Modernity, Morals and More Information:

Mapping the Gaps Between Expert and Public Understandings of Early Child Development in Australia

Kendall-Taylor, N. & Lindland, E. (2013). *Modernity, Morals and More Information: Mapping the Gaps Between Expert and Public Understandings of Early Child Development in Australia.* Washington, DC: FrameWorks Institute.

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INTRODUCTION

The research presented here was sponsored by the Centre for Community Child Health and is part of a larger collaboration between the Centre and the FrameWorks Institute that seeks to shift and expand the public conversation around early child development in Australia. This particular report lays the groundwork for this larger reframing effort by comparing how experts and members of the Australian public talk and think about early child development.

Over the last 10 years, the FrameWorks Institute has conducted multi-method, empirical communications research in the United States and Canada[1] on how to effectively translate scientific information about early child development to public and policymaker audiences. This research has produced a "Core Story of Early Child Development" — a narrativized set of communications tools — that has been shown empirically to increase public understanding of science messages and shift public opinion towards support for evidence-based early childhood programs and policies.[2] The research presented here represents the first step in developing a Core Story of Early Child Development that can be used for these purposes in Australia.

This report is comparative in two ways. First, it "maps the gaps" between expert and Australian public thinking on early child development. With knowledge of these gaps, FrameWorks researchers propose to move toward the second stage of Strategic Frame Analysis™: identifying and testing communications strategies that close these gaps by expanding and channeling the ways that Australians think about child development — making science an available source of information as they reason and make decisions about public policy issues. The comparison, thus, is between what exists in mind and what could be achieved via reframing.

The research presented here is also comparative in that it looks at understandings of early child development across cultures. FrameWorks' existing work, as well as scholarship from psychological anthropology more generally,[3] has shown that patterns of understanding are heavily influenced by culture and therefore vary across cultural groups — even between those that we generally think of as similar, such as Americans and Canadians. Comparing data gathered in the United States and Canada with those recently collected through interviews with a sample of Australians allows us to look at similarities and differences in how individuals from these populations understand child development. This is essential from a strategic perspective — it allows us to leverage a decade of existing communications research for use in Australia. The key to this leveraging is the conceptual nature of the mapping-the-gaps exercise, which produces a set of conceptual challenges that must be addressed in order to successfully translate information. By conducting this exercise across cultures, researchers can see where conceptual challenges are similar. Where a similar conceptual challenge is found, the tools designed to address the challenge in the original context have promise in the new

communications context. Of course, confirmational research is necessary in such cases to assure that the tool functions similarly across cultural contexts. Comparing the results of the mapping-the-gaps exercise across cultures also reveals differences in translational challenges. These differences suggest the need for new prescriptive strategies that address context-specific obstacles to effective science translation. Differences also suggest areas that may have been particularly challenging in the initial context but that do not pose a challenge in the new context. In this case, recommendations can be streamlined and unnecessary tools set aside. In summary, the cross-cultural comparison of communications challenges allows communicators to efficiently use existing framing tools and to be strategic in the development of new recommendations.

The remainder of the report is organized as follows. We (1) present a summary of the report's key findings, (2) review the research methods, (3) present and compare the expert and public stories and describe the implications of these findings for translational work, and (4) conclude with recommendations that can be used to improve communications practice around this issue in Australia, as well as implications for future communications research in the country.

EXECUTIVE SUMMARY

The Expert Story of Early Child Development
FrameWorks drew on over 70 interviews conducted with Australian and international experts in child development, as well as 10 years of participant observation at science and professional meetings, to construct the expert story outlined below. We then compare this to the public's narrative, based on data from 40 interviews conducted with ordinary Australians (see methods section for more details).

- *What is early child development about?*
  It's about the brains of young children, the way these brains change, and the role of genes, biology and the environment in this change.

- *What develops?*
  The brain develops, which effects the development of skills and mental health.

- *How do children develop?*
  Genes and environments interact to shape development. Personal interactions and relationships are key in this process, as are opportunities to apply skills in supportive contexts.

- *What threatens development?*
  Chronic, unbuffered stress and ineffective policies threaten development.

- *What can be done to improve development and outcomes?*
  Using what we know from cutting-edge science to provide high-quality services to children and effective supports for their parents and caregivers will lead to positive developmental outcomes for more children.

The Australian Public's Story of Early Child Development

- *What is early child development about?*
  It's about childcare, physical safety and a time when things were better for kids and their families in Australia. It's about school age children who are similar to some children but very different from others.

- *What develops?*
  Morals, discipline, self-reliance, social skills and the ability to be happy.

- *How do children develop?*
  Children are filled up with content by being exposed to relatively simple worlds. They have traits and characteristics that are determined by genes or shaped by environments, and they develop by being challenged and supported as they meet these challenges.

- *What threatens development?*
  Development is threatened by unfortunate changes that are part of modernity, by parents who don't parent well because they don't have enough information, and by a system of medicine and science that over-diagnoses and over-prescribes medication.

- *What can be done to improve development and outcomes?*
  We can improve development by going back to a time when families and communities were strong, by giving people more information so that they can be better parents, and by improving the education system so that it does a better job of teaching children what they need to know how to do.

Key Gaps

There is a set of gaps between these stories. By bridging these expanses, science information on early child development can be made more accessible and applicable in how the public thinks and makes decisions about this issue.

1. *Childcare: A site of development vs. a place to put children where they will be safe while parents work.* While experts see childcare as a site where key developmental processes take place, members of the Australian public have a different mental image of childcare — as a custodial institution where physical safety is the primary concern.

2. *Similarities and differences: Common processes vs. group differences.* There is a marked difference between the expert emphasis on common, underlying processes of development, and Australians' focus on differences between groups of children.

3. *The process of development: Active and dynamic vs. passive and uni-directional.* Using one of their dominant ways of thinking about development, Australians conceive of children as passive absorbers of content. The expert account, on the other hand, is built on the understanding that active and participatory interactions between child and caregiver drive development.

4. *Relationship of causal factors: Interactive vs. discrete.* For experts, synthesis and interaction are the dominant features of the connection between causal factors and outcomes — genes interact with environments to shape all outcomes. From

the public's perspective, genes influence some outcomes and environments others in a discrete way.

5. *Stress: Developmental derailer vs. (almost) non-existent.* For experts, stress is a key threat to development, whereas Australians have a view of the worlds of young children — as simplified and uncluttered by influences — that impedes the ability to see stress in the lives of young children, let alone recognize its long-term negative effects.

6. *Science: Solution vs. part of the problem.* While experts see science as a source of effective remedial programs and preventative policies, several of the public's ways of thinking about development create a powerful science push-back — in some cases casting science as the source of problems.

7. *Information: Better vs. more.* For members of the public, the remedial power of information hinges on its amount and availability, and Australians explain that more information about parenting leads to better parenting and thus improved developmental outcomes. For experts, the focus is on the *quality* of information and its implications for practice.

8. *Temporal focus: Forward vs. backward.* Australians look backwards to find solutions to current issues of child development — to an idyllic past when every child had two parents, a full-time mom, "heaps of quality family time" and a strong community. Experts, on the other hand, see the progress of scientific knowledge as the way to create better programs and improve outcomes.

Strategic Overlaps

In addition to these gaps, there is a set of overlaps — areas where the expert account and the public's thinking merge on key principles. These are areas which science communicators can leverage to begin to move science more effectively into the public discourse around children's issues.

1. *How skills develop: Challenge and scaffolding.* Both experts and members of the public emphasize a similar process by which skills develop — through the provision of skill-appropriate challenges in the presence of support.

2. *Focus on skills and recognition of what skills matter.* Both experts and ordinary Australians place importance on skills as the products of development and, further, agree as to the specific skills of importance.

3. *Environments matter.* The deep recognition on the part of the public as to the importance of environments in the developmental process is another key area of overlap with the expert account of early child development.

4. ***Information is a part of the solution.*** The recognition that information provision is part of the solution is, despite difference in understanding the way in which communication can improve outcomes, another strategic overlap.

Future Directions
Future communications research will need to confirm existing framing tools and recommendations in the Australian context. Based on the similarity between the conceptual challenges identified in Australia and those documented in the U.S. and Canada, the following reframing tools developed by FrameWorks hold promise and warrant confirmational testing in Australia: *The Resilience Scale*, *Environmental Edits/Signature*, *Levelness*, *Toxic Stress*, *Weaving Skill Ropes*, *Serve and Return*, *The Brain's Air Traffic Control System* and *Brain Architecture.*[4]

In addition, future research will need to develop a set of new communications tools to address gaps and challenges unique to the Australian context. Specifically, further concretizing the process by which skills develop and building a more comprehensive understanding of the factors that affect prenatal development appear areas ripe for the development and testing of original explanatory metaphors. Additionally, the dominance of the *Threat Of Modernity* cultural model, and the backward-facing perspective that its application creates in thinking about solutions, suggest that developing and testing *Values*[5] will be important in shifting from a conservative, backward-facing remedial perspective, to one focused on progressive, evidence-based solutions.

Initial Recommendations
The following are a set of initial recommendations that can begin to guide those communicating about the science of early child development in Australia based on this strategic analysis.

DO:
1. Reference specific age groups in communications about early child development.
2. Explain specific ways in which context is key, and develop clear explanations of how contexts shape outcomes.
3. Activate and build on Australians' understanding of how skills develop.
4. Reinforce the public's belief in the importance of developmentally important skills like planning, problem solving, self-reliance, behavioral and emotional control, and self-awareness.
5. Link the individual level to wider community and societal levels — both in terms of causal factors and outcomes.
6. Expand patterns of thinking in which contexts are seen in exclusively humanistic terms with specific references to non-human factors that shape development.

DON'T:

1. Get stuck in discussions that allow people to apply their thinking that genes and environments exert separate influences on discrete outcomes — such as referencing only genetic or only environmental factors in discussing specific outcomes.
2. Lead with messages about the importance of parents, or you risk getting people stuck there.
3. Use language that allows people to fall back on their understanding that children's worlds are "simple."
4. Present statistics that show that outcomes have grown worse over time.
5. Utilize over-medication and false diagnoses as focal problems in communications.

BACKGROUND: CULTURAL THEORIES MODEL

There are several concepts in cultural models theory that are important in understanding the research presented here. To distill these aspects of theory, we draw from a recent article that the FrameWorks Institute published in *Science Communication*.[6]

What is a cultural model?
Cultural models can be seen as systems of consistently implied relationships, propositions and assumptions that are applied to make sense of and organize the information and experiences that individuals confront. Functionally, cultural models are what allow individuals to make sense of a range of incoming information and interact seamlessly with the individuals and situations that they encounter.[7] Researchers in psychological anthropology have found these shared understandings to be implicit or, as Quinn writes, "referentially transparent."[8]

How do cultural models work?
Scholars have stressed the shared nature of cultural models, such that people in a cultural group who share cultural models make a common set of assumptions and, therefore, what is taken for granted is, in fact, tacitly understood by all.[9] These models are activated when individuals are engaged in cognitive tasks, like narrating an event, explaining something, or "reasoning."[10]

It is also important to note that the activation of a given model is contingent on contextual specifics at the time of processing or meaning-making. This is important in understanding how a given individual's talk may, at different points, evidence multiple, seemingly contradictory ways of "thinking" the same issue — different models become activated in different conversational and reasoning contexts.

Finally, within the broad foundational models that people use in "thinking" about a wide variety of issues lie models that are relatively more specific in their propositional content. Researchers refer to these as "nested models." Connections between discrete assumptions develop as specific understandings are consistently applied together in the same way over time in making sense of a given issue.[11] We employ this aspect of cultural models theory in the presentation of findings below — identifying broader, more foundational, models, as well as the more specific propositional structures that are "nested" in them.

METHODS

Establishing the Science Story of Early Child Development
To assemble the science story of early child development, FrameWorks' researchers relied on two methods: *one-on-one expert interviews* conducted with scientific specialists, and *participant observation and formal elicitations* conducted at professional meetings.

1. Expert Interviews
Over the last seven years, FrameWorks researchers have interviewed over 60 developmental science experts — with specialties ranging from child mental health to epigenetics, executive function to resilience, stress to social determinants, and infant caregiver relationships to neural plasticity. These experts have been identified by surveying the literature on target issues and selecting the most widely cited and influential scholars. Employing basic snowball sampling, members in these initial samples were in turn asked to recommend colleagues and other experts on relevant topics.

Data from these interviews were supplemented for the Australia project with a second set of 12 interviews conducted with Australian experts. These included neuroscientists, public policy experts, social workers, psychologists and public health scholars. Individuals in this sample were chosen for their ability to provide information on the nuances and considerations of child development issues in the Australian context. Data from these experts provided a way to focus and refine more-general science messages based on issues of particular importance and relevance in Australia.

Expert interviews were conducted by two FrameWorks researchers either in person or via telephone and lasted between one and two hours. With each participant's permission, the interviews were recorded and transcribed for analysis. During each interview, the interviewer guided the expert informant through a series of prompts and hypothetical scenarios designed to challenge them to explain their research, break down complicated relationships, and simplify concepts, methods and findings.

2. Expert Message Elicitations and Participant Observation at Professional Meetings
In addition to the data culled from expert interviews, the expert story presented below is the result of hours of research conducted by FrameWorks researchers over the past ten years at numerous scientific meetings where international child development experts have met to present and discuss their research and its implications for public policy.

At these meetings, FrameWorks' researchers have gathered data via formal moderated sessions and participant observation. Organized as discussions with sets of guiding questions, these were researcher-led sessions in which scientists reached consensus on science messages that are ready for "prime time" and which they feel are important for members of the public to understand.

FrameWorks' researchers have also conducted participant observation — a research method derived from anthropology — at these meetings. This produced a set of observations and notes about common, though frequently implicit, themes that run through discussions between scientists.

In this way, the expert story presented below has been triangulated from multiple sources of data and refined over time. The process of constructing a science story is discussed in greater detail elsewhere.[12]

Establishing the Public's Story of Early Child Development
The cultural models findings presented below are based on 40 in-depth interviews conducted in Australia (Sydney, Melbourne and Brisbane) by two FrameWorks researchers in July 2012. A sizeable sample of talk, taken from each of our informants, allows us to capture the broad sets of assumptions — cultural models — that informants use to make sense and meaning of information. Recruiting a wide range of people and capturing a large amount of data from each informant ensures that the cultural models we identify represent shared patterns of thinking about a given topic. And, although we are not concerned with the particular nuances in the cultural models across different groups at this level of the analysis (an inappropriate use of this method and its sampling frame), we recognize and take up this interest in subsequent parts of the larger research project.

Subjects
Informants were recruited by a professional marketing firm. Informants were selected to represent variation along the domains of ethnicity, gender, age, residential location (inner metro, outer metro and regional/rural areas up to three hours from city centers), educational background, political ideology (as self-reported during the screening process) religious involvement, and family situation (married, single, with children, without children, age of children).

The sample included 15 men and 25 women. Twenty-five of the 40 informants self-identified as white, 10 as Asian and five as "other." Eleven participants self-identified as Liberal Party, 12 as Labor Party, six as Green Party and the remaining 11 as other or "swing voters." The mean age of the sample was 33 years old, with an age range from 20 to 68. Ten informants had high school degrees, 12 had some post-secondary education, 13 had a college degree and the remaining five had post-graduate degrees. Twelve informants had children under 16 years of age, 14 had children over

16 and the remaining 14 had no children. Seventeen informants lived in inner metro areas, 14 in outer metro areas and nine in rural locations.

Interviews
Informants participated in one-on-one, semi-structured "cultural models interviews" lasting 1½ to 2½ hours. Cultural models interviews are designed to elicit ways of thinking and talking about issues — in this case, ideas about how children develop, what the outcomes of development are, what factors influence this process and how outcomes can be improved. As the goal of these interviews was to examine the cultural models informants use to make sense of and understand these issues, it was key to give them the freedom to follow topics in the directions they deemed relevant. Therefore, the interviewers approached each interview with a set of areas to be covered but left the order in which these topics were covered largely to the informant. All interviews were recorded and transcribed. More specific information about the interview can be found in Appendix A.

Analysis
Analytical techniques employed in cognitive and linguistic anthropology were adapted to examine how informants understand issues related to child development. First, patterns of discourses, or common, standardized ways of talking, were identified across the sample. These discourses were analyzed to reveal tacit organizational assumptions, relationships, logical steps and connections that were commonly made, but taken for granted, throughout an individual's transcript and across the sample. In short, our analysis looked at patterns both in what was said (how things were related, explained and understood) as well as what was not said (assumptions).

LAYING OUT THE STORIES

In the following section, we use a set of organizing questions to lay out the science and public understandings of early child development. Looking at how scientists and members of the Australian public answer these questions, and the differences between these answers, allows us to examine how existing FrameWorks communications tools — tools developed to address challenges in other cultural contexts — might be brought to bear in bridging conceptual gaps in Australia. Examining these questions also brings into relief culturally specific challenges that require the development of new communications strategies and tools for Australia.

The Expert Story
1. What is early child development about?

> **It's about the brain.** For early child development experts, development is, most simply, about the brain and the processes by which the brain changes over time. The expert story answers the orientational question of what development is about by talking about differences in outcomes between individuals (individual differences) and across populations. They place a particular focus on outcomes experienced by "vulnerable" and "at risk" populations, and the disparities between these outcomes and those that characterize less vulnerable and at-risk groups. In addition to a focus on difference, experts place an equal, if not greater, emphasis on common processes that shape the development of all children.

> **It's about the way brains change.** Experts also focus considerable attention on the idea of "plasticity" — the brain's capacity to change over time — and of particular "critical periods" where plasticity is at its peak. This idea of plasticity continuing, but changing over time, is a vital but complex point. It is a part of the expert story that extols a continued openness of the brain to change while also emphasizing the decreasing nature of this capacity over time.

> **It's about the environment of experiences.** The child's interactions and experiences in contexts and environments lie at the heart of experts' orientational perspective. Experts explain that development is essentially a "transactional" process between genetic constitution and environmental forces that intermingle through biological processes. The role of context and the quality of environments is heavily emphasized in this account and is critical to other parts of the expert account — especially with regard to how development happens. Ideal environments are stable and stimulating.

> **It's about relationships.** Among the central features of children's experiences are their interactions with others, in particular caregivers. Experts speak to the importance of everyday interactive engagements with caregivers of all types, and the

give-and-take of shared attention. This is deemed critical for social, emotional and psychological development.

It's about early childhood. Finally, in answering the orientational question of what development is about, experts focus overwhelmingly on early childhood, in particular the years from conception to age 3 or 5. This may seem a tautological point, but the fact that experts focus their attention from pre- and peri-natal periods through the age of 3 or 5 is significant in relation to the public's position on this orientational question. Experts recognize the importance of supports for children across the spectrum of growth, including the critical years of adolescence, even as they affirm the foundational effects of the earliest years.

2. *What develops?*

The brain develops. Related to the orientational position described above, experts conceive of the brain as the object of development — it is the dominant "what" in the expert account of development. More specifically, experts focus on particular areas of the brain (e.g., hippocampus, amygdala, prefrontal cortex) that are changing in early childhood, and the connections within and between those regions.

Self-regulation, cognitive flexibility and working memory develop. The expert account also emphasizes skills, specifically a set of skills called "executive function," as objects of development. They explain that executive function is a group of related and interdependent skills that control and regulate a broad range of life skills, competencies and behaviors. The skills that comprise executive function abilities are inhibitory control, working memory and cognitive flexibility.

Mental health develops. Mental health is also an object of development in the expert account, including the development of social and emotional security and confidence. Experts emphasize that mental health exists in young children and link a child's mental states to the development of the brain. They define mental health as the capacity and ability of a child to respond to experiences and function in productive and developmentally appropriate ways.

3. *How do children develop?*

Children develop through gene X environment interaction. The expert story focuses extensively on questions of process — of how development works and happens. Overwhelmingly, they rely on the notion that genes and environments interact to explain why children develop the way they do and why the outcome of one child's development differs from that of another (i.e., the reason for individual differences). The expert account emphasizes the idea that the outcomes of development are the result of a complex interplay between genes and environments.

Children develop through interactions and relationships. As a key part of the emphasis on gene-environment interaction, experts talk about personal interactions and relationships with caregivers as the primary way in which environments interact with genes to shape development and outcomes.

Children develop by building on simple skills and experiencing scaffolded learning. As skills are a key part of the expert story of *what* develops, the *how* part of the story focuses on how these skills develop. The expert account emphasizes two processes by which skills develop. First, experts discuss the process by which simple skills gradually build into more complex skills — how more complex skills are built on, and out of, more simple and basic operations and capacities. Second, they describe a process of "scaffolding," whereby the individuals with whom the developing child interacts provide opportunities for exploration and problem-solving play and the chance to apply skills towards skill-appropriate tasks, all the while supported and provided with feedback by the interactive partner.

4. *What threatens early child development?*

Chronic stress threatens development. Experts answer the question of what threatens development by focusing on the negative effects of the over-activation of the body's stress response system — that is, the body's reaction to experiences that initiate extended activation of the body's stress response systems. Scientists focus on factors such as violence, abuse, neglect and poverty which, when persistent and unbuffered by caregivers, lead to the activation of the body's stress response systems in ways that cause physical damage to the brain and other organ systems. Experts explain that the over-activation of these systems alters processes of development and leads to long-term negative consequences in multiple life domains, including learning, health and social functioning.

The research-to-practice gap threatens development. In addition to the over-activation of stress response systems, the expert account points at ineffective programs and policies as threats to development. For experts, the gap between research findings and child programs and policies is cause for considerable concern and threatens, or at least impedes, optimal early child development.

5. *What can be done to improve early child development and outcomes?*

Better contextual supports for families and caregivers can improve development. Experts point to the importance of environmental factors that support children's development directly, such as high-quality child care and primary care services, but also highlight an important indirect role of addressing context in improving development and child outcomes. They explain that by improving the

quality of environments and supporting the individuals who interact with and provide care for children — through mechanisms such as family leave policies, work support programs, maternal mental health services, and substance abuse treatment and prevention programs — public policies have the power to ensure positive developmental outcomes for more children.

Using science to make policy can improve development. In line with the focus on context and support, experts advocate for using the science of early child development to make better social policies and programmatic decisions. They call for "closing the gap between what we know and what we do" by using innovative science and knowledge of the factors that affect development and of the effectiveness of various interventions to guide policy-making and implementation.

More attention to at-risk populations. Alongside a broader effort to improve supports for children in general, experts emphasize the need for a more strategic and well-integrated effort to reach at-risk children. This involves efforts to end discrimination against marginalized populations, and to extend services and supports to populations less engaged with the child and family supports that do exist.

Better integration across institutions. While lauding improvements made over the past decade plus, experts argued for the value of increased interagency coordination and integration across the sector of organizations and agencies that focus on families and children.

The Public Story

The Expert Story of Early Child Development

➡ **What is early child development about?**
Its' about the brains of young children, the way these brains change and the role of genes, biology and the environment in this process.

➡ **What develops?**
The brain develops, which affects the development of skills and mental health, and shapes long-term outcomes.

➡ **How do children develop?**
Genes and environments interact to shape development. Personal interactions and relationships are key in this process, as are opportunities to apply skills in supportive contexts.

➡ **What threatens development?**
Chronic, unbuffered stress and ineffective policies threaten optimal development.

➡ **What can be done to improve development and outcomes?**
Using what we know from science to provide high-quality services to children, as well as effective supports for their parents and caregivers, will lead to positive developmental outcomes for more children.

We now present the results of the analysis of interview data gathered from members of the Australian public. These results are organized by the same five questions as those employed in presenting the expert section above. For each of the five organizing questions, we lay out the cultural models that structured informant thinking on that particular question. Many of these models are complex cultural scripts, comprised of more-specific and nested propositions and assumptions. When this is the case, we summarize the general model and then lay out its constituent assumptions. We also note the implications of these models for communicators.

1. What is early child development about?

Development is about ... children. Much of informant discussion about early child development, not surprisingly, focused on children. We identified three foundational cultural models that shaped informant thinking about children.

a. **The *aging up* cultural model.** When answering open-ended questions about development, informant discussion frequently moved to, and became trained on, older children — typically children between the ages of 8 and 15. Informants frequently answered questions about child development, and even early child development, with stories and examples in which it was clear that the child they were referencing was older — they talked about gangs, drinking and drug use,

playing organized sports at a high level, getting good marks in school. This suggests a shared assumption that early adolescence is an important period of development, and that it is this age group that comprises the dominant mental image of "developing child." At the same time, this suggests that Australians are relatively less practiced and comfortable with talking and thinking about development of young children. FrameWorks has observed this tendency in both the U.S. and Canada.[13]

b. **The *young children have mental states, but don't know it* cultural model.**
    When informants did discuss young children (often after probes with specific ages and age groups), analysis revealed a cultural model of the way children's minds work.[14] According to this cultural model, children are born with emotions, desires and thoughts — these things are present at birth. However, early in life children lack an awareness and understanding of these mental states and are unable to communicate them to others. Awareness is understood to develop "naturally" around 2 years of age. Children then develop the ability to communicate about these mental states and, through this communication, gradually gain (around 5 years of age) an understanding of their mental states. Awareness is seen as a prerequisite for the impacts of these mental states.

c. **The *clusters of difference* cultural model.** In discussing children and development, informants focused on differences between "groups" (children with disabilities or developmental disorders) and "types" (children of certain "personality types") of children. Informants talked about similarities between children within a group, and differences between children in one group and those in another. Analysis revealed a common, but implicit, understanding through which informants approached the topic of children through the understanding that children can be broken out into groups within which there are fundamental similarities, but between which lie significant differences. The underlying assumption is that similarities and differences between children operate at the group level — in short, that the concept of difference is important and is understood in terms of groups of children. For example, informants talked extensively about the differences between groups of children based on personality types, cultures, stages of development, disabilities and skill profiles (e.g., athletic types, studious types).

    This *Clusters Of Difference* model is particularly interesting in comparison with the dominant cultural model that Americans employ to think about children — the assumption that "each and every child is different," or what we call the *Hyper Individualization* cultural model. According to this American model, difference is important but is understood as an individual-level concept.[15]
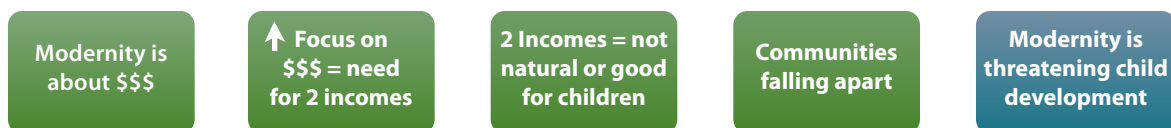
Development is about an ideal Australian past: The *Threat Of Modernity* cultural model. Informant discussion of child development was strongly structured by an assumption about Australia's past and present. The core constructs of this model are the understandings that life in Australia used to be better, and that features of modernity are currently threatening the Australian way of life. Trained on the concept of child development, this model structures an understanding in which things used to be better for children — when Mum could stay home, when one income was enough to support a family, when there was more quality family time, and when members of Australian communities knew and looked out for one another. In these ways, the foundational model was comprised of the following "nested" propositions.

a. **Modernity is about money.** Supporting this foundational model is the implicit understanding that the world today is more focused on money and wealth than it used to be.

b. **The increased focus on money has altered labor patterns.** Closely connected to the increased emphasis on money is the assumption that this shift has created the need for full-time employment for both parents in a family.

c. **The dual-income earning family is not natural or good for children.** The next proposition in the script is the shared understanding that having both parents working full time is not good for children. Informants explained that mothers should be the primary/full-time caregiver for young children, and that deviations from this pattern are not "natural."

d. **Communities are falling apart.** A final nested model in this cultural script is a common understanding about the state of Australian communities. Informants explained that communities have changed as a result of modernity — more specifically, that the people who constitute communities today and the way they relate to one another is different than it used to be. Informants shared an idealized image of an Australian past when communities were populated by Australians who held common values and morals, and understood, related to and supported their neighbors. There was a not-so-thinly veiled ethnocentrism that pervaded this talk, as informants explained that these Australian communities of the past have "disintegrated" as the demographics of the country have shifted. In relation to child development, informants explained that this change has meant that what were once strong, cohesive and supportive communities have become fragmented islands that fail to collectively look after children as they once did.

This *Threat Of Modernity* model and its constituent nested assumptions were evoked in concert and resulted in a powerful and pervasive script — a highly patterned logic sequence that structured a specific way of talking and thinking about child development — in this case, that children today are not developing as positively as they once did in Australia.

The *Threat of Modernity* Cultural Model

Modernity is about $$$	↑ Focus on $$$ = need for 2 incomes	2 Incomes = not natural or good for children	Communities falling apart	Modernity is threatening child development

Development is about safety: The *Bubble Wrap* cultural model. Also observed in FrameWorks' research in the U.S., the implicit understanding that development is fundamentally about "keeping kids safe," and protecting them from what is understood to be an inherently unsafe world, was dominant in the Australian interview data.[16] We refer to this as the *Bubble Wrap* model because of the way it structures beliefs that successful development is about insulating and protecting children from an outside world that is assumed to threaten the child.

Development is about environments: The *Context Is Key* cultural model. There was a strong tendency for informants to focus on *where* development happens, suggesting that when Australians think about early child development, they share a fundamental understanding that a child's environment is an important dimension of their development.

These context discussions revolved around a tension between in and out of the home. With striking similarity and predictability, informants answered open-ended questions about "what development is about" by comparing the advantages of development that happens in the home with the (more limited) advantages of development that happens outside of the home. Analysis revealed three nested models:

    a. **Out-of-home development = childcare centers.** Informant discussion of the development that happens outside of the home was restricted, with strikingly few exceptions, to childcare and "childcare centers." The pervasiveness of this pattern in informant discourse revealed the presence of an underlying, shared understanding that the primary site for out-of-home development is the childcare center.

b. **Childcare = babysitting.** In addition, childcare was understood as a place to "put" kids so that parents could go to work. This understanding was particularly apparent when informants were asked to talk about what goes on in a childcare center, where responses were largely void of discussions of development. This childcare = babysitting assumption became increasingly dominant in reference to younger and younger children. For 4- to 5-year-olds, informants were able to see some role for childcare centers in a child's development — primarily in a child's "social" development. However, when the child in question was closer to 1 or 2 years of age, childcare centers were overwhelmingly understood through the *Custodial Childcare is Babysitting* model — that for younger children, childcare centers are a "place to drop your kids and where you can pick them up in one piece on your way home."

c. **In-home is best.** Also apparent was the implicit understanding that the development that happens in the home is not equal in quality to what happens outside the home. When asked explicitly to think about children below the age of 3, informants were unequivocal that developing in the home environment with the mother as primary caretaker was preferable to having the child's development take place out of the home (i.e., at a childcare center).

These propositions were strung together to form a tight and logical script, the invocation of which resulted in the common opinion that child development should happen in the home, and that when development takes place early in a childcare center, the child may suffer.

The *Context is Key* Cultural Model

Out of home development = childcare center	Childcare = babysitting	In-home is best	When early development happens out of the home a child may suffer

Implications of the cultural models used to think about *What Development is About*

- *Addressing the problem of the Aging Up model.* When messaging about early child development, communicators should not assume that their intended reference population is the same as the image of "child" in the public's mind. However, our research shows that when probed with particular ages and age groups, Australians are able to break out of this associative assumption and age down their mental image of a child.

- *Assuming that young children lack awareness of mental states makes communicating about early child mental health challenging.* When Australians employ the assumption that very young children are not aware of, and do not understand, their thoughts, emotions and desires, communicating the science of early child mental health becomes difficult. If a child isn't aware of their emotions, it will be difficult for members of the public to acknowledge that these children actually experience mental health. If people employ an assumption which makes it difficult to think that children can, in fact, experience good and poor mental health, it becomes challenging to communicate that such states are not only possible, but have significant current and future effects and warrant action. FrameWorks research on child mental health — particularly the *Levelness* explanatory metaphor — addresses this challenge by structuring definitional understandings of mental health as the ability to function, and remedial thinking about the importance of addressing environments in encouraging positive mental states and adaptive functioning.

- *Viewing difference at a population level is promising.* At one level, the *Clustered Difference* model is likely to have some of the same effects as the U.S. *Hyper Individualization* model. Seeing individual children (or, in the case of the *Cluster* model, groups of children) as fundamentally different from other children or groups of children can obscure the ability to message about common processes that underlie development in all children. However, the population focus of the *Cluster* model presents a considerably less imposing obstacle for communicators than the *Hyper Individualization* model that focuses on individual-level difference. Interview data show that Australians are quite able to see common processes at the intra-group level. Shifting to focus on common processes across groups should be assailable. If Australians can see similarities between children in a group or of a type, it should be easier to get them to see universal processes of development than if they were of the mind that each and every child is inconsolably unique. We believe that many of the communications tools designed to help Americans see the existence, and importance, of common processes of development hold promise in helping Australians see that there are a set of processes and factors that affect the development and outcomes of all children. We note

here, however, that the ability of these tools to address this problem in the Australian context requires confirmational testing.

- *The Threat Of Modernity threatens science translation.* The *Threat Of Modernity* model, and the strength of the connection between this assumption and the topic of child development, is concerning from a communications perspective. FrameWorks has found similar notions — that modernity is the root of social problems and that returning to a (mythic) past is the solution — in work on education in the U.S. The U.S. work has shown that Americans view modernity and innovation as threats to learning and education outcomes, and advocate a strategy of "going back to the basics" as the silver bullet for education problems.[17] The effect of the *Threat Of Modernity* model in Australia is similar to this *Back To Basics* understanding in the U.S. — both create a strongly conservative perspective about change and time, in which change is seen as a threat and innovation as putting further distance between the way things were — and should be — and the way that they have become. The *Threat Of Modernity* model is therefore likely to make Australians less able to productively consider and support progressive and innovative child policies. Furthermore, this conservatism is likely to incite an anti-science sentiment that represents a direct barrier to attempts to translate the "new" science of brain development. For these reasons, the throwback *Threat Of Modernity* model is cause for considerable concern among those thinking about and working towards more-effective communications of the science of early child development.

- *The Bubble Wrap model blocks ability to think about community as a source of support for positive outcomes.* The *Bubble Wrap* model is likely to have many of the same effects as its application has been found to have in the U.S. When this model is active in people's thinking, communities are understood as places of danger rather than sites of support. This makes it hard to see community-based programs and resources as effective and necessary in improving child outcomes, and therefore harder to support such measures as public policies. Put another way, the *Bubble Wrap* model makes certain policies very "easy to think" — punitive measures such as more police in communities and schools, stricter sentencing for drug offenses, and better mechanisms to track offenders. While such policies may be important, the *Bubble Wrap* model makes other important policy solutions "hard to think" — policies that build on the ways in which communities support positive child development in order to amplify positive outcomes.

- *Context Is Key is generally promising, but several of its constituent propositions present communications challenges.* The tight association that Australians draw between development and context is promising. At a general level, the invocation of this model should help communicators message about the

importance of quality environments in improving development, and enhance support for policies and programs that address these contexts to generate positive outcomes. However, a deeper look into the constituent assumptions of the model gives a less optimistic view of its communication utility. If childcare is always second best, Australians' thinking about child policy is likely to focus on how to keep more young children out of childcare and in the home with Mum, rather than on addressing and improving the quality of these out-of-home contexts. The association of early childcare with babysitting is also problematic. When informants invoked this model, the idea that childcare centers are places of meaningful and important development fell out of thinking. Again, this assumption is likely to make it difficult for Australians to see the importance of policies that address these contexts from a developmental perspective. In short, the custodial model of early childcare obscures the fact that early childcare centers are vital sites of development and important levers for interventions designed to improve outcomes for Australians.

2. What develops?

The ability to function develops: The *Development=Learning* cultural model. When informants discussed the results of child development, attention was trained on learning. The "what" in the public's story of development is, "the things you need to know how to do when you grow up." This foundational model is comprised of several more-specific propositions.

a. **Morals are vital.** Informants focused extensively on the fact that development is the process through which children learn the moral code of society and how to operate within this code. Many informant discussions of "poor development" focused on cases in which children had not learned morals — highlighting the importance of morals as a vital outcome of development. Informants conceptualized morals primarily as the ability to identify right from wrong and to act according to the former.

b. **Discipline is an important part of functioning.** Closely related to the "morals are vital" proposition was a strong focus on discipline. Whereas morals entailed the ability to identify right and wrong and act accordingly, discipline was understood as the ability to persevere through difficult situations. The focus on discipline is reminiscent of a dominant cultural model that FrameWorks' U.S. research has revealed — what we have called "Mentalism."[18] The *Mentalism* model focuses more on process — that individuals become successful and development goes well because of individual internal fortitude and determination. In the Australian interviews,

the focus on discipline was oriented towards outcome — as what develops, rather than as a causal factor in positive outcomes.

c. **Self-reliance is central.** Informants placed great importance on self-reliance as an essential outcome of a child's development. Informants gravitated toward ideas of self-reliance and "being able to get things done for yourself." Self-reliance was assumed to rely on skills like decision-making, problem-solving and self-control.

d. **No person is an island.** Informants also paid considerable attention to the development of social skills. They explained that being able to "get on" with other children and, later, with other adults, was a vital object of development. These discussions and their pervasiveness in the data suggest that social skills are accorded considerable importance and are implicitly understood as a key product of development.

The *Development=Learning* Cultural Model

Morals are vital	Discipline is important for functioning	Self-reliance is central	No person is an island	Successful development results in a child's ability to function

Happiness develops: The *Success=Happiness* cultural model. Informants explained that the result of positive development is a successful individual. This same focus on individual success as the product of development has been observed in FrameWorks' U.S. research. Despite this apparent similarity, Australian and U.S. informants employed fundamentally different understandings of "success." When Americans discuss success, they do so in largely financial terms, evidencing an implicit understanding that success is about financial gain and independence. Our Australian data suggest a different shared understanding of success — a model in which success is about individual happiness and self-fulfillment. Both the Australian and the U.S. models of success relate to individuals, but the definitional criteria are dramatically different. Both of these models differ from those documented in FrameWorks research in Alberta, where success was more collectively defined as participation and membership in a well-functioning community.

Implications of cultural models used to think about *What Develops*:

- *Focus on skills can be strategically leveraged.* Australians seem cognitively predisposed to think productively about the importance of skills as a key outcome of development. Furthermore, they have default perspectives in which they see the importance of many of the same skills that experts wish to explain. Despite being a good distance down the path to science receptivity in their thinking about skills, Australians appear to struggle to pull these skills together and think synthetically about their importance and application. Our informants talked about decision-making, emotional skills (e.g., empathy, self-awareness), social skills and behavior control, but would benefit from a concrete way of integrating these acknowledgements of importance in order to bring them to bear in thinking about programs and policies. FrameWorks has developed and tested two explanatory metaphors[19] that have been empirically shown to do exactly this: *The Brain's Air Traffic Control System*, which concretizes the importance of and relationship between executive function skills; and *Weaving Skill Ropes*, which helps people see how social, emotional and cognitive skills are interrelated, both in their development and application. The *Development=Learning* cultural model and its constituent assumptions suggest that these two explanatory metaphors may prove powerful in communicating developmental science in Australia. This again suggests the need for confirmational research in Australia.

- *Success=Happiness individualizes thinking.* While perhaps more productive from a science translation perspective in its focus on a wider concept of success — one that entails some of the skills that experts want to communicate about — the Australian *Success=Happiness* model presents many of the same challenges as the American *Success=Financial Success model*. Both of these models center on the individual, and in so doing obscure the collective benefits of successful development. FrameWorks and other social scientists have found that when issues are understood on an individual level — caused by individuals with individual outcomes and individual solutions — people are less supportive of the use of public money to fund programs to address these issues, as compared to situations in which issues are conceptualized at the group or collective level.[20] We have seen just that in our research on early child development in Alberta, where cultural models of success are more collectively oriented and support for public policies addressing child development more robust.[21] This suggests that *Values* — frame elements designed to shift from individual to more collective orientations on an issue — will be an important part of the Australian reframing strategy.[22]

3. How do children develop?

Children develop like sponges or containers that get filled up: The *Fill It Up* cultural model. When asked more direct questions about "What do you think is happening as a child develops?" or "How does [outcome discussed] come to be that way?" informants fell back on the same murky "fill it up" absorption model documented in past work in the U.S. and Canada.[23] According to this assumption, all that matters is, as one participant said, "What you give your kid." As evidence of this model, when conversation in the interviews focused on children and how they develop, informants made frequent references to children as "sponges" and development as "osmosis." They used passive verbs like "absorb," "take on" and "soak up" to describe how development happens and how experiences "accumulate" "inside the child" where they "build up" or "fester." The model was also visible in the way in which informants discussed what could be done to address negative exposures, where informants focused on "letting things out," "getting the bad stuff out" and "cleaning out the negative things that have built up inside."

Children develop by being exposed to environments: The *Environmental Exposures* cultural model. The other side of the *Fill It Up* model is the assumption that ecological influences have considerable effect in shaping developmental outcomes (albeit in passive ways). Informants focused on the "exposures" children are subjected to and the primary role that these exposures play in how children develop. The emphasis on exposures, and the conviction with which informants advocated their importance in understanding why some children turn out well and others do not, evidenced a deeply shared assumption that children's environments are key factors in their development. A deeper look at these discussions revealed a nested assumption in this model.

- *Environments=People.* Quality environments were described primarily as access to supportive adults — evidencing an implicit understanding that *Environments=People*. When pushed to explain what it is about environments that matter for child outcomes, there was a predictable pattern by which informants conceptualized environments in human terms — that when it comes to development, the "environment" refers to the people in a child's life. This same cultural model has been documented in FrameWorks research on developmental outcomes in the U.S.[24]

Children develop through genes or environments: The *Separate Influences* cultural model. Informants recognized that both genes and environments are important in the process of child development — that these factors influence outcomes. At one level, the preoccupation with genes and environments suggests a shared understanding that development is, in fact, contingent upon and shaped by

these factors. But a closer look at these discussions shows that informants focused on how environments shape some outcomes and genes shape others. These discussions suggest an understanding from which Australians reason that genes and environments have important, but separate, effects on development. Despite the shared recognition that both these factors are important, informants were largely unable to reason about how these factors are related and might influence the same outcomes. This is manifest by informants' focus on explaining which outcomes of development are determined by genes and which outcomes are determined by environments, rather than entertaining the idea that the same outcome is influenced by both factors.

Analysis revealed a nested assumption — the notion of genetic determinism.

- ***Genes are Set in Stone.*** Informants relied on a shared understanding to reason about the effect of genes on development — revealing that genes and the outcomes they determine (medical conditions, physical characteristics and personality) are assumed to be set in stone. Informants acknowledged that "innate," "inherent," "inborn," "natural" or "genetic" traits are inflexible and impermeable.

Children develop through parents and parenting: The *Family Bubble* cultural model. Consistent with FrameWorks' past research,[25] Australian informants frequently became narrowly preoccupied with parents and parenting in discussing child development. The assumption was that if a child has responsible parents who practice "good parenting" guided by strong morals and values, the child will have positive developmental outcomes. In documenting this assumption, we are by no means claiming that it is incorrect — parents are surely important in shaping child well-being. However, the cognitive effect of this assumption is noteworthy. When informants found their way, and they always did, to parents as the explanation for developmental outcomes, they frequently became "stuck" on parents, and other factors dropped out of thinking and conversation. In this way, once this model became active, it was powerful in crowding out other ways of thinking about what might affect a child's development. It is also important to note that, in comparison with FrameWorks' work in the U.S., the *Family Bubble* appears somewhat less dominant in Australia — that is, it is less pervasive in the data and less powerful in crowding out other ways of thinking in the Australian data than what we have seen in our U.S. data. There were many instances in which Australian informants were able to get out of the *Family Bubble* and beyond the preoccupation with parents and parenting. In these cases, they were able to see that wider contextual influences, like patterns of employment, community dynamics and social supports, affect parents and their parenting behaviors. These perforations in the *Family Bubble* are rarely seen in our U.S. data.

Children develop through challenge and support: The *Stretch but Not Break* cultural model. Informants emphasized that, in order to develop successfully, children need to be challenged. However, what informants discussed was not unbridled challenge. Rather, it was the idea that successful development depends on appropriate challenge provided and supported by parents. Informants shared the implicit understanding that children develop (particularly that they develop skills) by completing tasks that are just outside of their "comfort zone," while parents provide just enough support to prevent unproductive failure (that which results in unwillingness to engage in subsequent challenges). This is a complicated model that consists of the following nested propositions.

a. **Meeting challenges is an important part of developing skills.** It was clear that informants were working with the common assumption of the importance of challenge in the developmental process. This was sometimes stated explicitly, but frequently was more implicit when informants talked about successful development by referencing the provision and successful completion of challenges, and explained unsuccessful development as either the lack of provision or unsuccessful completion of these challenges.

b. **Skills develop by successfully (and sometimes unsuccessfully) reaching just beyond your current skill level.** Informants shared the understanding that the type of challenge is significant in development. In describing the types of challenges that lead to skill and more general development, informants talked about challenges that were beyond the child's current skill level but not sufficiently beyond current skills so as to make success impossible. In other words, informants shared the understanding that a positive challenge was one that "stretched" skills, but in which the child had a reasonable chance of success.

c. **In order to stretch, children need to know that they are supported.** As a final part of this cultural model, informants shared the assumption that, for this challenge completion process to be successful, there needs to be an adult (in almost all cases described as a parent, as per the *Family Bubble* model) present to support the child should they fail in meeting the challenge. The provision of this support, but, even more importantly, the child's knowledge of its provision, was key, and was understood as a necessary prerequisite for children to be willing to engage in challenges in the first place.

The *Stretch but Not Break* Cultural Model

Meeting challenges is necessary part of development	**Challenges must be just outside the comfort zone**	**Children need to have and know that they are supported**	**Positive development requires appropriate challenge and support**

Children develop through a simple process: The *Children Have Simpler Worlds* cultural model. Informant discussion also evidenced an understanding that children live in and experience simplified versions of adult worlds. According to this assumption, the factors that influence individuals become more and more numerous and complicated as they grow older. The factors of significance in the life of a 2-year-old are fundamentally reducible to their parents and their home environment, whereas those factors that affect the lives of older children and adults are numerous and complex. Informants assumed that life gets more complicated as a person ages because there are more inputs that can have effects on outcomes. This model was particularly operative when informants were questioned about stress and the connection between stress and development. In these cases, informants employed the *Simplified Worlds* model to reason that children don't have stress because the things that cause adults stress (jobs, relationships, money…) are simply not present in a young child's life.

Implications of the cultural models used to think about *How Development Happens*:

- *The Fill It Up model limits thinking about development as an interactive and active process.* The *Fill It Up* model limits public understanding on two levels: (1) when development is seen as a "start from scratch" process (children come "empty"), it is difficult to communicate about the ways in which a child's experiences interact with biological and constitutional factors to shape outcomes; (2) when development is seen as parents "pouring" knowledge and experiences into children, the interactive nature through which key systems are built, and later outcomes shaped, easily drops out of consideration.

- *The recognition that quality of environment affects development opens the door for messages about the role for public policies in improving developmental outcomes.* The deeply shared understanding that the environments children are exposed to matter greatly in their development can be leveraged by science communicators. Communicators should activate this model by explaining and providing examples of the role that environments and

experiences play in child development, and then use this common assumption to build better understandings of how these environments shape outcomes. Two current FrameWorks explanatory metaphors appear particularly helpful in this strategy: The *Resilience Scale*, which concretizes the role that environments play in shaping outcomes; and *Serve And Return*, a process metaphor that focuses attention on the reciprocal feature of relationships essential for positive development. However, as cautioned above, both of these metaphors require confirmational testing to assure that they do this conceptual work when used in Australia.

- *Environments=People assumption promising but limiting.* The modeling of environments as personal agents positively predisposes Australians to thinking about the importance of relationships in early child development. As noted above, leveraging this cultural model with the *Serve And Return* metaphor that concretizes the particularly important features of these interactions will be important. However, the narrow focus on people as representations of "environment" presents a challenge for communicators who wish to talk about non-human features of environments and systemic components of context. Working from the *Environments=People* model, the "causes of causes" — or the physical, social, cultural, political and economic factors that define and set parameters around the actions of, and relationships among, individuals — become difficult to realize and hard to think.[26] Communicators need to widen the lens and help the public see that people are embedded in contexts that influence their behaviors and actions.[27] FrameWorks' e-workshop *The Wide Angle Lens* (http://hollyplays.com/wal/) provides advice on how to establish productive ways of thinking about the role of context in social issues like child development. In addition, *Resilience Scale*'s ability to move thinking beyond "people" as factors that influence development, suggests the promise of this tool in creating broader conceptions of environments and helping people think about other contextual factors that public policies have the power to address.[28]

- *There is a need to build an understanding of how genes and environments interact to shape outcomes.* The lack of a clear model for how genes and environments interact to shape outcomes is not a new problem for FrameWorks. This "cognitive hole" in public thinking has been well documented in FrameWorks' research in the U.S. and Canada.[29] The presence of this same challenge in Australia suggests that *Resilience Scale*, *Brain Architecture* and *Environmental Edits*, tools that have been shown to help Canadians and Americans think about this interaction, warrant confirmational testing in Australia. If these tools perform similarly in Australia to the way they have in the U.S. and Canada, they will play an important role in efforts to translated developmental science in Australia.

- *Genes are Set in Stone model challenges messages about the promise of public policies in improving child outcomes.* The assumption that certain developmental outcomes are the exclusive product of genes, and the implicit understanding that, because genes are set in stone, these characteristics are predetermined and immutable, is likely to inhibit the public's ability to think about ways to improve outcomes. Put another way, solutions to problems that function at the genetic level are "hard to think" because the *Set In Stone* model crowds out the fact that genes can be affected and that the outcomes they co-determine are neither predetermined nor set. When genes and their corresponding outcomes become impermeable, there is little chance of affecting these outcomes, and policies that claim to address these outcomes become hard to support. These challenges were also addressed in the U.S. and Canada using the *Signature/Edits* and *Resilience Scale* explanatory metaphors.

- *Translators need to be aware of the Family Bubble model — although the presence of other available ways of thinking is encouraging.* While clearly not dominant to the extent observed in the U.S., there were frequent instances in which the *Family Bubble* was operative in our Australian data. When this happened, the role of context in shaping development slipped from view, and focus became trained on families as the determinant of developmental outcomes. Communicators should remain aware of this assumption and the fact that it may derail thinking about the importance of larger contextual factors. The existence of other, more promising, ways of thinking about how development happens, and the factors that matter (such as the *Stretch but Not Break* model and the recognition that environments matter) suggests a two-pronged strategy for dealing with the *Family Bubble* model. First, communicators should avoid the explicit activation of this way of thinking by not discussing parents in prominent positions in communications materials. In other words, messages should not lead with the importance of parents, or they risk getting people stuck there. Second, messages should strategically activate models that structure more policy-productive ways of thinking about development. FrameWorks' e-workshop *The Wide Angle Lens* ([http://hollyplays.com/wal/)](http://hollyplays.com/wal/) can help communicators with this strategy.

- *Implicit understanding of the importance of supported challenges is highly promising.* The *Stretch but Not Break* model is strikingly similar to the expert concept of "scaffolding," and suggests the promise of a communications tool that activates, concretizes and builds on this understanding to give Australians a way to understand a key developmental process. This communications tool would draw on existing assumptions to communicate a part of the science that existing FrameWorks tools have not been able to adequately address — the question of how executive function skills (and

other skills, for that matter) develop. We believe that this task is ripe for the development and testing of an original explanatory metaphor.

- *The assumption that children's worlds are simplified limits ability to think about negative effects of stress.* The application of the *Simplified Worlds* cultural model is particularly important in the way that Australians think about stress. Reasoning that a child's world is simple and uncluttered by influences and determinants, informants questioned whether children can really experience stress. Questioning whether stress is even possible in early childhood impedes considerations of the fact that stress can not only happen, but that it can have serious long-term impacts when experienced in early childhood. We have solved this situation in the U.S. and Canada by differentiating between positive, tolerable and toxic stress. This distinction allows people the comfort of their existing model (stress in childhood = small and insignificant), while at the same time introducing confounding concepts that allow people to appreciate a different type of stress and stress effects.

4. What threatens early child development?

Modernity threatens development: The *Threat Of Modernity* cultural model. The *Threat Of Modernity* model not only shaped the way that informants thought about what development is about, but also structured understandings of what threatens this process and its outcomes. Informants reasoned that modernity has altered patterns of employment and, in so doing, has changed family dynamics in ways that threaten successful development. Modernity was also understood to have created a reliance on technology, replacing the one-on-one interactions that children "used to have" with adults and peers with passive digital media and technology. This interactional shift was seen to have negatively affected the development of social skills. Finally, modernity was understood to have fractured communities and led to an inability to collectively support children.

Over-diagnosis and over-medicating threaten development: The *Medicalization Of Childhood* cultural model. Informants focused considerable attention on instances of over- or false-diagnoses of developmental disorders. They explained that there are many instances in which children are assigned diagnoses for problems that are in fact, not problems, but rather normal variations and individual differences, or as one informant said, "just the way some kids are." This practice was seen as dangerous, as it stigmatizes children and affects their confidence and identity. This rash of over-diagnosis was also seen to create a problem in which children are over-medicated. Informants explained that there are many children who are on medication for "conditions" that do not warrant pharmacological intervention. These discussions evidenced a shared assumption that childhood and "normal" differences between children have become medicalized in harmful ways.

Bad parenting threatens development: The *Information Is Everything* model. Informants also focused on parents in discussing threats to development. A careful analysis of these discussions revealed an assumption that education and information are the primary determinants of parental behavior. Thinking with this assumption, informants focused on how "parents who just don't understand what to do with their children" is the cause of poor child development. Put another way, when asked about threats to development, informants implicated parents centrally, and when asked to think about what it was about parents and parenting that threatened development, they relied on the assumption that poor parenting results from parents not having enough information about "good" parenting practices.

Drugs and alcohol threaten development: The *Prenatal Exposures Damage Development* model. The theme of prenatal drug and alcohol use was another dominant feature of discussions of threats to development. Informants focused on the fact that if a mother chooses to take drugs, drink alcohol or smoke cigarettes while pregnant, the development of her child will suffer. This general model was structured by a set of more specific propositions.

a. ***Chemicals ingested get into the blood.*** Informants shared a common understanding that the things that a mother (or a person more generally) consumes get into her "blood and course through her veins."

b. ***Foreign* chemicals are harmful**. Informants also assumed that the ingestion of a chemical that is foreign to the body — one that is constituted of chemicals that do not naturally occur in the body — is harmful.

c. ***A mother and her baby share blood.*** Data also revealed a common assumption that a mother and her unborn baby share the same blood.

When these assumptions came together (as depicted in the figure below), they structured a powerful script in which the ingestion of foreign chemicals by a mother threatens the development of her unborn child.

The *Prenatal Exposures Damage Development* Cultural

Chemicals ingested get into the blood | Foreign chemicals are harmful | Mom and unborn child share blood | Maternal ingestion of foreign chemicals harms a child

Implications of the cultural models used to think about what threatens development:

• *Threat Of Modernity model remains problematic.* As noted above, the *Threat Of Modernity* model makes thinking about innovative and progressive policies difficult by focusing the remedial lens backwards in time. Also as noted, the model is likely to create a skepticism towards the new science of brain development that will directly impede translational attempts. In relation to thinking specifically on the issue of threats to development, the model is likely to have an added negative implication by creating a sense of determinism — that these problems are "natural" or unavoidable results of progress and modernity. This determinism has been shown in past FrameWorks research to depress people's support for public policies and interventions.[30]

• *The perceived over-medicalization of childhood impedes science translation.* The shared understanding that children are currently being over-diagnosed and over-medicated has inherent in its structure an anti, or at least strongly critical, stance toward science. Using this model, science is the agent responsible for threats to development, making communications in which science claims to be part of the solution hard to support.[31] This suggests the need for communications to build concrete understandings of how child development works such that people can think more productively about issues of diagnosis and treatment. Many of the tools that comprise the Core Story of Early Child Development that have been tested in the U.S. and Canada do exactly this.

• *Importance of prenatal period can be used to build better understandings.* Much of FrameWorks' research has focused on structuring and concretizing the recognition that what happens early matters — that early childhood is not an inconsequential period or one that "just happens naturally." The recognition that early — really early, in this case — matters is encouraging, and suggests that messages about the importance of prenatal development and intervention should have a receptive audience in the Australian public.

• *Despite recognition that prenatal period is one of risk, the process model is limited and negatively valanced.* While the association between the prenatal period and later child outcomes is promising, there are two shortcomings of this model. First, the model turns on a relatively simple understanding about the negative effect of the physical ingestion of foreign chemicals. There was no demonstrated ability to think beyond this foreign chemical introduction model to the realization that experiences affect development prenatally. Second, the fact that the focus of the model is on how harmful chemicals can

damage a developing child suggests that Australians need help thinking about how the prenatal period is not only a time of threat, but a period that can be leveraged to improve and create positive developmental outcomes. Because of Australians' receptivity to the importance of the prenatal period, despite limiting components of this assumption, prenatal development appears to be a promising area for the development and testing of a communications tool to build public understanding of a wider set of factors that can influence prenatal development and the effect of these factors.

- *Information Is Everything* model presents several important communications implications.

  - At one level, the presence of the *Information Is Everything* model presents an opening for science translation. Australians recognize the absence of information on child development as problematic. In theory, this should allow an opening for well-framed translations of the science to get into the public sphere.

  - On a less optimistic note, the *Information Is Everything* model threatens to drown out some of the more ecological thinking that is prominent in public thinking on early child development. If Australians see developmental problems as stemming from poor parenting, and understand these behaviors to be the exclusive result of a lack of information, considerations of the other factors that affect parenting and development more generally — things like poverty, programmatic quality, violence and residential instability — are likely to drop out of thinking.

  - Finally, through its focus on quantity and availability, the *Information Is Everything* model obscures the importance of information quality. If the lack of information is what threatens development, informants reasoned, the answer is to get more information out to parents. This obscures the fact that not all information is created equal, and that just pumping information into the public sphere might do nothing to improve developmental outcomes, or in some cases might actually reinvigorate unproductive cultural models and work against some of the goals of science translation.

5. *What can be done to improve early child development and outcomes?*

Research revealed that informants' thinking about solutions to developmental issues was structured and constrained by the dominant cultural models that they used to reason about the causes of development (i.e., *How* it works and *What* threatens it). Links between cultural models of process and perceptions of the appropriateness and effectiveness of solutions have been documented extensively in anthropology.[32] The associations between these two domains in the research described here is consistent with the findings of this literature more generally — demonstrating that the ways people think about the causes of events and conditions shape and bound perceptions of solutions.

The following were the dominant ways in which process models described above were evoked to think about solutions.

1. **Go back to a better Australia.** Employing the *Threat Of Modernity* model, informants reasoned that one way to improve development was to get back to the way that things used to be — back to an Australian past when: "mums stayed home"; "kids played with other kids instead of screens"; "children weren't so spoiled"; "people in communities knew and looked out for each other"; and "families had time to spend with each other." Such explanations dominated discussions of solutions and again evidenced the dominance of the *Threat Of Modernity* model in how Australians think about development.

2. **Get more information to parents.** "More information" was a familiar refrain when informants were asked about what could be done to improve development and well-being. Informants employed the *Information Is Everything* model to reason that providing more information about child development would improve parenting and, through parenting, child development. Seeing individual behavior change through the provision of information is not new in FrameWorks research — this thinking and the model on which it relies has emerged in our work across cultures.[33]

3. **Improve the education system.** Drawing on both the foundational models that early child development is about learning and the strong tendency to age-up children in thinking about development, informants focused considerable attention on how improving the quality of primary education in Australia would be an effective way of improving child development. Quite simply, since development is about learning and because school is a dominant place for learning, improving schools was understood as an effective way of improving the way that children develop.

Implications of cultural models used to think about *What Can be Done to Improve Child Development and Outcomes*:

- Solutions are limited by the dominance of a small set of cultural models. The association between learning and development, connections between information and parenting, and the preoccupation with an idyllic past constrain the solutions that Australians are able to generate and recognize as effective in improving child outcomes. Furthermore, the application of these ways of thinking in how people reason about solutions nods to the dominance of the *Threat Of Modernity*, *Family Bubble*, *Information Is Everything* and *Development=Learning* cultural models on the issue of development. That more of the productive cultural models documented above were not used in thinking about solutions suggests both that Australians do not have much practice in thinking remedially about development, and that, when asked to do so, they fall back on their most practiced tools of meaning-making. Much of the work on reframing the issue of child development in Australia will entail developing and testing tools that are able to expand the types of remedial strategies that members of the public can see as effective, and aligning these solutions with the policy implications of the science of development. There seem to be many models that, if activated and persistently connected to solutions, have promise in widening public thinking of ways to improve developmental outcomes.

The Australian Public's Story of Early Child Development

➡ **What is early child development about?**
It's about childcare, physical safety and a time when things were better for kids and their families in Australia. It's about school-age children who are similar to some children but very different from those from other groups.

➡ **What develops?**
Morals, discipline, self-reliance, social skills and the ability to be happy develop.

➡ **How do children develop?**
Children are filled up with context by being exposed to relatively simple worlds. They have traits and characteristics that are determined by genes or shaped by environments and they develop by being challenged and supported as they meet these challenges.

➡ **What threatens development?**
Development is threatened by unfortunate changes that are part of the modern worlds, by parents who don't parent well because they don't have enough information, and by a system of medicine and science that over-diagnoses and over-prescribes medication.

➡ **What can be done to improve development and outcomes?**
We can improve development by going back to a better time when families and communities were strong; by giving parents more information so that they can be better parents; and by improving the education system so that it does a better job of teaching children what they need to know and how to do what they need to do.

MAPPING THE GAPS (AND OVERLAPS) IN UNDERSTANDING

The goals of this analysis have been to: (1) document the way experts talk about and explain early child development; (2) establish the way that the Australian public understands these same issues; and (3) compare and "map" these explanations and understandings to reveal the gaps and overlaps between the perspectives of these two groups. We now turn to this third task.

Comparing the expert and public stories of early child development reveals a set of gaps in understanding. Below, we describe each of these gaps and discuss its communications implications.

1. **Childcare: A site of development vs. a place for children to go where they will be safe while parents work.** While experts saw childcare as a valuable site where key developmental processes take place, members of the Australian public had underlying conceptions of childcare as a largely custodial institution where physical safety is the primary concern. This difference is noteworthy, as many of the policies and interventions about which science offers implications deal with this site of development. If science translation is to realize its potential to influence policy, reframing public understandings of childcare — of the importance of these contexts, of characteristics of quality care and of the value of center-based care for improving outcomes — will be essential.

2. **Similarities and differences: Common processes vs. group differences.** While less imposing than the gap in the United States, there was a marked difference between the expert emphasis on common underlying processes and Australians' focus on differences between groups of children. As noted above, the recognition of common process at the intra-group level is promising here as a leverage point. By discussing similarities at a group level, and building back to common processes at a deeper and wider level, communicators should be able to create an understanding of common developmental processes, and to therefore message about the power of large-scale public policies to act on and improve these processes. Future communications research will need to tease out and test this hypothesis, answering the question of whether emphasizing intra-group similarities predisposes Australians to recognize common underlying principles of development at the inter-group level.

3. **The process of development: Active and dynamic vs. passive and uni-directional.** A dominant public model leads to conceptions of children as passive absorbers of content, while the expert story is built on the understanding of active and participatory interaction between child and caregiver. If the *Fill It Up* cultural model becomes active, expert emphasis on, and messages around, the active nature of development will be hard to think. If, however, other available ways of thinking about development can be invoked and strengthened in the public's thinking — for example, the *Stretch but Not Break* model — this gap

becomes less expansive and communicating about the active nature of development easier to achieve.

4. **Causal factors: Interactive vs. discrete.** For experts, interaction is the dominant feature of the relationship between causal factors and outcomes. From the public's perspective, genes influence some outcomes and environments others in a discrete way. Because of its central role in understanding many of the key messages that developmental scientists want to be able to communicate, addressing this gap is essential to translational work. The silver lining is that FrameWorks has bumped up against this same barrier in past work and, in so doing, has developed tools that create more interactive ways of thinking about genes and environments. We recommend that future communications research confirm the instrumental effects of these tools — *Resilience Scale* and *Environmental Edits* — in Australia.

5. **Stress: Developmental derailer vs. (almost) non-existent.** Literal translations of the science of stress are likely to be ineffective because of the fundamentally different way that the Australian public understands stress in children — especially young children. Translating this part of the expert story require shifting the way that the public thinks about stress rather than just pushing more information about its deleterious effects into the public sphere. This is, again, an area where past FrameWorks research offers considerable utility, as we have encountered and developed prescriptive tools to address this gap. The explanatory metaphor of *Toxic Stress* creates new ways for people to think about stress — ways that increase receptiveness to the idea that stress can be experienced by young children and, under certain circumstances, can have negative long-term effects. Because of this promise, *Toxic Stress* is another tool that warrants confirmational testing in future Australian communications research.

6. **Science: Solution vs. part of the problem.** Some of the public's models create a powerful science push-back — in some cases, casting science as the source of current problems. Other models, however, such as the shared understanding that "more information" about the science of development is an important step in improving outcomes, create more favorable views of science and scientists. As translation attempts will suffer directly from anti-science sentiments, the gap between experts and members of the public regarding the role of science in this issue are vital to address. Strategically navigating between available understandings — invigorating mental models from which people can think productively about science while pushing back other perspectives that structure suspicion and outright rejection of science messages — will be an important strategy of successful science translation in Australia. This may be a problem met more effectively by a wider array of messengers; again, this warrants testing.

7. **Information: Better vs. more.** Experts and members of the public share the conviction that improving development and child outcomes involves information. This is, however, where the similarities end. For members of the public, the remedial power of information hinges on its amount and availability, and Australians explain that more information about development would lead to better parenting and, thus, improved developmental outcomes. For experts, the focus is on the quality of information and the recognition that bad information does nothing to improve outcomes. The fact that the public associates information with solutions, but misperceives the effectiveness factor in an information-for-change strategy, suggests that communicators may be able to emphasize the importance of information in improving outcomes and then refocus attention away from quantity towards quality. Attention also needs to be paid to widening understandings of the factors that influence behavior and outcomes to include the idea that providing quality information is part of the solution, but that addressing developmental issues involves systemic changes at policy and programmatic levels.

8. **Temporal focus: Forward vs. backward**. Employing the *Threat Of Modernity* model, Australians look backwards to find solutions to current developmental issues. Experts see the progress of scientific knowledge as the way to create better programs and improve outcomes. This gap suggests that translations of science messages of progress and new, cutting-edge research are likely to be problematic in the public sphere. Instead, the public will need new ways of thinking about development that allow them to see the issue as one amenable to progressive, forward-thinking and innovative solutions. FrameWorks has encountered a similar backward-facing temporal perspective in its work on skills and learning in the U.S., and has found that *Values* — broad, orientational perspectives — are highly effective in orchestrating the type of backward- to forward-facing shift necessary here.[34]

In addition to these gaps, comparative analysis suggests areas of overlap between expert and public understandings. As areas of confluence, these overlaps represent features of the cognitive landscape that communications can strategically leverage to improve the accessibility of expert information.

1. **How skills develop: Challenge and scaffolding.** Both experts and members of the public implicate and emphasize a similar process by which skills develop. This suggests that science messages on skills development have considerable promise, and that with careful framing and additional concretization they can be readily incorporated into the public's thinking about children's issues and development.

2. **Focus on skills and what skills matter.** There is also an overlap in the way that both experts and Australians place importance on skills and, further, the specific skills on which they place this importance. This confluence suggests that communicators should have a ready audience for talking about executive function skills, and that communicating this area of the science should benefit from additional concretization with the explanatory metaphor of *The Brain's Air Traffic Control System*.

3. **Environments matter.** The public's deep recognition of the importance of environments in the developmental process is also encouraging, given a similar expert emphasis. This default recognition will be a tool in communicating about the potential of policies that aim to influence context to positively affect developmental outcomes.

4. **Information is a part of the solution.** As discussed above, the recognition that information provision is part of the solution is, with careful attention to the way in which communication can improve outcomes, an expert-public overlap that can be leveraged in translational attempts.

CONCLUSION AND FUTURE DIRECTIONS

This research has revealed a complex set of cultural models — a swamp of public thinking — that Australians use to reason about early child development issues. This swamp contains understandings that impede science translation. For example, understandings of the threats of modernity to development and the need to get back to a simpler Australian past, as well as assumptions about the relatively passive nature of development, will challenge science translators seeking to communicate messages that go directly against these ways of thinking. However, the research has also shown that the swamp contains ways of thinking that are consistent with the science messages and, if activated, should increase receptivity to many of the key parts of the science story. Default understandings, for example, that contexts matter and that skills are key outcomes of development represent understandings that communicators can build on and use to introduce science messages.

The oscillation between models that block and those that facilitate the translation of developmental science suggests that a foregrounding/backgrounding communications strategy will be essential in effectively framing the science for the Australian public. Communications will need to find tools and strategies that draw forward those cultural models which predispose Australians to productively consider science messages, while simultaneously inoculating and backgrounding those that make it hard for Australians to consider or endorse these messages. Finding messages that allow for this strategic shifting should be a top priority in communications work.

Over the last ten years, FrameWorks has encountered many of the challenges and gaps documented here. There is, therefore, a set of well-informed hypotheses about what tools will work to address these challenges and how these tools will work to achieve this bridging function. This suggests that much of the upcoming communications research will be confirmational rather than generative. More specifically, based on the similarity between the conceptual challenges identified in Australia and those documented in the U.S. and Canada, the following tools appear promising and warrant confirmational testing in Australia: *Resilience Scale*, *Levelness*, *Weaving Skill Ropes*, *Environmental Edits*, *Toxic Stress*, *Serve And Return*, *Air Traffic Control* and *Brain Architecture*.

In addition to the foregrounding/backgrounding strategy and the need for confirmational research, this research has shown the need for and promise of developing a set of new communications tool to address gaps and challenges unique to the Australian context. Specifically, concretizing the process by which executive function skills develop and building a wider understanding of the factors affecting prenatal development appear areas ripe for the development of explanatory metaphors. Finally, the dominance of the *Threat Of Modernity* cultural model, and the backward-facing perspective that it creates in thinking about solutions, suggests that developing and

testing *Values* will help in shifting from a conservative rearview of solutions to one focused on progressive, evidence-based solutions.

Despite the need for prescriptive research — to discern the best ways to pull productive cultural models forward, to confirm the effectiveness of extant reframing tools, and to develop and test new tools to address Australia-specific communications challenges — this research has produced the following communications recommendations:

DO:
1. Reference specific age groups.
2. Leverage understanding of *intra*-group similarities to establish common *inter*-group developmental processes on which interventions and public policies can act.
3. Explain specific ways in which context is key and develop clear explanations of *how* contexts shape outcomes.
4. Activate and build on the *Stretch but Not Break* model to explain the process of skill development.
5. Reinforce the public's belief in the importance of developmentally important skills such as planning, problem-solving, self-reliance, behavioral and emotional control, and self-awareness.
6. Link individual level to wider community and societal levels — both in terms of causal factors and outcomes.
7. Activate and use the *Context Matters* model to build better understandings of how environments shape outcomes.
8. Expand the default assumption that *Environments=People* with specific references to non-human factors that shape outcomes.

DON'T:
1. Get stuck in discussions that allow people to apply their discrete model of genes and environments — such as referencing only genetic or environmental factors in discussing specific outcomes, or talking about the percentage of a given characteristic that is determined by each factor.
2. Explicitly activate the *Family Bubble* model by discussing parents in prominent positions in communications materials. Messages should not lead with the importance of parents, or they risk getting people's attention stuck there.
3. Use language that allows people to fall back on their default understanding that children's worlds are "simple."
4. Present statistics that show that outcomes have grown worse over time — this will activate the unproductive *Threat Of Modernity* cultural model.
5. Utilize over-medication and false-diagnoses as the focal problems in communications.

Appendix: MORE ABOUT THE CULTURAL MODELS INTERVIEW

Cultural modes interviews were designed to begin broadly and in as open-ended a way as possible to uncover the organizational mental models that informants used to understand the topic of child development — an inherently broad concept. Questions were designed to be consistent with the interview guides used in the research conducted in the U.S. and Canada. As this research was comparative in nature, parallel interview guides allowed researchers to confirm similar patterns and differentiate between unique patterns of thinking among data gathered from these populations.

Informants were first asked to respond to a general issue ("What do you think about child development?") and were then probed throughout to explain their responses ("You said X, why do you think X is this way?" or "You said X, tell me a little bit more about what you meant when you said X," or "You were just talking about X, but before you were talking about Y, do you think X is connected to Y?"). This pattern of probing leads to long conversations that stray (as is the intention of the interview) from the original question. Both the open-ended nature and the order of topics covered in the guide allowed informants to identify and introduce the information and entailments that they implicitly connected and thought most relevant, rather than gathering information about the connections that we *suspected* they would make, or by biasing thinking of one topic based on previous discussion of another topic. Informants were then asked about various valences or instantiations of the issue ("What do you think happens when development goes well versus when there are problems — what are the results and why do you think this is?") and were probed for explanations of these differences ("You said that X is different than Y, why do you think this is?"). The pattern of questioning begins very generally and moves gradually to differentiations and more specific topics.

Kendall-Taylor, Nathaniel & Lindland, E. (2013) *Modernity, Morals and More Information: Mapping the Gaps Between Expert and Public Understandings of Early Child Development in Australia.* Washington, DC: FrameWorks Institute.

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[1] Communications research in the United States has been in partnership with the Center on the Developing Child at Harvard University. Research in Canada has been in collaboration with the Alberta Family Wellness Initiative and supported by the Norlien Foundation.

[2] FrameWorks Institute. (2009). *Framing early child development Message Brief.* Washington, DC: Author.

[3] Holland, D., & Quinn, N. (1987). *Cultural models in language and thought.* New York, NY: Cambridge University Press.

[4] See the following reports for more detailed descriptions of these tools and the research that produced them:
Erard, M. (2013). *Weaving skill ropes: Using metaphor to enhance understanding of what skills are and how they develop.* Washington, DC: FrameWorks Institute.
Kendall-Taylor, N. (2012). *The resilience scale: Using metaphors to communicate a developmental perspective on resilience.* Washington, DC: FrameWorks Institute.
FrameWorks Institute. (2010). *More to genes than that: Designing metaphors to explain epigenetics.* Washington, DC: Author.
FrameWorks Institute. (2009). *Framing early child development Message Brief.* Washington, DC: Author.
Kendall-Taylor, N., Erard, M., Simon, A. & Davey, L. (2010). *Air traffic control for your brain: Translating the science of executive function using a simplifying model.* Washington, DC: FrameWorks Institute.
Erard, M., Kendall-Taylor, N., Simon, A., & Davey, L. (2010). *The power of levelness: Making child mental health visible and concrete through a simplifying model.* Washington, DC: FrameWorks Institute.

[5] Simon, A. (2012). *The pull of values.* Washington, DC: FrameWorks Institute.

[6] Lindland, E., & Kendall-Taylor, N. (2012). Sensical translations: Three case studies in applied cognitive communication. *Annals of Anthropological Practice 36*, 45-67.

[7] Goffman, E. (1967). *Interaction ritual: Essays in face-to-face behavior.* New Brunswick, NJ: Transaction Publishers.

[8] Quinn, N. (2005). *Finding culture in talk: A collection of methods* (p. 3). New York, NY: Palgrave Macmillan.

[9] Goffman, E. (1967). *Interaction ritual: Essays in face-to-face behavior.* New Brunswick, NJ: Transaction Publishers.

[10] Quinn, N. (2005). *Finding culture in talk: A collection of methods* (p. 3). New York, NY: Palgrave Macmillan.

[11] Quinn, N. (1987). Convergent evidence of a cultural model of American marriage. In D. Holland, & N. Quinn (Eds.), *Cultural models in language and thought* (pp. 173-194). Cambridge, MA: Cambridge University Press.

[12] Bales, Susan N. (2005). *Talking Early Child Development and Exploring the Consequences of Frame Choices: A FrameWorks Message Memo.* Washington, DC: FrameWorks Institute.

[13] Bales, S.N. (2005). *Talking early child development and exploring the consequences of frame choices: A FrameWorks Message Memo.* Washington, DC: FrameWorks Institute.

[14] Kendall-Taylor, N. (2010). *Experiences get carried forward: How Albertans think about early child development.* Washington, DC: FrameWorks Institute.
Kendall-Taylor, N. (2010). *"Kids must have mental health … but they can't, can they?": How Albertans think about child mental health.* Washington, DC: FrameWorks Institute.
FrameWorks Institute. (2009). *Framing early child development Message Brief.* Washington, DC: Author.

[15] D'Andrade, R. (1987). A folk model of the mind. In D. Holland and N. Quinn (Eds.), *Cultural models in language and thought.* Cambridge, MA: Cambridge University Press.

[16] Kendall-Taylor, N. (2011). *"Anyone can do it: Wake up, rise up, and get some gumption": Mapping the gaps between expert and public understandings of resilience and developmental outcomes.* Washington, DC: FrameWorks Institute. Lindland, E., Kendall-Taylor, N., Baran, M., O'Neil, M., & Simon, A. (2012). *Mapping the gaps on skills and learning: A core story of education report.* Washington, DC: FrameWorks Institute.

[17] Bales, S.N. (2006). *Framing lessons in elevating prevention policies for children: A FrameWorks Message Memo.* Washington, DC: FrameWorks Institute.

[18] Chart, H., &Kendall-Taylor, N. (2008). *"Reform what?": Individualist thinking in education: American cultural models on schooling.* Washington, DC: FrameWorks Institute.

[19] Kendall-Taylor, N., Erard, M., Simon, A., & Davey, L. (2010). *Air traffic control for your brain: Translating the science of executive function using a simplifying model.* Washington, DC: FrameWorks Institute.

[20] Kendall-Taylor, N., Erard, M., Simon, A., & Davey, L. (2010). *Air traffic control for your brain: Translating the science of executive function using a simplifying model.* Washington, DC: FrameWorks Institute

[21] Iyengar, S. (1991). *Is anyone responsible? How television frames political issues.* Chicago, IL: University of Chicago Press.

[22] Simon, A. (2010). *Moving north: Translating child mental health values and models to Canada.* Washington, DC: FrameWorks Institute.

[23] Simon, A. (2012). *The pull of values.* Washington, DC: FrameWorks Institute.
Manuel, T. (2009). *Refining the core story of early childhood development: The effects of science and health frames.* Washington, DC: FrameWorks Institute.

[24] Kendall-Taylor, N., McCollum, C., & Manuel, T. (2009). *Caught between osmosis and environments: Mapping the gap between the expert and the public understandings of the role of executive function.* Washington, DC: FrameWorks Institute.
Kendall-Taylor, N. (2010). *Experiences get carried forward: How Albertans think about early child development.* Washington, DC: FrameWorks Institute.

[25] Kendall-Taylor, N. (2011). *"Anyone can do it: Wake up, rise up, and get some gumption": Mapping the gaps between expert and public understandings of resilience and developmental outcomes.* Washington, DC: FrameWorks Institute.

[26] See: Kendall-Taylor, N. (2009). *Conflicting models of mind in mind: Mapping the gaps between the expert and the public understandings of child mental health as part of Strategic Frame Analysis™.* Washington, DC: FrameWorks Institute; and The FrameWorks Institute (2009). *Framing early child development: A FrameWorks MessageBrief*. Washington, DC: Author.

[27] FrameWorks' e-workshop *The Wide Angle Lens* (http://hollyplays.com/wal/) provides valuable tools and advice on how to establish a more productive way of thinking about the role of context in social issues like child development.

[28] See: Rose, G. (1992). *The strategy of preventive medicine.* Oxford, England: Oxford University Press; and Evans, G. (2006). Child development and the physical environment. *Annual Review of Psychology, 57*, 423-51.

[29] Kendall-Taylor, N. (2012). *The resilience scale: Using metaphors to communicate a developmental perspective on resilience*. Washington, DC: FrameWorks Institute.

[30] Kendall-Taylor, N., & McCollum, C. (2009). *Determinism leavened by will power: The challenge of closing the gaps between the public and expert explanations of gene-environment interaction.* Washington, DC: FrameWorks Institute.
Kendall-Taylor, N. (2011). *"Anyone can do it: Wake up, rise up, and get some gumption": Mapping the gaps between expert and public understandings of resilience and developmental outcomes.* Washington, DC: FrameWorks Institute.

[31] Bales, S.N. (2009). *How to talk about climate change and oceans.* Washington, DC: FrameWorks Institute.

[32] Bales, S.N. (2009). *How to talk about climate change and oceans.* Washington, DC: FrameWorks Institute. Kendall-Taylor, N. (2009). *Conflicting models of mind in mind: Mapping the gaps between the expert and the public understandings of child mental health as part of Strategic Frame Analysis™.* Washington, DC: FrameWorks Institute.

[33] For more on the connection between cultural models of causation and perceptions of treatment see the following: Kleinman, A. (1980). *Patients and healers in the context of culture: An exploration of the borderland between anthropology, medicine, and psychiatry.* Berkeley, CA: University of California Press.
Mathews, H., & Hill, C.E. (1990). Applying cognitive decision theory to the study of regional patterns of illness treatment choice. *American Anthropologist 92*(1), 155-169.
Quinn, N. (1978). Do Mfantse fish sellers estimate probabilities in their heads. *American Ethnologist 5*(2), 206-226.
Wilce, J.M. (2003). *Social and cultural lives of immune systems.* New York, NY: Routledge.
Kendall-Taylor, N. (2009). Treatment seeking for a chronic disorder: How families in Coastal Kenya make epilepsy treatment decisions. *Human Organization 68.*

[34] Kendall-Taylor, N. (2009). *Conflicting models of mind in mind: Mapping the gaps between the expert and the public understandings of child mental health as part of Strategic Frame Analysis™.* Washington, DC: FrameWorks Institute.
Kendall-Taylor, N. (2010). *"Kids must have mental health … but they can't, can they?": How Albertans think about child mental health.* Washington, DC: FrameWorks Institute.

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