10 Years Post- *Neurons to Neighborhoods*: What's at Stake and What Matters in Child Care?

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Child care is a crucible for early child development. The big strides we've made in both child care research and developmental science more generally in the last decade (since *Neurons to Neurons* was published) involve insights into what is **truly at stake** during the earliest years of life, what **really matters** in young children's environments, and what are the **long-term consequences** of ignoring this evidence.

<u>What is at stake?</u>

Some facets of early development emerge quite reliably almost no matter what kind of early environments a child experiences (e.g., virtually all children acquire language – they understand words and they talk, all children acquire depth perception and size constancy, and all children, to one degree or another, are drawn to other people, especially little ones and caretakers).

Other aspects of development are deeply affected by the early environments and experiences that young children encounter. These include the child's vocabulary and how WELL they talk, a love of and skill in early reading, the acquisition of early math concepts, the ability to make and keep friends and to accurately identify what others are feeling (i.e., social perception), the ability to pay attention and focus on important information (= executive functions, so

fundamental to learning), and the capacity and tools to control impulsive emotional and physical outbursts.

In our society, characterized by early and heavy reliance on child care, the toddler – if not the infant – years are often when children are first introduced to the crucible of peer groups. As such, this marks the beginning of their development as a person who gets along with, respects, and enjoys others or a person who does not, with profound consequences for their social competence, mental health, and compliance with social norms as they grow up.

By the preschool years, most children have learned the basics of the grammatical system in their language, can understand others' points of view, experience emotions that are important to the developing conscience (e.g., shame and guilt), have learned the rudiments of how to plan and negotiate with others to achieve common goals, and can sit quietly with a group of children and pay attention for at least brief periods of time.

Underlying this complex and intricately inter-related array of behavioral development is the astonishing development of the brain. In the first few years of life, our brains create 700 new synapses every second. And, by the end of the early childhood period, just as each child is different, each brain will be different in part due to genetics, but due in even larger part because the brain is designed to actively recruit experience into its structure (hardware) and neurochemistry (software).

Nature (or our genes) depend on nurture (or our experiences) for its expression. It is not a zero sum game (that asks "which is more important?"); it is a dance in which our genes affect our responses to our experiences and our

experiences modify the expression of our genes. This is the essence of adaptation. But, it can cut two ways. Good experience fosters optimal development; Bad experience undermines development. The brain is ecumenical about this. It will recruit and be shaped by whatever it is presented with – a supportive or a depriving rearing environment, a secure or insecure attachment, a healthy or toxic physical environment. The brain doesn't care…but the mind and heart and soul do.

If the brain is presented with child abuse, research now tells us that it will develop an aberrant way of perceiving facial expressions. When presented with an array of faces that gradually shift from a neutral to an angry expression, it will perceive anger much earlier along the spectrum than will brains that have not experienced abuse. These children see anger in others when it does not exist; they attribute hostile intent to others when it is not there, and they experience highly disrupted social development and high levels of anxiety as a result.

If the developing brain is presented with chronic (and untreated) maternal depression, it will display atypical patterns of stress hormone production and of right vs. left brain activation (mimicking patterns seen in the brains of their depressed mother), as well as lower overall brain activity. These children's heart rates increase, rather than decrease, when they interact with their mothers. They also experience stress and sad feelings not only when interacting with their mothers but also with other adults. They have trouble paying attention, show compromised language development, and some go on to development problem behavior.

The exceptionally strong influence of early experience on brain architecture makes the early years of life a period of both great opportunity and great

vulnerability. In sum, early experiences have a profound impact on a myriad of elements of brain development ranging from calibration of the stress response system with life-long implications for physical health, development of the prefrontal cortex so crucial to executive functioning and self-regulatory skills (making plans, memory, attention, mental flexibility), to social information processing.

It is because of this that the term "early intervention" cannot be reserved for Head Start and Early Head Start, or for the Perry or Abecedarian Preschool Programs, or for specialized programs for children with special needs. Every environment is an intervention in the development of young children. Every environment actively shapes who that child will be, in a cumulative fashion, day by day. Development is a bottom-up process. **Child care is early intervention**.

So, what is at stake? Early learning is at stake. Healthy self-regulation is at stake. Social skills, friendships, the capacity for empathy, and happiness are at stake.

Healthy stress responses systems are at stake. It is *this* outcome that offers the perfect, if worrisome, departure point for the next section of this talk. It is with regard to the development of the stress response system that we are learning about **what really matters** in young children's environments, including their child care environments.

<u>What Really Matters?</u>

Here's the answer: Adults who make children feel safe, secure, and loved every day…not just intermittently or at random, but consistently and predictably, and who know how to foster children's early learning, self-regulatory, and social

skills. I know this won't make headlines. It's not sexy or controversial...it's not even new. What *is* new is the research evidence that undergirds this conclusion.

This takes me to the concept of toxic stress. Toxic stress is defined as the strong, unrelenting activation of the body's stress response systems in the absence of the buffering protection of supportive adults. These situations can include physical or emotional abuse, chronic neglect, severe maternal depression, deep poverty, substance abuse, or neighborhood or family violence. Without the support of a caring adult, toxic stress can disrupt brain architecture and lead to stress "coping" systems that respond at relatively lower thresholds (a kitten becomes a tiger, a neutral face becomes an angry face), and resets or recalibrates the brain's systems for responding once it experiences stress. What gets turned on more easily, is also harder to turn off. A bump in the school hallway is not a passing clumsy classmate, but a taunt that warrants retaliation. A birthday party with many unknown children becomes a terrifying experience. A game of red light, green light becomes a huge challenge because it's so hard to stop once you start running. And the fear and anger and energy that are activated are hard to turn back down.

Call it dysregulation, Call it reactivity. Call it hard to manage. It's very damaging to the brain. Brains subjected to toxic stress have fewer connections in the parts of the brain that house activities related to memory and decision-making (executive functioning), and they have more connections in parts of the brain that govern our fear responses. Toxic stress is also damaging to the body (it compromises the immune system), and to the heart and soul of a child.

But, (a kinder Henry Higgins might say) let a consistently caring, responsive woman (or man) into this child's life, one who knows how to reduce or help the child handle stress, and the impact of toxic stress will be much less severe. Teach (and support) a depressed mother to maintain the kind of "serve and return" responsivity with their children and the impacts on development are much less harmful. Consider the work of Megan Gunnar in which highly anxious and fearful 18 month olds were brought into a lab with their mothers and presented with a live clown, and a noisy wind-up toy, and a puppet that suddenly popped out from behind a screen. Many of these little toddlers were terrified; they are quick to feel threatened. But if they had a secure attachment to their mother, their stress hormones remained at normal levels. In contrast, if they had an insecure attachment to their mother, their stress hormones went through the roof. Consider the work on the neurological and behavioral development of young children who are rescued from severely depriving orphanages and placed early on in loving foster or adoptive homes. The recovery is astonishing, although often not complete.

This is the evidence that has led us to portray "what matters" for young children as the **environment of relationships**. It's not the physical surroundings or the toys. It's the adults.

So, what does this have to do with child care? This work focuses on children in orphanages, or who have been abused and neglected, or who have severely depressed mothers. Surely, it takes extreme situations such as these to constitute toxic stress and set in motion the disturbing outcomes seen in children

subjected to highly stressful rearing circumstances. If only this was true. But it's not.

Here is the headline news: Child care can constitute toxic stress. Recent neurobiological studies have implicated child care experiences in the early development of physiological processes that govern the regulation of stress. Put simply, child care – for some children and under some conditions – can be a highly stressful experience with documented negative impacts on young children's stress reactivity, development and health.

If there is one *salient* feature of child care in the United States, it is its *variability*. Using the very familiar ECERS as the metric, some children experience 1's ("inadequate") and others experience 7's ("excellent"). The majority experience 3's and 4's….thus the language of "mediocre", "minimal and below good" and "barely adequate", around which the extreme variability exists. We also know that access to higher quality arrangements is characterized by shameful inequities based on income.

Some argue that this extent of variation really doesn't matter that much. Some argue that "harm" is restricted to the very bottom of this range and better enforcement of the health and safety provisions of state regulations is really all that is needed. Some argue that children are in child care for only a few years and if they have good homes and go into good schools, there's no need to worry. Let's focus on education reform instead, which still – to my amazement -- seems to start in kindergarten. How can we win a Race to the Top if we have a 5-year delay before taking the first step?

But child care research conducted since N to N was published makes it all too clear that this variation matters a lot.

Secretary Duncan has called on the country to "have the courage to say the truths about our current state of education [replace with: child care] and pursue fundamental change".

So, let me share with you some of the new "truths" – evidence -- that have been revealed by post -*Neurons to neighborhoods* research:

My own work, and that of Megan Gunnar, Sarah Watamura and others, has revealed that it is not unusual for children to display elevated stress hormone levels (cortisol) over the course of the child care day (seen in toddlers and preschoolers). For about 40% of children, these levels pass a threshold that neurobiologists consider worrisome; if sustained, they indicate high and potentially harmful levels of stress. The strongest predictor of elevated stress hormones in our work is "intrusive-overcontrolling" caregiving. This is characterized by adults who are harsh, inconsistent, issue a lot of commands and prohibitions, and let their own needs, rather than the child's interests and needs, determine the activities and pace of the day. This is what we hear: "Stop it", "What is your problem?", "Go sit in that chair", "Get over here now", "I'm tired of waiting for you", "Line up and don't talk", "no you can't stay in the book corner, it's circle time". It is the opposite of sensitive, responsive care.

When the children in this study were seen 6 months later, those who had experienced stress responses at the first observation displayed more fear and anxiety in their child care setting, and notably so among those children with

inhibited, shy temperaments. These children also showed significant evidence of internalizing symptoms, namely signs of sadness, anxiety, and withdrawal. **Variation in what children experience in child care matters, and it is the caregiving they receive that is the active ingredient.** Indeed, in very new data, Sarah Watamura found that a secure attachment between a child and his or her lead teacher was protective against rising cortisol over the course of the day in child care, just as we've seen with mothers.

Sarah's research has also examined whether the rising cortisol pattern seen at child care is related to children's immune functioning. It appears to be. Higher cortisol levels predicted greater parent-reported infection frequency and lower antibody levels among the 3-6 year olds in this study. This is quite alarming in light of longstanding animal and human research linking dysfunctional stress response systems to poor adult health outcomes, including obesity and diabetes, and heart disease. As of today, this is a big and unwarranted leap from emerging child care evidence to longitudinal research linking early life stress to adult health outcomes, but it is cause for concern.

We also now have much stronger documentation of the long-term effects of variation in the quality of child care. In both the 10-site NICHD study of child care and the 3-city study of welfare reform, which focuses on very low-income families, children who received more sensitive caregiving as youngsters in child care displayed better language and math ability, memory, and attention skills through the later elementary grades, and even into adolescence, especially if they received

higher than average quality of care. Ask any parent or teacher if they are willing to dismiss these findings as inconsequential and you'll get a resounding "no".

Very recently, a group of developmental scientists have been looking at the question of whether the so-called "modest" associations between quality of child care and children's development may be the result of assuming linear relationships, namely that each increment along the quality spectrum matters to the same extent for children's outcomes, whether moving from a 1 to a 2 or a 3 to a 4 or a 5 to a 6. This work has been summarized in a fabulous new document from OPRE authored by a dream team of researchers at Child Trends, Mathematica, and UNC. This research thus far has indicated that benefits to children of experiencing quality care accrue primarily at the high end of the scale, meaning the good to high range. This has been documented for language outcomes, math scores, reading skills, and prevention of problem behavior. If these results hold up in the more refined analytic work underway now, the implications for quality improvement efforts are profound.

Finally, child care researchers have also begun to provide us with more refined insights into the dimensions of quality scales that matter most for developmental outcomes. Their findings complement the evidence I provided a moment ago regarding stress responses among children in child care and the critical role played by caregivers' treatment of the children. Specifically, it is those items that capture children's direct experience of interactions with their caregivers, the emotional quality of the setting, and the caregivers' skill at encouraging exploration,

curiosity, and early learning that carry the variance in child outcomes. So, from the ECERS, it is the items that address **caregiver-child interactions** and **program structure**, **not** those that focus on **personal care** and **activities**. On the **CLASS,** the developmentally important items capture the **Emotional Climate**, **Productivity** and **Behavior Management** .

In essence, it is the **environment of relationships** that matter in child care, just as they do at home, for young children. These relationships need to provide a safe harbor for young children; they need to provide consistency and predictability; they need to offer them a secure base from which they can explore their physical and social environments with curiosity and joy. They need to help children – with tremendous sensitivity and skill -- navigate the crucial world? of peer relationships before they have strong social skills. And, they need to foster early learning by knowing how to assess what individual children know and can do, following their lead, and guiding them into and out of their zones of proximal development. And, they need to do these things quite well…not just barely or minimally. Good and excellent are the key words here. It may not be rocket science, but it's a close cousin…call it rockette science. As with all teaching, it takes a blend of knowledge, skill, personality, and dedication. And, as with all teaching, it requires preparation, support, and reward.

Herein lies the challenge:

We know what we can't tolerate.

We can't tolerate evidence like the following: In the NICHD Study of Early Child Care (1996), one in four infant caregivers were moderately insensitive, only

26% were moderately or highly stimulating of cognitive development, and 19% were moderately or highly detached.

Or like this: Turnover rates among ECE providers and teachers are among the highest of any profession that is tracked by the U.S. Department of Labor (U.S. Bureau of Labor Statistics, 1998), hovering at 30% per year. In the only available longitudinal study of the center-based ECE workforce, three-quarters of ECE providers had left their jobs after 4 years (Whitebook & Sakai, 2004).

Or like this: In 2006, the average hourly wage of a child care worker was $9.06 with an annual wage of $18,126 (U.S. Department of Labor, 2009). This falls below the hourly wage of animal and pest control workers, amusement park attendants, and janitors. It also barely exceeds the 2006 poverty threshold of $16,600 for a family of three. Preschool teachers fare somewhat better, with an average hourly wage of $15.95 and annual earnings of $28,099, but they still earn almost half of what kindergarten teachers earn ($30.13 hourly, on average).

Or like this: The English literacy skills reflected in this [California] sample of child care teachers and providers varied widely, from "highly proficient" to "extremely limited". Their average score was higher than the national average, but nearly one- third (31%) scored in the "limited proficiency" range. Variation in literacy scores was associated with the language interactions and literacy environments they offered to young children.

Or like this: More than one-quarter (26.2%) of center directors met the criteria for depression, as did 21.7 percent of center-based teaching staff.

One-half (50%) of directors in low-income non-subsidized centers met the criteria for depression, compared with 24 percent in subsidized centers and 11 percent in middle-income centers. Directors who met the criteria for depression were more likely to earn lower wages than those that did not, particularly if they had a bachelor's degree or above. Overall 16 percent of licensed family child care providers met the criteria for depression on the CESD; 20 percent of those serving low income, subsidized children met the criteria for depression.

We also know what we need: It is nothing short of a vision for the child care workforce. My colleague, Marcy Whitebook, has put forth a vision, based on her decades of research on and work with the child care workforce. I fully endorse it.

It emphasizes preparation, support, and compensation…no single part of which can stand alone. Her vision for **preparation** includes revised curriculum content to include what we now know about the developing brain and to reflect the realities of our diverse early childhood population (Dual Language Learners, SN) and new methods of delivering higher education to accommodate "non-traditional" students (e.g., cohort approaches).

Her vision for **support** emphasizes expanded mentoring or induction opportunities, requirements (perhaps in QRIS systems?) for paid common planning and professional learning time, improved benefits regarding breaks and sick leave (could also go into QRIS systems), and I would add, supportive program and community leadership.

Marcy would be the first to say that a vision for **reward** is the most urgent and challenging need without which efforts to upgrade preparation and support will "all be hot air". I join her in calling for a high level federal commission with representatives from business, industry, and labor to generate viable solutions to this problem. I would add membership from the military for two reasons: they have dealt with this problem within the military, and what the nation requires is akin to mobilizing for a war. I would also add education leaders because there is very focused attention now on the needs of the K-12 workforce and things we are hearing about "what works" in K-12 education bear a not-surprisingly close resemblance to the kinds of recommendations that Marcy makes: stronger financially-supported preparation, equitable salaries that map onto preparation and skill, mentoring, and time for planning and peer collaboration. There is a model for this in the Health Care Act….It calls for a federal Health Care Workforce Commission to serve as a resource to the administration and the Congress. Why not for child care?

In *Neurons to Neighborhoods*, the preamble to our child care recommendations reads as follows: "The time is long overdue for society to recognize the significance of out-of-home relationships for young children, to esteem those who care for them when their parents are not available, and to compensate them adequately as a means of supporting stability and quality in those relationships for all children, regardless of their family's income and irrespective of their developmental needs." Our recommendations addressed this conclusion: "The major funding sources for child care and early childhood education should set aside

a dedicated portion of funds to support initiatives that jointly improve the qualifications and increase the compensation and benefits routinely provided to children's nonparental caregivers."

CCDBG sets aside 4% for all quality improvement efforts. The states deserve immense credit for actually spending 11% on quality improvement efforts, which is a statement about the concern and urgency that is felt in the field around the condition of child care. It is, frankly, where the policy and program action is on developmentally appropriate child care. QRIS systems are contributing to transparency for parents (I think of them as the core of a consumer advocacy movement in child care) and accountability for programs and administrators. But, by and large, they do not address the workforce issues. Nor do they distinguish between aspects of quality that we now know matter and lot and those that matter less. And, we need to make sure it is possible for programs to attain the highest level where, it seems, the greatest benefits to children will be seen.

I deeply believe we are in one of those moments of opportunity, with this administration, this state leadership, new research evidence regarding what is at stake and what matters, and a growing infrastructure for quality improvement efforts, where we can take a meaningful step – if not make major strides -- in ensuring that the child care in this country is developmentally beneficial for all children. To draw from the final words of *Neurons to Neighborhoods*, it is essential to ensuring both a decent quality of life for all of our children and a promising future for the nation.

Related Readings

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