tribe but the tribe remains within, and to try to count (and name) every one of our guides is daunting, if not impossible to do. Most children have anywhere from 40 to 80 elementary and high school teachers. And then there were coaches, physicians, store owners, and clergy, plus so many friends and family and strangers along the way who provide positive neuroplasticity examples.

Photos are published originally by U Wisconsin-Madison