The Power of Levelness:
Making Child Mental Health Visible and Concrete Through a Simplifying
Model

A FrameWorks Research Report

Prepared for the FrameWorks Institute
by
Michael Erard, Nathaniel Kendall-Taylor, Lynn Davey and Adam Simon

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INTRODUCTION

The research presented here was sponsored by the Center on the Developing Child at Harvard University, and represents the latest iteration of a larger body of research, supplemented by initial funding from the Endowment for Health (NH), that seeks to advance more effective ways of communicating about the science of early childhood development and its policy implications. The research described in this particular report is part of a more specific and conceptually targeted study exploring the ways that Americans think about and make sense of child mental health. The project seeks to apply this understanding to craft new tools and strategies for communicators that can help them translate what child mental health is and the policies and programs that would promote it. In this report, we identify a single *simplifying model* that, through a multi-method empirical testing and refinement process, has proven effective in creating, extending and expanding understandings of child mental health and in translating the science on this important topic.

Simplifying models are metaphorically based frame cues that change the fundamental ways people understand what issues are "about." They are, therefore, useful ingredients in shifting and expanding interpretational frameworks that people access and employ in processing information. By fortifying understandings of complex phenomena like how brains develop, how environments interact with biology over the course of that development (or, in this case, what factors shape child mental health), simplifying models can strengthen Americans' appreciation for the science of child development. With a better understanding of this science and its real-world implications, Americans are well-positioned to consider child well-being and development as public issues, amenable to and dependent upon sound public policy.

Following FrameWorks' multi-disciplinary approach of Strategic Frame Analysis™,[1] we have unpacked and distilled the science of child mental health. We have also focused, in past research, on how Americans' understandings of the components and concepts of this science are shaped by a shared set of assumptions and understandings — what anthropologists call "cultural models."[2] These shared assumptions are what allow individuals to navigate their social worlds. However, cultural models can also play a more restrictive role, shaping available interpretations and making some messages "harder to think" than others.[3]

FrameWorks' research has shown that the existing dominant cultural models associated with child development and child mental health restrict Americans' ability to understand the neurobiology of children's mental health, the environments that affect these neurobiological systems and the appropriate targets of effective interventions to protect and promote positive mental health in children. Therefore, these shared cultural understandings make many of the messages of scientific experts, child advocates and policy reformers decidedly "hard to think." The result is a problem of translation.

Without new ways to translate the science of child mental health, our research suggested that it is likely that members of the public will continue to default to certain culturally dominant ways of thinking about mental health, about children and about early child development. These dominant patterns of thinking occlude the conclusion that policy and public programs can (or should) serve as an effective means through which to shape and improve the lives of American children and therefore the future of our nation.[4]

In our research, we have identified a number of gaps between expert and public knowledge of children's mental health.[5] We have addressed the most conspicuous and problematic of these conceptual gaps with a simplifying model. The expert/public gaps in understanding that the simplifying model addresses are as follows: 1) What is children's mental health? 2) Why is mental health essential for children's development? 3) How can children's mental health be protected and promoted?

The research described in the following report shows that one simplifying model, based on the metaphor of *Levelness,* was more successful than 11 other candidate models tested with respect to the objectives mentioned above. This simplifying model makes the science of child mental health more concrete and accessible for the American public. It can play an important role in improving understanding of child mental health and more generally contribute to the ability of scientists and advocates to communicate about early child development. It is important to note, however, that even the best simplifying models cannot accomplish everything that needs to be done in reframing a complex issue like child mental health. Other frame elements — Values, Messengers, Visuals, Tone, Causal Chains, etc.[6] — need to be tasked with addressing other routine misdirections in thinking. Toward that end, this report is one in a series of explorations designed to identify effective elements of an always-evolving frame around child mental health and early child development.

WHAT IS A SIMPLIFYING MODEL?
A simplifying model can be thought of as a bridge between expert and public understandings — a metaphor that presents a concept in a way that the public can readily deploy to make sense of new information. More specifically, FrameWorks defines a simplifying model as a research-driven, empirically tested metaphor that captures and distills a concept by using an explanatory framework that fits in with the public's existing patterns of assumptions and understandings (cultural models).[7] A simplifying model renders a complex and/or abstract problem as a simpler analogy or metaphor. By pulling out salient features of the problem and mapping onto them the features of concrete, immediate, everyday objects, events or processes, the model helps people organize information into a clear picture in their heads. This has the potential effect of making people better critical thinkers and careful consumers of media and ultimately better situated to think about how policy impacts social issues like child mental health.

On the basis of this theoretical perspective, FrameWorks has built a robust, reliable sense of what an effective simplifying model looks like and how it behaves.[8] An effective simplifying model:

(1) improves *understanding* of how a given phenomenon works;

(2) creates more *robust, detailed and coherent discussions* of a given target concept (e.g., child mental health);

(3) is able to be *applied* to thinking about how to solve or improve a situation;

(4) *inoculates* against existing dominant unproductive default patterns of thinking normally applied to understand the issue;

(5) is highly *communicable* — moving and spreading easily between individuals without major breakdowns in key concepts; and finally,

(6) is *self-correcting*. In other words, when a breakdown in thinking does occur, people using the model can re-deploy it in its original form, where it is able, once again, to clarify key aspects of the issue.

WHY CHILD MENTAL HEALTH NEEDS A SIMPLIFYING MODEL

When FrameWorks researchers design and test simplifying models, they employ the results of earlier qualitative research, cultural models theory and an understanding of the communications challenges surrounding a particular topic. We conceived of the work that a simplifying model must do on the specific issue of child mental health in the following way:[9,10]

a. The simplifying model must be understandable to people unfamiliar with the topic.

b. The simplifying model has to convey an understanding of the neurobiology of mental states.

c. The simplifying model needs to make it "thinkable" that children can have mental health and that it is crucial for their successful development.

d. The simplifying model has to also convey an understanding of the interplay between neurobiology and environmental factors that impacts mental health and the developmental course.

e. The simplifying model has to help people appreciate how the mental health of children can be protected and promoted through effective interventions — it is not something the individual child can be tasked with (or blamed for not doing).

Following the executive summary below, we briefly discuss the process by which FrameWorks' researchers identified, developed and empirically tested the power of one specific simplifying model, chosen from a long list of other candidate models, in broadening public understanding of the concept of child mental health. We then examine the findings from this research, and

conclude with specific recommendations about using the simplifying model. We end with a discussion of how this simplifying model can be applied in communication and science translation efforts. We provide Appendix A for those wanting to read more specifics on research methods.

EXECUTIVE SUMMARY

FrameWorks' simplifying model process produced one simplifying model, "Levelness," which was a powerful tool that changed how people talked and thought about child mental health. The resulting model is provided here:

> **Levelness**
> Scientists say that children's mental health affects how they socialize, how they learn, and how well they meet their potential. One way to think about child mental health is that it's like the levelness of a piece of furniture, say, a table. The levelness of a table is what makes it usable and able to function, just like the mental health of a child is what enables him or her to function and do many things. Some children's brains develop on floors that are level. This is like saying that the children have healthy supportive relationships, access to things like good nutrition and health care. For other children, their brains develop on more sloped or slanted floors. This means they're exposed to abuse or violence, have unreliable or unsupportive relationships, and don't have access to key programs and resources. Remember that tables can't make themselves level — they need attention from experts who understand levelness and stability and who can work on the table, the floor, or even both. We know that it's important to work on the floors and the tables early, because little wobbles early on tend to become big wobbles later. So, in general, a child's mental health is like the stability and levelness of a table.

- Levelness is a highly communicable model that showed significant impacts on people's ability to define child mental health, not in terms of negative emotions or inattention to moral values, but in terms of mental well-being. The model enabled people to see that the determinants of mental health are multiple; that possessing mental health has functional outcomes; and that mental health is necessary for child development. Importantly, the model also kept people from equating "mental health" solely with "mental illness"; using the model, people articulated a range of interventions that might protect and promote child mental health. The model also enabled people to see: that children *do* have mental health; that their mental states, though different from adults', do in fact exist; and that early impacts, both negative and positive, play a large role in later outcomes in a child's life. Finally, it is worth noting that though the model's title is "levelness," people compared child mental health to a table without any apparent obstacle.

- Significantly, Levelness also inoculated against a number of cultural models that previous FrameWorks research showed to be dominant in how Americans understand mental health and children:

- that children, even the very young, do not have mental health
- that "mental health" is associated with pathology
- that mental health is merely about feelings or that it is about moral failings
- that the family is the only contextual determinant of child development and the only means of protecting child mental health

• While testing Levelness, we also encountered another patterned implicit understanding in which informants assumed that creativity actually *requires* mental instability. Employing this assumption, informants reasoned that by promoting good mental health, we may be dampening creative genius. We found that the Levelness simplifying model inoculated against this line of thought by focusing individuals' attention on the idea of *functioning*.

• Overall, Levelness outperformed another simplifying model, "Cornerstone." Though Cornerstone scored well on the experimental quantitative survey, it had the strong tendency in the final qualitative phase of the research to focus discussions on determining the single most important factor of children's mental health. In turn, this led discussions back to the dominant "family bubble" cultural model. Using the family bubble model, Americans operate under the implicit assumption that parents and the home are the only important factors that determine developmental outcomes; this cultural model limits them from thinking about the roles that schools and teachers, built environments (such as neighborhoods), environmental health, churches and other religious institutions, social programs, crime, exposure to violence and media play in this complex process.

• The On-the-Street Interviews generated some concern that Levelness might cue exclusively pharmaceutical therapies for mental illness because the "imbalance" of the table could be equated with "chemical imbalance." However, in the Persistence Trials associated with this model, there was no evidence of this narrow focus on drug therapy; rather, pharmaceutical approaches were deemed appropriate for certain types of serious mental illnesses and always appeared in a cluster of approaches to protect and restore child mental health. The "unbalancing" of the table was never compared to chemical imbalances in the brain and invoked a decidedly multi-modal perspective on promotion and intervention.

HOW SIMPLIFYING MODELS ARE IDENTIFIED AND TESTED

Phase 1: Mapping the Gaps
FrameWorks' research team first conducts two types of interviews, *cultural models interviews* and *expert interviews.* Cultural models interviews are conducted with members of the general public and are designed to gather data that, through qualitative analysis, reveal the underlying patterns of assumptions — or cultural models — that members of the public apply in processing

information on a given topic. Expert interviews are conducted with researchers, advocates and practitioners who possess an "expert" or technical understanding of the given phenomenon. These interviews are designed to elicit the expert understanding of the issue. Comparing the data gathered from these two types of interviews reveals the gaps that exist between how experts and average Americans understand and approach issues.

Phase 2: Designing Simplifying Models

FrameWorks' research team then analyzes transcripts of the interviews conducted in Phase 1 to generate a list of metaphor categories that capture salient elements of the expert understanding, using approaches to metaphor from cognitive linguistics and psycholinguistics. The result of the design process is a list of both metaphor categories (e.g., "Structure," "Power") and multiple candidate simplifying models in each category (e.g., "Roadway Effect," "Game Plan Effect"). The initial simplifying models generated from this phase are listed in Appendix A.

Phase 3: Testing Simplifying Models

FrameWorks tests the candidate simplifying models in multiple research formats, beginning with On-the-Street Interviews and followed by experimental surveys that test the candidate models on measures of issue understanding, metaphor application and metaphor-to-concept fit, what has been termed "aptness."[11] Finally, we take the most effective models into a final phase of qualitative testing, Persistence Trials, that mimics the game of telephone, to see how well the models hold up in social interaction as they are used by and shared across individuals. At each stage, we use our findings to winnow our selections as well as refine the models that remain.

Test I: On-the-Street Interviews

On-the-Street Interviews provide an opportunity to gather data on the effectiveness of candidate simplifying models. These interviews examine which specific elements of the models are functioning well and which are less successful at shifting perspectives and improving understanding. They clearly showed that while some models were far more effective in improving understanding on issues of child mental health, the set of models to be taken to the next phase of research needed to be refined. The interview data was employed in this refinement process. Most of the models were easily employed by informants and successfully applied in thinking and talking about child mental health. In this way, informants used the metaphors to define mental health, to define mental health in children, and to talk about how it could be protected.

Test II: Quantitative Experimental Research

Using the results from On-the-Street Interviews to guide the revising and refining of existing iterations, FrameWorks designed a large-scale quantitative survey to test and demonstrate the varying efficacy of the simplifying models with statistical accuracy. The survey was conducted online with approximately 2,000 participants who were drawn from a national online panel. A nationally representative sample was first created. Individual members of the online sample were then selected to "match" members of this sample — constructing a nationally representative experimental sample.

The experiment measured three things: the general understandability of the metaphor (understanding), the participants' assessment of its appropriateness as a way to think about children's mental health (aptness) and each model's efficacy in structuring understandings of what child mental health is and how to protect it (application).

Using the quantitative results as a key criterion to decide which to graduate, we brought two candidate models, Levelness and Cornerstone, into the next stage of research.

Test III: Persistence Trials[12]

Cornerstone and Levelness were brought to Persistence Trials in San Diego, Calif., and Boston, Mass. In this phase of research, participants were recruited on the basis of their interest in public affairs and involvement in their communities, as well as assuring variation in gender, race/ethnicity, education level, occupation and self-reported political affiliation.

In a Persistence Trial, an initial pair of participants are presented the paragraph-long iteration of the simplifying model, first to read alone and then orally. They then discuss the model with the moderator and teach it to a subsequent pair after being given a few minutes of time alone to discuss the model and plan their presentation. Following the transfer, the second pair explains the model to a third pair. Finally, the first pair returns to hear the transmitted model from the third pair. This last step allows us to see if the model has "persisted" over the session and if and how participants reason about any changes that occurred to the model. These trials are, with written consent from all participants, video recorded from start to finish. This allows FrameWorks' researchers to capture and analyze all interactions.

This series of Persistence Trials allows researchers to observe how the participants react to and use the model, how and how well the model travels and holds up as it is passed between individuals, what parts of it are "sticky," and how it appears to change participant thinking on the target issue. The design of these sessions also allows us to observe several types of interactions (e.g., alone with each other, alone with the moderator, with the moderator and a new pair), which provide valuable insight into how the model is articulated and its thinkability.

Three Persistence Trials with six participants apiece were conducted on each of the two candidate models. In this way, data was gathered from a total of 36 participants. Analysis of these data facilitated a detailed look at the specific communication advantages and challenges inherent in each model, and ultimately confirmed the effectiveness of the Levelness model. These data were also used to make final refinements to the iteration, or instantiation, of the simplifying model to address specific issues and maximize its effectiveness.

THE WINNER: AN EFFECTIVE SIMPLIFYING MODEL FOR CHILD MENTAL HEALTH

Employing the research process outlined above, FrameWorks' research team identified, refined and empirically tested eight broad simplifying model categories and a total of 12 iterations across those categories. One of these simplifying models emerged as most effective in countering other dominant patterns of thinking about skills and abilities and introducing new ways for people to think about child mental health: *Levelness*.

What *Levelness* Contributes to Public Understanding

Levelness makes extensive contributions to public discussions about child mental health and can help people see the range of policies that the science suggests for promoting and protecting child mental health. Below we review the development of this model through the iterative research process. We discuss the general effects of the winning model, summarize the empirical evidence that demonstrates its explanatory power and describe the specific strategic advantages it would confer if employed in communications on child mental health. Additionally, we describe some of the finer points of using Levelness that advocates and other users of this simplifying model should be aware of, concluding with directions on applying these models in actual communications.

I. General Effects

Each stage of research confirmed the salience of the category of Structure from which Levelness (and Roots, another high-scoring model) originated. Salient parts of the metaphor included ideas of stability, early foundations, functionality, a wide range of causal factors, and modifiability. The metaphors from this category made child mental health concrete and functional and robustly fended off thinking in terms of the following assumptions that comprise a dominant cultural model of mental health:[13]

1. Mental health is the exclusive product of emotional states
2. Negative experiences get embedded and cause negative emotions
3. Individuals are responsible for controlling their emotions

Additionally, there is an assumption that "mental health" implies "mental illness" or some pathology. In other words, there is no conception of the "mental states" that underlie learning and memory, social behavior, self-conception, automatic functioning, and other cognitive and psychological processes. Confounding the public's thinking about mental health is that the assumptions built into the cultural model of mental illness are themselves highly dominant and include:

1. Mental illness is a "chemical imbalance" — something wrong with the brain
2. Chemicals are the product of genes
3. Genes are set in stone/you're born with it
4. Treatment of mental illness is drugs

The Levelness simplifying model successfully moved people's talking and thinking away from both the dominant models of mental health and avoided activation of the unproductive models that so "virally" attach and shape thinking on mental illness.

II. Evidence from On-the-Street Interviews

At this first stage of the simplifying models research process, Levelness was titled "Leveling," and showed promise. It expanded people's sense that environments, not just parents, contribute to developmental outcomes; it also removed the stigma from bad mental health as an emotional or moral failing by focusing thinking on "functioning." Additionally, it markedly improved people's conceptions of child mental health as something could be intervened on — something positive that could and should be promoted. On the negative side, people wanted to know who would be responsible for this leveling process. Renaming the model as a clear noun (Levelness), not as an ambiguous gerund (Leveling), clarified this issue moving forward. As mentioned above, this model seemed to encourage people to talk specifically about chemical imbalances, but this was not observed in subsequent testing of the model.

All of the promising models that emerged from the On-the-Street Interviews stage shared many attributes of the Structure category to which Levelness belonged. Deploying concrete objects like engines and places like roadways were often repeated within conversations and often structured conversations in ways that were compatible with an embodied perspective on mental health — that is, that mental health is a biological characteristic, not an emotional or moral one.

III. Evidence from the Quantitative Experiment

The quantitative experiment showed that Levelness was among a group of highly effective models that 1) were clear and understandable, 2) were assessed by participants to be appropriate ways to think about children's mental health and 3) structured understandings of child mental health that were consonant with the science. That is to say, it led people to see a wide range of

causal factors, helped people choose scenarios in which children's mental health was protected and supported through diverse means, and elevated policy solutions. These three measures were aggregated into an Overall Effectiveness score for each model, which are presented in Figure 1.

Figure 1: Overall Effectiveness
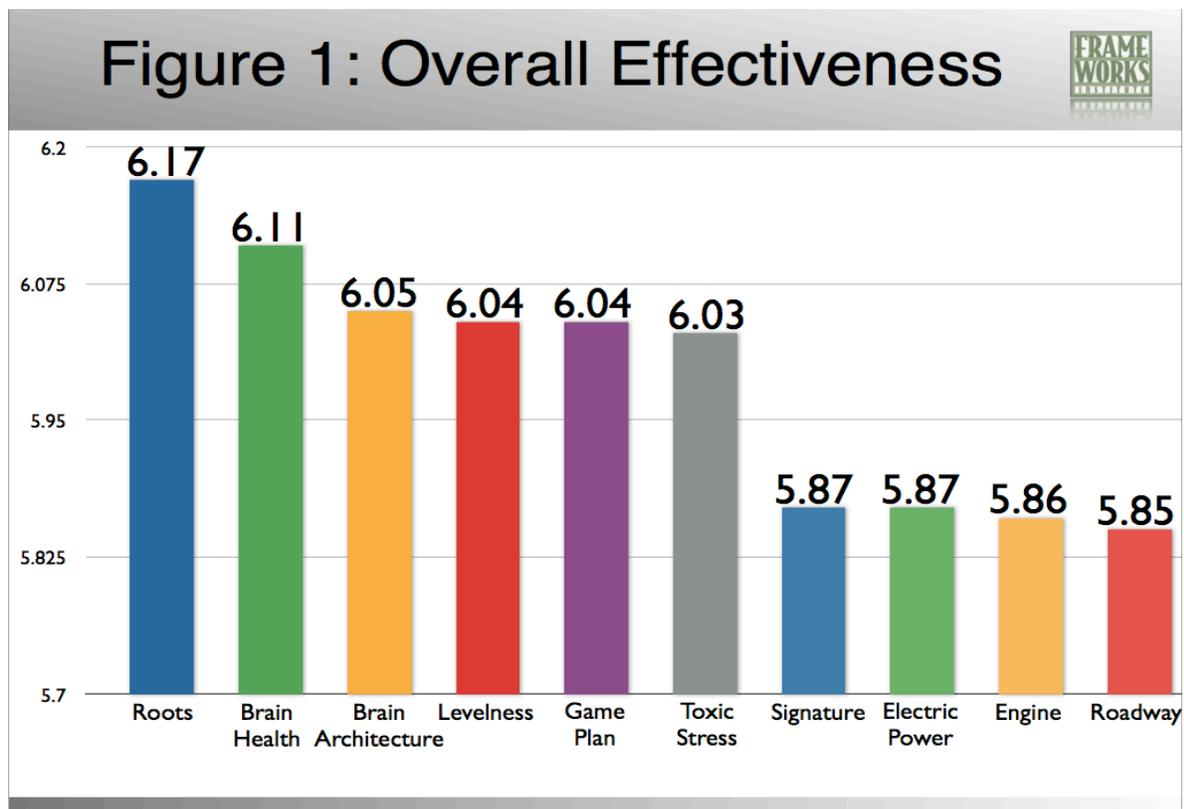
The observer will note that the highest scoring six models form a tight cluster on the overall effectiveness score and that, despite their generally high performance, only two were taken on to the final stage of testing and refinement. In general, the experiment serves as a reliable though wide-gauge filter — it allows us to identify a group of highly successful models and separate out another group of the notably less successful. We deal with the fact that the most effective models tend to cluster by employing other data and criteria in deciding which candidates to graduate to the final qualitative stage of testing and refinement. In this triangulation process we include past experience with similar models and input from advocates and practitioners working in the given field; we also rely on data from the On-the-Street Interviews. One result of this winnowing is that models that will have other unproductive framing ramifications when rolled out into the field are eliminated from further consideration. For instance, based on 10 years of FrameWorks' research on a wide range of issues, researchers came to the conclusion that the "Brain Health" model, while effective in the quantitative experiment, in practice would cue other negative frames that were not specifically tested in the experiment. One such pattern is the personal health frame, which we know from previous work people associate with individual choices; thus, to be unhealthy signifies that someone has made wrong choices. Finally, we promoted some models

over others with similar scores because of their particular promise at other stages of research; for this reason, Levelness was promoted over "Game Plan," since it was highly effective in On-the-Street Interviews.

IV. Evidence from Persistence Trials

It was in extended verbal interactions in a social setting that we observed the clear advantages that Levelness had over its fellow candidate model, "Cornerstone." Data from Persistence Trials are analyzed along several lines: if and how participants can apply the simplifying model; whether and how the model inoculates against unproductive cultural models; whether and how it self-corrects; and the degree to which it is communicable. In these terms, the specific advantages of the Levelness model are as follows:

Application. Persistence Trials showed that the Levelness metaphor was applied in the following ways:

Understanding what child mental health is

The Levelness model was highly effective in helping people explain what child mental health is and in this way can be a powerful asset for communicators. It easily generated a brain-based conception of mental health (as opposed to one based on emotional or moral conceptions). It also structured an understanding of the functional aspect of child mental health; participants readily grasped that, if a table isn't level, it can't be used for whatever purposes that table has. When this understanding was mapped onto discussions of child mental health, it led informants to realize and discuss the importance of child mental health in their overall functioning — an idea that is highly consonant with the science in this area.

In addition, people were readily able to bring up examples of children they knew and had worked with; while the role of parents was discussed, it did not overwhelm and become the focus of discussion as the sole determinant of any outcomes.

Importantly, we also observed long stretches of discourse in which people were able to reason and talk in terms of the model, which means they assigned parts of the table, its origins, its environment and its functioning to the appropriate areas of child mental health and negotiated differences of perspective and opinion about child mental health in terms of "Levelness." In short, they easily and successfully employed the Levelness metaphor in talking about what child mental health is and the application of this model produced discussions that were dramatically different from discourse gathered in earlier methods in which individuals did not have a simplifying model to work with.

> *The table is like a child, and this table here is very sturdy, it has four legs. But first think about the ground, and the foundation. If a table's not on a good*

foundation, it could wobble, it could not be sturdy. So we could think about … maybe the foundation being the beginning of life for a child, maybe … when the mother is pregnant with that child. If she happens to do things to herself that can cause harm to the baby, that foundation's already at a rocky point. And then we look at the table and the legs, and we think of things that … help this child, the education, medical issues the child might have, home life, different things that affect the child, and then genetics plays a part, so that's one of the legs … So if you think about the "mental issues," and we think about this table … let's see what we can do to help the child. What are things in society that … what we need to fix if one of the legs is a little short, or if the foundation's really rocky … what are things as a society we can do.

<div align="right">

Persistence Trial Participant

</div>

Sometimes it's not until the table is very off, out of level … Sometimes just a little out of level they can go … under the radar and not be noticeable … and so it could be that … it isn't seen but when it's very off … you're not seeing somebody that's functioning in a normal way.

<div align="right">

Persistence Trial Participant

</div>

Child mental health contributes functioning to child development.
Child mental health experts whom we interviewed discussed how descriptions of mental health in terms of functioning emphasize what is at stake when children experience poor mental health. Despite the powerful default position that children can't have mental health because of their lack of emotional development, informants exposed to the Leveling metaphor were able to acknowledge the reality of mental health in young children. The metaphor and its entailment of an inanimate object's ability to perform its role allowed informants to see the connection between mental health and functioning in a powerful way.

Well, I mean, 'cause everyone knows that you got to have a solid table that's not wobbly for you to get anything done if you're gonna work, or to do anything.

<div align="right">

Persistence Trial Participant

</div>

Your mind has to be level for you … to do anything … effectively.

<div align="right">

Persistence Trial Participant

</div>

There are degrees of mental health

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Rather than advocating a single manifestation of poor mental health, participants readily acknowledged using the idea that a table could have various degrees of unlevelness, that there were also degrees of good and bad mental health, as in the following example.

> *So if you have an unlevel floor built on, then the child's view of the world is unlevel. If the foundation is level, but the legs aren't right, then they start out looking at the world level, but develop an unlevel view. And then, if the table legs are okay, and the floor's okay, but the table is still is unlevel, that's when you bring in more advanced treatments, and medications, and things to level the table out after all — everything else is level.*
>
> *Persistence Trial Participant*

——

> *Moderator: Why is the levelness of the table even important?*
>
> *Participant 1: That table is meant for a reason, right? To support something else. So let's say if you put a glass of water or something [on an unlevel table] —*
>
> *Moderator: — you can't use it.*
>
> *Participant 1: You could, but eventually it's going to fall off the table and so there's the other problems that arise because of the unlevelness.*
>
> *Participant 2: So to say that if the table isn't level, it can't support other things so it couldn't be a productive member of society, because if it can't support anything else … like a lamp or you might want to put your hamburgers on your table next to your chair at home, if it can't hold anything, then it's not a good table.*

——

> *The way I see mental health is the quality to adjust to the society's conditions without causing any … like, they could be uncomfortable, but the others could be uncomfortable … he will be comfortable on his own, but he will fit in with the parameters.*
>
> *Persistence Trial participant*

Child mental health is influenced and determined by a range of factors
In unprimed interviews, members of the public overwhelmingly thought of mental health as emotional health — as being how "happy" or "sad" an individual was. Good mental health was seen as the result of experiencing positive emotions and dealing with the occurrence of negative emotions so that negative emotional states do not persist over time. By contrast, when thinking

about "Levelness," participants readily talked about a wide range of factors that influence and shape mental health. They also viewed these determinants as factors that could be addressed and corrected to promote good mental health.

> *This is a four-legged table ... and then those [legs] would be the pillars of that child's mind, that would be from their parents, teachers, healthcare and education, okay? So now the legs of this table have to be balanced, so that the level floor mirrors the top of the table. So we want the child to be level. We want them to be healthy, how do we make them healthy? How do we keep them on a level? Do we start with a level floor? Do we start with any floor and adjust the pillars? Do we start with a level table, and build the pillars up to it? Who do you look to? Where do you find what you need to get that child to a place where he's ready to face the world on a nice level even keel? And so, you're looking at the metaphor saying, a child's health is like a level table, but that brings into account all that affects that child: <u>whether their parents are together or separate, whether the grandparents raised the child or not, what kind of scientific research has been done on this, how can it be incorporated into the care of that child, and at what time should different parts of the science be brought in</u> so that you end up with a child who faces the world ready to go, you know, with a nice level look instead of being skewed one way or the other.*
>
> <div align="right">

Persistence Trial Participant (underline added for emphasis)
</div>

Children's mental health can be protected and promoted
Leveling was also effectively applied to reason that a child's mental health was something that could and should be addressed through intervention — something that could be protected and promoted. Rather than assume that child mental health was beyond the reach of intervention — or worse, that situations with child mental illness had reached crisis proportions, people readily talked about resources and solutions that can be drawn on both to prevent mental illness and to protect mental health, as in these examples.

> *We determined what the cause is of mental health, and then try to help to identify a solution, which might be, for an example, if the table was off kilter a little bit, you could just put, you know, something underneath one of the pillars, help build up one of the pillars to make an even playing field.*
>
> <div align="right">

Persistence Trial Participant
</div>

> *And resources can help them ... make that come back into a straight and level ... ground that we discussed about the table you — you touched on it using the other table ... is the table on a uneven ground, is it not level because it's on level ground but the table's not level. Why isn't the table level and how many legs*

might not be level or is the table not level because it's on a slanted or uneven ground and that's causing the levelness to be off of the table and we just talked about the levelness factor and how important that is in a child's mental development and growth.

Persistence Trial Participant

Inoculation. Apart from the model's effectiveness in being applied to thinking about child mental health, the most significant challenge for Levelness was to *inoculate* against dominant ideas associated with mental health, mental illness, and what role mental health plays in the development of children. By "inoculation," we mean that a highly effective simplifying model deactivates the default ways of understanding the issue by supplanting these understandings with new perspectives. Blocked by the simplifying model, the dominant model becomes less robust in the conversation.[14]

1. Against the "Mental Health is Mental Illness" model

In cultural models interviews, participants had a strong tendency to equate "mental health" with "mental illness," in the sense that no discussion about mental health, whether of adults or children, would be necessary if there wasn't a pathology or disturbance. It is easy to see why this tendency is so strong; for one thing, the phrase "mental health" dominates as a bureaucratic euphemism for services provided to mentally ill people. For another, "mental health issues" is another euphemism for "mental illness." But the comparison between the levelness of the table and a positive quality of the mind or brain was a persistent feature in Persistence Trials, where discussions focused heavily on mental health as a positive state to be cultivated rather than as a negative condition to be treated.

2. Against the "Family Bubble" model

In unprimed discussions, participants located the source of child development outcomes as the family, especially in the parents' attentiveness to teaching their children to be obedient and know right from wrong. After working with the Levelness model, however, individuals assigned positive outcomes for child mental health to multiple sources, as in the following example:

That's what we want a child's mental health to be, but a child's mental health — the stability of a child's mental health then depends on how even those four pillars are underneath it … and so the pillars we've discussed would be education, medical issues, home life and social environment, and then the fourth pillar would be all remaining factors, which would include things like genetics, and possibly abandonment, things like that.

Persistence Trial Participant 1 to Participant 2,
while moderator is out of the room

The model was so effective in this regard because the metaphorical vehicle, the table, has multiple structures (i.e., multiple legs or other supports) that force people to recognize the fact that Levelness (and mental health) is influenced by multiple factors rather than being the narrow outcome of homes and parents. The model enables more expansive thinking because people engaged in the task will not leave structure with unassigned meaning.

3. Against the notion that children, especially 0- to 5-years-old, cannot have mental health because they are too young

In uncued discussions, people often reason that children don't — and can't — have mental health, since they do not experience emotions like adults do. And if they deploy the cultural model that mental illness is the result of embedded negative emotional experiences, they conclude that children cannot have yet experienced enough in their young lives to cause negative mental health. Yet as other FrameWorks research on child mental health has found, non-experts possess contradictory ideas about mental health in children.[15] In addition to reasoning that children can't have mental health, participants also reasoned that children *do* have mental health (and mental health issues) because they are really "just little adults"; therefore, they can also be tasked with "pulling themselves up."

Across all of the discussions of Levelness, there was broad evidence that participants were engaged in thinking about child mental health without resorting to the default notion that the concept did not apply to children. For one thing, they did not dispute the relevance or reality of the topic. For another, they emphasized the early origins of positive mental outcomes, even as early as the prenatal. They also did not make statements explicitly comparing adults' mental health issues to those of children, perhaps because this simplifying model does not prime a comparison between children and adults. However, even though it does not explicitly compare children to each other, it seemed to promote comparisons among children. This aided the focus on good mental health as a necessary precursor to subsequent good functioning. The notion that each child is unique but that some children face more challenges than others were consistent themes in all of the discussions.

4. Against the notions that mental illness is caused by chemicals, that chemical are the result of genes and that genes are set in stone

In cultural models interviews, informants readily ascribed the source of mental illness to an "imbalance" of chemicals, which led them to contend, in powerfully prescriptive ways, that chemical solutions are the only effective means of addressing issues of mental illness. In short, when they assumed chemical causation, they also perceived the only effective solution as being pharmaceutical measures to rebalance those "out of whack" chemicals. In discussions of "Levelness," informants raised the possibility of pharmaceutical intervention — but as only one of a range interventions to the "table" that could also be accompanied by a range of other

effective ways to address the floor itself. This innoculative function was one of the biggest strengths of the Levelness simplifying model.

> **Moderator [to participant describing his work with at-risk youth]:** *Is that trying to change the table?*

> **Participant:** *That's trying to change both. If you get the floor a little higher and the leg a little longer, they can meet each other.*
> <div align="right">*Conversation from a Persistence Trial*</div>

Similarly, advantages or problems that stem from genetics — analogous to an endemic levelness or unlevelness of the table itself — were only one part of the discussion. Interestingly, there were no instances where levelness of the table was explicitly attributed to good genes.

Self-Correction. Persistence Trials also showed that Levelness is able to self-correct. Self-correction refers to a simplifying model's ability to snap back to its initial form following a deterioration of the concept in discussion. At times, one structural feature of the metaphor has been forgotten, drops out of conversation, or devolves into an alternative formulation. For instance, participants may forget that tables have legs. An important measure of a model's strength, self-correction occurs when this feature re-asserts itself in subsequent discourse *without being cued by the moderator*. When communicated in the public sphere, simplifying models are likely to break down. Therefore, it is important that a concept have sufficient internal coherence to recover from such devolutions — to encourage people to arrive at key entailments despite partial or inaccurate communication of the simplifying model.

A prime example of the self-corrective ability of Levelness occurred at the end of one session. The discussion had come to focus on economic and educational opportunity, not children's mental health. When Generations 1 and 3 were debriefing at the end, one participant from Generation 1 observed how Levelness had become something more akin to "level playing field," which was not a part of the original model.

> **Participant:** *Tina used the term "playing field" and it's funny because ... in our first discussion she talked about playing field and then when we shared it with James and Holly she used the word playing field and then I just heard you repeat that word of playing field and about levelizing, leveling the playing field.*[16]

> **Moderator:** *So what do you think that means to level the playing field as we've used it here?*

Participant: I think it's different than being able to learn, socialize and reach their potential, to me that's different — the playing field is a different place than that.

Moderator: I'm interested in this because leveling the playing field wasn't anywhere in here [the original presentation of the Levelness model].

Participant: No it wasn't and to me leveling the playing field is making yourself even or comparable to others surrounding [you] ... where being able to learn, socialize and reach your potential is totally different.

Moderator: Uh-huh.

Participant: Where the other one [leveling the playing field] is a group comparison and, to me [the leveling idea] is comparing your individual growth.

Persistence Trial Discussion

Another example occurred when one participant realized that his view of what the table represents is incorrect.

Moderator: What is the table?

Participant 1: The table is the environment, their, you know, it takes a village to raise a kid. I'm saying the table is their village.

Moderator [to other participant]: Do you have that same sense?

Participant 2: My understanding is the table is their mental capacity. It's I guess, their brain.

Moderator: So if the table is the brain, then the environment would be what?

Participant 2: Their environment would be their floor.

Participant 1: Oh, now I got it.

Persistence Trial Discussion

Communicability. The title and the central ideas of the model were sticky across the pairs of participants in Persistence Trials — they were highly "communicable." Versions of the model at Generation 3 were very similar to versions at Generation 1. Also, the model generated a set of

words that were usefully associated with the metaphor. These words, along with the model's communicability, were signs that the people were tapped into a domain rich with meaning for them. For instance, an unlevel table was called "downslope" or "off kilter," while a level table was called "stable," "even," "balanced." Children with good mental health had a "level keel." The supports of a table were called "legs" as well as "pillars," and the notion of the floor easily cued "foundation."

Perhaps the most striking instance of the model's communicability was how, over the course of the session, it won over one participant who was, at the beginning of the trial, resistant to the model (and blind to the need for a simplifying model):

> *If you were talking to kids or young adults, that would be okay. If you're talking to parents being one, or professionals being one, you just lost them. It's too simplistic for them to listen to you. If you want to get into the mental health, and why you need mental health, and why you need to look for the indicators of good and not-so-good mental health, you've got to give them a reason. You've got to give them more than just "you see the brain," and "do it early." It's not enough. You're not gonna convince anybody that you know what you're talking about. You need a little more science in there, a little less talking to the lower common denominator kind of thing.*
>
> <div align="right">Persistence Trial Participant</div>

By the end of the trial, her attitude about the model had reversed itself, and she was eager to explain what she saw as the model's advantages:

> *You know, talking about "floor, table and legs" puts everybody — I don't care how old you are, how young you are, your socioeconomics, nothing; everybody knows what a table looks like. Everybody knows what the floor is, and everybody knows what the legs on the table are. So you're all starting here (demonstrates a level table with her hands and arms). And going from there. If you want to build something, that's a good starting place, 'cause everyone is on the same page. You've got nobody misunderstanding you. You've got nobody who has this screwy picture somewhere off there somewhere, who's going, "Well I don't understand what you're talking about," 'cause everybody knows what a table is.*
>
> <div align="right">Persistence Trial Participant</div>

In general, the outcome of this process is not to make people "like" the simplifying models. "Liking" a model is a conscious response, often influenced by personal experience and culturally-based preferences. At FrameWorks, we are interested in something quite different: effects, or how people process information before and after they are exposed to models. This

processing is not available to conscious introspection by individuals and is only visible in the patterns in their subsequent verbal and nonverbal behavior. We have observed numerous instances when people insist that they do not like a model yet are able to deploy it successfully and effectively to reason through unfamiliar territory — in fact, they are often unable to resist deploying it, despite their expressed antipathy to the model! That said, it is worth bearing in mind that affective responses to new ways of thinking *can* influence how members of the public, as well as advocates and other users of simplifying models, interact with communications and meta-strategies. However, it is also worth noting that people might have negative affective responses to *any* unfamiliar metaphor, not only to this specific one. As such, these responses can be anticipated and explicitly prepared for when simplifying models are taught for the first time to advocates and other users.

Recessive Models

An additional function of simplifying models is that they can sometimes strategically activate more productive, although many times more latent, cultural models. Sometimes these recessive models may be productive in structuring ways of understanding that are more consonant with the science. However, because of their latency, these patterns of understanding can only be effective if more dominant models are disabled. In earlier research, FrameWorks identified four recessive but promising cultural models:

    (1) environments are important determinants of child mental health
    (2) prolonged stress affects mental health
    (3) poor foundations cause poor child mental health
    (4) functioning is the key to child mental health

The above discussion of inoculation provides evidence about how models 1, 3 and 4 surfaced in discourse about "Levelness." Significantly, not only does Levelness itself represent a new resource that helps people think about child mental health, but it is also reinforced by linking up to and activating other aspects of participants' existing set of cultural understandings.

USING LEVELNESS

This research has shown that the Levelness simplifying model stands to make a significant contribution to framing child development in general and child mental health more specifically. The metaphor proved to be highly understandable, applicable, communicable, self-correcting, able to inoculate against damaging dominant perspectives, and impactful in the way that our sample of Americans perceived the foundational skills and abilities that result from and facilitate child development. For these reasons, FrameWorks offers this new strategic frame element to aid in translating the science of and reframing the public conversation about child development and mental health.

We add two notes of caution in the application of simplifying models in general and Levelness more specifically. First, the simplifying model suggested here was tested both for its underlying concept and with respect to the highly targeted linguistic execution of this concept. Therefore, the emerging model represents both an effective metaphor and an effective linguistic packaging of that metaphor. A certain latitude and flexibility in the use and application of Levelness is to be expected, even encouraged. Yet the specific concept and language that appear in the report have empirically demonstrated effectiveness. We do not claim to know the results or effectiveness of using alternative but related concepts or dramatically different linguistic packagings.

We conclude with a set of notes about using the simplifying model that scientists, practitioners and advocates should keep in mind when they set out to use Levelness in publications, talks, and other communications.

First, they should include the following basic elements in using the simplifying model:

> A. Levelness is **a quality** of a piece of furniture, such as a table.
> B. Levelness is important because it determines the **functioning** and **usability** of the table.
> C. In reality, there are **many degrees** of the levelness of a table, as there are also degrees of levelness of the floors they're placed on.
> D. There are many reasons that a table might be level or unlevel — it could depend on the condition of the table, the floor, or both.
> E. Positive outcomes — positive mental health — can be achieved by adjusting the floor, the table or both.
> F. Tables don't level themselves — they must either be made that way or require intervention by people who know about furniture and levelness.

Second, they should keep in mind some of the following characteristics that we observed in the model and in people's behavior while talking about the model.

- Note that the model did not compare child mental health to a table, but to a quality that a piece of furniture such as a table possesses. As we found in the qualitative portion of the research, people were very quick to relocate the metaphor from "Levelness" to "table" without any apparent interference by other types of furniture; this is because a table is a prototypical piece of furniture, and because they saw Levelness as a central feature of a table.

- When the metaphor was relocated to "table," the table was equated both with "the child" and with "the child's brain."

- Users of Levelness should be aware of a tendency for the phrase "level playing field" to arise in discourse. We mention it because it does not indicate that the model is ineffective or that the discussion has gone irrevocably awry. Saying "level playing field" for "Levelness" occurs for two main reasons: First, participants in the Persistence Trials knew the correct phrase but misspoke and selected the wrong one in their minds — as "level playing field" is a more frequent phrase, it is easier for people to search and find in their minds. Second, the replacement occurs because participants mistakenly equated "child mental health" with some other outcome such as intelligence or educational opportunity. We have also observed that, once this phrase was introduced, it tended to be very sticky in conversation. For example, in one session, "level playing field" was introduced around 34 minutes into a 90-minute session and used 11 times over the next hour. However, in this instance, a participant used the model to bring the discussion back to mental health, away from socioeconomics (which "level playing field" had partly prompted).

- We also observed that, in two cases, Levelness as mental health morphed into Levelness as uniformity of personality or personhood. In other words, participants reacted to the model as if the model were promoting the notion that everyone should be the same.

- One advantage of the model is that it can be titled both "Leveling" and "Levelness," depending on the specific communications challenges that the user faces. If the task is to define what child mental health is and why it is important, then Levelness would be recommended, but if the task is to talk about how child mental health can be promoted and protected, then "Leveling" would be the title of choice. Even the "Leveling Process" is a beneficial option, as it highlights how the object (the table) and the surroundings (the floor) need to be accommodated to each other. However, the differences among these titles are not significant, and we observed people using the titles interchangeably. Thus, users can enjoy some latitude in the specific name they give to the model. The way these models will be used in the real world will likely involve repetitions of the model's name/title, which may prime people to use, repeat and remember the chosen title.

Another thing we observed in two generations in two separate Persistence Trials was the emergence of the question, "Why are we assuming that mental health is a good thing?" There seems to be a prevailing cultural model that holds that creative people are not bound by the same norms as others; in fact, our society needs to give creative types the latitude to be "off" (or in terms of the model, "unlevel") in order to do the things they're best at. This might also be the result of communications that seek to reduce the stigma of mental illness.

About FrameWorks Institute

The FrameWorks Institute is an independent nonprofit organization founded in 1999 to advance science-based communications research and practice. The Institute conducts original, multi-method research to identify the communications strategies that will advance public understanding of social problems and improve public support for remedial policies. The Institute's work also includes teaching the nonprofit sector how to apply these science-based communications strategies in their work for social change. The Institute publishes its research and recommendations, as well as toolkits and other products for the nonprofit sector, at www.frameworksinstitute.org.

APPENDIX A: THE METHODOLOGICAL APPROACH TO IDENTIFYING AND TESTING SIMPLIFYING MODELS

I. PHASE 1: MAPPING THE GAPS

In the first phase of this simplifying models research process, FrameWorks employed an interview method called cultural models interviewing. Using a detailed interview guide, interviewers asked questions aimed at getting at how average Americans understand and approach the issue of child mental health.

More generally, cultural models interviews reveal the cognitive "terrain" on a given issue by focusing on the implicit patterns of assumptions — or cultural models — which individuals employ to process incoming information on an issue. These patterns are the "mental bins" into which people try to fit incoming information and represent both potentially productive and damaging ways of making sense of information. To uncover the gaps in understanding on the target issue, we held the findings from cultural models interviews up to data gathered from experts on child mental health. FrameWorks calls this process "mapping the gaps."

II. PHASE 2: DESIGNING SIMPLIFYING MODELS

After identifying the gaps in understanding, the second phase of the simplifying models research process aimed to generate a set of candidate simplifying models that were then empirically explored and tested in the third research phase. The result of the design process is a list of both metaphorical categories (e.g., "Structure") and multiple iterations or "executions" of each category (e.g., "Leveling," "Roots"). FrameWorks' linguist analyzes all of the transcripts from the "mapping the gaps" phase of the research process and generates a list of metaphor categories that represent existing conceptual understandings that can be recruited as well as overlap between the experts' and general public's use of metaphorical language and concepts. The linguist generates metaphor categories that capture the *process* element (how the thing works) of the expert understanding in metaphors that, given the data gathered from members of the general public, have the potential to be easily visualized and incorporated into thinking about the issue under consideration.

FrameWorks researchers who are specialized in cultural models and cognitive theory conduct a cognitive analysis of the model categories, which examines the *expected* public response to the metaphors based on cultural models theory and existing FrameWorks research on cultural models that Americans employ in understanding child development in general and child mental health more specifically. Researchers then use this analysis to review the metaphor categories, adding new possibilities and suggesting ones to be cut. At this stage, researchers also compare the candidate metaphors to the data from the initial cultural models interviews. Metaphor categories that contain elements or aspects of models found to be damaging or distracting in the

public's thinking about the topic are eliminated from the candidate list. On the other hand, simplifying model categories containing elements of more productive cultural models are highlighted as particularly promising.

During the process of designing candidate simplifying models, FrameWorks also assesses the models' abilities to be incorporated into practice by journalists and advocates/practitioners. In some cases, this practical assessment has suggested that some candidate models are too provocative or insipid to pass into the public discourse. These models are removed from the working list. The refined list is then returned to the linguist, who begins to compose iterations or executions of the categories on the list. The list of categories and iterations is sent back to FrameWorks' researchers for additional revisions.

III. PHASE 3: TESTING SIMPLIFYING MODELS — THREE TESTS OF MODEL EFFECTIVENESS
TEST I: ON-THE-STREET INTERVIEWS
As the initial opportunity to test candidate simplifying models, On-the-Street Interviews present an ideal opportunity to gather empirical data on the effectiveness of candidate simplifying models — which specific elements of the models are functioning well, and which aspects are less successful in clarifying concepts and shifting perspectives.

The metaphors are written up as "iterations," paragraph-long presentations that cue the listener/reader to two domains of meaning, one of which is typically referred to as the "source," the other of which is known as the "target." In the metaphorical statement "encyclopedias are goldmines of information," the source domain of meaning is "goldmine" and the target is "encyclopedias." In FrameWorks' terms, "encyclopedias" is the target because it is the object or process that the application of knowledge about goldmines is meant to illuminate.

Iterations on the following metaphors were brought to this stage: Toxic Stress, Brain Architecture, Exposure Effect, Ladder Effect, Engine Effect, Roadway and Leveling.

In 2009, FrameWorks tested a total of seven candidate simplifying models in three locations in Arizona. Each candidate model was presented orally, in separate interviews, to two to three informants in each location for a total of seven interviews per model, comprising a data set of 49 10-minute interviews. All informants signed written consent and release forms and interviews were video and audio recorded by a professional videographer.

The seven models tested represented executions of seven different candidate simplifying model categories. Data from the interviews were used to winnow and refine categories as well as to refine the individual executions of metaphors within categories.

Subjects
A total of 49 informants were recruited on site in the three locations. A FrameWorks researcher approached individuals on the street or walking through a mall and asked if they would be willing to participate in a short interview as a part a research project on "issues in the news." The recruiting researcher paid particular attention to capturing variation in gender, ethnicity and age.

Data on each informant's age and party affiliation, as self-identified, were collected after the interview. Efforts were made to recruit a broad range of informants. However, the sample is not meant to be nationally representative. Although we are not concerned with the particular nuances in how individuals of different groups respond to and work with the simplifying models tested in these interviews, we recognize the importance of between-group variation, and take up this interest in quantitative testing of simplifying models — where the virtues of quantitative sampling techniques can effectively and appropriately address issues of representativeness and across-group variation.

The Interview
FrameWorks had the following goals in designing and conducting On-the-Street Interviews: (1) identify particularly promising simplifying model categories, (2) refine those categories with more mixed results and (3) eliminate highly problematic categories, in which the underlying *concept* created problems that could not be overcome by refining existing or designing new executions. FrameWorks' approach to this winnowing process is highly conservative to assure that only the most unproductive categories — those that are beyond repair — are eliminated.

However, winnowing is a necessary feature of a process that intentionally produces a large set of possible iterations, but that culminates in the one most effective simplifying model. More specifically, interviews were designed to gather data that could be analyzed to answer the following questions:

- A. Did the informants *understand* the model and its underlying metaphor?
- B. Did they *apply* the model to talk about child mental health?
- C. Did the model *shift* discussions away from the dominant thought patterns that characterized the initial responses?
- D. Did exposure to the model *lead to more articulate answers and robust, fully developed conversations* of issues that informants had problems discussing prior to being exposed to the model?

The interview began with a short series of open-ended questions that dealt with fundamental skills and abilities as well as discussion of a scientific explanation of child mental health. The interviewer then discussed one of the candidate simplifying models using a memorized but conversational script. Following this exposure to the simplifying model, the researcher asked

informants a second series of open-ended questions designed to gauge the effect of the simplifying model in shifting perspectives on child mental health and in facilitating more robust conversations around the issue. Some of these questions were reformulations of the initial questions using different language so as not to appear repetitive.

TEST II: QUANTITATIVE EXPERIMENTAL RESEARCH

After analyzing On-the-Street Interview data, FrameWorks subjected the refined set of simplifying models to an online quantitative experiment. The overarching goal of this experiment was to gather representative and statistically powerful data on the models' effectiveness. These data then provided an empirical basis to select one or two models that were most successful relative to a set of theoretically-driven outcome measures. In the end, experimental data were used to select and refine one model that was then taken into the final stage of the empirical testing process. The categories that emerged as successful in On-the-Street Interviews were built out to include other iterations.

Power
1. Engine Effect
2. Electricity Effect

Pathways
1. Roadway Effect
2. Game Plan Effect

Structure
1. Leveling Effect
2. Roots Effect

In addition, three other simplifying models that had emerged from FrameWorks' past research on early child development were tested in the experiment. These models were:

1. Toxic Stress
2. Brain Architecture
3. Brain Health

In July 2010, FrameWorks conducted the survey, which measured the performance of nine candidate simplifying models in three metaphor categories in relation to a set of outcome measures. Approximately 2,000 survey participants were drawn from a national online panel and data were weighted on the basis of gender, age, race, education and party identification to ensure that the sample was nationally representative.

Experimental Design

Following exposure to one of nine "treatments" — paragraph-long iterations of candidate metaphors — participants answered a series of questions designed to measure a set of theoretically-based outcomes. Effects were compared both across and within categories — meaning that general categories were tested against other general categories, and specific iterations were tested against other iterations both within and across categories. Outcomes measured included: *understanding*, *application* and *aptness.*

Treatments

In designing the survey instrument, multiple iterations were generated by a linguist as alternative representations of the larger metaphor categories. For example, the "Structure" category included specific instantiations of "Roots" and "Leveling," while "Power" contained the "Engine" and "Electricity" effects as specific iterations.

In total, nine specific simplifying model iterations were developed. Each treatment consisted of a paragraph that described the metaphor, as in the following example:

> *I'm going to talk to you about a way to think about child mental health. New*
> *scientific research shows that you can see a child's mental health in their brain.*
> *And scientists say that a child's mental health is vital to their overall*
> *development, because it affects how they socialize, how they learn, and how*
> *well they meet their potential. So one way to think about this is through the idea*
> *of an engine. Children's mental health is like an engine — something that uses*
> *fuel and needs regular maintenance. Children's mental health is also similar in*
> *the sense that children have to have the right influences from their environments*
> *so they can develop and thrive. Another similarity is that when you promote a*
> *child's mental health, you protect children's potential to do many things. There*
> *are many other points of comparison that you might think about, but in general,*
> *a healthy brain is well-fueled, maintained, and smooth-working.*

Among iterations, only the name of the model (e.g., Engine Effect), entailments and structural features specific to that metaphor, and appropriate lexical items or phrases differed. This balance of *variation* between models and *standardization* in construction and language is designed to ensure that any differences in effect were due to differences between the models themselves, and not to some unintended confounding variable.

Outcome Measures

After receiving the treatment paragraph, participants were asked a series of multiple choice questions to test each model's performance in relation to three outcome measures:

understanding, application and aptness. The numerical outcomes of this experiment were provided in the main body of this report.

TEST III: PERSISTENCE TRIALS
After using quantitative data to select the most effective model, FrameWorks conducts Persistence Trials to answer two general research questions: (1) *can* and *do* participants transmit the model to other participants with a reasonable degree of fidelity? and (2) *how* do participants transmit the model? In other words, the method examines how well the simplifying models hold up when being "passed" between individuals, and how participants use and incorporate the models in explanation to other participants.

The Persistence Trial
A Persistence Trial begins with two participants. The researcher presents one of the candidate simplifying models and asks the two participants a series of open-ended questions designed to gauge their understanding of the simplifying model and their ability to apply the model in discussing the target domain (child mental health). For example, the researcher asked how the participants understood the simplifying model; what they imagined the source domain (e.g., Levelness) referred to; and how the idea presented related to fundamental skills and abilities. Questions and analysis were also designed to locate any terms or ideas in the execution of the model that participants had difficulty with or explicitly recognized as problematic.

After 15 to 20 minutes of discussion between the two initial (hereafter referred to as "Generation 1") participants and the interviewer, Generation 1 was informed that they would be "teaching" the simplifying model to another group of two participants (Generation 2). Generation 1 was given five minutes to design a way of presenting the simplifying model, after which they had five minutes to present the simplifying model to Generation 2. Generation 2 then had five to ten minutes to ask Generation 1 questions about the presentation. During this time the interviewer generally allowed dialogue to unfold naturally between the two groups but periodically probed for additional information on ideas that emerged.

Generation 1 then left the room and the interviewer asked Generation 2 an additional set of questions designed to elicit their understanding of the simplifying model and ability to apply the concept. This questioning lasted for approximately 10 minutes, at which point Generation 2 was informed that they would be "teaching" the idea to two new participants (Generation 3). Generation 2 had five minutes to plan their presentation after which Generation 3 entered the room and the two groups went through the same steps and questions as described above.

A Persistence Trial ends when Generation 1 returns to the room, where they are allowed to debrief with Generation 2 on the direction the metaphor has taken. The interviewer then reads the original paragraph-long iteration and asks questions about its transmissibility.

For the child mental health research discussed here, FrameWorks tested two candidate simplifying models (Levelness and Cornerstone, a modified iteration of a simplifying model previously known as "Brain Architecture") in San Diego, Calif., and Boston, Mass., in July 2010. Each candidate model was tested in three Persistence Trials. All informants signed written consent and release forms prior to participating in the sessions, and interviews were video and audio recorded by professional videographers.

Subjects

A total of 36 informants participated in Persistence Trials. These individuals were recruited through a professional marketing firm, using a screening process developed by and employed in past FrameWorks research. Informants were selected to represent variation along the domains of ethnicity, gender, age, educational background and political ideology (as self-reported during the screening process).

Analysis

In analyzing data from Persistence Trials, FrameWorks sought to answer the following specific questions in relation to each simplifying model:

A. *Were* participants able to *apply* the simplifying model; and more specifically *what* were the ways in which they applied the model?

B. Was the simplifying model *communicable?* Was Generation 1, 2 and 3's presentations of the simplifying model faithful to the initial model presented by the interviewer? How did the groups' presentation of the model differ from that presented by the interviewer (i.e., did they use different language, use different ideas related to the metaphor, emphasize different entailments, etc.)?

C. Did the simplifying model *inoculate* against the dominant default cultural models? That is, did the model prevent discussions from falling back to the dominant unproductive cultural models? Furthermore, if one of these cultural models did become active, could the simplifying model prevent the discussion from veering narrowly in these perceptual directions?

D. Did the simplifying model *self-correct*? That is, if one Generation's presentation was not faithful to the original simplifying model or left out a key component, did the ensuing Generation's interpretation and/or presentation self-correct?

E. What specific *language* did the groups use in discussing the model? Was there language that participants used that was not included in the original execution of the simplifying model?

As described in the main body of this document, Levelness produced a number of beneficial effects on participants' talking about the concept of child mental health and how to promote it in developing children.

Notes

[1] For more about SFA, see http://www.frameworksinstitute.org/sfa.html.

[2] Quinn, N. & Holland, D. (1987). *Culture and cognition*. In Holland, D. & Quinn, N. (Eds.) *Cultural models in language and thought* (pp. 3-40). New York, NY: Cambridge University Press.

[3] See: Lévi-Strauss, C. (1963). *Totemism*. Translated by Rodney Needham. Boston, MA: Beacon Press and Lévi-Strauss, C. (1966). *The savage mind*. Chicago, IL: University of Chicago Press.

[4] 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.

[5] Kendall-Taylor, N. and Mikulak, A. 2009. *Child mental health: A review of the scientific discourse*. FrameWorks: Washington, D.C.

[6] For an overview, see http://www.frameworksinstitute.org/ezine8.html and www.frameworksinstitute.org/assets/files/PDF/framingpublicissuesfinal.pdf
For more on causal chains, see http://www.frameworksinstitute.org/ezine31.html. For more on tone, see http://www.frameworksinstitute.org/ezine17.html

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

[8] Kendall-Taylor, N. (2010). *An empirical simplifying models research process: Theory and method*. Washington, DC: FrameWorks Institute.

[9] Kendall-Taylor, N. (2009).

[10] Holland, D. & Quinn, N. (1987).

[11] Jones, L. & Estes, Z. (2006). Roosters, robins, and alarm clocks; Aptness and conventionality in metaphor comprehension. *Journal of Memory and Language, 55*, 18-32.

[12] Those familiar with FrameWorks research may recall earlier studies that included what we then referred to as "TalkBack Testing." "Persistence Trial" research is an expanded and updated method that has replaced TalkBack Testing.

[13] Kendall-Taylor, N. (2009).

[14] Relevant dominant models related to child mental health are outlined in FrameWorks' cultural models reports on these subjects. See: Kendall-Taylor, N. (2009).

[15] Kendall-Taylor, N. (2009).

[16] These names are pseudonyms to protect the anonymity of the participants.