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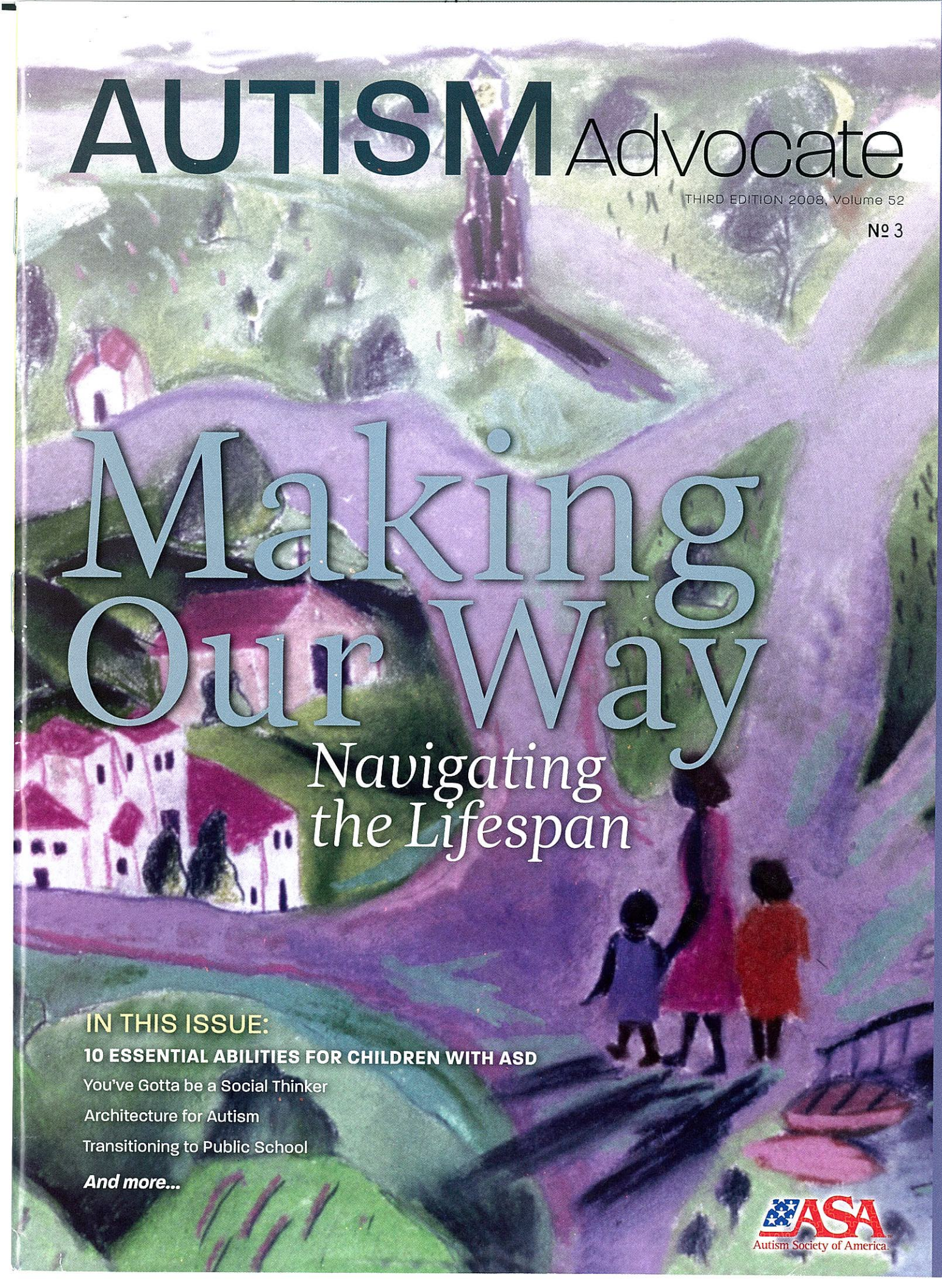

Making Our Way

Navigating the Lifespan

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Photos courtesy of Mackey Mitchell Architects

Comfort, Clarity and Calm

Architecture for Autism

BY DAVID HELFRICH AND MARCUS ADRIAN

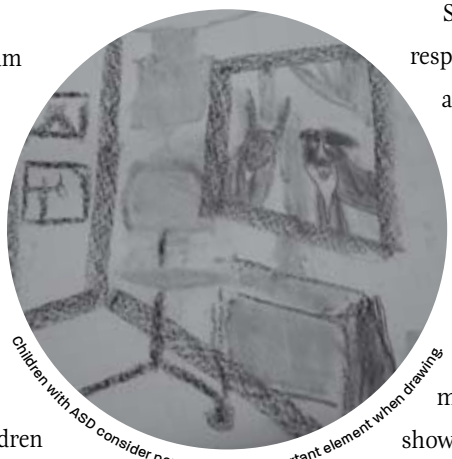
During a 2006 visit to a school for children with autism spectrum disorder (ASD), architect David Helfrich watched as a teacher led a child down a hallway. Along the corridor, direct sunlight blazed in from a skylight above, sharply illuminating the wall and floor. As the child crossed into the glare, he immediately collapsed to the floor and became uncooperative. One thing was strikingly clear to Helfrich—it's time for school designers to pay much closer attention to the sensory needs of spectrum learners.

At Mackey Mitchell Architects in St. Louis, Mo., Helfrich and a team of designers are collaborating to find environmental solutions for special-needs children, particularly deaf learners and children with ASD. Their work has led to innovative designs based on children's sensory needs, rather than a one-size-fits-all educational blueprint.

CONSIDERING SENSORY NEEDS

Fellow architect and firm principal Marcus Adrian explains how architecture can affect attention and learning. Helfrich's and Adrian's current focus on—and passion for—designing learning spaces for children with ASD is based on insights from their broad experience with deaf children. They are adapting their design strategies by considering all of the sensory needs of children with ASD, and incorporating them into innovative architectural solutions.

"All learning is sensory," says Adrian. "The five senses are the only pathways to the brain. We analyze sight, sound, touch, even taste and smell, to craft the perfect multi-sensory environment for each school's population." The design process begins with the realization that, just as every child has differing sensory and sensory-processing capacities, every child can be seen as having some kind of sensory needs, even those who might be referred to as "typical."



Children with ASD consider perspective an important element when drawing.

So, how can one school building respond to many different needs, across multiple age levels?

"It all comes back to signal and noise," begins Helfrich. "Think of the signal as each classroom's day-long sensory stream of information—from math to manners, and from science to show and share. Capturing each child's full sensory attention is essential to all learning." And as anyone who has worked with ASD learners knows, attention can be elusive, particularly with so many different sources of distraction. "Noise," continues Adrian, "is how

we refer to sensory pitfalls in any building that can derail a child's attention, and it isn't just the noise we can hear."

RECOGNIZING DISTRACTIONS

When creating a new elementary school for the Delaware School for the Deaf (DSD), Mackey Mitchell focused on each classroom's visual landscape, since deaf and hard-of-hearing children learn primarily through vision. In recent years, technology has enriched the visual signal in DSD's learning spaces. Computers, projectors and interactive whiteboards have been added to the time-honored chalkboard and American Sign Language. With so much emphasis on signal, attention has been diverted from some highly distracting sources of *visual* noise. When windows are placed within a few feet of instruction walls, children are at risk of being distracted by passing cars or playground friends. Even worse, if a teacher is silhouetted against a bright window near the front of a classroom, children at the back may not be able to discern the signed message from the teacher's face and hands. In that case, noise has actually overcome the signal, and learning stops altogether.

Sensory noise can be more subtle, but equally disruptive. Many special-needs schools engage in multi-sensory activities to promote development and to more fully engage their students' attention. Art rooms, occupational therapy suites, music rooms, greenhouses and project kitchens are all examples, and each comes with its own sensory noise that can affect nearby classrooms. "Imagine the disruption for the average third-grader, trying to focus on a difficult math lesson at 11 a.m.," says Adrian. "If the mechanical system isn't carefully balanced to avoid it, that child might suddenly get blasted by the smell of cookies baking in the cafeteria down the hall. When that happens, you've lost that child for the next several minutes."

DESIGNING A BALANCED ENVIRONMENT

In designing spaces for children with ASD, Mackey Mitchell employs strategies that separate it from other firms that emphasize only a soothing environment. "Soothing has nothing to do with signal and noise, "according to Adrian. "The way children with ASD process information through their senses is fundamentally different. A total lack of noise—or more precisely, lack of sensory stimulation—can be just as distracting as noise," which is why Adrian and Helfrich spend design time searching for what they call the "sensory sweet-spot" for each school population. "It's always about balance," says Adrian. "Whether we're designing for deaf toddlers, middle-school children with ASD or the mainstream population, we're always looking for ways to provide a stimulating environment without crossing the threshold into distraction and noise. Striking this kind of balance requires an extremely thorough understanding of how children with sensory or cognitive issues deal with various levels of sensory signal and noise."

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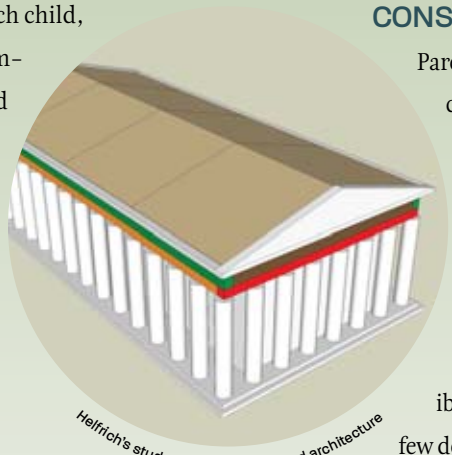
Helfrich and Adrian have built their innovative strategy thorough personal experience, trial-and-error and research—often one-on-one with parents, teachers and children with ASD. To gain the fullest understanding of how autism spectrum learners experience and process sensory input in the classroom, David Helfrich set out to engage children at their level. Helfrich volunteers weekly at the Judevine Center in St. Louis, an internationally acclaimed pioneer in the treatment and training of individuals with ASD and their families.

Inspired by artist Stephen Wiltshire, Helfrich wanted to explore the ability of children with ASD to sketch and draw. Once a week, he works with children at Judevine to understand spatial relationships and how children react to various environments. Children are asked to sketch what they see in their classroom setting, giving Helfrich a better understanding of elements within their space that are most important. He especially notices the attention paid to perspective. Using charcoal as the chosen medium (without the ability to erase), every line drawn is visible, better informing and recording the image in the child's mind. By observing their drawings, often beautiful and detailed, Helfrich is

beginning to understand how space affects each child, and which characteristics of the space seem important to them. "Children are greatly affected by the overall feeling of their classroom," says Helfrich. "What may seem to be subtle details can make a world of difference in the child's ability to block out noise and concentrate on signal."



Helfrich's students also work on 3-d architecture

BUILDING SPACES TO EASE TRANSITIONS

With Adrian's work on deaf schools and Helfrich's work with autism spectrum children, they've found a whole set of characteristics that appear to be common among most kids, in almost every school. "Transitions are difficult for nearly everyone," says Adrian, "but particularly for kids with special needs." As evidenced by the boy who collapsed in the glaring sunlight of a poorly-placed skylight, it's usually in transitional spaces like corridors where things can go wrong. "This is where you're forcing a somewhat fragile person to completely switch gears in a very short period of time—such as transitioning from the quiet calm of a one-on-one speech therapy visit back into the relative chaos of a bright classroom," remarks Helfrich. "If that transition isn't carefully designed—considering the length of the corridor, color choices and location of bathrooms along the way—you're setting kids up to fail when they get back in the room."

Helfrich believes that spaces designed for a child with ASD should be simple to understand in both building layout and appearance, allowing for easy transitions throughout the day and during their entire educational experience. "Children have to be comfortable with their environment," says Helfrich, "and the way for them to feel a sense of comfort is to create an environment where different components are easy to understand." These include window placement, floor patterns, wall colors, and room geometry and scale, to name a few. All of these vital components must be thoughtfully composed and strategically integrated throughout a building.

CONSTRUCTING AREAS FOR LEARNING

Parents often ask how architectural design can help children learn. One of the most basic examples is the use of color. Most people are familiar with how color can influence mood, but the potential impact of architectural and interior spaces for the learning disabled is not widely understood. Yet architecture has a direct correlation to every child's sensory compatibility in a room. "If we can design spaces with as few detractors as possible, we can really help these children, "Helfrich says. "We're working on designing the ideal school for each population's needs."

Across the country, parents, educators and physicians are agreeing with Mackey Mitchell's viewpoint and strategies. Resource centers, often linked with a school or hospital, for children on the autism spectrum are beginning to pop up in many states. Mackey Mitchell's concepts for McClean County's Autism Society headquarters are being used to raise funds for their new resource center.

Concepts were developed for computer rooms with training and Internet access, whiteboards and sensory walls, as well as a simple, flexible, innovative series of modular "cubbies" that serve to filter direct light and provide much-needed storage. "Visual zoning," or defining separate, distinct places without walls, helps to create areas within the classroom for children to learn and explore through multiple sensory experiences. These zones were achieved by hanging beads between spaces within the room, changing floor materials and using various lighting effects.

As families and communities seek solutions to address the needs of the increasing ASD population, Mackey Mitchell anticipates that partnerships of private and public organizations will become more common.

Adrian and Helfrich believe that a good strategy will always result in a good solution. They're even looking beyond schools to adaptations for homes and playgrounds. Bouncing ideas off each other, they wonder how a fragrant garden could be used at an ASD learning center. The possibilities are limitless as long as there are families and professionals seeking ways to help children with ASD.

About the Authors

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