

# Developmental Rerouting

March 22, 2012



Scientists often think of the adult brain as being “modular,” containing many systems that each specialize in a given function like language or number, relatively independent of one another; this explains why damage to the mature brain in adults tends to impair certain brain functions while leaving others intact. However, Annette Karmiloff-Smith believed that this modular framework cannot be applied to the developing brain. In her research on infants with genetic developmental disorders like Williams syndrome, Down syndrome and Fragile X syndrome, she found that these disorders are not manifestations of damage to specific brain areas in an otherwise intact typical brain, but rather that early atypical processing impacts on many regions, some more subtly than others, and that interactions across brain regions give rise to different developmental trajectories of brain development. Karmiloff-Smith believed that a genetic disorder’s cognitive-level symptoms can be traced back to these early neural developmental differences, and that understanding full atypical trajectories is critical for designing treatments. Since it is in infancy that the brain shows maximum plasticity, even a small developmental rerouting could have a large impact later in life. Karmiloff-Smith, a Past APS Board Member, passed away in December 2016.

[Watch Inside the Psychologist’s Studio with Annette Karmiloff-Smith and BJ Casey.](#)