

Moving the Public Beyond Familiar Understandings
of Early Childhood Development
Findings from Talkback Testing of Simplifying Models

Prepared for the Frameworks Institute
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RECOMMENDATION

Based on a combination of cognitive analysis and empirical testing with over four hundred individuals, Cultural Logic recommends the following ways of framing early childhood development in communications with the American public¹. In each case, information framed in the recommended way is perceived as new, interesting and relevant, and helps lay people understand and engage with developmental accounts in new and productive ways.

The recommended models are also memorable and repeatable – they have the potential to enter public discourse, as well as being attended to by individual Americans. In sum, they can serve as tools to initiate a cultural shift towards increased appreciation of scientific perspectives on early childhood development.

Very importantly, these conceptual pieces work best *in combination* – no one of them is as strong individually as they are when presented together, as pieces in a single causal story. Equally significant, advocates should be wary of substituting alternative terms that might seem to “do just as well” for the models recommended here – apparently small changes to the models can have dramatic effects in the public’s understanding.

Taken together, these models can allow advocates to promote a science-based understanding of early childhood development, while also taking account of the public’s natural nurturant stance towards children.

“Brain Architecture”

Brain Architecture is a very helpful and memorable model which allows lay people to think about brain development itself. Lay people are engaged by explanations of the ways in which a child’s *brain architecture* is *built* and *strengthened*, or information about things that can *weaken* brain architecture or hinder the development of the brain’s *structure*. Thinking about childhood development in this way can help people see, for example, that it would make sense for pediatricians to take an interest in children’s mental and emotional development.

Interaction and “Mirroring”

Members of the public are very engaged by discussions of the types of interaction children need in order to develop properly. In particular, when they are presented with information about “Mirroring” – the instinctive interaction style in which adults *get in sync with* babies and *mimic* their coos, gestures and facial expressions – they are able to grasp the importance of this mechanism. Accounts of mirroring strike people as new and instructive ways of thinking about a familiar type of interaction. Thinking about

¹ While empirical evidence leading to these recommendations is qualitative rather than quantitative, as discussed below, it is nonetheless strong enough to suggest that advocates can confidently use these tools in their communications, even as further research is conducted.

development in this way can help people see, for example, that child care must involve one-on-one interaction with attentive providers.

Mirroring is most productively understood as one of the key factors that *helps build brain architecture*.

Stress-related “Chemicals in the Brain”

When lay people are told that *stress releases chemicals in the brain*, and that these chemicals *weaken brain architecture*, or *hinder its development*, they find this explanation important and memorable. When they understand the situations that can cause a baby to feel stress – including lack of interaction, or interaction with an adult under stress – they are able to extrapolate to the kinds of situations which are detrimental to the development of a baby’s brain architecture, including the effects of poverty on families.

TWO COMMUNICATIVE TASKS

The work reported on here began with a consideration of two chief obstacles to new learning about early childhood development:

- The “mentalist” bias: lay people’s exclusive focus on the abstract and subjective domain of *thinking, wanting, character, ideas, morals, learning*, etc. which exist in a causal universe that is in important ways removed from the practical and material considerations that concern advocates and experts – things like brains, hormones, attachments, toxic chemicals, etc.
- The complexity of “the expert model”: Expert understandings include an extremely wide range of facts about children’s development, any *one* of which can be too technical for lay people to appreciate.

There are, of course, many other obstacles to overcome (many of which are discussed below, such as the default assumption that anything that goes on *outside the home* is nearly irrelevant for a child’s development), but these are two central problems which can prevent the public learning process from even getting started. If public understandings of ECD are to advance significantly, lay people must acquire a new comfort with the *material* perspective on development (since it is fuller, more accurate, and more objective than current understandings), and advocates must be able to focus on certain key propositions that can be introduced into the public’s thinking through repetition and user-friendly presentation.

Shifting the Public from Mentalist Folk Models to Materialist Expert Models

Much of the public’s resistance to new information about ECD results from a “mentalist” or Cartesian perspective inherent in our folk models of the Mind. That is, people reason as if minds were nonmaterial objects, defined only in terms of our subjective and abstract mental experience. According to the folk theory, our minds are characterized by internal states such as perceptions, beliefs, feelings, desires, intentions, and most importantly, an inner Self. While this mental world can involve causal connections (e.g., desires lead to intentions), these causal stories bear little connection to the sort of material events (such as the firing of neurons) that are central in expert understandings. For most people, the gap between the nonmaterial mind/soul and the material body is a very wide and even unbridgeable one.

It is important to keep in mind that for most practical purposes, the mentalist perspective guides people’s thinking in useful ways.² For example, it allows us to make educated guesses about what others are thinking, and about what they are likely to do next – which tends to matter more than information about others’ brain processes. On the other hand, the mentalist perspective acts as a barrier to new learning about important aspects of early

² According to recent work by evolutionary anthropologists, for example, the existence of a module for a theory of mind is what separates us from other apes (see e.g., Tomasello, Dunbar).

childhood development. For example, the mentalist perspective does not include the important notion of a “damaged system” (i.e. the idea that a person might behave a certain way because of a damaged internal system rather than a moral failure); it excludes certain kinds of causality, such as the lasting effects of chronic stress; and it tends to imply a kind of “all or nothing” perspective, in which personhood emerges fullblown even in very young children, rather than developing through the growth of individual parts and systems.³

The task of translating the sorts of expert models of ECD that lead directly to sound policies – such as those found in *Neurons to Neighborhoods* – is difficult largely because it depends on opening the public to materialist explanations of mind. Expert models and folk models are in this case truly like oil and water.

Simplifying the Expert Theories

An important part of the cognitive analysis for this project involved identifying key “stories” within the numerous propositions about early childhood development presented in *Neurons to Neighborhoods* and other expert materials. Here are is a small sample of the many diverse ideas that make up the expert model of ECD:

- Important aspects of development continue into adolescence.
- A child’s nutritional intake is key to healthy development.
- Healthy development crucially involves changes in physical, cognitive, social, emotional and regulatory systems.
- Healthy development requires stable relationships with caregivers.
- The brains of neglected infants are measurably smaller in particular areas than those of healthy babies.
- Emotional health screenings for children and adults can contribute to healthy development.

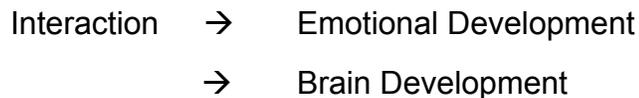
The most important and promising causal stories are those that (a) have the best chance of being understood and accepted by the public, and (b) are most likely to lead to positive policy implications. These are stories that would be experienced by the public as coherent, vivid, interesting, and would lead to further understanding. These are also the

³ Previous research by Cultural Logic has shown, for example, that one significant source of child abuse and neglect is the belief on the part of caretakers that even very young children have fully-developed selves (see “Two Cognitive Obstacles to Preventing Child Abuse: The ‘Other-Mind’ Mistake and the ‘Family Bubble’”). One could also cite the tendency of jurors in criminal cases to hold highly limited and restrictive models of what counts as “insanity.”

stories that are central to the larger model described in *Neurons to Neighborhoods* – i.e. those that imply other important propositions.

The Central Causal Story

In the most general schematic terms, the causal story we see as central includes a cause defined in terms of interaction between a child and an adult, and effects defined in terms of brain development and/or emotional development.



There are specific reasons, based on current and previous analysis, for identifying these as central elements of the story:

Interaction

In order for the public to engage with policies that can improve developmental outcomes, they must have in mind a model that includes cause and effect. (Importantly, this kind of model has the potential to displace folk understandings that child development “just happens” according to some default timeline.) The most central of the various kinds of causal factors mentioned by ECD experts is interaction. While nutrition, chemicals in the home and other causal factors are also important, the causal role of interactions is especially critical in all accounts of development, and is also one that the public can be expected to engage with.

Emotional Development

There are several important reasons why emotional development has potential as a central part of the ECD model.

- Emotion is the closest link between mind and body in folk understandings – it involves both abstract “feelings” and bodily sensations. For this reason, emotional development provides the possibility of a blend of materialist and mentalist perspectives.
- Emotional development is a simplified version of one of the key tenets of expert accounts – that social, emotional and regulatory development (SER) are critical but underappreciated.

- The recent popularity of discourse about emotional ability (see e.g., *Emotional Intelligence*, by Daniel Goleman) suggests that the public may be primed for discussions of emotional development.
- People intuitively associate babies with emotion – babies respond to emotion, and are shaped by emotion – and emotional development offers a natural avenue for talking about ECD.
- Emotion is a topic which obviously relates closely to motivation. Since non-experts have many understandings about emotion, it represents an area where strong folk models can provide motivation if tapped into effectively.

Brain Development

Similarly, there are several (different) important reasons why brain development has special potential as a central part of the ECD model.

- Reference to the brain provides a vivid and concrete starting point for material (rather than mentalist) explanations of ECD.
- Brain research is new, interesting, and often referred to in media discourse.
- Discussions of the brain can include clear causal mechanisms (for development of “the person”).

Each of these conceptual elements also comes with its own challenges, however:

Interaction

- Because interaction is a very familiar part of the folk model of children and development, it is important not to slip back into familiar (and unproductive) ways of thinking. Discussions of interaction must somehow seem *new*.
- Interaction can easily be interpreted in a very limited way, that does not expand the causal universe beyond the “family bubble” to a broader community, and larger policy issues.

Emotional Development

- Discussions of emotional development must be carefully framed in order to support objective, scientific understanding. Although emotion is at the “materialist end” of the mentalist folk model, it is important to make sure that thinking bridges outward to include materialist explanations, rather than slipping inward to comfortable, purely mentalist explanations.

Brain Development

- The brain is complicated and difficult to understand. It is important to find descriptions that are simple enough for lay people to grasp, while remaining true to the larger causal stories.
- The brain is closely associated with reasoning and intellectual ability, often to the exclusion of emotion, for example. It is important that references to the brain not simply evoke notions of “increasing babies’ IQ.”
- Framing ECD in terms of the brain is the most direct attack possible on the preferred mentalist perspective. It is important not to make ECD seem like an overly clinical process, in which we can no longer recognize actual children.⁴

Ways of expressing the central concepts

The process of finding candidates for expressing the central concepts involved discussions with FrameWorks colleagues, reading broadly in materials by child development experts (from Stanley Greenspan to Allan Schore), and even hiring the services of “naming experts,” (professionals whose work involves the generation of thousands of names, terms and concepts related to commercial products and services). This lengthy process ultimately led to a shorter list of terms, explanations and concepts discussed below.

⁴ See previous focus group research conducted by Margaret Bostrom of Public Knowledge.

RESEARCH METHODOLOGY

The empirical testing of simplifying models for early childhood development was originally conceived as involving a pilot phase during which more promising and less promising directions (plus controls) would be identified and refined, and a quantitative phase during which comparative evidence would be gathered regarding the effectiveness of each candidate. In fact, however, the resistance of lay people's thinking to new information about early childhood proved so surprisingly difficult to overcome that the actual process can best be described as a single, extended period of pilot testing and refinement. (For ease of reference, however, we distinguish between earlier "pilot" phases and later stages of the research in the discussion below.)

The empirical research involved a broad range of methods designed to explore different aspects of subjects' responses to new information and concepts related to early childhood development.⁵

Types of Stimulus

"Term-only": In some cases, subjects were presented with a term with no explanation, e.g.

The term "brain architecture" is unfamiliar to most people.

Explanatory Paragraphs: In other cases, subjects were presented with a paragraph-length explanation of a concept, e.g.

New research shows that "Attunement" is one of the most important factors in the development of an infant's brain. A baby's brain "tunes" itself to the world, through give and take with other people. If a baby does not receive the right kind of feedback in response to his or her actions, parts of the brain don't grow or develop in the way they should. The right kinds of interaction between infant and adult help parts of the brain develop and organize themselves, so that a child is able to respond appropriately to new experiences.

(See Appendix 2 for additional examples.)

Types of task

Term-based speculation: In some cases, subjects were asked to speculate about the meaning of a term, e.g.

⁵ The authors thank Alex Bolyanatz, Ph.D. (Benedictine University), Jeffrey Snodgrass, Ph.D. (Colorado State University), Lauri Andress, JD, MPH (Rice University), and Cary Oliva (Charlottesville, VA), as well as Mark Hershon (Los Angeles, CA) and Steve Price (Sausalito, CA) for their assistance in arranging and executing various pieces of the research.

What do you imagine that the term “Emotional Regulator” refers to? ... What kinds of experiences would you imagine affect the development of the “Emotional Regulator”? ...

TalkBack: Many subjects were asked to repeat information and explanations they had just been presented with (see Types of format, below).

Policy-related questions: Some subjects were asked questions about topics related to policy preference, e.g.

Why do young children from poor backgrounds score worse on standardized tests when first entering school than kids from more affluent backgrounds?

What are the differences between a good and a bad child care facility?

Types of format

Several different formats were used, including:

- Written questionnaire
- In-person interview (10-15 minutes)
- Telephone interview (10-15 minutes)
- “TalkBack chains”

This method was the most unique to the present study. The aim of the method was to test whether subjects are able to teach their new understanding relating to early childhood development (including terms and concepts) to naïve subjects. An assumption behind the method is that in order for new understandings of the topic to enter public discourse (and the culture, broadly speaking), they must be quickly graspable and repeatable by lay people.

TalkBack testing sets up a challenge to any new ways of framing that is quite severe. As each “generation” of subjects acquires the material, it has an opportunity to distort what it has learned, and to introduce unwanted elements. The strongest frames show some ability to self-correct – i.e., to lead subjects back to the original formulation, even if they themselves were given a somewhat distorted version of the stimulus.

Subjects were read an Explanatory Paragraph, and given several minutes to ask for clarification. When new subject(s) entered the room, the previous subject was asked to pass the information along to this next link in the “chain,” without any help from the researcher. Subjects were not allowed to take notes, so whatever information was passed along had to be remembered and, to some extent, internalized. New subject(s) would then enter the room, the first subject(s) would leave, and the chain would be continued.

Subjects generally worked in pairs, to reduce the chances that the chain would fail due to a single individual who (for whatever reason) did not do a good job of absorbing the information. Chains extended as long as four generations (not including the researchers' initial presentation of information):

Initial presentation → 1st generation TalkBack → 2nd generation TalkBack
→ 3rd generation TalkBack → 4th generation TalkBack

All TalkBack sessions were videotaped and analyzed later.

Recruitment methods and sample

Subjects were recruited through a variety of methods. For in-person pilot tests in Washington DC and New York, subjects were passers-by recruited in various public settings. (Subjects in all phases of research were offered small incentives for participation, usually a \$5 Starbucks coffee certificate.) For telephone interviews, subjects were recruited through ads placed in local “craig’s list” web sites – e.g. in Atlanta, Phoenix, Seattle and New York. Classroom subjects were graduate and undergraduate students in anthropology classes. TalkBack subjects in Houston were recruited by local business leaders working in partnership with the Texas Program for Society and Health (James Baker Institute, Rice University).

The range of subjects included broad diversity in terms of gender, ethnicity, age, and educational background, and also included a mix of parents and nonparents. The Houston subjects in particular represented considerable diversity. They were employees at all professional and staff levels in four very different workplaces – a Hispanic-owned accounting firm, a bank branch staffed by a diverse ethnic mix, a primarily European-American chamber of commerce office, and an African-American bank in an economically struggling area of Houston.

Summary of Research Phases

The research involved just over 400 subjects, and took place between July and September, 2003.

- Pilot TalkBack “Chains”– Washington DC, 12 subjects
- Pilot Policy-related Questions (Written Questionnaires) – Bryant Park, New York City, 30 subjects
- Pilot Explanatory Paragraphs (In-person Interviews) – Washington DC, 23 subjects
- Pilot Telephone Interviews (various types of stimulus and task) – National, 18 subjects

- Telephone Interviews (Term-only and Explanatory Paragraphs; Term-based speculation, Policy-related questions, and TalkBack) – National, roughly 120 subjects
- Classroom Questionnaires (Term-only and Explanatory Paragraphs; Term-based speculation, and Policy-related questions) – Benedectine College (IL) and Colorado State University, roughly 100 subjects
- TalkBack Chains – Houston, roughly 100 subjects

FINDINGS 1: DEFAULT MODELS THAT INTERFERE WITH NEW LEARNING ABOUT ECD

In this section we briefly describe some important patterns of reasoning that emerged as obstacles to learning in the research. While some of these patterns are discussed in previous research about public understandings of children and development⁶, the current round of research uncovered several new problems.

“Mentalist” understandings of children and ECD

This pattern represents the single most difficult cognitive challenge facing advocates on the ECD issue. A “materialist” perspective on child development – i.e. in terms of development of the brain, hormonal systems, etc. – does not come naturally to lay people, who tend instead to think in terms of familiar ideas like mind, soul, character, morality, intention, etc. If one of advocates’ goals is to increase public understanding of how children develop and how their circumstances affect this development, then this ancient and deeply entrenched “mentalist” preference remains a key obstacle. While it is perfectly reasonable to think in terms of childrens’ *minds*, what they *want* and why, how they *learn*, and so forth, reasoning along these lines tends to block out thinking about the more material aspects of development.

The “Hallmark” problem

One pattern in subjects’ responses to material about ECD was so common and important that it deserves its own special designation. This was the tendency for any new information about the material aspects of development to be misunderstood, misremembered and/or reinterpreted in terms of a mentalist account – neural “connections” become emotional “connections” between people; literally mimicking a child’s actions becomes giving her positive feedback, and so forth. The problem is especially acute when information is presented in metaphorical terms – when a child is likened to a plant, for instance – but even the term “brain” was sometimes understood to refer metaphorically to aspects of the self and the mind.

The Hallmark problem is pernicious because of the tendency for many metaphors that would otherwise be useful in conveying and simplifying *new* information to reinforce *old* ways of thinking.

The “Family Bubble”

One of the public’s most dominant and stubborn understandings about children is that when it comes to a child’s development nothing outside the home *really* matters. For example, a good parent can do a fine job whether rich or poor. This pattern of reasoning

⁶ See, e.g., Cultural Logic’s reports “Promoting School Readiness and Early Child Development: Findings from Cognitive Elicitations” and “Business Leaders and Early Childhood Development: Findings from Interviews.”

can block out thinking about the connections between a child's community and her development.

Association between brain and intellect

Another powerful (and familiar) obstacle facing advocates is the strong association between the brain and intellectual ability. Advocates know that brain development is just as relevant to a person's social and emotional life as it is to intellectual achievement, but lay people are very biased towards the latter associations. This association can (and should) be defeated, but it takes careful framing to do so.

Negative associations with emotion

From advocates' perspective, emotional health is one of the most important keys to overall wellbeing. Unless emotional systems develop properly, odds of success in all spheres of life are diminished. From the nonexpert perspective, however, emotion can be associated with weakness, irrationality (essentially, locked in a zero-sum game with reason), volatility, a lack of control, extreme and traumatic events, femininity (as opposed to masculine rationality and strength), and so forth. Each of these patterns can interfere with communications about emotional development.

Emotion as the "currency" of adult-child transactions

A very different problem relating to folk models of emotion is that emotion, largely a "mentalist" concept, is seen as the key transaction between caregivers and infants. This means that any terms and concepts that can refer to emotion are likely to be interpreted in this way. For instance, a discussion of "positive" and "negative" factors in brain development is likely to be interpreted in terms of positive emotions like happiness vs. negative emotions like stress. While there is considerable overlap between the intended meanings and the interpretations in a case like this, the mentalist, emotional interpretation can also serve to block out new learning about (the more material side of) development.

Emotional "osmosis"

When nonexperts think about the effects of adults' emotions on young children, they tend to think about how emotions are transmitted directly from adult to child. Adults create an "emotional environment" – positive or negative – which children absorb. Like other default models, this one has elements of truth in it, but can also block out new understandings – e.g. the idea that the quality of an adult's interaction with a child can actually have effects on the developing brain.

Children learn by imitating their parents.

While certainly true, this understanding can get in the way of learning about other facts. In particular, it can block out the idea that caregivers need to take care *to get in sync with children*. (See the discussion of “Mirroring” below.)

The value of positive reinforcement

This is another true and important idea about child-rearing which nonetheless interferes with new learning: children need adults to *validate* them through positive reinforcement. A problem with this understanding is that it filters out information about being in sync with children on a short time scale (seconds, minutes) and translates it into ideas about validating children’s actions in a more general sense. (See the discussion of “Mirroring” below.)

Nature vs. Nurture

Once a discussion of child development reminds people of this “debate,” new learning can effectively end. Information can simply be classified into the nature or nurture basket, and there is no more need to pay close attention.

FINDINGS 2: HOW THE MAJOR DIRECTIONS FARED

A number of apparently promising directions were discarded early because pilot testing made clear what a powerful trap the “Hallmark Problem” presents: Nearly any metaphorical description of children’s development is misinterpreted by lay people and understood as a colorful way of expressing some familiar truth – essentially, a proverb about children. This meant that it was unproductive to frame ECD in terms of exercise, symphonies/orchestras, garden plants, trees, toolkits, rivers, machines, conversations (between child and environment), exploration, and sailboats, for example. (Note that some of these failures confirmed skepticism raised in an earlier phase of this research, funded by the Mailman Foundation.)

Instead, the promising ways of expressing the central conceptual pieces seemed to include either very literal (if simplified) description, or a few metaphors that showed potential to be correctly understood as statements of new, factual information.

Interaction

This is a strong direction which, as hoped, lay people easily become engaged with. Thinking in terms of kinds of interactions also effectively primes lay people to focus on the causal factors that affect development. And most importantly, when interaction is described in new and concrete terms, it can open non-experts’ minds to new learning.

Mirroring

In particular, a discussion of “mirroring” – a specific type of interaction in which adults get “in sync” with babies and mimic their coos, gestures and facial expressions – struck subjects as new information, especially when paired with the idea that mirroring helps build and strengthen brain structure. Subjects almost always remembered the term, and were usually able to describe it well, when it was presented in the right context (i.e., in connection with brain development).

Mirroring is when you mimic the cooing, the faces the baby makes – not when the baby mimics you. So when parents or adults or whatever mirror the child it has a positive result.

While “mirroring” worked very well overall, it was not immune to misunderstanding and reinterpretation in terms of familiar schemas:

- “Reverse mirroring” – modeling

One source of interference was the common understanding that *children mimic parents* and learn from them:

mirroring, when the baby replicates the facial expressions and gestures that an adult or caretaker gives

This not uncommon mistake illustrates the power of familiar schemas, and their ability to block new information from entering our consciousness – subjects were explicitly told one thing, but heard the opposite.

- Mirroring as validation, positive reinforcement

Mirroring was also misremembered due to interference from the common understanding that it is important to make children feel good about themselves – under this misinterpretation, mirroring simply means “validating” children in a general sense by showing them that you approve of their actions. A subject who had heard a (second-hand) presentation about the Emotional Brain explained that mirroring is about

validating what they’re feeling by mirroring them, not the other way around.

Attunement

The term “attunement” – used by some child development experts to refer to the same aspects of interaction – proved less effective, because it was apparently too technical for many people to remember, and because when associated with a musical metaphor, the term was quickly reinterpreted to have an overly general meaning relating to supportive and “harmonious” interaction. Because these patterns were clear in early pilot rounds, the term was quickly discarded.

Emotional Development

The idea that emotional development is a central aspect of ECD seemed very promising for reasons discussed above, and substantial effort went into exploring some promising terms and explanations. In the end, however, discussions focusing on a child’s emotional development proved to be ineffective at conveying new information. Even when paragraphs included a great deal of information about the brain, for example, the introduction of the Emotion concept appeared to trump all other content, so that new information about ECD usually dropped out, and the conversation often degenerated into a recitation of truisms. The concept of Emotion appears to operate so powerfully in people’s thinking about ECD that any mention of it – or anything that can possibly be interpreted as a mention of it – guides the conversation towards comfortable and familiar understandings about nurturance etc., and blocks out new information.

Because this direction seemed initially promising, we analyzed and tested many different terms referring to the development of an emotional system or device (“E-X”).⁷ Of these, “emotional architecture” and “emotional brain” seemed to have some special strengths, which helped ultimately guide the testing toward the phrase “brain architecture.”

⁷ See the selection of E-X terms in Appendix 1.

The “Emotional Brain”

This term represented an attempt to frame emotional development in the most “materialist” way possible. Overall, responses to it in various rounds proved positive enough to continue testing. In some cases, it prompted comments which were directly in line with expert perspectives on emotional development:

The aspect of the brain that deals with one’s emotional thinking. Creates well-developed person...leads to success.

More generally, subjects (such as college students filling out questionnaires) associated the term with a body-based perspective, and there were indications that it might serve as an effective bridge between “mentalist” and “materialist” understandings:

Parts of the brain that develop emotional feeling

Regulates the levels of brain chemicals

Emotional areas of the brain, possibly having something to do with the amygdala

It sends messages throughout the body telling you to feel a certain way.

It uses feelings to choose how to affect the body

Responsible for controlling emotions – it releases chemicals that give people emotion

Part of the brain that connects emotion with the physical body

Where you store feeling

There were also particular indications that “emotional brain” might be a good way of promoting understanding of SER development:

The part of the brain that controls people’s emotions, depending on environment as well as brain chemistry

A person’s ability to control their emotions, and also how they express them.

The part of the brain mechanism that controls your emotions.

Associations with Emotional Intelligence (à la Goleman) were also taken as positive signs, since that concept has gained broad public currency, and is widely accepted as an important and *objective* aspect of human mental ability.

On the other hand, the term was sometimes subject to the “Hallmark problem” – it was interpreted as just another metaphor for a purely abstract aspect of a person:

How someone feels about things.

It was also subject to negative associations with the term “emotion”:

the illogical side of the brain

The part of you that wants to forget logic and just decide issues based on feelings.

Even when the emotional brain did not evoke negative associations with emotion, it did often evoke a contrast between emotion and reason. Since reason is so highly valued, this contrast seems unproductive.

How a person deals with their emotions and what part of the brain is stimulated. ..The emotional brain makes a person deal with their emotions and helps them or may hurt them with their actions.

the emotional side of people

the side of the brain that retains feeling

helps the child with coping, interaction, social skills and other nonacademic functions

It gives power to [over] emotions and allows someone to react in their own way to a situation.

Most troubling of all, TalkBack discussions of the Emotional Brain established that in a conversational setting, the term “Brain” all too often drops out of the discussion, which does not help lay people focus on a materialist understanding of development.

Pediatricians have done a survey and studied, it's called emotional ... emotional stress? Oh I can't remember now what is was called ... I can't remember the exact word that was used. Emotional ability?

After hearing a (first-hand) paragraph about development of the Emotional Brain, which mentioned the brain several times, this TalkBack subject began her summary without mentioning the brain at all:

We learned about pediatricians' studies of babies, and their emotional development. And there's a couple concepts about emotional development. The first one is mirroring. And the second one had to do with stress – I guess there's a positive one and a negative one.

As she and her partner continued to talk about what she heard, the brain still was not mentioned – and naturally it wasn't mentioned by later subjects in the same “chain” either.

In other cases, the brain was mentioned, but appeared to play no real role in subjects' thinking. After hearing a (third-hand) presentation on the Emotional Brain, this subject did mention the term emotional brain but described the topic as

the development of children and their cognitive abilities and capacities.

His summary of the effects of stress were that it

is received by the child in an emotional way

and that emotions such as stress and fear

can affect the ability of the child to learn and retain the information.

None of this reasoning refers to the brain, or to any material understanding.

In sum, explanations focusing on the Emotional Brain were not effective at helping subjects internalize new understandings, and were often heard as more technical restatements of obvious truths.

That just sounds normal – kid sees good things, good kid; kid sees bad things, bad kid.

“Emotional Architecture”

This term was suggested because of a number of positive analogical associations – it potentially adds notions such as solidity, complexity, strength/weakness, and foundations to the idea of emotion – the term “architecture” combines the concreteness of a *building* with the complex (and predictive) design of a *blueprint*.

how kids are put together emotionally, how they respond to the world

whether kids’ emotional structure is sound

How you react to situations and other people

Makes up a person and their behavior and choices.

A person’s structure... the way that they carry about their feelings

The building or structure of your mental emotions...helps to structure how you feel or think.

What the emotional psychology of a person is structured by.

It is construction of our emotional system.

Why it is that they respond [emotionally] in this way.

Why people have different responses to situations.

This TalkBack subject is able to generate a fairly coherent discussion of the brain’s structure.

Interaction with a stressed parent, or feelings of fear hunger, loneliness will weaken the structure of the brain in forming connections between cells.

Unfortunately, the term does not provide a solid enough “anchor” to keep non-experts grounded in a materialist perspective. They often “backslide” into familiar (even trivial) understandings of what children need.

There’s building blocks, and one of these building blocks in the beginning would be what happens when the child is young, how they’re affected, whether they’re in a safe environment or a non-safe environment

In a conversational (TalkBack) format, the “architecture” component of the term was not sufficient to offset the misunderstandings that arise during discussions that focus on a child’s emotional development. For instance, this subject misunderstands the directionality of mirroring:

You mentioned child mimicking a parent as being a way that they learn ...

And this subject misunderstands neural connections as social connections.

Stressful situations can influence a child's ability to make these connections and be happy.

Overall, the term “emotional architecture” was not strong enough as a “conceptual hook” to free people from the tendency to fall back into the mentalist perspective, but the associations with “architecture” were strong enough that the term “brain architecture” was introduced to the testing.

“Emotional Aptitude”

This term was considered because, like Goleman’s “emotional intelligence,” it can suggest the central importance of healthy emotional development in overall success and wellbeing. Some early subjects did respond along these general lines.

*The potentiality as far as social and emotional functions
emotional health
how a person reacts
expected emotional state*

On the other hand, the term is also misinterpreted as the ability to *intellectually* understand or analyze feelings – others’ or one’s own. (Note that this is also a weakness of the term “emotional intelligence.”)

*Understanding your emotions and analyzing your feelings
a person's understanding of his/her emotions*

Furthermore, the term “emotional aptitude” can sound like something a person gets trained in as an adult – sidestepping the issue of development. (This is also a weakness of “emotional intelligence.”)

The term is also misinterpreted as simply a scale of emotionality (in which case greater “aptitude” would not necessarily be a positive).

*how emotional a person is [note – a tendency is for emotional to be an
ingredient, of which women have more]
determines their level of emotion*

“Emotional Character”

This term was considered because it is fairly close to lay people’s current patterns of thinking, but might suggest a quality that it is important to develop early.

*Basis for decision-making
A person's ability, their emotional capability, their limits*

The term was ultimately dropped because it is *too* close to current understandings, and showed little potential to move people beyond familiar notions.

it has to do with their personality

how a person reacts to events in their life

what emotions a person is likely to exhibit in response to certain situations

the way an individual responds to various situations...such as a death in the family or a fight.

“Emotional System”

Like many of the tested terms, this one was intended to emphasize that emotional responses are not haphazard or even entirely conscious – they are in some sense the predictable products of an existing structure.

Some of subjects’ responses to explanations using this term reflected this sense of a system whose early development continues to have consequences later.

Positive experiences produce children emotionally ready for life’s challenges.

How a child is treated early will likely determine to a great degree their quality of life.

Influences and environment that a child experiences at a young age have a lasting life-long impact.

On the other hand, there was little sense that the term helped convey any new information. Instead, people often “recognized” a comfortable and familiar perspective in discussions of the emotional system.

“As the twig is bent, so grows the tree.”

What you give your children is what get out of them. Essentially “do unto others.”

A good home environment contributes greatly to a child’s positive emotional development. A poor environment creates negative consequences.

Children need to be loved, cherished, taught, and helped.

Positive childhood experiences are key in solid child development.

“Emotional Response System”

This term was an attempt to promote a relatively mechanistic version of the folk model of the mind – while it does not refer to the brain, it does suggest an organized, structured mechanism which could either be in better or worse shape.

how individuals respond emotionally/mentally to certain events in their life

the way you react emotionally to a situation...a natural mechanism

the system in which we respond to situations
our psychological reaction to something. Everything has a cause and effect.
the message is sent to the brain and an emotional response is presented [note
that the subject had only seen the term, and no mention of the brain]

The term performed well overall and was only dropped because of the greater overall assets of “Emotional Brain” and “Emotional Architecture.”

“Emotional Regulator”

This term was considered because of the importance of self-regulation in expert understandings of emotional development, and because it suggests a physical device which plays an important role in regulating a system.

The term was abandoned early because subjects found it confusing, and especially because of strong associations with *external* factors that can regulate (e.g. “even out”) our emotions – pharmaceuticals, music, nature, etc.

“Emotional Driver”

The idea behind this term was that an analogy with pieces of software called “drivers,” which guide and control various physical devices connected to a computer – a person’s emotional system can be thought of as guiding and organizing behavior.

The term was abandoned quickly because of a pattern of associating it with “drive” as in motivation.

Something that motivates a person

The Brain

Advocates on early childhood issues know the importance of research findings in the field of brain development, and also recognize that this information can engage the attention of parents and others. Many of the materials produced by organizations focused on children refer to recent findings in brain science, and to general lessons about what children need in order for their brains to develop in a healthy way. But advocates may not realize how little information about the brain has seeped into public consciousness, how rarely people think in terms of children’s brain development, and how narrowly limited the relevance of brain-related information can seem to lay people.

For reasons outlined above, information about the brain should have a special potential to engage the attention and interest of the public, and to shift them to new and productive perspectives about childhood development. Yet previous research has shown that people rarely think about the brain in connection with young children, and that they can even

find mentions of the topic off-putting.⁸ The challenge for the TalkBack research was to identify ways of talking about brain development that have the potential to be remembered and internalized by the public, and to open lay people's minds to new learning.

In the TalkBack testing, discussions which effectively framed the topic of the brain proved to be very effective at getting and keeping people's attention, and at getting them to shift to a more objective and factual perspective on development.

I think what really gets me from the study is that it could actually have a chemical or biological or some sort of impact on the child's brain. ... Behavior is one thing, and attitude and personality is one thing, but if it can really negatively impact ... the chemistry and the makeup of the brain - you can damage that that early – that's really serious. That's more than just having a bad personality, that's really screwing up a kid.

In particular, the phrase “brain architecture” – presented in the context of a causal story about interaction – was not associated exclusively with intellect and IQ, and did not strike people as too clinical to be comfortable or relevant. If explanations are not framed properly (e.g. if they focus too much on emotion), then the brain drops out as a conceptual element. But if explanations do focus on the brain, and are made simple and vivid – and “humanized” by association with topics like interactions between adults and babies – lay people are capable of staying focused on understandings which approximate expert models. This summary (by a TalkBack subject) demonstrates that the person has internalized a coherent (if very much simplified) set of causal stories about brain development:

The study is about what stimulates the brain [i.e. mirroring] and what sends out toxins in the brain [i.e. stress]

These excerpts from telephone interviews demonstrate that the phrase “brain architecture” effectively conveys the idea of a material, concrete and complex object with multiple parts and functions.

the shape of the brain

how the brain is made up

all of the working pieces together to make one piece

the different parts of the brain control different things – a very well planned out, intricate, complex system

the different regions of what they apply to – like, this part is emotion, this part is/the way that the brain is broken up into and what each, like the hypothalamus, whatever, what it means in your body and as well as your personality

⁸ See, for example, M. Bostrom's (Public Knowledge) focus group research and Cultural Logic's report, “Promoting School Readiness and Early Child Development,” commissioned by the FrameWorks Institute for the David and Lucile Packard Foundation.

it's the building of who you are, just the levels, the rooms ...

how the different parts of the brain are located. Like, there are creative/ or another part of the brain, maybe analytical part of the brain, like the right and left half of the brain and so forth

“Brain architecture” also seems to serve as an effective bridge between mind and body – naturally it is important that people understand that brain architecture is important to the whole *person*, not just in a medical sense.

The make-up of the brain, physically and psychologically

Many subjects are able to imagine that “brain architecture” is built and shaped by experience

I think preschool does have a lot to do with the building of the brain and I guess you would say architecture as well because it's their first experiences

but others express surprise (of a productive kind) that the architecture is not entirely genetic.

Like anything related to the brain, “brain architecture” is sometimes associated primarily with intellect:

You have to use your brain in every aspect [of life], that's the one tool that we have for reasoning and so on, the mind.

[Brain architecture relates to] intelligence quotient, IQ, memory...

But with many subjects, the term evoked broader associations, even in the absence of any other context or explanation. These subjects were simply given the term “brain architecture,” with no explanation, and asked what aspects of life it might relate to.

future, financial future and mental stability, family, um, geez, just choices social dynamics, maybe the way your brain functions, just your social intelligence, ... maybe the way you actually go about solving problems

If you have a bigger brain mass in a certain area, maybe that has an impact on [whether] you would react emotionally or intellectually to a certain situation. [i.e. depending on whether emotional or rational parts of the brain are more dominant within your particular architecture]

your emotional part of your life?

Brain Chemistry

One particular causal story which people were able to grasp and repeat – and which served as a “doorway” into the supercomplex world of the brain – was the idea that stress releases chemicals in the brain that damage brain structure.

Stress makes babies' brains release a chemical that stunts cell growth

Note that the word “stunts” was not part of the explanation the subject saw, and reflects the fact that he is not merely parroting. Another subject embellished the explanation in a vivid way, stating that stress causes the release of chemicals that

corrode the brain’s infrastructure.

By comparison, subjects who heard about the “Emotional Brain,” (which emphasizes emotion more and “material” development less) were more likely to omit any mention of chemicals, or to reinterpret them as chemicals in the body. This subject heard a (second-hand) presentation about the Emotional Brain, and then reported that stress is a negative factor because

the child’s body is robbed of certain abilities to manufacture chemicals that allow for proper emotional development.

Note that this subject in fact left out any mention of the brain – not surprisingly, since the (second-hand) presentation he heard began with a topic statement about how the emotional development of a child is based on his or her environment.

A very general positive effect of discussions focusing on chemicals in the developing brain is that they anchor lay people in a more materialist understanding of development – which turns out to be an important starting point for taking in new information about the causal factors in early childhood development. Even when subjects had some objection to a proposition about chemicals in the brain – or when they themselves didn’t mention chemicals in their discussion – their thoughts seemed to stay grounded in the physical world.

Just because a child’s experiences stimulate chemicals that are released into the memory center of his/her brains, doesn’t that they will be totally controlled by these chemicals later.

Negative stimulation has a negative physical effect.

Stressful environments cause a chemical imbalance affecting a child’s growth and development.

Certain chemicals can affect a developing child either negatively or positively.

Healthy brain development is dependent on chemical stimulation that can occur from outside factors including a nurturing environment.

Brain architecture and mirroring

A connection with brain architecture also seems to lend the notion of mirroring a special concreteness and importance. This subject, for example, is so persuaded about the importance of mirroring that she is miffed that her doctors didn’t take the time to tell her about it while she was raising her own (now fully grown) children.

I don’t know that I would even have to know why [mirroring helps] ... I raised three children and I don’t feel that that was imparted to me.

Advocates, of course, would hope that more pediatricians *would* now find the time to talk about brain development with parents – and that parents would expect to hear about this important information.

School Readiness

The “School Readiness” frame was included in several rounds of testing (see Appendix 2 for a sample School Readiness text), and intended as a control for comparative purposes. Since this frame has gained considerable popularity and enthusiasm among advocates, we were interested in comparing the kinds of responses it evoked with responses to frames involving more specific information about development.

Our conclusion, based on qualitative evidence (and confirming findings from earlier FrameWorks research), is that this frame does little to help people think about early childhood development in a new way. Overall, discussions also do not stay particularly focused, and do not strike people as new information.

While this concept may be useful for short-term motivation – it is easily connected with relevant policies – we feel that in the long run advocates will need other tools (such as those tested in this project) in order to promote the variety of policies they have in mind.

Priming familiar perspectives

The School Readiness frame does seem to be effective at reminding people of what they already believe about what children need.

Children that do not have proper stimulation or care in early childhood are more prone to lack the proper development in social, cognitive, and educational skills needed in life to succeed

In some cases, the School Readiness frame reminds people of constructive policy preferences.

Lack of memorability

On the other hand, subjects have a hard time remembering and repeating the term “school readiness” (or related terms such as “ready to learn”), probably because there is very little specific substance to the concept. Many of subjects’ attempts to recap the “School Readiness” story do not include any particular term that has “stuck” with them.

Q: First I’d like to ask you to repeat as much as you can remember of the information I just read you, including any particular terms you recall.

A: Um, well, I don’t remember. I know it was something about the main idea was that students who come equipped for school, or ready, are simply better suited to the rigors of school.

Tautology

TalkBack subjects' attempts to recap the School Readiness story often have a trivial or tautological quality, amounting to the idea that if kids are not well prepared for school they will do poorly in school. That is, the important part of the story related to *other types of outcomes* (crime, pregnancy, etc.) often drops out, since school itself seems central to the frame.

The more prepared they are beforehand, the more effective they will be and the more success they will have

Children who are not adequately prepared for school can suffer and fall behind

Children who have done pre-schools, have better communications, linguistic skills and lower drop out rates in education and education is vital for children.

No new understanding of ECD

Subjects who hear about “school readiness” make various guesses about how children can be prepared to learn, but there is nothing about the frame that helps them speculate in a consistent or productive way. This subject is trying to imagine why poor children have more trouble as they begin school:

I think without financial money, I guess you couldn't buy them things, the learning tools, maybe the computers or learning toys or something like that.

Another recurring problem with terms like “school readiness” and “ready to learn” is that they are often initially misinterpreted as references to preparedness *on a given day*. With this interpretation, subjects think about kids getting a good night's sleep, having their books packed, and so forth. Related to this interpretation is the tendency for subjects to think of school readiness as something that refers exclusively to school age children – a direct contradiction of the emphasis of ECD advocates.

A Note on Policy-related Effects

It was initially hoped that this round of testing could yield strong evidence of the effectiveness of particular simplifying models at moving members of the public in productive directions with respect to their policy views. Because the pilot testing and refinement of the simplifying models proved to be such a challenging process, it was impossible to create statistically meaningful comparisons of people's policy views based on which material they were shown. (As has been demonstrated in many studies, changes in policy views based on brief exposures to new material are always subtle enough to require statistical demonstration.)

On the other hand, the testing did yield qualitative indications that the recommended models can help move people in the right directions. The example responses below

cannot be called “typical” without more quantitative testing, but they do illustrate patterns observed in the research.

Effects of poverty on ECD

Many people understood that the connection between stress and brain structure is important and is a reason why children from poor families are at a disadvantage. The “family bubble” problem is very stubborn, but the recommended models seem to help people recognize that the stresses caused by poverty affect children in ways that parents are not ultimately responsible for.

Here is a response from a person who has heard an “Emotional Brain” paragraph, which includes no mention of poverty:

Q: How does growing up in poverty affect the emotional brain?

A: I believe because you’re stressed a lot because you have a lot of stress; usually parents that do not make a lot of money are usually under a lot of stress, so that makes the child be under stress as well, so that would affect I guess the growth of the brain.

By contrast, here is a less helpful response from a subject who has heard a “School Readiness” paragraph:

Q: How does growing up in poverty affect a child’s school readiness?

A: I would say in a lot of cases, I wouldn’t say in all cases, growing up in poverty would hinder them, but I guess in some cases it would hinder them, sort of being ready to get to school as knowing, I guess maybe kids who are not in poverty growing up do have an advantage, as far as they probably know a little more when they do start school than children who are raised in poverty.

Role of daycare in ECD

The most common application from the recommended models to daycare is that providers should spend quality time interacting with children and “mirroring” them.

Good daycare = stress-free, caregivers paying attention to baby’s needs: hunger, diaper changing. Loving caregivers that play with children and music, play, song, etc. Bad daycare = a place where they keep them “safe” without individual attention

The caregivers need to spend time with the children – interaction is important – actually imperative

Good daycare provides positive stimuli (mirroring). Negative daycare stresses out the babies

Having the staff to take the time to spend time with individual children one-on-one. Responding to their gestures and verbal interaction

Many subjects also suggested that daycare itself is probably a negative, given the importance of interaction with parents – a conclusion supported by the expert research.

I tend to think there's a negative impact on the brain architecture [from daycare] because ... you know, the nurture argument, so if you have a loving home, there's the potential to positively impact the brain architecture.

By contrast, people who have seen a “School Readiness” often offered perfectly reasonable opinions about daycare, but not based on a developmental perspective, per se.

I suppose socially [daycare] would help out. It would help the kid socially and depending on the curriculum I suppose they would learn the basics before they got into kindergarten then.

Role of pediatricians in assessing development

The recommended models appear to help people recognize the appropriateness of having pediatricians assess ECD, including children’s emotional development, mental health, and even “brain architecture.”

Q: Some people have suggested that children’s emotional health should be assessed now and then. Does this seem like a good idea to you? Why or why not?

A: Yes. It seems that the earlier years are so key that the earlier an emotional problem could be caught, the better chances are for a child to make the right brain connections.

And, another response to the same question:

A: It probably is a good idea, but should be done by professionals such as doctors and trained medical personnel.

In sum, various helpful patterns could be seen in responses from subjects exposed to the recommended models of child development, but further research will be needed in order to test their effectiveness quantitatively.

CONCLUSION: THOUGHTS ON FUTURE RESEARCH

Changing the public's thinking about early childhood development involves refining or replacing understandings with hundreds or thousands of years of tradition behind them. The research and testing reported on here represents a step in the right direction, but it is clear that additional research will be necessary in order to keep this important and challenging cultural work moving forward. Among the steps that can help confirm and improve on the current findings are:

Further testing of policy impacts

This round of testing did not yield strong conclusions about the effects of simplifying models on people's policy-related views. While there were a number of (qualitative) indications that the models help move lay people in the right directions, there is room for substantial additional work on this question. This further work should include, for example, refinement of the key policy indicators themselves.

Development of additional simplifying models

In some sense, the simplifying models here were chosen as (especially promising) *examples* of how new understandings of early childhood development might be conveyed to the public. There are obviously many stories that can be told about the brain, for example. The idea that stress causes the release of chemicals which are damaging to brain architecture is one story that is remembered and grasped, and helps lay people focus on a developmental perspective, but we have no reason to believe it is the only one. The findings reported on here – including the obstacles and dead ends encountered along the way – can help guide continuing work toward the goal of improving public understanding of ECD.

Comparative/quantitative testing of terms

The testing in this round was qualitative, and would be strengthened by quantitative comparisons with statistical validity – e.g. about which terms are better remembered, or are more strongly associated with correct inferences about development.

APPENDIX 1: LIST OF TERMS FOR “EMOTIONAL X”

One of the directions pursued in the testing was the idea that ECD crucially involves the development of a child’s emotional system, including a “device” that is responsible for our emotional responses (healthy or unhealthy) to situations. The following terms are a sample of the potential candidates that were generated for talking about the emotional system/device.

Emotional Activator	Emotion Channels	Emotional Dynamo
Emotional Actor	Emotional Circuitry	Emotional Ecology
Emotional Adaptor	Emotional Clarifier	Emotional Editor
Emotional Adjudicator	Emotional Code	Emotional Elementals
Emotional Adjuster	Emotional Coefficient	Emotional Elements
Emotional Advisor	Emotional Components	Emotional Elicitor
Emotional Agency	Emotional Conductivity	Emotional Embryo
Emotional Agents	Emotional Conductor	Emotional Empathizer
Emotional Anchor	Emotional Conduit	Emotional Emplacement
Emotional Arbitrator	Emotional Cone	Emotional Enabler
Emotional Architecture	Emotional Connectivity	Emotional Energies
Emotional Arrangement	Emotional Connector	Emotional Energy Center
Emotional Arranger	Emotional Constituency	Emotional Engineer
Emotional Array	Emotional Construct	Emotional Envelope
Emotional Arrows	Emotional Construction	Emotional Environment
Emotional Ascender	Emotional Constuctor	Emotional Equalizer
Emotional Assembler	Emotional Context	Emotional Executor
Emotional Atmosphere	Emotional Continuity	Emotional Fabricator
Emotional Attunement	Emotional Contract	Emotion Facilitation
Emotional Background	Emotional Control Panel	Emotion Facilitator
Emotional Backpanel	Emotional Controlpad	Emotional Factor
Emotional Base	Emotional Controls	Emotional Factory
Emotional Basement	Emotional Coordinates	Emotional Factualizer
Emotional Bevel	Emotional Coordinator	Emotional Field
Emotional Bias	Emotional Core	Emotional Flexor
Emotional Blueprint	Emotional Creation Set	Emotional Floorplan
Emotional Body	Emotional Cursor	Emotional Focus
Emotional Brain	Emotional Dashboard	Emotional Folder
Emotional Building	Emotional Datastore	Emotional Force
Blocks	Emotional Delta	Emotional Formant
Emotional Canvas	Emotional Design	Emotional Formation
Emotional Capacitance	Emotional Designation	Emotional Formatting
Emotion Capacitor	Emotional Designator	Emotional Formulation
Emotional Case	Emotional Designer	Emotional Formulator
Emotional Catalyst	Emotion Developer	Emotional Foundation
Emotional Causal Base	Emotional Device	Emotional Fuel
Emotional Cellar	Emotional Directives	Emotional Gate
Emotional Center	Emotional Distribution	Emotional Gearbox
Emotional Centerforce	Emotional Distributor	Emotional Generator
Emotional Central Site	Emotional Domain	Emotional Girders
Emotional Changepoint	Emotional Drive Train	Emotional Grade
Emotional Channeler	Emotional Dynamics	Emotional Gradient

Emotional Graduator	Emotional Operant	Emotional Sounder
Emotional Grammar	Emotional Operations	Emotional Source
Emotional Gray Matter	Emotional Orchestra	Emotional Spectrum
Emotional Grid	Emotional Orchestrator	Emotional Spring
Emotional Group Factor	Emotional Organ	Emotional Stabilization
Emotional Grouping	Emotional Orientation	Emotional Stabilizers
Emotional Growth Matrix	Emotional Overview	Emotional Standards
Emotional Guidance System	Emotional Panel	Emotional Status
Emotional Guywires	Emotional Pathways	Emotional Stem
Emotional Gyrus	Emotional Pie	Emotional Stimulator
Emotional Handle	Emotional Placement	Emotional Structures
Emotional Harmonic	Emotional Plane	Emotional Struts
Emotional Headwaters	Emotional Playbook	Emotional Studio
Emotional Home	Emotional Pointers	Emotional Sublayer
Emotional Homebase	Emotional Portfolio	Emotional Subregion
Emotional Horizon	Emotional Powerplant	Emotional Superset
Emotional Identifier	Emotional Preview	Emotional Superstructure
Emotional Indicators	Emotional Prime	Emotional Synthesis
Emotional Infrastructure	Emotional Print	Emotional Synthesizer
Emotional Instruction Set	Emotional Program	Emotional System
Emotional Instrument	Emotional Quantity	Emotional Tabulator
Emotional Instrumentation	Emotional Quiver	Emotional Terrain
Emotional Integrator	Emotional Reactor	Emotional Thermostat
Emotional Integrity	Emotional Realizer	Emotional Toggle
Emotional Internet	Emotional Receptor	Emotional Tonotrope
Emotional Intrinsic	Emotional Reflector	Emotional Toolbox
Emotional Lexicon	Emotional Refractor	Emotional Tools
Emotional Litmus	Emotional Regimenter	Emotional Topography
Emotional Lobe	Emotional Register	Emotional Touchpoint
Emotional Manifesto	Emotional Registry	Emotional Transformer
Emotional Map	Emotional Replicator	Emotional Triggerpoints
Emotional Matrix	Emotional Resonator	Emotional Underpinning
Emotional Mechanics	Emotional Resourcer	Emotional Validator
Emotional Medium	Emotional Responder	Emotional Vector
Emotional Meters	Emotional Revisor	Emotional Volume
Emotional Method	Emotional Rig	Emotional Web
Emotional Mindset	Emotional Scaffold	Emotiset
Emotional Model	Emotional Scalar	Emotistat
Emotional Modification	Emotional Scope	Emotivator
Emotional Modifier	Emotional Script	ERC (Emotion Response & Control Mechanism)
Emotional Motivator	Emotional Sculpture	ERF (Emotional Response Function)
Emotional Motor	Emotional Selector	ERM (Emotional Response Mechanism)
Emotional Motor Skills	Emotional Sensitizer	ERS (Emotional Response System)
Emotional Navigator	Emotional Sensor	
Emotional Nerve	Emotional Server	
Emotional Nest	Emotional Set	
Emotional Net	Emotional Settings	
Emotional Network	Emotional Setup	
Emotional Nucleus	Emotional Shaper	
Emotional Nydus	Emotional Sightlines	
	Emotional Skill Set	

APPENDIX 2: SAMPLE EXPLANATORY PARAGRAPHS

Brain Architecture – Mirroring – Stress/chemicals

More and more doctors are talking to parents and communities about what they call “brain architecture.” Brain architecture refers to the structure of the brain. We now know that if a baby doesn’t have the right kinds of interactions in the first few years of life the baby’s brain architecture doesn’t build itself properly. And if the brain architecture doesn’t build itself properly, kids can be at a disadvantage in long term ways. We know a lot about what helps and hurts the growth of brain architecture. What helps build and solidify brain architecture is Mirroring. Mirroring isn’t about babies imitating adults. It’s about adults instinctively mimicking the baby’s facial expressions, coos, and gestures for example. This practice strengthens the architecture. What weakens and damages brain architecture is frequent stress – from fear, hunger, or interacting with a parent under stress, for example. Stress releases toxic chemicals in the baby’s brain. These chemicals corrode and weaken brain architecture. This stops brain cells from growing and forming connections with each other.

Brain’s Emotional Architecture – Mirroring – Stress/chemicals

Pediatricians are paying more and more attention to what they call the brain’s emotional architecture. We now know that the emotional architecture of the brain determines how we feel and respond in all different situations. We also know that this architecture is built and strengthened by a child’s interactions with caregivers in the first years of life, and especially by “mirroring” – when adults instinctively get in sync with babies and mirror their facial expressions, coos or gestures. Frequent stress – from hunger, fear, or interacting with a parent under stress, for example – weakens and damages the brain’s emotional architecture by releasing chemicals in the brain that stop cells from growing and forming connections.

Brain chemicals

New research shows that different kinds of experiences cause different chemicals to be released in a young child’s brain, and that these chemicals have important effects on the child’s development. A young child’s developing brain is like a plant’s immature root system, that requires the right environment to grow and develop in a healthy way. Stressful experiences release negative chemicals in the brain, like cortisol, that make it harder for neurons to form connections with each other. Positive experiences release chemicals that promote growth and development. But a child’s brain development can be stunted by the chemicals associated with stress.

Attunement of the Brain

New research shows that “Attunement” is one of the most important factors in the development of an infant’s brain. A baby’s brain “tunes” itself to the world, through give

and take with other people. If a baby does not receive the right kind of feedback in response to his or her actions, parts of the brain don't grow or develop in the way they should. The right kinds of interaction between infant and adult help parts of the brain develop and organize themselves, so that a child is able to respond appropriately to new experiences.

Emotional Brain – Mirroring – Stress/chemicals

Pediatricians are paying more and more attention to what is called the “emotional brain.” We now know that the emotional brain determines how we feel and respond in all different situations. We also know that the architecture of the emotional brain is built and strengthened by a child's interactions with caregivers in the first years of life, and especially by “Mirroring” – when adults instinctively get in sync with babies and mirror their facial expressions, coos or gestures. Frequent stress – from hunger, fear, or interacting with a parent under stress, for example – weakens and damages the structure of the emotional brain by releasing chemicals that stop brain cells from growing and forming connections.

Emotional Aptitude – Mirroring – Stress/chemicals

Researchers have recently discovered a key factor that determines a person's ultimate happiness and success. They call this a person's Emotional Aptitude, and Emotional Aptitude is active in all aspects of thought and behavior – from learning in school, to making good decisions. The development of Emotional Aptitude depends on a process in early childhood known as “Mirroring.” When parents instinctively mirror their babies' smiles, coos or gestures, this mirroring process triggers development of the brain's Emotional Aptitude. We also know that development of a child's Emotional Aptitude is impaired by frequent stress – from things like hunger, poverty, or interactions with a parent under stress. Research has shown that stress *prevents* the growth of Emotional Aptitude by releasing chemicals in the brain that stop brain cells from growing and forming connections.

Ready to Learn

When children don't come to school ready to learn, they are starting at a disadvantage, and may never achieve their full potential. These children can face alarming challenges as they begin their school careers. Children who enter kindergarten without the healthy minds and bodies they need in order to succeed face academic and social problems — for example, they have significantly higher dropout rates than kids who are ready to learn. Children who do come to school equipped to succeed have a specific set of cognitive, linguistic, social, and motor skills that allow them to do well in school and beyond.

About the Author

Cultural Logic, directed by anthropologist Axel Aubrun and linguist Joseph Grady, is an applied cognitive and social science research group that helps organizations frame their messages for maximum effect. Working with a network of experts and partner organizations including the FrameWorks Institute, Cultural Logic focuses on research relating to public interest issues. Topics have included global warming, violence reduction in communities, conserving the Chesapeake Bay, global interdependence, gender equity in schools, and toxins in the domestic environment. Axel Aubrun, Ph.D. is a psychological anthropologist whose research and publications take an interdisciplinary approach to problems of communication and motivation. Joseph Grady, Ph.D. is a linguist whose research and publications focus on the relationship between metaphor and other aspects of thought and communication.