

SENSICAL TRANSLATIONS: THREE CASE STUDIES IN APPLIED COGNITIVE COMMUNICATIONS

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The FrameWorks Institute applies cultural models and metaphor theory from cognitive anthropology to develop communications devices that reframe public understandings and discourses on social problems. This article traces three case studies, in the areas of child mental health, budgets and taxes, and environmental health, where substantial gaps between scientific and public knowledge were identified, and describes the research process to develop “explanatory metaphors” to close those gaps and cultivate more accurate and expansive patterns of public thinking. Three distinct cognitively attuned communications tasks are described: (1) foregrounding an extant but recessive cognitive model prominent among the public; (2) filling a domain-specific “cognitive lacuna” in public thinking by introducing a modified version of an existing model from a kindred cognitive domain; and (3) building off or working around an existing dominant cognitive model that is consistent with expert knowledge but incomplete. The article concludes with observations on how the practice of applied communications has challenged and strengthened our theory of culture and cognition. [cultural models, communications research, applied research, metaphor, science translation]

Western anthropologists have long been keen to explore the boundaries between everyday and specialized knowledge: between cultural knowledge that is broadly distributed among members of a population, and that knowledge that is more exclusively the domain of specialists who, by whatever means, have come to see and think differently about some aspect of the world. When anthropology’s focus was more squarely trained on non-Western cultures, this line of exploration often delved into the study of shamans and diviners, and on the means, purposes, and functions of esoteric knowledge and ritual practice in socioreligious contexts (Benedict 1922; Boas 1902; Lévi-Strauss 1963). As the discipline’s lens has turned increasingly on Western society and knowledge, the same impulse has led to explorations on the margins between everyday “common sense” notions of the world and those derived from the specialized pursuit of scientific knowledge (Kempton 1987; McCloskey 1983).

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At the FrameWorks Institute—a nonprofit, interdisciplinary, social science research group—we work in this zone between common sense and scientific knowledge. Since 1999, the FrameWorks Institute has been investigating how Americans think about social issues—from early child development to climate change to criminal justice reform—to help scientists, policy experts, and advocates more effectively engage the public in thinking about public policy solutions to these issues. FrameWorks has developed an approach to communications research and practice called Strategic Frame Analysis™, which integrates theory and methods from the cognitive and social sciences to describe and explain how communications in general, and media in particular, influence public support for social policies. FrameWorks defines framing as “the way a story is told—its selective use of particular symbols, metaphors, and messengers, for example—and to the way these cues, in turn, trigger the shared and durable cultural models that people use to make sense of their world” (Bales and Gilliam 2004:15).

FrameWorks undertakes this work with support from foundations, groups of scientists and policy experts, and a range of other nonprofit organizations. Our goal is to deliver a communications strategy that is grounded in research and has the potential to broaden the public debate. On any given issue, our work is twofold: descriptive in characterizing both commonsense and scientific understandings of an issue, and prescriptive in developing communications devices that translate expert perspectives to the public in ways that are accessible and can effect shifts in thinking.

In both our descriptive and prescriptive work, we employ the theory and language of “models.” Grounded in psychological anthropology, we describe the public’s commonsense patterns of thinking as cultural models, those “presupposed, taken-for-granted models of the world that are widely shared . . . by the members of a society and that play an enormous role in their understanding of the world and their behavior in it.” (Quinn and Holland 1987:4). In this view, cultural models are constituent features of both culture and cognition, realized both in the world and in the mind via what Bradd Shore (1991:22) calls “two moments of birth.” As features of cognition, cultural models are “a community’s conventional resources for meaning making” (Shore 1996:47) and organize perspectives, interpretations, and understandings of what is both real and ideal in the world. As Keesing (1987:374) writes: “Such models comprise the realms of (culturally constructed) common sense. They serve pragmatic purposes; they explain the tangible, the experiential (hence perspectively egocentric), the probable; they assume a superficial geology of causation; they hold sway in a realm in which exceptions prove rules and contradictions live happily together.” This approach builds off attention to the well-recognized limitations of cognitive capacity and our need as humans to create mental shortcuts to function amid a tremendous volume and complexity of environmental and sensory inputs (Bruner 1990; Hastie and Park 1986; Schank 1995; Sherman et al. 1989).

Two further assumptions guide our work. The first is that people operate with multiple models in mind, often about the same domains of experience, and that the operational salience of any given model varies and alternates according to context (Shore 1996). For example, a person who on a Tuesday marches to “get government off our backs” might, following a tornado on Wednesday, seek aid from that same government. The model of

government as oppressor that informed Tuesday's march is different from the model of government as assister invoked in Wednesday's appeal. This is not to say that alternate cognitive models always contrast in such strong terms, but only that they can.

The second assumption is that people construct and employ models at varying degrees of specificity and generality in making meaning—that cognition is layered. Following Shore (1996), we find it useful to distinguish between models that are more concrete, focused, and linked to specific domains of human experience, and more abstract and comprehensive models, called “foundational schemas,” that structure cognition across a range of domains (see also Bennardo 2011). Often, specific models will be “nested” in more generalized models, which can in turn be nested in even more comprehensive and foundational ones. In our research across issue domains we have identified a set of foundational schemas that underlie and organize cognition on social issues in U.S. society, a topic we will return to in our conclusion.

We also use the language of “models” to characterize scientists' and experts' conventionalized understandings of a given issue, describing these as expert models that constitute a scientific sense that typically differs from those commonsense understandings in broader circulation (Kempton 1987; Linde 1987). That is not to say that scientists and experts do not themselves participate in “common sense,” for they most assuredly do (D'Andrade 1995; Keesing 1987). What it does suggest is that the body of knowledge that emerges from a scientific perspective is typically differentiated in key ways from knowledge derived from everyday processes of meaning-making. As such, it comes as no surprise that, alongside areas of more shared understandings, our work has identified substantial differences between public and expert models.

Accurately identifying these differences represents the first task around which our work revolves. It requires describing the predominant patterns of shared thinking that characterize both the U.S. public's common sense and experts' scientific sense of a given social issue, and then analytically “mapping the gaps” to characterize how they overlap and diverge. Once this landscape has been mapped, our second task emerges—developing communications devices that translate some targeted body of expert knowledge in ways that are “easy to think” and can be fluidly integrated into public discourse and thinking, bringing both into greater alignment with scientific and expert perspectives. As our case studies will show, this second task is anything but straightforward.

Over the course of many research projects, this second task has pushed FrameWorks researchers to characterize with increasing specificity our own theory of mind in response to several key questions: How do we characterize the cognitive landscape in which cultural models are held and organized? What is the relationship among models in mind? How do communications, especially linguistic ones, enter into this interplay of models and to what effect? What kinds of shifts in cognitive modeling can be predicted, targeted, and instigated in communications? Although our efforts to address these questions have been grounded in psychological anthropology and communications theory, we believe there are larger lessons in our research for applied efforts across the cognitive sciences, including emergent research fields like neuroanthropology. In this way, we hope our work can serve as one model for how to harness cognitive theory to address applied problems.

To help establish this theory-to-practice model, we present three case studies below from our applied communications research, each of which demonstrates a unique cognitively attuned communications challenge. But first, a brief description of our methods and theory.

RESEARCH METHODS

Recognizing that cognitive models come in many forms—spatial, temporal, visual, auditory, and otherwise—our research methods, collectively called Strategic Frame AnalysisTM, have consistently focused on linguistic modeling. This reflects the importance of language as a central communications device across the spectrum of modern media and the strength and facility of using interviews, focus groups, and other forms of talk research as a way to access people's patterns of thinking (Quinn 2005).

Descriptive

Early on in the research process, FrameWorks conducts semistructured, one-on-one, two-hour cultural models interviews with members of the public to elicit “chunks” of talk (Quinn 2005) that allow for identification and analysis of the deep and implicit patterns of understanding that inform how members of a culture approach and understand a specific issue. As a set of 20 to 30 interviews, typically distributed across three or four geographic locations in the country, they are conducted by a team of anthropologists trained in cognitive theory and cultural models interviewing and analysis. Analysis seeks to identify and characterize those models that are most broadly shared across the sample, and deemphasizes those variations, complexities, and idiosyncrasies that are observed.

We then select a sample of thought leaders in the specific area of expertise targeted for translation. We use a mixed-methods approach to ascertain how these experts understand and define the target issue, including one or more of the following methods: (1) one-on-one phone interviews with a range of experts, typically drawn from academia, advocacy, and public service; (2) materials reviews of organizational literature, websites, pamphlets, white papers, etc. to ascertain content and messaging strategies; (3) literature reviews; and (4) professional conference attendance by one or more ethnographers. Using data from these sources, we conduct a thematic analysis using grounded theory (Strauss and Corbin 1990) to identify how experts define and understand the issue area and its challenges, and the policy and program solutions they point to as ways forward.

We then compare these two bodies of data to identify both congruities and incongruities between expert and public conceptualizations and models. The incongruities, or “gaps in understanding” as we call them, represent areas where understandings are likely to break down as members of the public interpret and make sense of expert and scientific messaging. These gaps, therefore, become the primary targets to address in prescriptive reframing research. As described in the case studies below, these gaps can take many forms, with models diverging simply by level of detail or degree of elaboration, or because they are based on entirely different underlying premises and assumptions.

To appreciate the way that public discourse is patterned and disseminated (Gamson and Modigliani 1989), FrameWorks often conducts media content analyses to review and analyze the framing of an issue across a variety of news media, including network and cable television channels, national and regional newspapers, news radio programs, and online news and blog sites. We code these materials to identify and quantify the frames and models used within that coverage (Iyengar 1991), as well as important thematic patterns like reporting style, content, and allocation of news time. By comparing patterns in news coverage with those from cultural models interviews, we begin to see whether and how cultural models are propagated and reinforced in news (Goffman 1974).

To round out the descriptive research, we conduct six to eight peer discourse sessions, similar to focus groups, in two or three geographic locations to explore intragroup negotiations around an issue. Typically consisting of nine people, sessions are designed to open a space for discussion and debate to see the discursive life of models and frames as they are articulated in and shaped by peer-to-peer social interactions and expectations. Demographic criteria vary by issue, but are often differentiated across sessions by education, race, age, or political affiliation. The sessions also serve as an opportunity to experiment with early versions of prescriptive strategies as potential reframing devices are inserted into conversations and subsequently analyzed to determine their effects.

Prescriptive

FrameWorks develops and tests a range of tools and strategies that communicators can use to reframe public understandings of an issue. Among them, two stand out as the most consistent and foundational to our work: values and explanatory metaphors. We understand values to be an important subset of cultural models that are imbued with heightened degrees of salience and sentiment and constitute an important feature of cognition. They often act to mediate cognition in important ways by preferencing, filtering, grouping, or otherwise organizing relations among models in mind (Jennings 1991; Rokeach 1973; Schwartz 1994). In the social and public policy areas where we do research, we develop and test values to assess whether and how they provide answers to questions such as, “Why does this matter?” or “What is at stake?” and in so doing shift people’s orientation to the issue domain.

Explanatory metaphors are created to concretize and clarify technical concepts and processes in terms that are easily understood and highly communicable.¹ Numerous studies in the cognitive sciences, as well as a growing body of FrameWorks research, have established that people’s ability to reason about complex, abstract, or technical concepts relies heavily on metaphor and analogy (Collins and Gentner 1987; Lakoff and Johnson 1980; Ortony 1993; Shore 1996). We develop, test, and refine simple and concrete metaphorical devices to help people organize information in new ways, fill in missing understandings, and shift attention away from problematic defaults. We pay close attention to the entailments that accompany specific metaphors and whether and how they direct peoples’ thinking and talk. We recognize that some can be effective in

achieving instrumental translation goals, but that others may reinforce default models or direct thinking in novel but counterproductive directions. By the end of the research process on any given project, most of the candidate, most of the candidate metaphors will have been put aside as either problematic or insufficiently effective, and only the one or two that have been validated as effective will be recommended as reframing devices. The three case studies that follow focus specifically on the research process and criteria through which explanatory metaphors are developed and tested.

National Experimental Surveys are used to quantitatively test the relative efficacy of reframing elements (Iyengar 1991; Iyengar and Kinder 1987). These are large-N (2,000–7,000), web-based, random assignment experiments in which respondents are exposed to either a control or one of a set of framed messages built around values, metaphors, or other frame elements. Each respondent is then asked a series of questions to assess their attitudes and support for a variety of related policies and programs. Using this method, we demonstrate the effects of exposure to particular frames on policy preferences. For candidate explanatory metaphors, experimental surveys are adapted to test the effects of each metaphor on issue understanding, application, and metaphor-to-concept fit.

To test the utility and user-friendliness of an explanatory metaphor, FrameWorks conducts short, 10–15 minute on-the-street interviews. Recruited in public places, informants are asked to reason about an issue unaided by a metaphor, are then introduced orally to a single explanatory metaphor, and are then asked to talk further about the target issue. Those metaphors that emerge as potentially effective undergo a second round of qualitative testing in Persistence Trials, a research version of the game of telephone. In sequence, pairs of research participants take turns learning a metaphor as a way to talk about an issue area and then teaching the metaphor to subsequent pairs of participants, allowing researchers to evaluate how well a given metaphor holds up in social interaction as it is used and shared across generations of paired users.

CASE STUDIES

The three case studies presented below demonstrate the complexity of reframing, and the utility of a cognitive and cultural models perspective in creating communications strategies. Each case study identifies a different cognitive task toward which our prescriptive communications research has been or is being applied. Although the summary of each case study provided here is necessarily abridged, PDF copies of all research reports for each case study can be accessed at the FrameWorks Institute website.²

Study One: Foregrounding Recessive Cognitive Models to Translate the Science of Child Mental Health

Between 2008 and 2010, with funding from the Center on the Developing Child at Harvard University and the Endowment for Health (NH), FrameWorks conducted research to explore and broaden the U.S. public's understanding of child mental health (CMH). The project aimed to make messaging about the science of CMH more accessible to the public and in so doing increase support for policies and programs this research suggests are effective in improving child outcomes.³

FrameWorks's research on CMH illustrates both a communications challenge we commonly encounter and a cognitively attuned strategy for addressing this challenge. The challenge comes when a set of dominant cultural models is persistently applied in ways that occlude more science-based or comprehensive understandings of the issue. The strategy emerges when we are able to identify, as we often are, a set of more backgrounded or "recessive" cultural models that is available for thinking about the target issue, models that are in greater consonance with expert models. In these cases, as described below, we focus on developing strategies that pull these backgrounded models to the forefront of cognition in a way that can upstage those dominant models that block engagement with the target content. This is essentially a model-shifting strategy.

Descriptive research

FrameWorks began the project by reviewing various academic literatures on CMH, paying careful attention to the multidisciplinary nature of this work (Kendall-Taylor and Mikulak 2009). This review was supplemented with a set of eight one-on-one phone interviews conducted with what the literature review suggested were leading experts in the field. These two streams of data were synthesized to produce a set of key expert messages about CMH. These were further winnowed, built out, and refined as FrameWorks researchers attended, as participant-observers, several key multidisciplinary meetings of CMH experts. FrameWorks subsequently participated in the design and facilitation of a two-day summit, *Healthy Development: A Summit on Young Children's Mental Health*, designed specifically to arrive at a final set of messages that would serve as the content to be communicated in reframing efforts (see Society for Research on Child Development 2009).

Research continued with 20 cultural models interviews conducted in Dallas and Cleveland and eight peer discourse sessions in Boston, Phoenix, and Chicago. Across both research methods, participants were asked a cascading series of open-ended questions about CMH, analysis of which demonstrated key contours of a broadly distributed and generalized public understanding:

In general, Americans rely on different sets of assumptions to think about mental health than they do to think about mental illness. The former is largely defined in terms of "feelings" over which an individual is responsible for exerting control, while the latter is characterized in terms of chemical imbalances in the brain resulting from faulty but immutable genetic factors. This bifurcated modeling applies to both children and adults.

Public thinking about mental health in children is strongly mediated by two generalized models of "children." In one, children lack basic emotional capacities like memory and "strong" emotions, leading informants to doubt whether young children can even have mental health. In the second, contradictory, model, children are "really just little adults," as one informant put it, and therefore, "of course" experience emotional states just as do adults. In this case, comparable diagnostic criteria and treatments should apply.

Across these various ways of thinking about child mental health or illness, a developmental perspective was weak or lacking altogether. The genetic model of

chemical imbalances was highly deterministic and largely lacking developmental process, while the “feelings” model of mental health was largely framed in terms of personal control and responsibility. Sensitivity to environmental and developmental factors, if extant, was subsumed in talk about the parental role and the importance of upbringing.

These patterns are dramatically different from the explanations experts wish to advance, which emphasize (1) the reality of mental health in even very young children; (2) the importance of understanding the developing brain as the location for mental health; (3) the importance of environmental factors both in and out of the home; and (4) the deleterious effects of chronic and severe stressors on brain development. These contrasts lay open key features of the communications challenge, as the public’s most readily accessible and practiced ways of modeling mental states in children run counter to the messages that experts believe are essential for the public to understand if they are to support a new set of public policies. In short, thinking the science through the public’s dominant, or foregrounded, cultural models renders key parts of the science of CMH hard to think.

At the same time, however, lay interviews also evidenced a set of less top-of-mind, more backgrounded assumptions and understandings about CMH that are more consonant with expert thinking: (1) that the community that surrounds a child is an important determinant in their mental state; (2) that prolonged and severe stress can negatively affect mental health; (3) that poor foundations of health and development cause poor mental health; and (4) that CMH is about a child’s ability to function. In terms of translating the science to the public, these backgrounded models represent promising targets for communication efforts.

By this point in the research process, the communications task was becoming clear: to develop messaging strategies that could foreground these more promising recessive models, and background the less productive dominant ones, and in so doing help make the science easier to think. More specifically, the work of the reframing strategy was to (1) foreground an ecological perspective regarding the factors that shape and remediate mental health while backgrounding more individualistic assumptions of responsibility over mental states; (2) foreground a model of CMH as linked to the brain and development, while backgrounding assumptions that mental health “is just about feelings”; (3) pull a sense of pragmatism and solvability to the foreground, while backgrounding deterministic orientations; (4) activate and preference the linkage model between a child’s mental health and notions of functioning; and (5) foreground the recessive understanding that ongoing and severe stress threatens a child’s development and mental health, and supplant notions that stress is a necessary and useful feature of those processes.

With clarity on these specific goals, we began to design and test communications tools that could be deployed to accomplish these background-to-foreground cognitive shifts.

Prescriptive research

As described in our methods section, values and explanatory metaphors are two key reframing tools employed by FrameWorks. In this article, we focus our attention on

the development and testing of explanatory metaphors and their cognitive effects. That said, coming out of the descriptive research, FrameWorks researchers hypothesized that values could be effective in doing some of the cognitive shifting work just identified, as they have in previous research areas (Gilliam 2007; Simon and Davey 2010). More specifically, we hypothesized that values could background individualist orientations to causation and remediation, while foregrounding more latent ecological systems and collective conceptions. We also thought that values might be effective in pushing senses of fatalism and determinism into the background by pulling forward a sense that CMH issues could, in fact, be addressed and improved. We return briefly at the end of this case study to describe our values results, but now focus on the development and testing of explanatory metaphors.

Drawing on over a decade of framing research on early childhood development, FrameWorks first looked to two metaphors that have proven effective in helping Americans think about child development more generally (see Erard et al. 2009) as potentially useful tools in communicating about CMH. The first is *brain architecture*, or the notion that brain development can be compared to building a house from the ground up. The second is *toxic stress*, or the notion that some types of stress (severe and ongoing) can disrupt developmental processes and damage stress-response and connected systems. Results of qualitative research confirmed the utility of brain architecture in pushing dominant models of mental health as “just feelings” into the background and foregrounding latent connections between mental health and developmental processes. Research also confirmed that toxic stress, when employed in conversations about CMH, backgrounded the ideas that genes are the only concrete determinant of mental states and that stress is beneficial to development, and instead foregrounded the recessive cultural model that stress can have negative impacts on health and development (Simon 2010a).

Recruiting these two metaphors from earlier research left two key reframing tasks unaddressed: (1) to shift people off the models that children do not have mental health or that it is primarily about controllable feeling-states, and instead foreground models of its reality and functional importance; and (2) to promote a sense of preventative and remedial agency. Ideally, we would also identify a metaphor that reinforced and worked in concert with the values in accomplishing the individualist-to-collective and determinist-to-solvability shifts. With these tasks in mind, FrameWorks designed and tested a new set of 12 potential metaphors, with titles like engine, electricity, roadway, game plan, roots, cornerstone, brain health, exposure, signature, and levelness. Over the course of more than a year, candidate metaphors were tested, culled, and refined through on-the-street interviews ($\times 49$), Quantitative Testing ($N = 2,000$), and Persistence Trials ($\times 6$), from which one metaphor, the comparison of CMH to the levelness of a table or piece of furniture, emerged as most successful (Erard et al. 2010b). This was a surprising result for FrameWorks researchers, as early on in the design process levelness was considered one of the weaker candidate metaphors. Its success across the research methods highlights the importance of rigorous empiricism in this form of applied work and shows that the only way to know what a metaphor will actually do and how it will “behave” is to empirically test its effect.

One way to think about child mental health is that it is 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. [See Erard et al. 2010b for full version.]

The levelness metaphor, which proved both readily understandable and communicable, was powerful in foregrounding two of the extant but recessive models—that environments are important determinants of CMH, and that CMH is connected to a child's functioning more generally. The metaphor also helped people to locate mental health in the brain, rather than in vague feeling states, and to think about degrees of mental health, rather than use a bifurcated model of health or illness. In getting people to think about the relationship between a table and the ground it rests on, and about the multiple ways one can address an unlevel table, the levelness metaphor also helped people consider the range of factors that can influence CMH, and opened up thinking about multiple intervention strategies. In the process, the metaphor also effectively pushed more problematic cultural models into the background—including models of mental health as the exclusive product of emotional states, of individuals as responsible for controlling their emotions, and of senses of genetic determinism.

The final suite of reframing recommendations included a set of tools that could be deployed to push dominant but unproductive cultural models about the mental states of children into the background of cognition while pulling extant but more latent models to the forefront. This suite included two values that emerged as useful from Quantitative Testing. The first was a call to national prosperity, which backgrounded individualist orientations about CMH and foregrounded a more ecological, systemic, and collective perspective. The second was the value of ingenuity, which backgrounded notions of futility associated with CMH and foregrounded pragmatic, innovative ways of thinking about the issue. These values were recommended for use in concert with three metaphors: brain architecture, to bring connections between CMH and development to the forefront; toxic stress, to recruit the recessive model of stress as having negative impacts on mental health; and levelness, to push a host of unproductive dominant definitional models of children's mental states into the background and pull forward latent understandings of functioning, of connections between development and mental health, and of the importance of ecologies, resources, and populations. These reframing tools were combined in a messaging toolkit, as well as in a multimedia presentation that includes examples of effective applications of the communications strategies.

Study Two: Filling in a Cognitive Lacuna on Budgets and Taxes by Recruiting Models from Kindred Domains

Starting in 2008, with funding from the DEMOS Center for the Public Sector, Kansas Action for Children, and the John D. and Catherine T. MacArthur Foundation, FrameWorks has examined ways that Americans think and talk about budgets and taxes. The research was designed to ascertain whether and how Americans understand

the relationship between taxes and the public goods and services they make possible, as well as the process by which priorities are set for the allocation of public resources. The research sought to identify evidence-based framing strategies that could be used to communicate to Americans a more deliberate, realistic, and informed view of the relationship between budgets and taxation and their role in achieving collective services and goals for the country (Davey and Bales 2010).

In this project, FrameWorks identified and addressed a second kind of cognitively attuned communications challenge. This involved developing an explanatory metaphor that could fill a domain-specific cognitive lacuna by recruiting an existing model (or models) from a kindred domain. By “cognitive lacuna,” we mean a domain of cognition where the public has very weak or nonexistent models for thinking about some process, relationship, role, or other feature that is defined by experts as necessary to understanding the reality of that domain (see also Levy 1984). In short, cognitive lacunae exist when a key feature in the expert model is conspicuously absent or “un-modeled” for members of the public. In translating scientific and expert knowledge, such absences represent a core challenge.

In the CMH research just described, the communications challenge was to develop a metaphoric device that could foreground recessive models and enhance their cognitive salience in and connection to the target issue domain. In our work on budgets and taxes, the task was to recruit a dominant model from another, more familiar, domain and use a metaphoric device to fill the existing conceptual void.

To begin this research, FrameWorks conducted 25 cultural models interviews in Baltimore, Philadelphia, and Cleveland and six peer discourse sessions in Phoenix, Charlotte, and Kansas City. In both interviews and peer sessions, participants were asked to engage general questions and topics about budgets, taxes, and the relationship between the two. Unlike most of our research projects, we did not conduct interviews with experts on this topic, but instead relied on a comprehensive report written by the National Research Council and the National Academy of Public Administration, entitled “Choosing the Nation’s Fiscal Future” (www.ourfiscalfuture.org). This document was analyzed to distill the set of messages toward which our communications research was directed and to which our strategies and tools were held accountable.

Descriptive research

FrameWorks used both the cultural models interviews and peer discourse sessions to draw conclusions about the cultural models used by Americans to think about budgets and taxes, and whether and how they are related to the larger work of government. Four findings stand out:

An ill-defined and monolithic model of “government” as a large, bureaucratic, and often corrupt “other” whose functions are too vast, complex, and mysterious to comprehend was dominant among the public. Faced with questions about public functions, this model provides a ready-made cognitive “shortcut” that mutes attention to specific government functions, processes, or services (see also Aubrun and Grady 2004).

The public largely uses a consumer, rather than a civic model to define taxes and their purpose. Informed by this model, individuals who pay taxes should “get their money’s worth” in identifiable and measurable services within a short-term timeframe.

Most members of the public appear to lack a well-articulated model of large-scale public budgets. Given this domain-specific absence, or “cognitive lacuna,” when asked to speak to public budgets, our informants recruited a model from another familiar domain—that of the monthly personal or household budget, a small-scale model where planning is relatively short term and success is defined by outputs never exceeding inputs.

Budgets and taxes are largely unconnected concepts for most members of the public. Initially this was a surprising finding for us, but with time the reasons for this disconnect became increasingly apparent. Lacking a clear model of public budgets, and using a consumer rather than a civic model to think about taxation, informants struggled to cognize a relationship between budgets and taxes, the processes that relate the two, or their combined relationship to public services and structures. Without such an integrative model, the implications of both budgets and taxes and the public’s role in either were poorly conceptualized, and public services were largely taken for granted.

By the end of this descriptive research we had a good understanding of the problem, and were positioned to define the key cognitive work for an explanatory metaphor to accomplish: to fill the cognitive lacuna about public budgets—what they are, how they function in time, and the collective purposes toward which they are directed—and in so doing, model a structural and temporal relationship between taxes, budgets, and resultant public services. Ideally, the metaphor would also facilitate a collective rather than individualist framing of these relationships.

We hypothesized that values could be effective in cultivating civic rather than consumer orientations and help shift people’s thinking toward more collectivist notions of budgets and taxes. Ideally, one or more values could be identified to work in parallel with an explanatory metaphor to help people see themselves as citizens in the give-and-take of a larger social contract (see Kendall-Taylor and Bales 2009).

Prescriptive research

We used the last question in the cultural models interviews to begin experimenting with potential reframing strategies. Each informant was presented with two possible ways to think about “taxes”—“taxes as investments,” which represents an argument frequently made in advocacy materials, and “taxes as exchanges,” an idea derived in part from Marcel Mauss’s seminal work *The Gift* (1990). Informants were then guided through a discussion to explore whether and how each idea might open up new ways of thinking about the relationship between budgets and taxes. As will be discussed below, the “taxes as exchanges” idea generated several productive directions, while the idea of “taxes as investments” was largely unproductive. Informants’ dominant model of investments, as long-term processes that carry risk, conflicted with a model of taxation as payments that should result in quick and predictable benefits in which taxpayers get their “money’s worth.” These conflicting base models quickly suggested an unproductive reframing analogue.

Based on these results, and drawing from previous FrameWorks research on government, peer discourse sessions were designed to explore the effectiveness of several prospective reframing devices (see Kendall-Taylor and O'Neil 2009). Of the ideas explored, three were metaphors—"household budgets," "prosperity grid," and "exchanges"—and one was a concept entitled "pay now or pay later," which focused on the savings incurred by taking a preventative, rather than a remedial approach to intervention.

The "household budgets" and "prosperity grid" metaphors were generally unsuccessful in structuring thinking and talking in the desired directions. Discussions of the former were undermined by talk about how public budgets are not like household budgets because of their scale, while "prosperity grid" frequently led to critiques of unfair efforts to "spread the wealth." The "exchanges" metaphor demonstrated more promising, if still mixed, results. It helped participants talk about the otherwise taken-for-granted services that government budgets provide, through an assumed reciprocal process and obligation of "give and take." It also led, however, to problematic discussions of "unfairness" and the idea that some pay more or less than their "fair" share. This moved talk away from public purposes and social responsibility and toward ideas of taxes as unfair involuntary exchanges with distorted cost-benefit ratios.

Productively, the "pay now or pay later" concept shifted talk away from a short-term consumer model of "getting one's money's worth" and toward discussions of long-term goals and purposes. Conversation shifted from "what I need to get from my taxes," or "what budgets do for me" toward the need for taxes to support "our country" or "our society." The concept also connected budgets with taxes, helping participants explicitly recognize that the services and infrastructure that budgets provide and on which citizens rely have to be funded, and that this funding typically comes from public taxes. This more explicit talk about the goal of taxes led to more pragmatic discussions about the need to fund public services and infrastructure for the long term.

In the months that followed, FrameWorks developed and tested a total of nine candidate metaphors to evaluate their capacity to fill in people's understanding about the relationship between budgets, taxes, and public structures, and to cultivate more supportive ways of thinking and talking about those relationships (see Erard et al. 2010a). These metaphors were run through our standard sequence of evaluative and experimental methods, with each method serving both a winnowing function—as some metaphors performed well while others did not—and a refining function—as each iterative source of data was used to change the execution of the metaphors to address specific conceptual problems. The methods also allowed for evaluation of each metaphor's functionality with an eye toward eventual deployment in concert with values and other framing recommendations. Space does not permit a discussion of the findings from each of those methods and subsequent analyses, although reports from each method are available at the FrameWorks Institute (n.d.a).

The result of this research trajectory was development and refinement of an explanatory metaphor that built off two strong cultural models that were already part of public thinking, but that were not typically applied to thinking about budgets and taxes.

Future Planning: The idea that it is a good idea to plan ahead and to put aside the funds necessary to realize plans and visions

Exchange: The idea that much of human social and economic life is structured by relationships of giving and receiving where bonds of expectation and obligation are created and sustained

On its own, neither model succeeded in filling the public's cognitive lacuna on public budgets, nor helped structure an improved understanding of the relationship between budgets, taxes, and services, and the collective benefits of that relationship. The exchange model lacked sufficient temporal perspective, while the planning model failed to structure the relationship between taxes and services. Combining the two models, however, produced a powerful effect, borne out in subsequent quantitative testing (Erard et al. 2010a). The result was an explanatory metaphor entitled "forward exchange," which read as follows:

Public budgets and taxes make up a system of forward exchange. Budgets give us a schedule for paying taxes forward in time for public goods whose importance we all agree on. The public goods we have today weren't paid for by taxes we just paid or are about to pay. They were paid for in the past, by taxes that were budgeted then to meet our needs now. So, a good public budget is one that plans for the future and for the unexpected. And good taxes are those that allow us to pay for public goods and services that we've planned for.

Combined with the value of prevention, which also tested well (Simon 2010b), forward exchange helped people think about the common goals to which budgets and taxes are the central means. Together, these tools helped shift people away from short-term, consumerist thinking and toward a notion of shared priorities for a common future. Thought of in terms of a forward exchange, budgets and taxes became means to a now visible end, not ends in themselves.

Study Three: Addressing a Productive but Narrow Dominant Model of Environmental Health

A project on environmental health provides insight into a third kind of cognitively attuned communications challenge. This involves the effort to develop an explanatory metaphor that builds off or works effectively around a dominant cultural model that is aligned with the science and is productive, but remains too narrow in scope.

Starting in 2010, FrameWorks began research on environmental health (EH) on behalf of the American Public Health Association, the Association of Public Health Laboratories, and the Association of State and Territorial Health Officials with funding from the CDC's National Center for Environmental Health. The goal of the research was to develop communications strategies to help those working in EH policy, practice, research, and advocacy speak with a more consistent and strategic voice to both public and policy audiences about their field and its work. The larger goal is to build the social and political will required to support efforts to reduce harm associated with

environmental hazards, and to help build a strong and enduring infrastructure for EH communication.

Four research methods were employed to generate a summary of the expert view of environmental health: (1) ten one-on-one phone interviews with expert practitioners and academics; (2) a literature review; (3) participant-observation at an EH professional meeting; and (4) a FrameWorks-hosted online webinar with 14 experts from the field, consisting of a structured Q-and-A session and solicited response to and critique of an initial summary of “the expert view” derived from the first three methods.

To map public understandings of the issue, FrameWorks conducted 21 cultural models interviews with members of the public in Dallas; Cleveland; South Bend, Indiana; and Boulder, Colorado. Informants were asked a series of open-ended questions designed to elicit implicit understandings associated with the terms and work of EH (Lindland and Kendall-Taylor 2011).

Descriptive research

The phrase “environmental health” was unfamiliar to most of our informants, even as a majority were able to correctly guess that it referred to some form of environmental impact on human health. A minority understood it to refer instead to the health of the environment. That said, once a correct definition of the topic was established, broader patterns of public modeling emerged, concerned largely with EH threats and structured by a dominant model of what constitutes such threats—contaminants, especially those that threaten the safety of food, water, air, and household environments. The strength and broad distribution of this contaminant model was evidenced in consistent talk about fears of exposure to chemicals, particulates, artificial hormones and steroids, heavy metals, pollen, plastics, and the like.

Although informants’ talk revealed a robust model of contaminant threats, it showed a very weak and fragmented model for thinking about EH work. When primed, informants were able to articulate basic knowledge about prevention efforts in sanitation (“garbage men” and dumps) and food safety (hairnets and inspectors), but were unfamiliar with the broader scope of work in these areas, and unable to discuss EH work in other arenas, like chemical and radiation exposure. Unpracticed in thinking about the contours and scope of EH work overall, members of the public struggled to identify the key agencies, institutions, hierarchies, professions, and skill sets of the field, and consistently defaulted to the more familiar arenas of environmentalism and health care.

Notably however, over the course of interviews, as informants engaged in discussions of EH threats and what can be done about them, they quickly and consistently changed their tune and began speaking to the criticalness of basic EH functions like sanitation, air and water quality, and food safety work. In other words, once pulled into active thinking, these functions shifted from absent and taken for granted to present and very important. From a cognitive perspective, it seemed that actively talking about contaminant threats served to foreground and bring onstage a model of salience that otherwise lived mostly in the cognitive background—offstage, if you will—where it failed to structure people’s thinking about and understanding of the domain.

In addition to the dominant contaminant model, informants employed a series of more recessive or “backgrounded” models about EH impacts, including understandings that social relationships, economic conditions, and the organization of built environments can have profound health effects. These models represented promising targets for communications development and testing.

Although we do not attempt a full summary of expert perspectives of EH here, there are key features that stand out relative to the patterns in public thinking. Experts agree that EH’s work is to assure the conditions of human health and provide healthy environments for people to live, work, and play. This work is accomplished through two parallel emphases: (1) risk assessment, prevention, and intervention efforts aimed at reducing or eliminating contaminant and contagion threats to human health via air, water, food, soil, vector, and animal exposures; and (2) health promotion efforts that address large-scale systemic factors and construct wellness-friendly environments at the population level. This two-pronged mission depends on publicly funded research, communications, surveillance, epidemiology, subject matter expertise, and policy efforts that address the full scope of environmental impacts on health from the local to global scales.

In comparing the expert and public views, two areas stand out, regarding (1) the relationship between threats and work, and (2) the factors recognized as having EH impacts. In both areas, a significant gap and overlap between expert and public thinking can be identified. In the first, while experts demonstrated a consistent awareness of, and commitment to, the importance of EH work, the public often took this work for granted and failed to consider its ongoing nature and critical importance. This represents a key gap for communications to address. Yet, once the public’s thinking was activated through questioning from the interviewer, talk about EH work was generally consistent with expert positions, asserting that preventative, proactive approaches to EH threats are ideal. This represents an important overlap. The second notable area concerns EH factors. Both experts and the public agree that contaminants and contagions represent a real and pervasive threat to human health. This also represents an important overlap. Yet, experts emphasized a broader set of interconnected factors that affect human health at the population level, including social, economic, infrastructural, and climatic factors. Although several of these factors were evident as backgrounded or recessive cultural models among members of the general public, they were minor themes in a larger story focused overwhelmingly on toxic exposures at the individual and household level. This represents a key gap.

COGNITIVE COMMUNICATIONS IMPLICATIONS

As of the writing of this article, FrameWorks has yet to begin the next phases of prescriptive research to develop and test metaphors, values, and other framing devices to evaluate their potential to align public thinking with expert opinion and build public support for EH efforts. The overlaps identified suggest an avenue for moving

forward by deliberately engaging those patterns in public thinking that are consistent with the expert story, including attention to social, economic, and infrastructural factors.

The challenge is what to do about the contaminant model. It is clear that the public has a robust model of contaminant threats to human health, one that is consistent with expert thinking. It is also clear that many people have a well-developed pattern of avoiding engagement with the broader scope of those threats, thereby keeping thoughts about the work required to address them offstage. Finally, it is clear that the strength of the contaminant model as a source of threat provides a cognitive pathway for an offstage model of EH work to quickly emerge onstage as salient, even critical. In this respect, the contaminant model serves an important function.

With all of this said, the communications strategy for the EH field might seem clear: construct messaging that triggers the contaminant model, and in so doing raise the public profile for EH work. If raising issue salience was the only goal for our partners in the field, that would likely be an effective strategy. However, there is another key goal held by many in the EH field, including our partners in this research: to help the public think more broadly about EH impacts, to move their thinking “upstream” to consider the broader, macrolevel factors that result in downstream contaminant and contagion threats to human health—factors like urban and infrastructure planning, built environments, patterns of transportation and energy use, and social and economic factors, like poverty, that create differential susceptibility to negative EH impacts. For EH experts and advocates, making the public smarter about this broader set of factors is a major goal—one that many feel will translate into building support for the kind of policy initiatives that can have the greatest impact.

In light of this larger communications agenda, the advantages of triggering the “contaminant model” become less clear. Does the activation of this highly available way of thinking constitute a building block for constructing a more elaborated and expansive vision of EH, including increased attention to social, economic, cultural, infrastructural, and climactic factors? We have seen that some of these factors exist as recessive public models, so perhaps the strength of the contaminant model can be harnessed to bolster them. Or, is the contaminant model so dominant that its invocation will crowd out other ways of thinking about EH as it takes people to a satisfying, ready-made cognitive moment that says “I know what this is about—contaminants”? Or, worse yet, will triggering the contaminant model invoke the avoidance pattern that has already been evidenced, thereby reinforcing the default pattern of not thinking about EH work, efforts, and solutions in the first place?

Future research will work to develop and test one or more explanatory metaphors that can address these questions while accomplishing two critical tasks: (1) heightening awareness of the importance of publicly funded EH work, and (2) moving people’s thinking “upstream” toward more macro- and population-level EH causal factors. Considering how the contaminant model both dominates and constrains people’s thinking, even as it serves to bring EH work “on-stage” in thinking, it remains for future prescriptive

communications research to ascertain the model's utility or liability as a referent in a broader communications strategy.

CONCLUSION: THEORY TO PRACTICE AND BACK AGAIN

Our experience in doing applied cognitive research has compelled us to engage theory with increasing specificity even as we find our applied work pushing that theory in new directions. Our work has both been informed by and confirmed many core features of cognitive theory more generally, and cultural models theory more specifically. These include the hierarchical nature of modeling (D'Andrade 1984; Kronenfeld et al. 2011; Shore 1996); the contextual nature of cognition generally and modeling more specifically (Ewing 1990; LeVine 1984; Kempton 1987); and the extent to which people typically hold multiple, sometimes conflicting, models in reasoning about complex issues (Ewing 1990; Quinn and Holland 1987; Shore 1996; Strauss and Quinn 1997). At the most basic level, our work affirms that many of the cognitive constructs brought to bear in making meaning operate largely at the implicit level, even as there are also more explicit cultural constructs or "cultural theories" (D'Andrade 1984, 1995; Quinn and Holland 1987; Shore 1996). Our research also affirms the integral relationship between metaphoric reasoning, cultural models, and meaning making (Collins and Gentner 1987; Lakoff and Johnson 1980; Shore 1996), as we have found repeatedly that metaphors are powerful tools in communicating ideas, in large part because of their ability to tap into and orchestrate movements among cultural models in mind.

Two key assertions likewise inform and are confirmed by our applied work. The first is the general assertion, which has been more fully developed by others (Bales and Gilliam 2004; Carey 1988), that culture matters in communication. The second, more specific, assertion is that communications practice benefits from a concrete and workable theory of culture that provides a unit of analysis that can be operationalized both analytically and in subsequent messaging efforts. We have attempted to show that cultural models theory is an effective theoretical and methodological framework through which to conceptualize and articulate the mediating role of culture, allowing researchers to describe and map the assumptions, representations, and propositions that shape the way people understand issues and information and, in turn, to create more effective means of communicating. Like any model of reality, the linguistic representations of the cultural models that we identify are by necessity simplifications of reality (Shore 1996), but we are convinced that they serve as viable representations of the key features and contours of that underlying cognitive and conceptual reality we seek to describe.

So, too, are the spatial metaphors we employ to account for both cognitive processing and the potential effects of communications on that processing. As have others, we find it useful to think of cognition as a landscape (Sayre 1997), with features of cognition (models) that are more or less foregrounded or backgrounded, or as a theater stage, with models that are coming and going on-stage and off-stage based on contextual cues. In many respects, these metaphors mirror notions of explicit and implicit, and of conscious and unconscious, yet in our view carry less binary and more gradated and processual

associations. In fact, what we have seen in our work is that the right metaphor can serve to bring off-stage models on-stage, and even upstage otherwise dominant models. We have seen how typically backgrounded models can become increasingly foregrounded, especially when a value or metaphor carries entailments that facilitate that shift. This language of spatiality suggests a dynamic perspective on models—in terms of their relative positioning in mind and the extent to which communications or other factors can serve to mediate their repositioning. It also raises key questions—about the relationship among models and their relative effects on reasoning, and about the relationship between any given model’s position and the reasoning process. Our hope is that some of these questions will prove provocative for others working at the intersections of the behavioral and brain sciences.

To conclude, we point to a central challenge in our work, one that emerges at the intersections of our research findings, our organizational goals, cognitive theory, and the confluence of neuroanthropology and applied work that characterizes this volume. Across the scope of our research, we have repeatedly identified a strong and pervasive pattern in public thinking that attributes primary, if not exclusive, responsibility for social problems to individuals. Whether the topic is levels of crime, educational disparities, health and fitness, sexual violence, or immigration, the model of the individual as the self-determining, responsible agent emerges over and over again as the dominant perceptual lens through which Americans define, diagnose, and think about solutions to social problems. In our CMH research, this was manifest in people’s talk about helping children gain control over their emotions as the most effective intervention. In our budgets and taxes research, it was evident in talk about individual consumers getting their money’s worth for their tax dollars paid. Finally, in our EH research, it could be seen in talk about individuals taking responsibility at the household level, as the first and most important line of defense, to protect themselves and their families from contaminant threats.

In our view, this pervasive pattern is rooted in what can be best described as an underlying foundational schema of individualism in U.S. culture. This foundational schema underlies and informs a series of more domain-specific, person-centered models that are dominant, foregrounded, and easy to think, and that run directly counter to efforts to help people think about policy interventions at the social and population levels. As such, one of FrameWorks’s central tasks is figuring out ways to help people widen the scope of their thinking, to see a bigger picture defined not by the actions of individual agents, but by systems that both shape and are shaped by their actions—social, economic, political, and otherwise—and that can be addressed through public policy. On any given research issue, we seek to widen the lens on that issue, even as we recognize that our work across all issues confronts a larger challenge in shifting the foundations of how we as Americans understand and think about improving our collective life and future together. We feel that attention to this widening task is central not only for communications with the general public but also for scientists doing similar applied work, especially for neuroanthropologists seeking to widen perspectives about the complex intersections between human nervous systems and the social and cultural systems that people inhabit.

We hope that this article has made the case for the relevance of cognitive theory for communications practice, and of that practice for cognitive theory. We hope, too, that this discussion can contribute to a larger theoretical effort to address the relative strength and dynamic interplay of mental models and their role in cognition and reasoning, as well as the effects of media and communications on that interplay. Finally, we hope that it might contribute to the work of others seeking to integrate theory and practice within the larger emerging field of neuroanthropology. Our experience in conducting applied cultural research has strengthened in us the conviction that theory-driven applied research is a critical tool in creating effective communications about social and scientific issues in the service of improved public policy. It has also strengthened our belief that creating effective communications is an empirical endeavor that turns on a set of propositions and questions about which social scientists know a great deal. Above all else, we hope that this piece has made it clear that effective public policy communication is anything but simple “common sense.”

NOTES

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1. For most of FrameWorks’s existence, we have called these metaphoric devices “simplifying models” to emphasize their function in translating complex expert perspectives to the public in more accessible terms.

2. See FrameWorks Institute (n.d.b).

3. This connection between causal understandings and perceptions of solutions has been widely studied in anthropology (Hurwicz 1995; Kendall-Taylor 2009; Mathews and Hill 1990; Young and Garro 1994). In addition, past FrameWorks research has shown that improved understandings of how issues like child development “work” is important in creating support for policy solutions (Erard et al. 2009).

Editors’ Note: The FrameWorks Institute research reports identified in the References Cited can be accessed via the organization’s website (FrameWorks Institute n.d.b).

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