

Earlier is Better! Predictiveness of Early Delays

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Neurobiological research shows that timing of experiences and stimulation are critical for optimal brain development. The brain develops by an "experience-dependent" process, where experience activates certain pathways in the brain and not others. Lack of experience leads to cell death in a process called "pruning" where pathways that are not used are eliminated (Siegel, 1999). From birth, a child's brain is primed to create connections which are involved in motor, language, cognitive, and emotional development. Experiences which occur early in life during these windows of opportunity are especially crucial in organizing the brain's basic structures, as they create the neural foundation for all subsequent development (Siegel, 1999; Yim, 1999). This neurobiological data indicates that to have the most potential for impact on the developing brain, therapeutic experiences should be created for the child as early as possible.

Empirical research has demonstrated that the duration of early intervention services and age of entry into services are critical for successful outcomes. Reynolds (1994) reported that the number of years of intervention is directly and significantly related to later achievement in school at grades 3 through 5. Children who received early intervention services the longest were held back in school significantly fewer times than other children. Since the age of entry is directly related to the duration of services, to

increase duration, one must refer as early as possible (Reynolds, 1994). Schafer and colleagues (1987) reported a similar finding in their investigation of the correlation between various demographic, biological, and intervention variables and development in different domains. Child's age was negatively correlated, with cognition, language, and social domains, meaning that younger infants identified and served at a younger age progressed faster than older infants in these areas (Schafer, et al, 1987). According to Lavigne and colleagues (1993), children who are not referred as early as possible miss the chance to receive therapy when its impact on their development could be the greatest.

Another important finding of Schafer and colleagues (1987) was that medical risk category (developmentally delayed, environmentally at risk, or medically at risk) was correlated to the child's level of development at an older age. The evidence indicated that early delays predicted later delays, and most children will not simply "grow out of it." Saylor and colleagues found that children who showed significant cognitive and language delays at 24-30 months, were highly likely to present with severe social skill deficits at school age. Saylor, Boyce, Price, (2003) and Byrd & Weitzman (1994) found that children with speech defects were at increased risk of early grade retention. In a critique of a 1996 article by Paul, van Kleeck, Gilliam, and Davis (1997) report Paul's evidence that 26% of children who function at the low end of the normal range of language development at 20 to 34 months were identified with a language delay in the early school years. They argued that given the critical advances in language development that occur when a child is young, very valuable language learning time

could be lost if professionals choose to “watch and see” instead of referring for early intervention services.

Together, this evidence supports the importance of early, quality intervention services for children in need (Diamond, 1993). Predictors of development vary depending on the developmental domain being measured (Guralnick, 1997; Schafer, et. al., 1987). Below is a list of risk factors associated with 4 general domains of development.

Motor Development

- Medical status and biological factors (Guralnick, 1997; Meisels, 1992):
 - ⇒ Pre-, peri-, or postnatal events such as perinatal asphyxia, cerebral hemorrhage, fetal malformation, and breech presentation (but not actual breech delivery), twin gestation, placental abruption, and neonatal seizure.
 - ⇒ Prematurity
 - ⇒ Low birthweight (e.g. below 2.001 g)
 - ⇒ Genetic or metabolic disorders or other biologically based problems such as Down's Syndrome.
 - ⇒ Abnormal findings on neurodevelopmental or physical examination
 - ⇒ Encephalopathy
 - ⇒ Asthma (Byrd & Weitzman, 1994)
- Maternal age (i.e. younger mothers have children with more delays; Guralnick, 1997).
- Maternal retardation (Meisels, 1992)
- Maternal thyroid disorders (Meisels, 1992)
- Low socioeconomic status (Meisels, 1992; Newacheck, et. al., 1998)
- Single parent (Newacheck, et. al., 1998)
- African American race (Newacheck, et. al., 1998)

Language Development

- Low birthweight & very low birthweight (Byrd & Weitzman, 1994; Pederson, et. al., 1988)
- Early sensorimotor delays (Pederson, et. al., 1988)
- Mother's age (i.e. younger mothers have children with more delays; Byrd & Weitzman, 1994; Guralnick, 1997)
- Poverty/low income (Byrd & Weitzman, 1994; Newacheck, et. al., 1998)
- Low maternal education (Byrd & Weitzman, 1994)
- Exposure to household smoking (Byrd & Weitzman, 1994)
- Single parent (Byrd & Weitzman, 1994; Newacheck, et. al., 1998)

- Male gender (Byrd & Weitzman, 1994)
- Deafness (Byrd & Weitzman, 1994)
- Frequent ear infections (Byrd & Weitzman, 1994)
- Speech defects (Byrd & Weitzman, 1994)
- Enuresis (Byrd & Weitzman, 1994)
- African American race (Byrd & Weitzman, 1994; Newacheck, et. al., 1998)
- Asthma (Byrd & Weitzman, 1994)
- Behavior problems (Byrd & Weitzman, 1994)
- Vocal turn-taking by 12-18 weeks (Locke, 1992)
- Gesturing to objects and people by 9-12 months (Locke, 1992)
- Utterance capability by 6-10 months (Locke, 1992)

Cognitive Development

- Low birthweight and prematurity (Pederson, et. al., 1988; Saylor, C., Boyce G., & Price, C. 2003)
- Drug/alcohol/tobacco exposure during gestation (Nord, Zill, Prince, Clarke & Ventura, 1994; Shonkoff, 2003)
- Low maternal weight gain during pregnancy (Nord et al., 1994)
- Frequent ear infections (Byrd & Weitzman, 1994)
- Specific infections (Shonkoff, 2003)
- Asthma (Byrd & Weitzman, 1994) Early sensorimotor delays (Pederson, et. al., 1988).
- Male gender (Byrd & Weitzman, 1994)
- African American race (Byrd & Weitzman, 1994; Newacheck, et al. 1998)
- Early sensorimotor delays (Pederson, et al., 1988)
- Deafness (Byrd & Weitzman, 1994)
- Speech defects (Byrd & Weitzman, 1994)
- Enuresis (Byrd & Weitzman, 1994)
- Behavior problems (Byrd & Weitzman, 1994)
- Poverty/low income (Byrd & Weitzman, 1994; Newacheck, et. al., 1998)
- Mother's age (i.e. younger mothers have children with more delays; Guralnick, 1997)
- Low maternal education (Byrd & Weitzman, 1994)
- Prenatal care in third trimester, or not at all (Nord et al.,1994)
- Birth closely spaced to previous live birth, and high parity (Nord et al.,1994)
- Single parent (Byrd & Weitzman, 1994; Newacheck, et. al., 1998)
- Significant parent mental health problems (especially maternal depression) (Shonkoff, 2003)
- Substance abuse in the family environment (Shonkoff, 2003)
- Family Violence (Shonkoff, 2003)
- Exposure to household smoking (Byrd & Weitzman, 1994; Nord et al., 1994)
- Poor nutrition (Shonkoff, 2003)
- Environmental neurotoxins (Shonkoff, 2003)

- Chronic stress (Shonkoff, 2003)

Social/Emotional Development

- Parent/child interaction (Guralnick, 1997).
- Biological conditions of unknown etiology (e.g. children with autism; Guralnick, 1997).
- Poverty/low income (Newacheck, et. al., 1998; Saylor et. al. 2003)
- Single parent (Newacheck, et. al., 1998; Saylor et. al. 2003)
- African American race (Newacheck, et. al., 1998)
- Prematurity, low birth weight (Drotar, 2002; Saylor et. al. 2003)
- Maternal depression (La Paro, Olsen, & Pianta, 2002)
- Parental perception of child's difficult temperament (Saylor et. al. 2003)
- Underdeveloped language skills (Saylor et. al. 2003)
- Family violence (Drotar, 2002; Saylor et al., 2003)
- Failure to thrive (Drotar, 2002; Saylor et al., 2003)

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