Savant's amazing abilities remain a mystery

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us screen out irrelevant stimuli, suppress the orienting reflex, map out space, learn places, and encode memories contextually, they theorize that "hyper-hippocampal functioning" could contribute to both the problems and the abilities of the savant. Such "hyper-functioning" of the hippocampus might be the brain's effort to compensate for a deficiency of the amygdala, a brain area responsible for different memory functions that include providing "emotional tone" for memories.

Another theory they offer is that areas of the cortex in savants may be reorganized in ways that lend themselves to the high-level performance of specific skills. For instance, they say, if an autistic child pays little attention to faces or speech, the areas of the cortex that normally would become strongly "dedicated" to these functions "may [instead] be available to serve the higher but nonsocial pattern-recognition functions of the auditory and visual systems that they . . . .adjoin."

Some partial explanations . . . ?

Treffert notes that "no single theory, as yet, can explain the savant syndrome." He lists theories experts have advanced to account, at least partially, for savants' abilities:

—Some savants use eidetic imagery, "freezing" an image in their minds much as a VCR freezes a frame. Eidetic memory, however, cannot explain the abilities of many savants—for instance, the blind calendar calculator, or people who do calendar calculations for future years for which no calendars are available.

—Some savant skills may be inherited. For instance, musical savants may come from families with greater than usual musical talent. But Treffert notes that hereditary factors "are not a universal explanation," as many families have no history of the special abilities their savant relatives possess.

—Sensory deprivation and social isolation may "sensitize the savant to minute changes in the environment and lead to the development of bizarre or trivial preoccupations, concentration, or rituals such as memorizing obscure facts and calendar calculating." However, most people with sensory impairments, such as blindness or autism, do not develop remarkable savant abilities.

—Savants may be unable to think abstractly, and therefore channel their energies into concrete thought processes.

—Savants may use their skills to gain praise, compensate for intellectual deficits, or gain approval or love. Yet most developmentally disabled people who seek praise and approval do not develop savant abilities.

—In the savant, left brain damage—from physical injury or from prenatal hormonal imbalances, which are more likely to affect the left than right hemisphere—may produce retardation and lead to compensatory development by the right side of the brain, the side most linked to the types of skills savants have. This, coupled with defects in the hippocampus, amygdala, and/or forebrain, could produce the savant's remarkable skills and profound deficiencies.

Treffert notes that savant skills generally involve memory, and cites Goodman's point that "what stands out remarkably is the savant's long-term memory . . . which may be due to failure in the swift metabolism of short-term memory." In other words, Treffert says, savant skills may be due to "a failure to forget rather than an enhanced ability to store."

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Exercise decreases aggression, self-stimulation

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levels" of self-stimulating behaviors. They found that following brief jogging sessions "there was always a marked decrease in self-stimulatory behavior." Also, the children's appropriate responses in play and academic settings increased following jogging sessions.

—Robert and Wilhelmina Watters observed five autistic boys while they exercised, watched TV, and did academic work. They found that "for all subjects, there was a decrease in self-stimulation following . . . exercise." However, they did not find that the children did better at academic tasks following exercise periods than they did under other circumstances.

Two large, long-term studies of the effects of exercise on retarded adults were done by Phillip Tomporowski and Norman Ellis. Both studies lasted seven months; one involved 65 subjects, the other 50. While standardized tests reflected little change in the behavior of the participants in these studies, the researchers say that project staff members saw significant improvements in behavior for most subjects. "During the course of the treatment," they say, "[staff members] reported that many subjects displayed a greater tendency to interact appropriately with staff and other subjects in the program." Subjects also enjoyed the exercises and participated with little prompting, and they greatly improved their cardiovascular fitness.

Tomporowski and Ellis note that an exercise program is an excellent natural setting to teach "activities such as grooming and dressing, social behavior, and many cognitive tasks [which] occur in a normal fashion during the course of exercise training."

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