Study finds autistic children excel at numbers

Children with autism and average IQs consistently demonstrated superior math skills compared with non-autistic children in the same IQ range, according to a new study by Stanford researchers.

“There appears to be a unique pattern of brain organization that underlies superior problem-solving abilities in children with autism,” said Vinod Menon, PhD, professor of psychiatry and behavioral sciences at the School of Medicine and a member of the Child Health Research Institute at Lucile Packard Children’s Hospital.

Though all the children in the study had normal IQs, those with autism did better on a standardized math test, using analytic strategies to solve problems. MRI brain scans of the autistic children revealed an unusual pattern of activity in an area typically associated with recognizing faces and objects.

The researchers say the study confirms that high-functioning children with autism have especially strong number-solving abilities, based on different brain organization. “Our study supports the idea that atypical brain development in autism can lead to some remarkable cognitive strengths. We think this can be reassuring to parents,” Menon said.

Nurses and registration administrators enter patient information into the hospital electronic medical records system during a emergency drill.

Prepared for the worst

Hospitals practice for emergency situations

The woman in the emergency department waiting area was screaming for her friend. “Where is she? I lost her in the crowd!” she wailed.

Moments later, she dashed across the room to hug her missing comrade, who was covered in blood, with serious burns on her arms and legs.

Happily, the burns were fake—as was the blood. The two women were among several hundred volunteers taking part in a university-wide emergency preparedness drill that included Stanford Hospital & Clinics and Lucile Packard Children’s Hospital at Stanford. The drill involved a mock explosion at Stanford Stadium to coordinate evacuations and first-response teams, followed by an exercise to see how the hospitals would respond to a Code Triage, a major disaster involving dozens of casualties in a short time.

The event brought together university response teams and local and regional agencies that care for victims, including firefighters, ambulance crews, police and emergency services.

Volunteer patients were rushed by ambulance to the Marc and Laura Andreessen Emergency Department, where they were triaged based on the severity of their condition. They each were color coded and routed for immediate care or sent to the admissions station to be treated and released. Nurses from units throughout the hospitals received their assignments, along with security, housekeeping, pharmacy, social workers and other support services, to accommodate a patient surge while maintaining daily standards of care. Administrators set up a command center in a third-floor conference room with 40 officials tracking every aspect of the drill, using scripted dialogue to keep team members up-to-date.
**Exercise may prevent ‘sedentary death’**

Carol Hutner Winograd, MD, is a professor emerita of medicine and former clinical director of the Geriatric Research Education Clinical Center at Stanford. A specialist in geriatric medicine, she has co-authored a book, *Treatments for the Alzheimer Patient: The Long Haul,* and has written more than 40 scientific articles on functional impairment in hospitalized elders, mobility and geriatric assessment.

**Is it inevitable that we will lose mobility and/or become frail as we age?**

It is common, but it is not inevitable. The 20th century gave us 30 years more of life expectancy—from 47 years in 1900 to 77 years in 2007. It was added without any understanding of how to prepare and what physiology and metabolism and muscle strength were needed to thrive in those later 30 years. We’re now beginning to have the research data that confirms that it is not only possible but desirable for older adults—even adults in their 90s—to exercise doing cardiovascular work, strengthening, balance and flexibility.

**Does being sedentary put us at greater risk of disease and death?**

It’s very important for people to know that there is a phenomenon known as sedentary death syndrome—that inactivity may lead to premature death. Lack of activity can contribute to chronic diseases like type 2 diabetes and cardiovascular disease. Hypertension, falls, back pain, osteoporosis, arthritis—all may increase with inactivity. And mortality may increase with inactivity.

**How is a sedentary lifestyle related to aging?**

We all start adult life with a certain amount of muscle, though men start out with more than women because of testosterone. So over time there is a gradual loss of muscle that begins in the 20s. Men and women lose muscle at the same rate, but women start at a lower level. Because women start with less muscle mass, they tend to arrive at the disability threshold—the point at which it becomes difficult to carry groceries or go up the stairs—much earlier than men. That is part of why so many women are frail.

**At what point in life does your ability to do exercise training begin to decline?**

Never. There was a study by Tufts University researchers who worked with eight men and women in their 90s whose function was basically bed-to-chair. They were put on high-intensity training for eight weeks, and at the end, they were able to increase muscle size by an average of 9 percent. The average strength gain was 174 percent on the right and 180 percent on the left. They were able to lift twice as much weight with both legs. What I think is most important and clinically meaningful is that some people no longer used canes to walk at the end of the study and were able to walk faster.

The study really revolutionized thinking because it was thought that once you lost muscle mass, you couldn’t gain it back. These findings now have been reproduced in numerous places.

**What other studies reinforce the value of exercise in older adults?**

A group in Pittsburgh looked at the ability of people to walk a quarter of a mile. Over six years, they followed 2,700 people between the ages of 70 and 79 and measured the speed of their walking on a track. People who couldn’t do it at all had the highest mortality rate. The people who did it the fastest had the lowest mortality rate. The slower you were, the more likely you were to be in need of walking aids or to become wheelchair bound several years later. So your ability to walk a quarter of a mile predicted both your function down the line and your mortality.

When I first read this study, I was jumping up and down in the kitchen. My husband asked me, “What’s going on?” And I told him about the study. He said, “You’ve been saying that for years.” Yes, but now we have the data.
Marking the milestones

The largest construction project in Palo Alto’s history—the Stanford Medical Center Renewal Project—reached a new milestone this summer. And it was ahead of schedule. The reopening of Welch Road—four months earlier than planned—marks an important transition in the project, and its new look offers a tangible sign of the vision for the future. Though hardhats, backhoes and cranes will remain part of the medical center landscape for several more years, there already have been a number of important project milestones.

“We’re making great progress, in every sense of the word,” said Mark Tortorich, FAIA, vice president of planning, design and construction for the hospitals.

6/11
PLANS APPROVED

After more than four years and more than 100 public hearings, plans for the project are approved by the Palo Alto City Council, allowing construction to begin. The design of both hospitals had already been endorsed by the city’s Architectural Review Board, which held 29 public hearings on various aspects of the project—what city officials call the largest in Palo Alto’s history.

9/11
SITE PREPARATION

More than 80 trees are boxed and stored, ready to be replanted once the project is complete. Heritage oaks and redwoods are carefully prepared and put in safekeeping so they can be transplanted later; some are relocated to new sites on the university campus.

9/11
CLINIC BUILDINGS DEMOLISHED

Clinics at 701 and 703 Welch Road are demolished as part of the “make-ready” preparations for below-grade work for the Packard Children’s Hospital expansion.

9/12
PACKARD CHILDREN’S HOSPITAL GROUNDBREAKING

More than 200 people attend the official groundbreaking ceremony for Packard Children’s, marking the formal start of construction. The expansion will add 521,000 square feet, providing more beds, private rooms, state-of-the-art operating suites, family-friendly amenities and the flexible floor space the hospital needs to adapt to new technologies and more efficient services.

10/11
WELCH ROAD UTILITY PROJECT BEGINS

Utility work and surface improvements to Welch Road include replacing utility lines, water services, gas lines and information technology infrastructure to serve the new hospital facilities. The street becomes one way between Quarry Road and Pasteur Drive, and sidewalks, curbs and gutters are removed. Access to several clinics is relocated to Vineyard Lane.

10/12
PARKING STRUCTURE DEMOLISHED

The three-level parking structure adjacent to Stanford Hospital and the Stanford Cancer Center is demolished to prepare the main construction site of the new Stanford Hospital. Visitor parking is rerouted to the underground parking facility on Pasteur Drive.

9/12
HOOVER PAVILION OPENS

After an extensive, 14-month renovation process, Hoover Pavilion—the original Palo Alto Hospital—is restored inside and out and modernized to accommodate diverse health-care specialties and expanded outpatient services. The landmark Art Deco building now serves as headquarters for several Stanford primary care clinics, including the Express Care Clinic, and houses the main branch of the Stanford Health Library.

12/12
STANFORD HOSPITAL GROUNDBREAKING

About 350 administrators, donors and community members gather to mark the official start of construction for the new Stanford Hospital. The 824,000-square-foot floor plan will increase patient capacity to 600 beds and feature 368 private rooms, an enlarged Level 1 trauma center and an expanded emergency department.

Learn more about the Medical Center Renewal Project at SUMCRenewal.org.
“The objective is to identify and fix any flaws in the system before the hospital is faced with a real mass-casualty event,” said Brandon Bond, administrative director of the Office of Emergency Management (OEM) at Stanford Hospital & Clinics and Packard Children’s. “Since an emergency by its very nature is not a normal part of operations, we must have a system in place and make sure that everyone knows their part in the process.”

**Plans and preparations**

As head of the emergency group, Bond is responsible for planning, organizing and rehearsing various scenarios should the hospitals have to respond to a natural or manmade disaster—an earthquake, flood, viral pandemic, explosion, bioterrorism incident or act of violence.

The group has established partnerships with local communities and businesses, works closely with the university to coordinate campus-wide response strategies and stocks emergency supplies and equipment. The team oversees two major drills each year, as well as smaller scenarios such as patient evacuations.

Major drills take months of preparation and involve more than 145 people, who consider various contingencies, chart processes and script dialogue. A top priority is to test communications systems and procedures.

“We think of the worst-case scenarios and then make a plan to prepare for them,” Bond said. “We look at every aspect of every system in the hospitals to find any vulnerabilities.”

**Real-life test**

These drills are particularly important because Stanford Medicine is the only designated Level I trauma center on the Peninsula, which means that patients with serious injuries are routed to its emergency department, where they have immediate access to trauma surgeons, operating rooms, highly skilled specialists and follow-up care. Stanford Hospital has been a Level I trauma center since 1998; Packard Children’s was verified as a Level I pediatric center this summer—the only one in the Bay Area recognized by the American College of Surgeons.

The practice sessions paid off in early July when the hospitals were notified about a “potential mass casualty occurrence” shortly after the Asiana Airlines crash at San Francisco International Airport. Within minutes, physicians, nurses, staff members and administrators were prepared for a Code Triage disaster plan. Officials established a command center, erected an orange tent for triage by the emergency department entrance and readied operating rooms. Fifty-five patients were treated within four hours that Saturday, almost a third of them children; 11 adults and seven children were admitted.

“The staff really rose to the occasion in large part because they knew what to expect,” said Bond. “The many hours we devote to disaster planning and training really paid off.”

In fact, shortly before the crash, the team had organized a mass casualty drill and discovered that patient paperwork was getting lost in the shuffle. The group ordered simple plastic sleeves to hold important documents that could be placed around each patient’s neck during initial triage, and the system proved invaluable during the real-life incident.

**Tools for change**

“The drills are not so much about medical care as they are about process and communication,” Bond said. “They touch every aspect of the hospitals at every level of organization. They are a training tool to examine what works and what can be improved.”

The stadium explosion scenario, for example, was designed to monitor a patient surge to track how patients were triaged and to see if there were bottlenecks or processes that could be streamlined. Thirty-three patients with problems ranging from dizziness to internal bleeding were transported to the hospital within an hour. Patients arrived with mock injuries, including blood spatters, burns and gaping wounds, and many acted out the trauma and confusion that a horrific incident would evoke. Each was carefully examined, processed, tracked and admitted.

“In previous drills we noted that the registration process could be reorganized more efficiently, so we made that a focus of this exercise,” said program manager Eric Giardi. “We saw a significant improvement in how the patients were admitted.”

While the focus was on the emergency department, all units had a playbook to prepare staff for possible contingencies. The team spent the weeks following the drill looking at the playbacks and notes from the official evaluators to identify any additional ways to streamline the system. They also went through reams of reports from hospital services, such as finance and Spiritual Care, that were not directly involved in the drill but would be affected in case of a real patient surge.

Normally the emergency department sees about 160 patients in a day, said Assistant Manager Anthony Siniscal, RN, MBA. The point of the day was to practice intake of the sudden influx of patients. The system is well organized, so I feel more confident about my role if something like this took place in real life.”

**Ongoing process**

The new Stanford Hospital and the expansion of Packard Children’s raise new challenges for Bond and his team. The scenarios will have to be revised since the floor plans will be different, supplies and exit points moved, and internal operations reorganized.

“Emergency preparedness is an ongoing process,” Bond said. “It’s a cycle of preparing a number of response plans, scheduling and conducting drills, and evaluating our performance so we can constantly improve.”
Residents help document community health hazards

Feliciiana Jimenez, an 80-year-old with nine children, squints with a critical eye at the camera window of a tablet computer. Through this lens, she sees her street in a whole new light. She takes pictures of crumbling sidewalks and a construction worker’s hose, coiled at her feet. She hits the record button on the tablet to describe how these hazards could cause seniors to trip and fall. She captures images of clogged sewer drains covered in stagnant water that could breed mosquitoes. As each problem is recorded, the tablet uses its built-in geographic positioning system to record its precise location on a map.

Jimenez lives in the North Fair Oaks neighborhood of Redwood City, where she is fighting for a safer, healthier neighborhood. She has volunteered to test two new devices—a customized tablet computer and a wearable camera—both of which can be used to notify city planners about things that need to be fixed and improved.

The benefits of these changes in the “built environment”—the man-made structures that define a place—go well beyond aesthetics: People who live in places that promote walking, socializing and eating fresh foods are physically and mentally healthier than those who do not.

For the record

Abby King, PhD, a Stanford professor of health research and policy and of medicine, developed the customized tablet for documenting neighborhood hazards. She and her team at the Stanford Prevention Research Center are now creating a social blueprint for teaching residents and grassroots organizations how to persuasively communicate these community needs to city planners.

Jimenez’s street is lined with boxcar rows of houses adorned with cast-iron grates on windows, brick fences and plaster lawn ornaments. Around the corner are small retail stores selling Mexican groceries, piñatas and quinceañera gowns in Easter-egg colors.

Two Stanford researchers observe Jimenez’s interactions with the tablet computer, looking for ways to improve it. Called the Stanford Healthy Neighborhood Discovery Tool, the simple-to-use tablet is loaded with software developed by King’s team to track users’ walking routes and geographically tag hazard locations, linking them with audio narratives and photographs. Afterward, it leads the user through a questionnaire about the walk.

As Jimenez stops to snap pictures of graffiti and an overflowing trash bin, the two researchers—Sandra Jane Winter, PhD, a Stanford post-doctoral scholar, and Priscilla Padilla Romero, MPH, MPP, a community partner from San Mateo Medical Center—take a few moments to show her how to verbally record her impressions of each neighborhood feature.

After the walk, images and location coordinates can be uploaded to an online map, which can be shared with researchers, city planners, policymakers or others involved in the project. The walking routes of all participants are overlaid on the map, making it easy to identify the more frequently used routes where repairs need to be made first.

Data collection

Jimenez also wears a Microsoft SenseCam camera around her neck. It automatically snaps a picture of everything in her field of vision every 12 seconds. These images will be analyzed using software developed by King’s collaborators at the British Heart Foundation Health Promotion Research Group in Oxford, England. The camera’s built-in GPS provides information on distances and walkability to food sources, jobs and local transportation. It also allows researchers to identify hazards that participants might have overlooked.

King hopes that her tablet-based tool will provide a low-cost way for community advocates like Jimenez to work with city officials to improve their neighborhoods. But first, she and her Healthy Aging Research & Technology Solutions team need to collect more evidence not only to improve the tool but also to teach community groups how to use it.

About a year ago, King tested a precursor to the tablet in a community of 400 seniors in East Palo Alto. The study looked at ways to better inform city planners about the physical barriers to fresh-food sources. In February, the team celebrated its first success, after being contacted by Brent Butler, planning manager for East Palo Alto. “Some of the street issues that this Stanford study brought to our attention have been added to our comprehensive sidewalk inventory and repair program,” Butler said.

The study suggestions were influential in the city’s addition of countdown timers to crosswalks on its main thoroughfare, University Avenue, to ensure that seniors and children had enough time to cross. The study also helped the city to document sidewalk obstacles that impede people using wheelchairs, walkers and strollers.

Helping change happen

Some of these future improvements may be funded by Mark Zuckerberg, founder and CEO of Facebook. The company has pledged more than $800,000 annually to East Palo Alto and neighboring towns over the next 15 years to help improve traffic flow and create better pedestrian and bike paths.

This fortuitous collaboration with Facebook shows how valuable it is to have “shovel-ready” priorities documented when funding opportunities arise and how useful the discovery tool tablet can be for identifying those priorities.

After more data was collected, King and her colleagues organized a community advocacy meeting to help participants prioritize neighborhood issues by importance to the community and feasibility of being addressed. Together these residents developed an action plan and presented ideas to local policymakers.

“This phase of the study is important because it ensures that the community members, not outside researchers, are advocating for change within their own neighborhoods,” Winter said.
Heart-to-Heart Seminars
Presented by Packard Children’s Hospital
For Boys Only: Mondays, Oct. 28 and Nov. 4; Dec. 2 and 9, 6:30 pm
For Girls Only: Wednesdays, Nov. 6 and 13; Tuesdays, Dec. 3 and 10, 6:30 pm
Location: Packard Children’s Auditorium, 725 Welch Road, Palo Alto
Fee. Register online at calendar.lpch.org.

Grandparents Seminar
Presented by Packard Children’s Hospital
Date: Monday, Nov. 4 or Dec. 9, 6 pm
Location: Community Programs Classroom, 4100 Bohannon Drive, Menlo Park
Fee. Register online at calendar.lpch.org.

Getting Help in Caring for a Loved One
Presented by Stanford Cancer Institute
Date: Thursday, Nov. 7, 7 pm
Location: Stanford Hospital Health Library, Hoover Pavilion, 211 Quarry Road, Suite 201, Palo Alto
Registration is required; space is limited. To register, call 650-498-7826.

Staying Close While Standing Back: Parenting Teens While They Learn to Navigate Life
Presented by Packard Children’s Hospital
Speaker: Julie Metzger, RN
Date: Tuesday, Nov. 5, 7 pm
Location: Packard Children’s Auditorium, 725 Welch Road, Palo Alto
Fee. Register online at www.calendar.lpch.org.

Navigating the Legal and Financial Aspects of Caregiving
Presented by Stanford Cancer Institute
Date: Thursday, Nov. 21, 7 pm
Location: Stanford Hospital Health Library, Hoover Pavilion, 211 Quarry Road, Suite 201, Palo Alto
Registration is required; space is limited. To register, call 650-498-7826.
John Ayers didn’t hesitate to pursue the chemotherapy and radiation recommended to treat his Stage IV tongue cancer. But after the treatment, he developed further problems that called for an extraordinary solution: the use of slender robotic fingers directed by a master surgeon at Stanford Hospital & Clinics.

Ayers’ tissues were more than typically scarred by the effects of radiation, narrowing his throat to less than 10 percent of normal size. When he developed a cold, his throat would swell closed, and he couldn’t breathe. He couldn’t eat, either, because the scar tissue prevented food from passing.

That left Ayers with just one option: a feeding tube implanted in his stomach. He tolerated that for three years until he was diagnosed with a new health problem: thyroid cancer.

But the obstruction from his throat’s scar tissue made surgery to remove the new cancer problematic. By this time, he had been in conversation with Edward Damrose, MD, associate professor of otolaryngology and chief of Stanford Hospital’s Division of Laryngeal Surgery. Damrose has a special interest in using surgical robots to remove tumors through the mouth, a practice known as transoral robotic surgery.

“We had cured his first cancer,” said Damrose, “but we had left him with a set of problems that were quite serious. This new cancer forced our hand.”

Damrose and his team had to find a way to allow surgery on the thyroid cancer despite the scar tissue and restore Ayers’ ability to eat and reliably breathe.

Surgery conducted through the mouth has advanced greatly in the last five years with the aid of robotic devices that are significantly smaller and nimbler and are optically superior. Moreover, with a robotic-supported fiber optic laser and harmonic scalpel, surgeons can minimize the amount of heat required to remove tissue so that more healthy tissue is protected and more function is preserved.

“Advances in transoral robotic surgery allow us to do things through the mouth that previously required extensive incisions,” Damrose said. “Now we can approach these lesions entirely through the mouth with no incisions. Blood loss is minimized. Hospitalization is shorter. Complications are lower. It’s truly a win-win for the patient.”

When Damrose first mentioned the robot, Ayers said, “I’m used to new technology, but my faith was not in the robot—it was in the doctor. You could tell me all you want about the robot, but what’s going to make it run is the person. I said to myself, ‘This is the man I want to go to because he knows what he’s talking about.’”

To expedite Ayers’ care, Damrose and the Stanford team devised a plan to insert a tracheotomy tube for the thyroid surgery, which would be conducted traditionally, with large incisions from the outside. Then, by inserting the slender endoscopic tools through the patient’s mouth and down his esophagus, the surgeons could remove the scar tissue there and use stretchers to return it to a normal size. Damrose controlled the robotic arms while seated at a console and looking through a scope-like device with an almost 3-D image quality.

Ayers “healed beautifully,” Damrose said. He said the procedure also helped advance the field.

“Working through these problems gave us new ideas about how we could apply transoral robotic surgery technology to others,” Damrose said. The traditional answer for John would have been radical surgery—and that just wasn’t a palatable option, especially when you take into account the added risks of operating in a previously radiated field. And I don’t know how much longer he would have been able to go on the way he was.”

Following an additional treatment, Ayers now has complete freedom to eat.

“The most important message I’d like to get out there is that you don’t give up,” Ayers said. “No matter what anybody says—you don’t give up.”

Did you know?

Laughing lowers levels of stress hormones and strengthens the immune system.
**The power of touch**

Hands-on connections from birth to infant massage

For babies, the nine months of pregnancy may feel like one long, loving embrace. It’s not surprising, then, that studies support the benefits of skin-to-skin contact for mothers and babies from the moment of birth, throughout infancy and beyond.

Expectant mothers can enjoy these benefits by including immediate skin-to-skin contact with their babies as part of their birth plan. “Even for babies born by cesarean section, skin-to-skin time right after delivery can be a wonderful, strong start for both mother and baby,” said obstetrician Susan Crowe, MD, director of outpatient breastfeeding medicine services at Lucile Packard Children’s Hospital.

When the health of mom and baby allows, postponing the normal protocol of bathing, weighing and testing the baby can clear the way for shared skin-to-skin time.

“During this time, babies experience nine instinctive stages: birth cry, relaxation, awakening, activity, resting, ‘crawling’ (a shifting movement toward the breast), familiarization, suckling and sleep,” said Crowe, who’s also a clinical assistant professor of obstetrics and gynecology at Stanford University School of Medicine. “For a mother who desires to breastfeed, supporting skin-to-skin time is one way we can help her reach that goal.”

Depending on each mother’s birth plan and medical needs, skin-to-skin time with baby offers benefits, whether her baby is born vaginally or by cesarean section, whether it happens in the first hour or when mom is medically ready, and whether or not she is breastfeeding. Skin-to-skin time in the first hour helps regulate babies’ temperature, heart rate and breathing, and helps them cry less. It also increases mothers’ relaxation hormones.

A 2012 study published in the journal *Neonatology* showed that 95 percent of mothers who spent skin-to-skin time were breastfeeding exclusively 48 hours after delivery, and 90 percent were still breastfeeding exclusively six weeks later.

Babies and mothers with special medical needs also benefit from being skin-to-skin when it becomes medically possible. Until that time—and later as well—the mother’s partner can provide skin-to-skin time with baby, which can help keep the baby warm and provide bonding time.

As babies grow, infant massage provides a natural next step to continue this bond and its benefits. “Infant massage is always about bonding, loving and respect,” said Maureen McCaffrey, a certified infant massage instructor at Packard Children’s. “We start by asking permission and then listen for the baby’s cues to see if they’re engaging or disengaging. Babies communicate with us from the moment they’re born through body language, sound and behavior.”

In her classroom, McCaffrey sets up a nurturing environment that’s an easy, safe and relaxing example to parents. “The environment is very important. Parents can begin to feel the benefits just by setting up a quiet space where massage will take place.”

McCaffrey teaches a variety of infant massage techniques tailored to the unique needs of babies and families and focuses on the shared benefits for both mother and baby. In just a sampling of its benefits, infant massage:

- Enhances babies’ awareness of being loved, accepted and safe
- Improves sleep patterns for babies
- Improves digestion and elimination for babies
- Reduces fussiness for babies and increases their comfort in their environment
- Improves neurological function in babies
- Increases weight gain for premature and full-term babies
- Increases lactation production for mothers
- Reduces postpartum depression for mothers
- Improves relaxation for both baby and parents

From the first cuddle to the lasting bond, babies and parents can benefit enormously from learning their “first language”—touch—creating a strong start toward a lifetime of nurturing affection and good health.