Intrauterine Environment Affects Infant and Child Outcomes: Environment as Direct Effect

Abstract of talk
conference on Modeling Developmental Processes in Ecological Context
in Tempe, Arizona – March 2004

Keith F. Widaman
University of California at Davis

The teratogenic effects of phenylketonuria (PKU) are well known. If untreated by special diet during the developmental period, children with PKU suffer declines in intelligence to the level of severe mental retardation. Under appropriate treatment, children with PKU can develop quite normally, with IQs in the normal range. One interesting aspect of the PKU problem concerns mothers with PKU. If a woman with PKU is pregnancy, but does not adhere closely to her special diet, the build-up of phenylalanine (PHE) in the mother's blood passes the placental barrier and can damage the developing fetus. This presentation will describe the modeling of the nature of the PHE exposure – child outcome relation, modeled most simply using a two-piece linear spline model. The results of this analysis then affected the measurement of PHE exposure in the context of a structural equation model specified to estimate the effects of maternal background variables, pregnancy-related variables (including PHE level), and birth-related outcomes on later infant and childhood measures of intellectual development.