
Computer Taught To Recognize Attractiveness In Women

ScienceDaily (Apr. 5, 2008) — "Beauty," goes the old saying, "is in the eye of the beholder." But does the beholder have to be human?

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Not necessarily, say scientists at Tel Aviv University. Amit Kagian, an M.Sc. graduate from the TAU School of Computer Sciences, has successfully "taught" a computer how to interpret attractiveness in women. But there's a more serious dimension to this issue that reaches beyond mere vanity. The discovery is a step towards developing artificial intelligence in computers. Other applications for the software could be in plastic and reconstructive surgery and computer visualization programs such as face recognition technologies.

From Mathematics to Aesthetics

"Until now, computers have been taught how to identify basic facial characteristics, such as the difference between a woman and a man, and even to detect facial expressions," says Kagian. "But our software lets a computer make an aesthetic judgment. Linked to sentiments and abstract thought processes, humans can make a judgment, but they usually don't understand how they arrived at their conclusions."

In the first step of the study, 30 men and women were presented with 100 different faces of Caucasian women, roughly of the same age, and were asked to judge the beauty of each face. The subjects rated the images on a scale of 1 through 7 and did not explain why they chose certain scores. Kagian and his colleagues then went to the computer and processed and mapped the geometric shape of facial features mathematically.

Additional features such as face symmetry, smoothness of the skin and hair color were fed into the analysis as well. Based on human preferences, the machine "learned" the relation between facial features and attractiveness scores and was then put to the test on a fresh set of faces. Says Kagian, "The computer produced impressive results -- its rankings were very similar to the rankings people gave." This is considered a remarkable achievement, believes Kagian, because it's as though the computer "learned" implicitly how to interpret beauty through processing previous data it had received.

Beauty is Golden

The notion that beauty can be boiled down to binary data and interpreted by a mathematical model is nothing new. More than 2,000 years ago the Greek mystic, philosopher and mathematician Pythagoras observed the connection between math, geometry and beauty. He reasoned that features of physical objects corresponding to the "golden ratio" were considered most attractive.

"I know that Plato connected the good to the beautiful," says Kagian. "Personally, I believe that some kind of universal correctness to beauty exists in nature, an aesthetic interpretation of the universal truth. But because each of us is trapped with our own human biases and personalized viewpoints, this may detract us from finding the ultimate formula to a complete understanding of beauty."

Kagian, who studied under the Adi Lautman multidisciplinary program for outstanding students at Tel Aviv University, says that a possible next step is to teach computers how to recognize "beauty" in men. This may be more difficult. Psychological research has shown that there is less agreement as to what defines "male beauty" among human subjects. And his own portrait, jokes Kagian, will not be part of the experiment.

"I would probably blow up the machine," he says.

Kagian published the findings in the scientific journal *Vision Research*. Co-authors on the work were Kagian's supervisors Prof. Eytan Ruppin and Prof. Gideon Dror.

Beauty Bias: Can People Love The One They Are Compatible With?

ScienceDaily (Feb. 14, 2008) — Physical attractiveness is important in choosing whom to date. Good looking people are not only popular targets for romantic pursuits, they themselves also tend to flock together with more attractive others. Does this mean then that more attractive versus less attractive people wear a different pair of lens when evaluating others' attractiveness?

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Columbia University marketing professor, Leonard Lee, and colleagues, George Loewenstein (Carnegie Mellon University), Dan Ariely (MIT) and James Hong and Jim Young (HOTorNOT.com), decided to test this theory in the realm of an online dating site. The site HOTorNOT.com allows members to rate others on their level of physical attractiveness. Lee and colleagues analyzed two data sets from HOTorNOT.com -- one containing members' dating requests, and the other containing the attractiveness ratings of other members. Both data sets also included ratings of members' own attractiveness as rated by other members. The results, which will be published in an upcoming issue of *Psychological Science*, a journal of the Association for Psychological Science, are revealing. Consistent with previous research, people with similar levels of physical attractiveness indeed tend to date each other, with more attractive people being more particular about the physical attractiveness of their potential dates. Furthermore, people prefer to date others who are moderately more attractive than them. Compared to females, males are more influenced by how physically attractive their potential dates are, but less affected by how attractive they themselves are, when deciding whom to date. Also, regardless of how attractive people themselves are, they seem to judge others' attractiveness in similar ways, supporting the notion that we have largely universal, culturally independent standards of beauty (e.g. symmetric faces). These results indicate that people's own attractiveness does not affect their judgment of others' attractiveness. People of different physical attractiveness levels might instead vary the importance they place on different desirable qualities in their dates. Lee and colleagues conducted a follow-up speed-dating study in which more attractive people placed more weight on physical attractiveness in selecting their dates, while less attractive people placed more weight on other qualities (e.g. sense of humor). Much like the famous line from Crosby, Stills, Nash, and Young, people find a way to love the ones they can be with. *Adapted from materials provided by [Association for Psychological Science](#).*

Blind To Beauty: How And Where Do We Process Attractiveness?

ScienceDaily (Oct. 15, 2007) — Beauty may be in the eye of the beholder, but according to research conducted by a UBC medical student, eye candy fails to find a sweet tooth in patients with a rare disorder.

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Chris Waite, a third-year med student, has studied how patients with prosopagnosia -- the inability to recognize familiar faces, even family members, because of brain injury -- perceive facial attractiveness. The findings may provide another assessment tool to help clinicians localize areas of brain damage.

"We don't know a tenth of what goes on the brain," says the 26-year-old. "Face perception is a highly complex visual skill. Exploring how the brain processes judgments about facial beauty help us identify the role of various regions of the brain."

Waite worked with UBC prof Jason Barton, Canada Research Chair in the Neuropsychology of Vision and Eye Movements, and investigators from Harvard and the Massachusetts Institute of Technology. The study was the first of its kind and earned Waite the American Academy of Neurology Award for best medical student essay.

The research team studied eight individuals with prosopagnosia, an impairment also known as face-blindness. They wanted to know where the brain processes visual information that adds up to a judgment about facial attractiveness.

Individuals with prosopagnosia have trouble extracting and integrating information they see in a face and rely on other characteristics, such as hair, body shape and gait to recognize people.

The condition can result from trauma to the head, illness such as encephalitis, or inflammation of the brain, stroke, coma or insufficient oxygen supply at birth. In 2006, a web survey of 1,600 people conducted jointly by a team from Harvard and University College London suggested that up to two per cent of people have some degree of face-blindness.

The damaged area of the brain for those with face-blindness is usually found in the medial side of the occipital (low back of the brain, near the spinal cord) and temporal, or side lobes. The region is called the fusiform face area. Because attractiveness depends on non-changing elements of facial structure -- which in Western society include a strong jaw, big eyes and a straight nose -- it was thought that attractiveness might be processed in this area.

However, because attractiveness is a social signal that helps us judge personality or mating potential, scientists believed it might be processed in a region of the brain that "reads" changing facial properties, an area called the superior temporal sulcus that is located at the tops of the temporal lobes. Although prosopagnosia patients cannot identify faces, they can judge subtle facial clues, such as a raised eyebrow or pursed lips that express emotion and convey social cues.

The investigators' wanted to determine if recognizing facial beauty took place in the region that supports identification (fusiform face) or the one supporting social signals (superior temporal sulcus).

The research subjects, heterosexual men and women prosopagnosics ranging in age from 20s to 60s, were shown 80 anonymous male and female faces, both average and attractive, and asked to rate their attractiveness. A second test involved viewing a series of similar images while researchers timed how long participants looked at each image. A control group of 19 provided comparison data. Prosopagnosics also looked at famous beautiful faces to further test the relationship between ability to identify familiar faces and ability to judge beauty.

Both tasks showed that the same damage that prevented them from identifying faces impaired prosopagnosics in processing facial attractiveness. They rated the attractiveness of beautiful faces only slightly higher than average faces. Also, they were much more willing than the control group to continue looking at images of average faces.

The researchers concluded that processing facial attractiveness must use the same neural pathways -- those found in the fusiform region of the brain -- used to process identity.

"While the beauty of a face might seem a more fitting topic for an artist, this work helps settle a debate by showing that areas that code the identity of a face also play a key role in the perception of beauty. It helps us understand the contributions of different 'modules' of the brain to human experience," says Barton, an investigator at the Brain Research Centre at UBC Hospital and a member of the Vancouver Coastal Health Research Institute (VCHRI).

Although Waite feels fortunate to have conducted research with eminent neuroscientists, his heart still belongs to medicine and vision science in particular, influenced in part by his mother who is an optician.

"I think vision is the most important sense," he says. "If I could fix something to make a patient's life better, that would be a great feeling. That's what I want to do."

Once he completes his undergraduate degree in medicine, Waite is considering a residency in ophthalmology, among other options.

Funding for the study was provided by the American Academy of Neurology and the UBC Dept. of Ophthalmology Thomas Dohm Scholarship.

The Brain Research Centre at Vancouver Hospital, a partnership between VCHRI and UBC's Faculty of Medicine, has more than 200 investigators with broad, multi-disciplinary research expertise to advance knowledge of the brain and to explore new discoveries and technologies that have the potential to reduce the suffering and cost associated with disease and injuries of the brain.

Adapted from materials provided by [University of British Columbia](#).

Physical Beauty Involves More Than Good Looks

ScienceDaily (Apr. 19, 2004) — MADISON, Wis. -- There is more to beauty than meets the stranger's eye, according to results from three studies examining the influence of non-physical traits on people's perception of physical attractiveness.

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The results, which show that people perceive physical appeal differently when they look at those they know versus strangers, are published in the recently released March issue of *Evolution and Human Behavior*.

In many studies evaluating physical attractiveness, people are often shown an array of strangers' photos, computer-generated images or line drawings and asked to identify which ones, based on differences in physical features, are most attractive. Results from these studies suggest that physically attractive traits include high degrees of bilateral facial symmetries, such as eyes that are identical in shape and size, and waist-to-hip ratios of 0.7 for women and 0.9 for men.

"You can find study after study that focuses on which waist-to-hip ratios or particular facial features people find physically attractive, and these studies have captured popular attention," says Kevin Kniffin, an honorary fellow in the anthropology department at the University of Wisconsin-Madison and an adjunct assistant professor at Binghamton University. Kniffin co-authored the *Evolution and Human Behavior* paper with David Sloan Wilson, an evolutionary biologist at Binghamton University.

While these past studies do show which features people find physically appealing after just a glance, they overlook the non-physical traits that may influence a person's perception of another's beauty over time. In other words, people may see physical attractiveness differently when they know that person's other qualities, usually invisible to strangers, says Kniffin. Pressures selecting for the influence of non-physical traits on the perception of physical beauty have operated across millennia. According to evolutionary theory, many animals, including humans, are attracted to those who are likely to increase their own fitness -- the likelihood of surviving and reproducing.

In the case of humans, "the fitness value of potential social partners depends at least as much on non-physical traits -- whether they are cooperative, dependable, brave, hardworking, intelligent and so on -- as physical factors, such as smooth skin and symmetrical features," says Wilson. "It follows that non-physical factors should be included in the subconscious assessment of beauty."

To systematically consider the influence of non-physical traits on how people who are familiar with each other perceive physical appeal, Kniffin and Wilson conducted three studies of beauty involving people who know each other and people who don't. For all studies, the participants were asked to rate physical attractiveness and non-physical traits such as liking, respect and talent. Strangers rated only physical attractiveness.

In the first study, the participants rated people photographed in high school yearbooks, including one that belonged to each participant. In the second, members of a college sports team, as well as strangers, rated each team member. Finally, students in a summer archaeological excavation course rated each other on the first day of class and six weeks later at the end of the course.

"In each case, non-physical traits known only to familiars, such as how much the person was liked, respected and contributed to shared goals, had a large effect on the perception of physical attractiveness that was invisible to the strangers," says Wilson.

Each study provided an illustrative example of this finding. For instance, one middle-aged subject who had not seen the familiar person photographed in the yearbook for decades responded with absolute disgust when she recalled the person's character and described that person as ugly. In the sports team study, team members considered the slacker to be ugly and one of the leaders to be physically attractive, while strangers, blind to the members' relative contributions, rated them as equally attractive on the basis of photographs. And, after six weeks of working together on an archaeological dig, students' perception of physical attractiveness changed based on interactions during the course.

In a world where people are bombarded with messages about physical attractiveness from magazines, television and advertisements, the researchers say their results point to the influence of other traits on people's perception of physical beauty. Kniffin adds that he hopes these findings may encourage the consumers of this information to rethink the value of cosmetic surgery, especially if it involves risk.

At the end of their paper, the researchers offer this beauty tip: "If you want to enhance your physical attractiveness, become a valuable social partner."

Look at what that did for Abraham Lincoln.

"During his lifetime, he was regarded as so ugly that he once quipped, 'If I were two-faced, do you think I would be wearing this one?'" says Wilson. "Yet his physical features have become beloved, not because of their physical qualities per se, but because of what they stand for."

Adapted from materials provided by [University Of Wisconsin-Madison](#).

Do Attractive Women Want It All?

ScienceDaily (Mar. 24, 2008) — Although many researchers have believed women choose partners based on the kind of relationship they are seeking, a new study from The University of Texas at Austin reveals women's preferences can be influenced by their own attractiveness.

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David Buss, psychology researcher at the university, has published the findings in "Attractive Women Want it All: Good Genes, Economic Investment, Parenting Proclivities and Emotional Commitment" in this month's *Evolutionary Psychology*.

Previous researchers argued that what women value depended on the type of relationship they were looking for. Women looking for long-term partners want someone who will be a good provider for them and their children, but women seeking short-term flings care more about masculinity and physical attractiveness, features that may be passed down to children.

Buss and Todd Shackelford, psychology professor at Florida Atlantic University, found women ideally want partners who have all the characteristics they desire, but they will calibrate their standards based on their own desirability.

"When reviewing the qualities they desire in romantic partners, women gauge what they can get based on what they got," Buss said. "And women who are considered physically attractive maintain high standards for prospective partners across a variety of characteristics."

The researchers identified four categories of characteristics women seek in a partner:

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- good genes, reflected in desirable physical traits,
 - resources,
 - the desire to have children and good parenting skills, and
 - loyalty and devotion.

Most women attempt to secure the best combination of the qualities they desire from the same man, but the researchers said a small portion of women who do not find a partner with all the qualities may trade some characteristics for others.

Although women's selectivity across categories reflected how attractive they appeared to other people, the researchers found the characteristics men desired in a partner did not vary based on their own physical attractiveness.

Adapted from materials provided by [University of Texas at Austin](#).

First Impressions Of Beauty May Demonstrate Why The Pretty Prosper

ScienceDaily (Jan. 25, 2006) — We might not be able to resist a pretty face after all, according to a report from the University of Pennsylvania. Experiments in which subjects were given a fraction of a second to judge "attractiveness" offered further evidence that our preference for beauty might be hard-wired. People who participated in the studies were also more likely to associate pretty faces with positive traits.

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"We're able to judge attractiveness with surprising speed and on the basis of very little information," said Ingrid Olson, a professor in Penn's Department of Psychology and researcher at Penn's Center for Cognitive Neuroscience. "It seems that pretty faces 'prime' our minds to make us more likely to associate the pretty face with a positive emotion."

Olson, along with co-author Christy Marshuetz, of Yale University recently published their findings in the journal *Emotion*, a publication of the American Psychological Association. The researchers set out to study cognitive processes behind a very real phenomenon: physically attractive people have advantages that unattractive people do not.

"Research has demonstrated time and again that there are tremendous social and economic benefits to being attractive," Olson said. "Attractive people are paid more, are judged more intelligent and will receive more attention in most facets of life."

"This favoritism, while poorly understood, seems to be innate and cross-cultural. Studies suggest that even infants prefer pretty faces," Olson said.

In their report, the researchers describe three experiments to investigate the preference for attractiveness.

The first study tested the idea that beauty can be assessed rapidly by asking study participants to rate faces pictures of non-famous males and females taken from three different high school yearbooks and the Internet shown for .013 seconds on a computer screen.

Although participants reported that they could not see the faces and that they were guessing on each trial, they were able to accurately rate the attractiveness of those faces.

"There are no definite rules to what kind of face can be called beautiful, but we chose faces of either extreme very ugly or very pretty," Olson said. "Seen rapidly, viewers were able to make what amounted to an unconscious, albeit accurate, assessment of physical beauty."

In their second and third experiments, the researchers explored the notion of "priming" whether or not seeing a pretty face makes a viewer more likely to associate that face with positive attributes. The second experiment involved rapidly showing a face on the screen, followed shortly thereafter by a word in white text on a black screen. Participants were instructed to ignore the face and were timed on how quickly they could classify the word as either good or bad. Almost uniformly, response times to good words, such as "laughter" or "happiness," were faster after viewing an attractive face.

"In a way, pretty faces are rewarding; they make us more likely to think good thoughts," said Olson. "There are some underlying processes going on in the brain that prejudice us to respond to attractive people better even if we are not aware of it."

They repeated the priming test in a third experiment, this time using images of houses, to see whether the beauty bias is a general phenomenon or one that is limited to socially important stimuli such as faces. Unlike faces, response times to good words were not faster after having viewed an attractive house.

"Faces hold a special power for us, perhaps more so than art or objects," Olson said. "The beauty bias has a real influence upon us, something we should be mindful of when dealing with others."

Adapted from materials provided by [University of Pennsylvania](#).

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Traits Influence Perceived Attractiveness

ScienceDaily (Nov. 30, 2007) — A new study published in *Personal Relationships* examines the way in which perceptions of physical attractiveness are influenced by personality. The study finds that individuals – both men and women – who exhibit positive traits, such as honesty and helpfulness, are perceived as better looking. Those who exhibit negative traits, such as unfairness and rudeness, appear to be less physically attractive to observers.

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Participants in the study viewed photographs of opposite-sex individuals and rated them for attractiveness before and after being provided with information on personality traits. After personality information was received, participants also rated the desirability of each individual as a friend and as a dating partner. Information on personality was found to significantly alter perceived desirability, showing that cognitive processes and expectations modify judgments of attractiveness.

“Perceiving a person as having a desirable personality makes the person more suitable in general as a close relationship partner of any kind,” says study author Gary W. Lewandowski, Jr. The findings show that a positive personality leads to greater desirability as a friend, which leads

to greater desirability as a romantic partner and, ultimately, to being viewed as more physically attractive.

The findings remained consistent regardless of how “attractive” the individual was initially perceived to be, or of the participants' current relationship status or commitment level with a partner.

Previous studies examined physical appearance and personality mainly as independent sources in predicting attraction. By presenting this information in installments, the study simulates a more typical context in which seeing the person's appearance precedes learning about their personality, and shows that perceptions of a person's physical attractiveness may change over time due to their positive or negative traits.

“This research provides a more positive alternative by reminding people that personality goes a long way toward determining your attractiveness; it can even change people's impressions of how good looking you are,” says Lewandowski.

Adapted from materials provided by [Blackwell Publishing Ltd.](#)

Facial Characteristics Indicative Of Personality Traits, Say Experts

ScienceDaily (Feb. 14, 2006) —

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Biological scientists at the University of Liverpool launched the study to investigate the reasons why many couples tend to look similar to each other. The team, in collaboration with the University of Durham and the University of St Andrews, asked participants to judge perceived age, attractiveness, and personality traits of real-life married couples. Photographs of female faces were viewed separately to male faces, so that participants were unaware of who was married to whom.

Dr Tony Little, from the University's School of Biological Sciences, explains: "There is widespread belief that couples, particularly those who have been together for many years, look

similar to each other. To understand why this happens, we looked at the assumptions that people make about a person's personality, based on facial characteristics. We found that perceptions of age, attractiveness and personality were very similar between male and female couples. For example if the female face was rated as 'sociable' then her partner was also more likely to be rated as 'sociable.'

"We also found that couples who had been married for a long period of time, were perceived as having more similar personalities than those who had not been together very long. This may come from sharing experiences together - affecting how their face appears."

Scientists are now looking for people who are both single and attached to take part in an online study that will include questions about their personality, age and how they rate their own attractiveness. The study will also feature face preference tests, in which participants will be asked to rate the attractiveness of different face types. The online study will examine whether an individual's physical and personality traits influence their face preferences.

Scientists will also investigate whether face perceptions are different between those with and without partners.

Dr Little added: "These tests will allow us to see how particular face types communicate certain personality traits and how perceptions of unfamiliar faces, as well as our own face, influence us in the friends and partners we choose."

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Members of the public are invited to take part in the online face experiments by logging on to www.alittlelab.com

Adapted from materials provided by [University of Liverpool](http://www.liverpool.ac.uk).