



## The neurological and behavioral impact of uninvolved fathers

Each June, we take a day to celebrate the role that fathers play in our lives. Unfortunately, cultural influences appear to be diminishing the active involvement of fathers in children's lives. Most American children who grew up in the "postwar generation" had two parents present in the home. According to the U.S. Census Bureau, that number dropped from 88% of children (those younger than 18) in 1960 to 69% of children in 2016. Factors such as an increase in nonmarital births and high divorce rates have resulted in 23% of children in the U.S. (approximately 20 million children) living in households headed by single mothers. Whereas the vital role of mothers on the healthy neurological development of children has been well-established, the negative impact of absent or uninvolved fathers has been largely overlooked.

Fathers may be absent or uninvolved for many reasons, some of which are imposed by circumstances and some by choice. Data from the U.S. Census Bureau noted that divorce rates of 50% have resulted in 90% of divorced fathers becoming nonresidential parents, with "less than half of all children of divorce" reporting having seen their nonresidential parent in the past year. Only 1 in 6 children of divorce had seen their fathers in the past week, and 38% of daughters and 20% of sons reported having lost frequent contact with their fathers. Most divorced fathers attempt to stay involved in their children's lives but frequently succumb to the obstacles of unbalanced parenting schedules and their children's increasing independence. If these fathers eventually remarry, their focus often shifts, at least in part, to immediate marital and stepfamily demands.

Socioeconomic factors also affect the degree of parental involvement. In many families, both parents must work, and more than 60% of all U.S. households have at least one parent who holds two jobs. Parents who previously stayed at home to manage the family often find that they need to reenter the workforce. These circumstances often result in fatigue among working mothers and fathers and a lack of quality emotional availability for their children.

Still other factors can shape fathers' lack of involvement in their children's lives. These factors might include values-based decisions that largely relegate parenting duties to the mother, fathers who feel that they lack the prerequisite skills to parent effectively, and fathers who put too much emphasis on their work or personal interests to function effectively as a parent. Perhaps less frequently considered is the plight of fathers who are imprisoned and thus physically absent and functionally unable to be involved parents. Approximately 52% of all prisoners are parents, with fathers incarcerated at a rate of 10-to-1 compared with mothers. In addition, black and Hispanic fathers are far more disproportionately represented in the U.S. correctional system than are white fathers.

A father's involvement in his children's lives is important for many reasons. In research summarized this year by the federal Children's Bureau, it was noted that children of uninvolved fathers:

- ❖ Have less self-confidence
- ❖ Have weaker problem-solving skills and more behavioral and learning problems

- ❖ Have a 68% higher risk of later substance abuse problems
- ❖ Have lower school performance and lower overall academic achievement

In addition, daughters of uninvolved fathers tend to have delayed or impaired emotional development and poorer quality future relationships, whereas sons of uninvolved fathers have weaker gender role identity. At this time, little is understood about the impact of uninvolved fathers on the lives of special populations such as transgender and nonbinary children.

The Children's Bureau also wrote that when fathers are actively involved:

- ❖ Children tend to have higher cognitive, language and social development
- ❖ Daughters have higher IQ scores, do better in math and are less likely to drop out of high school or college
- ❖ Sons earn better overall grades
- ❖ Daughters are less likely to become divorced or live in poverty
- ❖ Children have a stronger inner core, with sons feeling an increased sense of stability and security
- ❖ Children have a greater sense of well-being, self-esteem and personal authenticity
- ❖ Daughters have healthier future relationships, are less sexually promiscuous and have fewer unplanned pregnancies
- ❖ Sons are less likely to act out or to become involved in the juvenile justice system
- ❖ Sons and daughters are more likely to learn healthy male behavior and are less likely to develop psychological problems

When both parents are involved, children benefit from learning the similarities and differences between maternal and paternal love. These children are more likely to hold and strive to meet the expectations of two loving parents and more likely to benefit from the lifelong emotional support and encouragement of their mother and father. Once again, little is yet understood on the value of involved fathers on the lives of special populations such as transgender and nonbinary children.

### Healthy attachment

Recent neuroscience research on children's healthy development has its roots in John Bowlby and Mary Ainsworth's seminal work on attachment, in which early caregiver–infant interactions give rise to the primary attachment relationship that shapes the maturation of the child's central nervous system and developing neurological regulatory ability. This in turn sets the stage for ongoing socioemotional regulation, stress response, cognitive development, physiological health, and later social, familial and romantic relationships.

Secure attachment occurs when a child feels safe and secure with a consistent, emotionally available and responsive caregiver. Anxious or ambivalent attachment occurs when the child feels unsure about the availability, consistency or responsiveness of a caregiver. Avoidant or negative attachment occurs when the child feels unsafe and insecure with an unavailable, unresponsive or abusive caregiver.

The research that has informed our knowledge of attachment and its numerous interpersonal, physiological and neurological mechanisms includes Stephen Porges' work on the polyvagal theory and the social engagement system, the role of pheromones in social communication, hormonal influences on autonomic physiology, electroencephalography, stress and glucocorticoid levels, and brain functional magnetic resonance imaging (fMRI) studies.

Several neurological structures are involved in healthy attachment. These include the sensory-motor cortex with its auditory, olfactory, gustatory, visual and

tactile functions; the hippocampus for memory processing; the hypothalamus and amygdala for regulation, threat response and interpersonal soothing; the anterior cingulate cortex for conflict monitoring; and the prefrontal cortex for attention, motivation and its role in emotional regulation. Overall, attachment styles represent neurologically based strategies, formed from prior infant–caregiver experience, for navigating our way through life's various interpersonal relationships and inevitable developmental challenges.

### Parenting and attachment

The vital importance of early nurturing relationships is not to be minimized, but just how important is the relative involvement of the mother and the father? From neurological research by Benedetta Leuner and others, we know that the brains of mothers and fathers change as a result of the presence of a child and are different from the brains of nonparents. The experiences of caregiving and hormonal changes alter the structure and organization of the hippocampus and the prefrontal cortex. This involves increased neuroplasticity and neurogenesis, with axonal sprouting and growth, dendritic remodeling, and the formation or elimination of dendritic spines and synapses.

Other research by Jennifer Mascaro et al., published in the American Psychological Association journal *Behavioral Neuroscience* in 2017, found that fathers' brains respond differently to daughters than to sons. Fathers of sons showed more lateral orbitofrontal cortex (OFC) activation, engaged in more rough-and-tumble play, used more achievement-oriented language, and responded more to their sons' neutral facial expressions. Fathers of daughters showed more medial and lateral OFC activation, engaged more fully and attentively, whistled and sang more to their daughters, and used more analytical language and language related to sadness and the body. These fathers also had a stronger neural response to their daughters' smiling faces.

The authors noted that the differences in fathers' neural responses may be caused by several factors, including hard-wiring through genetics or evolution,



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boys' increased levels of testosterone, or conformity to social norms. The authors further suggested that fathers may be best advised to use both parenting styles with their sons and daughters — being more attentive to their sons' emotional needs and engaging in more rough-and-tumble play with their daughters — to promote increased emotional regulation.

Still other research by a team led by Pilyoung Kim at the University of Denver and Yale University found increases in gray matter volume in brain areas related to parental motivation in fathers who were caring for healthy 2- to 4-week-old infants. These areas included the hypothalamus (hormonal control), amygdala (emotional processing), striatum (reward processing) and lateral prefrontal cortex (memory and decision-making), all of which are important in attachment and nurturing behavior. This study also found decreases in gray matter volume in the medial prefrontal cortex, postcentral sulcus, precuneus and inferior parietal cortex related to the default mode network (inward processing), suggesting

heightened outward vigilance for their new offspring. Still other decreases were found in the OFC, posterior cingulate cortex and insula during the first few months of their infants' lives. These areas are suggestive of decreased anxiety.

In a third study by Sarina Saturn, published in the *Proceedings of the National Academy of Sciences*, parents' brains were scanned while they watched videos of their interactions with their children. It was found that the same areas of the brain were stimulated for both mothers and fathers. These areas included the emotional network involved in social bonding, vigilance for distress and reward for behavior that maintains the child's well-being, and a network responsible for mental processing that monitors the child's likely state of mind, emotional condition and future needs. Mothers who were the primary caregiver and fathers who were the primary caregiver exhibited the same activated emotional system. Fathers who were in the secondary role, however, engaged more of the thinker-planner system. Perhaps most interesting,

fathers raising a child without a female partner were found to have the same level of emotional response and the same thinking-planning response as fathers who were in the secondary role.

Nurturing, by either the mother or the father, has been found to enhance the child's cognitive functioning. A more recent brain imaging study by Joan Luby, a professor of child psychiatry, investigated 92 healthy and depressed children and found that children without depression who had been nurtured by their mothers had a 10% larger hippocampus. This is a brain structure important in learning, memory and stress response. In another study, children whose fathers had been actively engaged in their lives when they were 3 months old showed greater cognitive development (recognizing colors and shapes) at 2 years old than did children whose fathers were not involved. Furthermore, children of fathers who were sensitive, calm and less anxious during reading sessions when the child was 2 showed better attention, problem-solving, language and social skills.

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## Parental absence or neglect

It has been well-established that early neglect can have significant consequences on a child's healthy development. In a study led by Eve Spratt, children ages 3 to 10 with a history of familial neglect were found to have lower cognitive and language scores, as well as higher rates of both internalizing (somatic, mood and emotional) and externalizing (attentional and acting out) behavioral problems, when compared with children who had not been neglected.

Children who have experienced a sudden and lasting separation from a parent have also been found to suffer significant alterations in their neurological development. These alterations include increased amygdala volume, with altered connections and rapid maturation of the brain circuitry for processing stress, threat and emotional regulation; chronic spikes in stress hormone levels; increased neurological inflammation; and epigenetic changes that can disrupt normal developmental trajectory and change how neural circuits are formed. As a result, these individuals experienced increased health risks, impaired academic performance, struggles in their career and personal lives, and a higher incidence of teenage and adult psychiatric disorders, including posttraumatic stress disorder, anxiety, depression, psychosis and substance abuse.

Newborns quickly absorb the signs of a parent's presence through sight, voice, touch, smell, and various safety and security signals. A literature review by Sara McLanahan of 47 studies summarized the effects of father absence on children's well-being. The review found a negative impact on children's social-emotional development and increased externalizing behavior, especially when the father's absence occurred during early childhood, with a stronger effect for boys than for girls. These effects were found to continue into adolescence, with increased risky behavior such as smoking or early childbearing and decreased rates of graduating high school. Longer-term effects on adult mental health were also noted. Finally, absence caused by divorce has been found to be much more debilitating than absence caused by parental death and has a more significant effect on the child's overall well-being.

The brain is especially vulnerable during a child's earliest years of life. This is due to the impact of unhealthy attachment and neurological dysregulation of neural circuitry during this critical period of development. Today we understand that neurological development continues through childhood and well into adulthood. Between the ages of 3 and 8, a child generally has twice as many neurons and neuronal connections (synapses) as an adult has and twice the energy. As children engage in life and are nurtured by emotionally available and consistent caregivers, certain synaptic connections are reinforced even as others are pruned away.

Absence, abandonment and trauma can catapult a developing brain into a state of sustained and elevated fear activation, thus altering and sabotaging the neurological pathways to healthy development. If overly activated, the brain's emotional center (the amygdala) can overwhelm the developing executive functions (frontal lobes). Impulse control, mood regulation, attention and cognitive functioning can become impaired.

Although maturation and myelination of neuronal pathways are not complete until well into early adult life, unhealthy early attachment — with its multiple experiences of repeated stress events — can set the course for deepening anxiety and distress. Parents who are withdrawn, remote, passive, neglectful, abusive or otherwise emotionally unavailable are likely to shape a child's neurological development. The child will become either overactivated by debilitating anxiety or emotionally shut down.

The brain always learns. It is learning either healthy strategies for self-regulation, interpersonal connection and resiliency, or it is learning unhealthy strategies of emotional dysregulation, interpersonal threat and conflict, and overwhelming distress and discouragement.

## Implications for counseling

1) Paternal involvement is important to the healthy neurological and behavioral development of children. Divorce and single-parent family structures need not impair a father's meaningful involvement in a child's life if generous co-parenting plans are followed.

2) More research is needed to better understand the impact of paternal involvement in the lives of special populations such as transgender and nonbinary children.

3) Fathers and mothers both experience structural and functional brain changes following the birth of a child. These changes appear to provide a valuable adaptive function for successful parenting.

4) Fathers and mothers, single parents of either gender or sexual orientation, and LGBTQ parents are all potentially capable of extending the beneficial parental functions of "emotional nurturer" and "thinker-planner" to their children. Children do best when both functions are provided to them.

5) Fathers are advised to engage boys and girls in both emotionally expressive and rough-and-tumble play. This approach appears to best ensure the balanced development of emotional and mood regulation skills in children.

6) The early, consistent and continuing involvement of both parents is important for children's early secure attachment, healthy ongoing neurological development, successful navigation of life stress, and behavioral maturation. Regardless of family structure and circumstance, children thrive with parents who are actively involved, emotionally available and nurturing. ❖

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