NeuroRelational Framework (NRF) Manual: Reducing Toxic Stress and Growing Relationships in Families & Communities

Connie Lillas, PhD, MFT, RN
NeuroRelational Framework (NRF) Manual: Reducing Toxic Stress and Growing Relationships in Families & Communities

(Version 1.0)

By

Connie Lillas, PhD, MFT, RN


© 2018 Lillas / NRF Global Communities
# Table of Contents

## INTRODUCTION & OVERVIEW
- Chapter 1: Critical Public Health Problems ........................................... 1
- Chapter 2: Big Picture Concepts in Using the NRF’s Three Steps ............. 17
- Chapter 3: The Clinical Use of the Self and Our Professional Roots ........ 37

## NRF STEP 1
- Chapter 4: Step One, the Foundation to Resilience, the Roots to the Tree 59
- Chapter 5: Orientation to Interview and Use of the Cultural Self .......... 79
- Chapter 6: Using our Hearts, Hands, and Heads in Understanding Parallel Process and Dyadic Patterns ........................................ 99

## NRF STEP 2
- Chapter 7: Step 2, Levels of Engagement, the Use of the Pyramid ........ 109
- Chapter 8: Levels of Engagement Rating Scale in Step 2 ......................... 129

## NRF STEP 3
- Chapter 9: Macro and Micro Approach to the Four Brain Systems, the Four Stories and the Use of the History Worksheet and Needs Assessment 141
- Chapter 10: Regulation Brain System .................................................... 169
- Chapter 11: Relevance Brain System ..................................................... 195
- Chapter 12: Sensory Brain System ....................................................... 235
- Chapter 13: Executive Brain System ..................................................... 257
Chapter One
Critical Public Health Problems

How is the NRF Part of a Necessary Public Health Solution? A Historical Context

Short summary and additional reading: This chapter introduces some of the large scale problems the NRF is trying to solve. Those of you in my study groups or on-line courses, please read Chapter One in the NRF “textbook” (below) as this is a parallel to the reasons for why the NRF was created and what concerns it tries to address. This NRF textbook will provide supplemental reading for the NRF manual. Some of you may be reading this manual because you are familiar with the “Neurorelational Framework” (NRF) textbook (Infant/Child Mental Health, Early Intervention, and Relationship-Based Therapies: A Neurorelational Framework for Interdisciplinary Practice) and you want to learn how to use it on a practical level. You likely are a professional and you are here to learn the NRF’s “three clinical steps.” Perhaps you are a parent working with a NRF therapist.

However you got here, welcome! This is a manual for the NRF’s journey to become an Evidence-Based Assessment and an Evidence-Based Treatment. This manual will be regularly updated to incorporate new science and clinical practice.

My (Connie) interest in creating a public health model that was more cohesive and comprehensive for parents, families, professionals, agency teams, and cross-sectored communities came out of my own multiple experiences with professional fragmentation. The problem with fragmentation is that it creates chaos and an inadequate understanding of the meaning of behavior. Fragmentation and isolation of the fields of medical, mental, developmental health, education, and child welfare create poorly integrated health care systems. When you add the burden of a silent public health crisis of toxic stress being present in our infants, young children and their parents which affects the development of brain architecture and inevitably leads to adult onset disease processes, you end up with non-existent or really poor preventative health care. In contrast, the NRF pulls together disparities and creates a common language and shared approach that can be universally used within and across each sector which then bridges the gaps in our service delivery systems. This chapter will give the personal story of how this fragmentation drove me to create a comprehensive and cohesive framework known as the NRF.

Early Phases of Encountering Fragmentation on a Professional Level

Originally, the professional fragmentation I encountered was due to my moving in and out of different professional roles. First, as a high-risk maternal child nurse and prenatal instructor, I was intensely interested in the earliest story of how the pregnancy came to be. What was the context for this pregnancy? Was this a time of happiness, stress, or dread? Was this a lonely journey shrouded in shame or a shared journey? Secondly, I was interested in the physiology of how a pregnancy changed a mother’s body and what having a baby meant to a couple. Having a child seemed to be a transformational experience. It changed everything. Whether it was a joyful event, and everything went “perfectly” (which was rare) or not, adding a newborn to a family system seemed to alter things dramatically. In some families, people who had not been seen or heard of for quite some time, came
out of nowhere and showed up; in other families, people disappeared. Experiencing the miracle of childbirth as a maternal-child nurse was life-changing for me. I was a privileged yet vicarious participant in each family’s newborn delivery. It had to be even more powerful for the ones living the experience.

My nursing career took place during some profound transformations in the field. The decade I was an active RN (from 1976 to 1986), women were taking charge of their own labor and delivery process, midwives were acknowledged and became accepted as a viable medical alternative. We started to care about “bonding” in the labor and delivery room – having fathers cut the umbilical cord and allowing breast feeding to occur on the delivery table. As an RN in a primary care hospital, I had the privilege of following my labor and delivery clients into their post-partum experiences. Rooming-in became typical rather than the exception. Mothers stayed three to seven days post-partum so that the continuity of nursing care into breastfeeding and building healthy attachments between the parents and their newborn were rewarding experiences. These were exciting times.

What was also amazing was that in the matter of just a few years’ time during the 70’s, newborns went from being described as functioning at a brainstem level with no ability to know what was occurring to them or to engage with others to actually being very observant and engage able if they were in a “calm, alert” state. This discovery by T. Berry Brazelton (known as America’s most famous pediatrician (ref) in the US and Prechtel (ref) in France transformed our understanding of babies on a very large scale. We learned that babies were capable of processing information, engaging, and learning and infants shifted from being “known” as passive participants, to becoming accepted as active participants. Infants now were described as moving in and out of different “states” over the 24-hour sleep-awake cycle and these states determined what level of engagement was possible. I never forgot the experience of this startling shift. The film called The Amazing Newborn shown to me as a high-risk labor and delivery nurse at the University of Washington Hospital during an in-service training about “states of arousal”. It was as if we all woke up from a deep slumber realizing the power and potential of engagement from birth, and later on, from the pre-natal condition as well. Once you “saw” an infant in the calm, alert state, there was no denying it. One could never go back to assuming infants were so much as blind, deaf, and dumb. How could we have been so “blind, deaf, and dumb” ourselves? This “calm, alert” state is now the cornerstone to the NRF’s Step #1 understanding of the wake-cycle, referred to as the “green zone.”

From this point, infant research began and evolved. If babies were competent, we could begin to find out just how competent they were. The green zone allowed infant researchers to begin to study what infants could do on their own and in relationship with others. As infant research was accumulating, there was accompanying scientific discovery referred to now, as the “decade of the brain” that occurred in the 1990’s. The combination of infant research in tandem with an emerging neuroscientific lens on early brain development has resulted in funds being allocated for infant mental health and early intervention. This may, in part, be why some of you have the interest and the job that’s positioned you with the ability to learn to use the NRF manual. Funding for work with birth to three-year old’s, three to five-year old’s, and birth to five-year old’s is now more possible than ever before. Within our Western world, a growing awareness about the developing brain and infants is building. A common knowledge is emerging about important brain development principles that should influence how we treat our babies – our babies that are competent, yet can be very vulnerable.
The NRF is a brain-based approach to clinical practice. What is the most information to know about brain development? As you will see, three core concepts about brain development are key components to the three clinical steps of the NRF. In bringing a translational view of brain development to public awareness, The FrameWorks Institute and The Center for the Developing Child at Harvard University teamed up, summarizing and presenting three core concepts about early development that are essential for everyone to know regardless of what age of child they have as parents or are working with as professionals. These are foundational concepts that are both described in text and in 2-minute video clip summaries. Please take a look! http://developingchild.harvard.edu/resources/three-core-concepts-in-early-development/ Essentially, these three core concepts relay:

1) The brain builds from the “bottom-up” and brain architecture is shaped through “epigenetics”. This means that gene expression is influenced by what we experience, so real-world-real-time early lived experiences influence brain and body development. Brain development builds upon brain development; brains are built from the bottom up and skills builds upon skills. Thus, it is essential to have a practical way to assess brain architecture over time that is developmentally organized.

2) The most powerful early lived experiences take place through the engagement between a baby and a caregiver. This interaction is described as a “serve and return” process of building back and forth communication cycles. Due to the brain principle that “neurons that fire together wire together” (Hebb, 1949; http://www.beingknown.com/2010/07/neurons-that-fire-together-wire-together/) poor quality and quantity of “serve and return” cycles will have a negative impact on brain architecture. Thus, it is essential to have a way to assess the quality of engagement along the way.

3) Adaptive stress is useful and necessary to develop tolerance for challenges in life. Toxic stress compromises brain architecture, no matter what one’s age, but is particularly damaging to the developing brain. Toxic stress is not just short-lived. There are long-term consequences to toxic stress that affect the one’s physical and emotional health and learning in later years to come. This is a silent public health crisis that quietly takes its toll. The effect of toxic stress has been documented in both longitudinal studies on allostatic load (the scientific term for toxic stress; Bruce McEwen, 2002) and in retrospective studies begun by Felitti and Anda (https://www.cdc.gov/violenceprevention/acestudy/index.html), now widely known as the Adverse Childhood Experience Study (ACEs). Nadine Burke-Harris, a medical doctor who uses the ACEs in her medical clinic, refers to the current advances towards precision in treating a variety of cancers as an analogy to the hope of identifying toxic stress with accompanying treatments to build resiliency into those young children and parents with ACEs. http://www.newyorker.com/magazine/2011/03/21/the-poverty-clinic http://www.ted.com/talks/nadine_burke_harris_how_childhood_trauma_affects_health_across_a_lifetime?language=en. It is essential to have a way to identify toxic stress patterns at any age, and in particular, in infants, young children, and their parents. (Additional ACE links: https://acestoohigh.com/; https://www.cdc.gov/violenceprevention/acestudy/index.html)

Therefore, these three core principles show that when the development of brain architecture (which is highly dependent on engagement) is compromised by poor quality engagement or toxic stress—or both—we must be concerned about a public health issue. Given that 78% of children in the U.S. child welfare system are being apprehended for neglect, which inherently carries with it both inadequate “serve and return” cycles and toxic stress, this high percentage alone warrants
being identified as a public health crisis. In the United States, it has been estimated that child abuse and neglect impose an annual cost of 80.3 billion to society (Gelles & Perlman, 2012). Given the devastating consequences of child maltreatment, both the World Health Organization (WHO) and the Center for Disease Control (CDC in the US) have recognized child abuse and neglect as a major public health crisis (CDC, 2010, 2012; Fang et al., 2012; Putnam-Hornstein et al., 2011; WHO, 2013). This crisis beckons for a way to turn these three core neuroscience concepts into practical applications.

As if in my own slumber, one day I “woke up” and realized that the NRF’s three clinical steps, which had emerged from working with the neuroscience within the NRF textbook, were the exact operationalization of these three key concepts. *We had a way to observe and begin to account for patterns of toxic stress (Step #1), we had a way to observe and assess the dyadic (any two people’s) “serve and return” levels of engagement (Step #2), and we had a functional way to assess brain architecture (Step #3).*

The Neurorelational Framework (NRF) “translates what matters in early brain development into three clinical steps:

<table>
<thead>
<tr>
<th>Three Core Concepts:</th>
<th>Assess &amp; Intervene:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Stress Resilience versus</td>
<td>• Step 1: Adaptive vs. toxic stress</td>
</tr>
<tr>
<td>Toxic Stress</td>
<td>(roots to a tree)</td>
</tr>
<tr>
<td>• “Serve &amp; return” levels</td>
<td>• Step 2: Age appropriate vs. low levels</td>
</tr>
<tr>
<td>of high quality engagement</td>
<td>of relational engagement</td>
</tr>
<tr>
<td>• Development of brain</td>
<td>• Step 3: Age appropriate developmental</td>
</tr>
<tr>
<td>networks and circuits</td>
<td>&amp; functional brain capacities vs. delays or disorders</td>
</tr>
<tr>
<td></td>
<td>(trunk of a tree)</td>
</tr>
<tr>
<td></td>
<td>(branches of a tree)</td>
</tr>
</tbody>
</table>

We not only had a match, to complete the picture, we had a way to bring cross-sectored communities together. Here (slide below), you see both the “micro” look of an individual’s functional needs and behaviors identified within the brain systems along with the “macro” look at the various systems of care these brain systems represent. The NRF currently has multiple (five in the US; one in Canada) that are using the NRF’s three clinical steps as a way to have common language and shared approach across sectors. It is time to actively move into the public health arena.
But first, more about the story of how fragmentation motivated the birth of the NRF and how the NRF got ready to become a public health model that is entering the evidence-based research world, with its manual in tow.

**Later Phases of Encountering Fragmentation on a Personal Level: A Personal Motivation for Building a Complexity Theory**

Without the NRF textbook, the three clinical steps would never have emerged. How was it that the professional scholarly book came to be? How is the NRF’s theory base related to the central theme of creating a more comprehensive and cohesive framework that can work on both a micro-individual/family and macro-community public health level? Since professional fragmentation was such a key to creation of the original book, I want to share a bit more about my experience of fragmentation. I eventually felt that something was missing in sharing intense and beautiful birthing experiences yet never seeing these parents and babies again. I loved being a part of the “start” yet I longed for more continuity. This drew me to work with marriages and families from a mental health level as I reached out to become a “marriage, family, and child therapist”. What I first noticed in the transition into this profession was that relationships interacting within a systemic perspective were foundational to this perspective on an individual’s emotional and mental health. Due to my years in labor and delivery where I had witnessed repeatedly the power of connections and disconnections, I resonated with that way of understanding the human condition. In fact, the MFT license had been birthed in the late 1970’s due to the mainstream psychological world staying committed to what I would refer to the isolated mind. To this day, some insurance companies only fund “individual psychotherapy,” continuing to see this as the sine qua non of mental health treatment. However, a parallel process exists as most of our child psychotherapists are also treating children in isolation from their parents. At the same time, what was strikingly missing was the body. There was no reference to anything physiological, as if it didn’t exist. I was puzzled and concerned about this.
As is common when you are new to any profession, as an MFT intern I saw some of the most disturbed cases when I had the least amount of experience. I soon had a full caseload of adults who had very few high-quality relationships in their lives. They lacked basic skills in creating positive “serve and return” levels of engagement. For those of you in the mental health world, they would have been labeled as “personality disorders”. In contrast to these often-damning labels, what I saw were adults who had had traumatizing early experiences. Strikingly, their early neglect, abuse, and trauma had followed them into their later life. Their early states of arousal stress patterns from years ago were still dominating their current lives. The connection between early and later life was very clear to me.

This led me to a search for a theoretical and clinical world that inherently believed that one’s early life experiences had connections to their current life. Due to this being a strong psychoanalytic tenant, I was organically pulled into psychoanalysis as a large body of knowledge that had believed this for quite some time! They had not needed contemporary neuroscience to verify these links. I found two essential tenants to psychoanalysis that I believe to this day, and they are core NRF principles. The first is that one must understand the early years of development in order to treat any older child, teen or adult. Even though the theories of early development were diverse and often contentious, creating splits amongst analysts and institutes, it was important to be planted somewhere in developmental understandings. Secondly, there was a premise in many of the psychoanalytic theorists that what we learn early on in relationships—such as through procedural memories before we ever have words—can have lasting effects. While some psychoanalytic theories were definitely more relational, others were more purely focused on the child’s inherent, self-determined internal world. These two tended to discount one another, which are quite unfortunate to me, since they both need each other. Again, in this large body of knowledge, what was missing was any understanding of the body and physiology; the “third” wheel that was always left out.

I began to become interested in theory development and I saw quite clearly, as others such as Robert Karen have, that much of theory development, which often developed in reaction to other theorists, occurred between particularly strong personalities who had clear ideas on what was harmful or what was curative. Personal experiences played a huge part in someone devoting his or her life to developing a particular theory base. Case in point, John Bowlby’s disheartened supervisory experience with Melanie Klein. He was quite angered by her perspective that the infant/child’s internal world existed quite separate from actual relationships, and spent the rest of his life working to prove her wrong. Here we witnessed a powerful encounter that changed the course of his life, hurling him into fathering attachment theory. In the dance, however, between attachment theory and temperament theory that followed, we can see the point/counterpoint reactivity. As Bowlby had fought to link the internal world to external reality, which ended up focusing on what the parents brought to the relational equation, temperament theory wanted to emphasize what the child brought to the relationship, quite on his or her own. In essence, what was missing were Bowlby and Klein complementing each other instead of battling each other. I started to become very interested in these theoretical positions that seemed to have a poignant, powerful, yet perhaps narrow focus, seemingly missing the importance of living in the dialectic (“both/and” instead of either/or), let alone embracing the notion that behavior is grounded in multiple causalities, rather than singular ones. But, I was not that interested in devoting my life to such a cause.

It was not until I became a parent that I devoted my life to this cause; the need for more complexity in theory development, which I was very interested in, turned into a passion when the living through the
theoretical fragmentation became personal. At that point, I could devote my life to this. This happened when I had a preemie twin boy, who had suffered from fetal malnutrition in utero when his placenta was not adequately feeding him. Actually, one twin boy was overfed, and the other was underfed. The cause of this phenomenon that can occur in utero with twins is still not understood. We had to get our at-risk baby "out" because he was increasingly becoming more and more malnourished, so the boys were born at 35 ½ weeks.

This twin subsequently cried two to six hours a day. It was here that the narrowness and fragmentation of theory and practice began to stir from the flames of an interest into a raging bonfire. Eventually, the fragmentation bothered me so much, that it became my passion and life’s goal to co-create a more cohesive and comprehensive theory base that could straddle bringing integrated services for high-risk infants, children, teens, and adults across the lifecycle in community settings. Hence, Janiece Turnbull and my six-year journey into co-creating the NeuroRelational Framework. She was the perfect complement to my thirst for understanding brain development from a dynamic systems point of view. Thank you, Janiece!

Why did it matter so much? There were several reasons that emerged. It mattered because when I saw myself, a professional in my own right in my early 40’s who had traversed several professional licenses and a certificate in psychoanalysis, and during that time, worked with infants, preemies, parents, children, and adults over those 20 years, that I was brought to my knees when I had an inconsolable baby. All the knowledge and experience helped, but it wasn’t sufficient. I thought, “If it’s this hard for me, what is the average person who doesn’t have the wealth of these internal and external resources doing? What about those with poor beginnings that cannot fight to find their way, with their own histories of procedural trauma - how are they not harming their children when their babies won’t stop crying? Suddenly, it mattered on so many levels. It mattered when I went from one professional to the next professional searching for answers and was given singular answers, as if this one answer was the answer for my child’s inconsolability. I knew it wasn’t so, yet I didn’t have the words to explain it. It mattered that each professional’s viewpoint held an unspoken perspective that their specialty was the whole pie instead of their work being a piece of the pie. Each one of the professionals on my team trying to help my inconsolable child was talented, and each one of them was “right” from his or her own perspective. One suggested the inconsolability was due to his poor suck, swallow, and breathe mechanism, which caused him to choke when eating. This was true. This same pediatrician suggested later that my son had reflux which was causing him pain. And he did. The occupational therapist I added to the team offered that he was sound sensitive, movement sensitive, and touch sensitive. Yes, those were additional problems. The speech and language therapist was concerned that my son’s speech delay was contributing to his distress. That was also well-said. By the time the home interventionist showed up, he perceptively picked up on our parenting styles being polarized and that we were not parenting in a united fashion. I could go on. While each one was accurate, at the same time, there was something terribly “wrong” because they were not a cohesive team and did not interact with one another with a common language and a shared approach.

It mattered on a much more personal level as well. The attachment vs. temperament “research laboratory wars” that I was to read in Robert Karen’s book (1998) were now being played out with my family and with my friendships. As my boy grew, and his storms were still so strong, everyone close to me became more and more anxious. Those that had experienced permissive parenting in their household came to me, sharing their wisdom that I needed to be firmer in my parenting. To be more specific, they said I needed to spank my boy because a good whooping would do him good and show
him who was in charge. This is actually the most culturally common perspective that many held in regard to my context. His behavior was based in non-compliance, defiance, and opposition; he was in charge, and he needed to be punished. It was a simple approach. And this is definitely the default mode most parents go to when they are experiencing unwanted behavior from their child. Whether we want to believe this or not, it’s so deeply embedded into our cultural “rightness” on what a child’s behavior means, that this is often an automatic response.

It was scary, and I could see why those that loved me were anxious and frightened. At age 3, he wasn’t just crying and screaming with inconsolability. He now was violent during his physiological and emotional storms. So much so, that I had to let him thrash around in a padded room with pillows and blankets because he was so strong that I would get harmed if I tried to hold him in any way. Others joined that perspective, proclaiming that he was doomed to become a sociopath unless I disciplined him further. One of these persons happened to be my mother, and after saying this for a while, I opted out of spending time with her for a season of time. It was one of the hardest things I had to do, but the bottom line was that I was struggling to hold the complexity and to be further frightened that I was raising a sociopath was more than what I could manage at the time. I needed emotional space to keep sorting things out with my husband, who was my best friend, confidant, and co-regulator through this madness. I needed psychic space to keep feeling and finding my way through all of the perspectives. Others “knew” it was my unresolved mother issues that were causing me to not be doing something right, so their recommendation was that I needed to go back to my own analyst to further work out my mother transference issues that were impeding me from properly parenting my out-of-control son. Otherwise, I was avoiding my past that was clouding my present perspective. The cacophony of voices between those on the side of the coin that mindful parenting and sensitive parental cue reading was core to his recovery versus those that believed I needed to punish him for his non-compliant behavior versus those that viewed him as clearly needing to get more intensive early intervention services (e.g., occupational therapy sessions, a skin brushing protocol for his tactile defensiveness, speech and language sessions) was poignant. So, it mattered that a more complex theory base and framework be developed that could hold all of these perspectives, helping sort out what direction(s) to proceed with.

Was my meaning-making system responsible for his inconsolability? Was it my own anxiety surrounding my fear of being hit with another inconsolable episode that was reverberating, causing him to be this way? Was his nervous system in need of more intensive interventions? And, how in the world is a “normal” parent supposed to figure all this out? Something had to be developed to hold the tension between these perspectives and to carefully triage the multiple reasons for such intense distress, targeting an individualized approach for each child and parent.

As I actively cycled back to working almost exclusively again with parents and their infants and young children, became involved in training other professionals, and evolved to be a national Zero to Three Graduate Fellow, I noticed other major points of fragmentation on a macro level. It mattered to me that the “special needs” theorists and clinicians functioned separately from the “trauma-informed” specialists, and those from the “medical” specialists, and all of these from the “educational” specialists. These silos run deep and are perpetuated by professional organizations and conferences which most often appeal towards one specialized diagnostic category at the exclusion of the others. Even mentioning the word “trauma” at a special needs conference for those who are on the autistic spectrum can be considered provocative in certain sectors.
Furthermore, I began to pay attention to the fact that research laboratories historically have focused exclusively on one diagnostic or developmental perspective, as do the evidence-based treatments. Evidence-based treatments are most often targeted to a specific age group, and a specific diagnostic population, so much so that if you do not fit within the diagnostic criteria you cannot participate in the study. This peaked my interest, because again, these seemed to be other permutations that were following the “narrow” and “fragmented” thread-line.

American National Shifts Away from Historical Simplicity Towards Complexity
Over time, I came to realize that many others were very aware and concerned about the research siloes, the diagnostic categorizations, and the linear simplicity involved in our research models. In a co-authored article with Mary Ann Marchel (2015), details of these thoughts are elaborated. This chart/table gives us a summary of the historical versus current and future directions.

<table>
<thead>
<tr>
<th>Category</th>
<th>Historical Position</th>
<th>Future Directions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Practice</td>
<td>Simple problems, simple solutions</td>
<td>Complex (dynamic systems - for “messy” problems)</td>
</tr>
<tr>
<td>Population Samples</td>
<td>Laboratory</td>
<td>Real-world</td>
</tr>
<tr>
<td>Category</td>
<td>Categorical Diagnoses</td>
<td>Underlying Dimensions</td>
</tr>
<tr>
<td>Research Methodologies</td>
<td>Linear</td>
<td>Non-linear, systems science</td>
</tr>
<tr>
<td>Research Perspectives</td>
<td>Isolated laboratories, “cottage industries”</td>
<td>Translational, Interdisciplinary, &amp; Community-Based Participatory Research</td>
</tr>
</tbody>
</table>

I will briefly comment on the nature of this list in a sequential manner.

1. Clinical practice - Simple vs. Complex. In essence, much of our historical theory building has occurred within more simplistic and fragmented conceptual bandwidths. While many social and behavioral science circles have adopted a dynamic systems viewpoint which inherently holds more complexity, these theoretical advances have not yet been well implemented in practice. Many of the “complexity” theorists have still been using paradigms from the left side of this table. The need to have synchronicity between one’s theoretical, clinical, and research stance is clear. The NRF’s goal for public health research became to align its obvious theoretical and clinical commitment to complexity with real-world population samples, dimensional understandings, non-linear research methodologies, and collaborative community participation.
2. Population Samples - Laboratory Samples vs. Real World Representations. While linear models of research give us valuable information, we have had a distinct mismatch between our linear research models and our dynamic systems advancements theoretically. For example, linear research models by their very nature reduce variables, and by design, require laboratory settings within which to control the variables for such purposes. This has led us to use research laboratory clinicians seeing children within families in university and hospital laboratory settings, often completing a linear protocol, holding a singular diagnostic category. Evidence-based outcomes are based on having narrowed the variables. “Across dimensions of clinic settings versus research university settings, actual practicing clinicians versus graduate students or research-employed therapists, and actual treatment-seeking clients versus children recruited for efficacy trials, ‘only 1% of the studies reviewed included some clinically referred children, with at least one practicing clinician, with some treatment carried out in a clinical service setting’” (originally in Weisz, et. al. 2005, p. 59; also in Lillas and Marchel, p 12).

How much of a mismatch is this? A pretty big one on multiple levels! This means that up to “99% of research conducted is based on 1% of an actual clinical population” (in Lillas & Marchel, p. 12, Winter, 2015). Most of the real-world community-based infants, children, teens, and parents that we see hold more than one diagnostic category, these families often do not match the ability to follow the linear progression of an evidence-based model’s manual, and the complexity of their lives is the norm not the exception. We often provide services to a population that does not fit the narrow diagnostic criteria and would never complete the laboratory study. These are all the families who dropped out of the laboratory research study or would never make it into one. One further note: most of our top-notch research journals have collected data drawn from “Western, Educated, Industrialized, Rich and Democratic (WEIRD) societies” (in Moving Away from WEIRD, originally in Henrich, Heine, & Norenzayan, 2010). The need to shift from laboratory based research to do research in real-world, real-time with co-morbid and complex cases across diverse populations is clear. Thus, the NRF’s research protocol needs to include gathering data in real-world, real-time, with complex clients and treating practitioners in actual community settings.

Brief Overview of NRF Research

We will be doing so by using sense technology that parents, and young children will wear in the form of watches to operationalize the 24-hour sleep-wake cycle in Step #1. Four variables in terms of live feedback are used from a MIT wristband referenced as the E4. These variables are heart rate – which will be translated into Heart Rate Variability, electro dermal skin responses, temperature, and movement. In addition, a NRF phone app, which the adult with the child will carry and be passed along from caregiver to caregiver, has GPS capacities, giving us data on proximity and caregiver responsiveness to the child’s distress. In addition, the four physiological awake zones will be present on the phone app, so that practitioners and parents can make notes and mark their observational skills of behavior in real-time. It is assumed that those caregivers that are working on cue reading may find the use of the phone with live feedback helpful in learning how to improve their cue-reading skills. For those that have these mastered these skills, drop-down menus for each parent and child with Trigger and Toolkits will be available for his or her use. NRF practitioners will guide this process of discovery. These
parents will be able to document in real-time what their understanding of their child’s and their own individual differences might be and what multiple causes they suspect triggered the stress response. They will also be able to record what they used as for Toolkits for improving stress recovery (both of Triggers and Toolkits are operationalizing Step #3). Over time, we expect that these menus will become highly individualized to reflect the personal and particular profile of each child and parent. If the Trigger and Toolkit menu is too overwhelming for a particular parent or adult caregiver, the NRF therapist will be using these menu’s, so the individualization of knowing each particular profile will be heavily relied upon from the therapist’s input.

3. Diagnoses - Categorical vs. Dimensional. As mentioned, most all EBT’s are organized around a singular diagnostic category. Two weeks before the DSM-5 was released in 2013, the National Institute of Health (NIH) and Mental Health (NIMH) announced that it was no longer supporting research based upon DSM criteria. This announcement was accompanied by the acknowledgement that the clustering of symptoms into categories reflected an outdated view of how the body, mind, and relationships work. Finally! Given that organizing mental categories around symptoms is akin to organizing a medical diagnosis around the symptom of having a fever or chest pain, begins to challenge categorical thinking. There is now a quest to shift into studying underlying dimensions that may accompany many different diagnostic categories that can be studied through multiple venues including but not exclusive to genetics, molecular and cellular biology, neural circuits, physiological activity, observable behavior, and self-report. Research Domain Criteria (RDoC) have been set up as a starting point for this seismic shift. These five domains of functioning serve as catchment areas for data collection. I have organized them in a way that links up with the NRF’s underlying dimensions in Table 1 below. The NRF was written to be exactly that – a way to understand the underlying processes behind any diagnostic category. Even if you do not yet know the NRF’s 3 steps, you can see their distribution across these domains of functioning. Thus, the NRF’s research protocol will not be relying on DSM diagnostic categories. While we will keep track of what their diagnostic labels are, the underlying dimension of various dimensions of stress and toxic stress patterns will be the focus for how one gets into the study. Along these lines, it has been recognized by NIH that the narrow specification of doing research within the narrow confines of a singular diagnostic category eliminates understanding that dimensions function on a continuum. By not allowing anyone “else” in the study, the range of non-clinical to mild, moderate, and severe continuums are not understood. Many functional behaviors, such as mood, may actually occur across a wide range of duration, intensity, and frequency. Hence, the NRF will include a wide range of non-clinical and clinical populations over time.
### Table 1.1. Comparison of NIH RDoC Categories and NRF Principles

<table>
<thead>
<tr>
<th>Research Domain Criteria’s Five Large Domains of Functioning</th>
<th>NRF’s Dimensional Approach to Underlying Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom-up</td>
<td></td>
</tr>
<tr>
<td>Arousal/modulatory/regulatory systems</td>
<td>Regulation and sensory brain systems (Steps #1 &amp; 3)</td>
</tr>
<tr>
<td>Positively valenced motivational systems</td>
<td>Relevance system (can include bottom-up and top-down elements) (Step #3)</td>
</tr>
<tr>
<td>Negatively valenced motivational systems</td>
<td>Relevance system (can include bottom-up and top-down elements) (Step #3)</td>
</tr>
<tr>
<td>Top-down</td>
<td></td>
</tr>
<tr>
<td>Cognitive systems</td>
<td>Executive brain system (Step #3)</td>
</tr>
<tr>
<td>Systems for social processes</td>
<td>Includes Step #2, Levels of Engagement and links to underpinnings in all brain networks (Step #3)</td>
</tr>
</tbody>
</table>

4. Research Methodologies - Linear vs. Nonlinear. In the notes on Population Samples I referenced the concerns about linear research methodologies that do not match theories that are grounded in complexity. NIH has recognized the need to complement linear research methods with systems science models, recognizing that “messy” and complex problems cannot be solved by reductionist methods. In line with this, NIH is now making significant investments in the use of systems science methodologies to begin to solve large scale disease processes (e.g., obesity, cancer, diabetes, cardiovascular disease). Prior to 2008, there were no US federal funding grants offered for such methodologies; subsequently, a shift in funding occurred between 2009 to 2013 wherein an investment of $35.4 million was made that went to 91 projects (from Mabry & Kaplan, 2013 in Lillas & Merchant WEIRD article).

Thus, as the NRF’s focus is looking at underlying dimensions that contribute to these large-scale disease processes of obesity, cancer, diabetes, and cardiovascular diseases which occur longitudinally, moving the NRF into the public health research arena necessitated it matching research methodologies with systems science’s capacities to honor and hold multiple variables. While there are many systems science methodologies, three specific ones are highlighted in
the literature. Systems dynamics modeling aids the capacity to understand and discuss the challenges and complexities in a system; agent based modeling examines individuals situated within communities; and social network analysis tracks the direction and “thickness” of social relatedness within family and community networks. To this end, one of the NRF’s co-PIs and consultants – Dr. Nathaniel Osgood – is an internationally revered systems science researcher, who is a pioneer in creating hybrid models between systems dynamics modeling and agent based modeling. These will hold the real-world, real-time physiological measurements of (toxic) stress patterns of individuals within a family system, while also looking at the complexities of population health’s growth of toxic stress clusters within communities. In this way, the co-evolution of both NRF theory and systems science research will inform each other as we get more families participating in real-world, real-time feedback loops. In addition, each of the five NRF communities will participate in a yearly Social Network Analysis that will show us how relational patterns across systems of care and within agencies are changing towards using a shared approach and a common language of the NRF’s three clinical steps.

5. Research Perspectives – Isolation vs. Community-Based Collaboration. NIH again recognized that health research laboratories have been organized “much like a series of cottage industries, lumping researchers into broad of scientific research and then grouping them into distinct, developmentally based specialties” (p. 1214, as cited in Herbert, Brandt, Armstead, Adams, and Steck, 2009; quote also used in Lillas & Marchel, 2015). This isolation has fed the research silos that lack interdisciplinary collaboration. The NIH Roadmap for Medical Research (NIH, 2014) is now actively promoting translational research (moving basic research discoveries into practical application), interdisciplinary research (breaking down disciplinary boundaries, which harness a collective power across individual domains to solve complex problems) and community-based participatory research (working collaboratively within communities as they actively participate in research data decisions and collection).

The NRF works to embody all three of these research efforts. The NRF represents a translational effort – building upon Harvard’s and FrameWork Institute’s translation of neuroscience contributions and developmental discoveries into three core concepts, translating these further into the practical application of three clinical steps. The NRF is an interdisciplinary framework, bringing an integrated common approach and shared language that is boundary crossing across medical, mental health, developmental delays and disabilities, early care and education, and child welfare pathways. The NRF is nested in building cross-sector participatory communities across similar service delivery systems that join together being trained together in both theory and practice. Each trainee is encouraged to participate in ongoing feedback that guides our changes in curriculum development. As cases are presented across sectors, our NRF communities hope to sustain long-term sustainability by grooming NRF Practitioners, NRF Facilitators, NRF Trainers, and NRF Mentors. As the NRF gears up for real-world, real-time data collection from families in our oldest NRF community in Edmonton, Alberta, Canada, their feedback loop to the research team will continue to be provide essential and valuable information. As we grow the NRF Learning Collaborative from the NRF administrative team leaders and NRF Facilitators/Mentors, we are becoming a NRF Global Community. While each sector influences other disciplines and sectors, each NRF community is now influencing the others. We foresee that others out there who have a vision for creating
NRF Cross-Discipline, Cross-Sectored, and Cross-Cultural Communities will be able to be mentored by those who have grown one from the inside out.

**The True Meaning of Evidence-Based Practice**

One last caveat I want to mention, is a real concern to me on a cultural and international level. The reality in community settings is that we often have administrators purchasing Evidence-Based Treatments for our most high-risk populations completely unaware of these aforementioned mismatches. The term “evidence-based treatment” is now automatically conflated with the term “evidence-based practice.” If an EBT is on a national or state-approved web site, it is assumed that this is an acceptable form of practice. There is often no understanding that this EBT may have come from a subclinical population or a culturally mismatched group. (For example, Triple P was normed on middle class Australian children with a primary issue of behavioral “non-compliance” with chores - such as taking out the garbage. For many, this would be seen as a cultural gap that is a far cry from the high-risk populations we see whose trauma history, and/or medical/genetic vulnerabilities would define “non-compliance” as violent behaviors, running away, sexualized behaviors, etc.).

These EBT’s then, as they are placed on an “evidence-based” list, and as long as one is using an EBT, one is considered to be offering an Evidence-Based Practice (EBP). Even though the Institute of Medicine, which began the EPT movement has defined an EBP as a decision making process using a three-pronged process that holds the tension between 1) the best available research, 2) professional wisdom gained from clinical theory and practice, and 3) family and cultural values with informed consent (IOM; Buysee & Wesley, 2006), the terms have long since been reduced to be one in the same. For additional discussions on this topic, I have co-authored some articles and a chapter in a book that takes one further into this concern [Please refer to “Infant Early Childhood Chapter 18-Evidence Based Practice” and “A Problem in Our Field- Zero to Three” articles in Chapter 1 on the website].

**Evidence Based Treatments (EBT) are being equated with EB-Practice**

- Evidence-Based Practice (EBP) is:
  - A **decision making process** that holds the tension between:
    - The best available clinical research (EBTs)
    - Professional wisdom based in sound theory and practice
    - Cultural and family values (with informed choice)
  
  \[\text{Buysee and Wesley, 2006}\]
This unfortunate event has caused there to be two main concerns the NRF attempts to address. The first concern pertains to a worrisome mindlessness emerging with graduate schools educating practitioners to a treatment list rather than in sound theory and practice which promotes critical thinking. The NRF’s hope in becoming both an Evidence-Based Assessment and an Evidence-Based Treatment is to restore a modicum of critical thinking to the clinical process across disciplines. By providing a highly attuned guide to a functional approach neurodevelopmental tracking and thinking, the practitioner is guided in being able to clinically know where to begin treatment, what are common goals that can be shared across disciplines, having an ability to document whether developmental progress is being made or not, and how to judiciously use the EBT(s) one “knows”, assessing if they are a good-enough match with what the infant, child, parent need. If not, other treatment modalities are suggested, as well as sound neurodevelopmental principles are offered to guide treatment.

The NRF Brings “Value Added” to Any EBT

Because of the intense focus on neurodevelopment

- Tracking neurodevelopment tells the practitioner where to begin treatment
- Tracking neurodevelopment guides one if one is making developmental progress or not
- Tracking neurodevelopment gets development back on track as quickly as possible
- Tracking neurodevelopment helps you match the EBT with what the child/parents need & where they are at

Thus, one viable solution to fragmentation and messy, large-scale public health problems is a shared approach and common language that translates key neurodevelopmental into three core concepts that are further translated into the NRF’s matching three clinical steps. The assessment and intervention of these 3 clinical steps link early toxic developmental processes with long-term health outcomes, and toxic stress is viewed as a silent, but powerful public health crisis. The NRF provides clarity and coordination between its theoretical commitment to dynamic systems theory and clinical and research practice. Thus, in entering the public health arena, it is grounded in systems science methodologies, real-world, real-time community based research subjects, with real-world community based clinicians who have been trained in the NRF’s global three steps as “value added” to any EBT.

The second concern surrounding the conflation of the terms “treatment” with “practice” is the all-too-often lack of regard for the cultural and family values of the infants/parents we work with, without enough intentional awareness of ourselves as practitioners as cultural beings. The reflective process so inherent in the field of Infant Mental Health necessitates an increasing ability to account for power differentials in our therapeutic relationships — recognizing the potential for rupture and repair work to
be done within relationships, along with the need to intentionally grow a community of multi-racial and multi-ethnic providers. In addition, we need to continue to build contexts for understanding historical trauma a particular cultural/immigrant group may have endured. In my experience, it is rare that our parents are being offered informed consent and choices about treatment modalities that actually match their child and family’s needs. This capacity to be trained in a variety of treatment modalities that are then matched to the infant/family’s needs with their informed consent along with an opportunity to choose treatments is an institutional community goal that must be advocated for.

The Diversity-Informed Infant Mental Health Tenants are a place to begin considering the multiple dimensions involved in this process:  [https://imhdivtenets.org/tenets/](https://imhdivtenets.org/tenets/)

The NRF’s most recent work has been to begin to integrate an organized curriculum developed by VISIONS, Inc., that is culturally and equity sensitive. This is an ongoing process that first began in the Central Valley NRF cohort and is was integrated into the Seattle King County cohort. As this integration emerges and continues, this dual process of integrating the NRF’s three clinical steps with diversity and equity principles held in mind will increasingly become a part of the NRF’s process in engaging Reflective Practice. In particular, Dr. Valerie Batts has been instrumental in bringing her talents in training this curriculum along with the provision of providing community experiences that build trust, creating an atmosphere where authentic conversations can occur, while supporting challenges and accountability without judgment or blame.  [http://visions-inc.org/who-we-are/](http://visions-inc.org/who-we-are/)

I will mention two important principles that emerge from the VISIONS curriculum. One is advocating for the need to shift from “monoculturalism” to “pluralism”. The ethnocentric view of prioritizing one cultural or ethnic experience over another’s often occurs automatically, on a procedural level. Sometimes it takes years to shed the inherent pride and value one’s own cultural heritage has over a person. Moving towards embracing diversity, celebrating differences along with similarities, requires a certain degree of flexibility. This journey is a parallel process in our need to shift from fragmented and isolated multi-disciplinary practice to inter- and transdisciplinary practice that is relationship-based.

The NRF provides the “interdisciplinary” framework that allows all practitioners to enter into a common language and shared approach. However, a second important principle that VISIONS curriculum points out, is that these dynamics occur on a personal, interpersonal, institutional, and cultural level. When we speak about cultural ethnocentricity, our academic institutions are often clear examples of isolated silos of automatically offering disciplinary superiority over others. Why are we re-training practitioners in interdisciplinary work post-licensure? Because the degree of institutional bias towards one’s disciplinary boundary is strong. Interdisciplinary work necessitates boundary crossing. This concept is frightening to many practitioners who are trained to stay within their isolated silos of practice as a necessary ethical guideline. As we look at the process involved in breaking down institutional barriers that hold many “ism’s” within them at a cultural level, we will see that a parallel process of these themes of dominance in our own disciplinary “culture” also exist, stimulating all of us to stretch and reach beyond our comfort zone on many levels.

I think we are ready to launch into an overview of the NRF’s three clinical steps and the organization of the NRF Manual introduced in Chapter Two. Here we go!