

**Refining the Core Story of Early Childhood Development:
The Effects of Science and Health Frames**

A FrameWorks Research Report

Prepared for the FrameWorks Institute

By

Tiffany Manuel, Ph.D.

April 2009

Acknowledgments

Funding for this report was provided by the Center on the Developing Child at Harvard University, in collaboration with the National Scientific Council on the Developing Child and the National Forum on Early Childhood Program Evaluation. This report is the latest iteration of quantitative work in a multi-year, multi-discipline study of how communications about early child development (ECD) influences public attitudes and policy preferences.

The author would like to thank the following technical advisors for their constructive feedback and input on the report: Hirokazu Yoshikawa (Harvard University) for his invaluable assistance in shaping the presentation and scope of the data presented; Frank Gilliam Jr. (University of California, Los Angeles), Susan Nall Bales (FrameWorks Institute) and Lynn Davey (FrameWorks Institute) for their contributions to the overall research design and the articulation of the key research questions.

The findings and conclusions presented in this report are those of the author and do not necessarily represent the positions of the project funders or advisors.

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EXECUTIVE SUMMARY

Since 2001, the FrameWorks Institute -- in collaboration with the National Scientific Council on the Developing Child, the National Forum on Early Childhood Program Evaluation, and the Center on the Developing Child at Harvard University -- has been engaged in a multi-year, multi-discipline study of how communications about early child development (ECD) influences public attitudes and policy preferences. This body of work relies on a wide range of methods associated with the Strategic Frame Analysis™ approach (cognitive interviews, focus groups, media content analysis, cognitive media content analysis, Simplifying Models¹ development and experimental surveys); and has examined a number of different populations (e.g., engaged citizens, parents and non-parents, business executives, legislators, and civic leaders).²

This report summarizes results from the latest iteration of FrameWorks experimental research focused on extending existing communications strategies on the science of ECD and the efficacy of adding health as a dimension of those communications. The results greatly expand on our previous work on this topic and offer new opportunities for refining the communications messaging around ECD. More specifically, we report the findings from our tests of 17 potentially constructive frame elements (additional Values, Simplifying Models, and general Principles) in the pages that follow. These 17 discrete frame elements, while not exhaustive of potential ECD reframes, are important in part because if adopted, they hold the potential to change the public conversation around early child development in ways beneficial to policy preferences.

We test the impact of these frames against several policy related outcome measures of interest – the most important of which we see as *public support for policies* that address children’s developmental needs. As such we devised, and give a detailed account of, experiments whose primary intent is to capture the public’s level of support for discrete groups of policies and then to fully evaluate the effects of using different frame elements on those measures.

In addition to the measures of policy support, we also evaluate the effect of these frame elements on several secondary policy-related outcomes of interest: the salience of policies related to child development, the willingness of the public to support public funding for such policies and, more generally, the extent to which people attribute responsibility for advancing children’s development and wellbeing to collective, rather than solely to individual, action. These challenges have emerged from the qualitative research that precedes this specific inquiry.

Across all of these outcome measures of interest, we find that:

- Two Values tested in the experiments proved to be extraordinarily promising and robust *in their ability to lift public support for a wide variety of child related policies*: Prosperity and Ingenuity. Prosperity as a Value (in the way it was narrated in the survey we administered) focused the message on investments in early childhood development as an engine for the sustainable growth of the nation. Ingenuity as a Value focused on generating innovation to solve problems in early childhood development and the notion that the result of that ingenuity would be broadly shared across society.
- Although we find that only Prosperity and Ingenuity have a robust impact across the various policy domains, several other Values demonstrated isolated impacts on particular policy batteries: both Future and Responsible Management seem to advance policy support for the issue of child abuse; and Health as a Value had a similar positive effect on policy support on health and nutrition.
- The Vulnerable Child/Fairness Value frame had no demonstrable effect on any of the policy domains tested.
- Five Simplifying Models and Principles as frame elements were shown to exert statistically significant effects on one or more of the policy domains: Toxic Stress, Toxic Stress with Health, Pay Now/Pay Later with Health, Brain Architecture and Return on Investment. Of these frame elements, Toxic Stress (with and without Health included) seemed to exert the most cogent influence across the policy domains we tested.
- The performance of Health had little effect as an addition to the Values we tested and showed mixed results when applied to one or more of the Simplifying Models. The strongest showing of Health was in its attachment to Principles where the emphasis is often on funding and where it has the advantage of a robust public debate over the cost of transforming a system.
- The Environment of Relationships frame produced the most support *for prioritizing children's development and wellbeing – indeed, more than any other frame elements tested*. No one frame element proved sufficiently strong to lift the policy salience of *all* policy areas; this is interesting, given the broad effects of such Values as Prosperity and Ingenuity on policy support.
- Several frames proved to exert substantial influence on *how the public thinks about the role of government* in addressing issues related to children's development: Ingenuity, Toxic Stress with Health, and Return on Investment.

- We found that three frames tended to lift public support for public funding of various ECD policies: (1) Ingenuity and Pay Now/Pay Later were shown to increase public funding support for child abuse policies; and (2) Health as a Principle had a similar effect on health care funding support. In terms of a funding mechanism, several of the frame elements lift public support for taxation in particular: Ingenuity, Health as a Principle, and Toxic Stress (with Health).

INTRODUCTION

The overall objective of this research is to provide empirical evidence to inform communications about early childhood development issues and to help communicators choose productively between competing narratives. This research expands upon our prior experimental research by testing several promising additions to the core story of early childhood development which was developed by the FrameWorks Institute and the Center on the Developing Child. By the term “core story”, we mean the enumeration of the fundamental scientific principles that need to be understood in order to achieve a rough appreciation for the process of early child development. Broadly construed, the experimental research detailed in this report tries to ascertain whether exposing politically and civically engaged persons to alternative ways of thinking about children’s development has a measureable impact on a broad set of outcomes – including the salience of, and support for, child development policies.

In preparation for conducting these experiments, researchers at FrameWorks conferred with our partners (National Scientific Council on the Developing Child; the National Forum on Early Childhood Program Evaluation; and the Center on the Developing Child at Harvard University) to develop a set of frame elements (Values, Simplifying Models, and Principles) that seemed promising in terms of advancing the effectiveness of the core story. Through several iterations of discussions and feedback sessions, we identified a list of potentially promising frame elements to take into this round of experimental research.

In examining new possibilities for extending this “story”, we explored several themes aimed at improving the articulation and efficacy of the: (1) Values presented at the outset of the core story, (2) Simplifying Models meant to capture vital processes and mechanisms of description in the core story, and (3) general Principles that experts and scientists believe to be both true and fundamental to comprehension of the topic.

In addition to testing Values, Simplifying Models, and Principles, we also have the separate challenge of thinking strategically about whether, and how best, to incorporate the concept of physical health into the core story. The increasing interest from the ECD field of experts in mapping the notion of health onto the articulation of the core story is an important consideration and one that seemed especially important to take into experimental testing. As such, we put considerable effort into making use of various iterations of the concept of health in the experimental frames. The result in terms of the development of the frame elements tested is that we explicitly test the proposition that attaching “health” as an additional condition or piece of information to various aspects of the core story substantially enhances the effectiveness of the message overall. Specifically, we tested in several ways: Health as a Value, as a self-standing Principle, and as an adjunct to existing Principles and Simplifying Models.

Finally, as a separate challenge, we sought to evaluate the effects of frames and concepts currently used in communications around ECD (either by child welfare advocates or within the ECD literature) against alternative ways of framing the issue. The most interesting of the frames in common usage that we tested was the “vulnerable child” frame (or a way of talking about ECD from the perspective of responding to children with the most acute needs through policy intervention). Our task in introducing this frame into the mix of frames tested was to see if there were any measureable improvements to be had by shifting away from current communications practice and toward alternative ways of engaging this issue with the public.

Given this constellation of framing challenges, this experimental survey set out to assess the effects of 17 frame elements across a wide array of child development policies. The scope of our research questions is fairly straight-forward:

- (1) is it possible to advance the public’s support for public policies that address child development and wellbeing by exposing them to alternative ways of thinking about these issues: (1) as broader social concerns, (2) as consonant with the ways they are discussed by advocates and in the early childhood development literature; and/or (3) by enhancing the public’s understanding of the science of early child development?*
- (2) to the extent that the frames we test successfully lift public support for policy reforms, is it also possible to demonstrate similar frame effects on other policy related outcomes such as policy salience, support for public funding, and attribution of responsibility for policies that address these social concerns?*
- (3) is support for the core story of early childhood development advanced by incorporating the notion of physical health as part of the frame and if so, at what level of presentation do we find the greatest impacts?*

We test these three propositions using a web-based survey of 4,200 registered voters in an interactive venue administered by the Political Communications Laboratory at Stanford University (under the direction of Dr. Shanto Iyengar) and YouGov/Polimetrix (under the direction of Dr. Douglas Rivers). The experiments include a 17 treatment panel of stimuli (or potential reframes) measured against a control group on a series of policy outcomes, most notably policy preferences.

This report summarizes the findings from these experiments and is organized as follows: after a description of the research methods (including the experimental design, sampling methods, and outcome measures), we present the findings from the experiments in some detail. The final section of the report discusses the implications of these findings for a communications strategy related to early child development.

RESEARCH METHODS

The Experimental Design

The experimental design used in this study largely consisted of exposing a group of 4,200 randomly assigned survey participants to one of 17 treatment conditions (or to a control) and subsequently, measuring their responses to a series of policy related questions (or policy batteries).³ Figure 1 provides a more detailed schematic of the experimental design and it includes a list of the treatments, the list of the policy batteries to which respondents were asked to react, as well as the statistical comparisons we were interested in as part of evaluating the performance of the frames tested.

Figure 1. Experimental Design Schematic

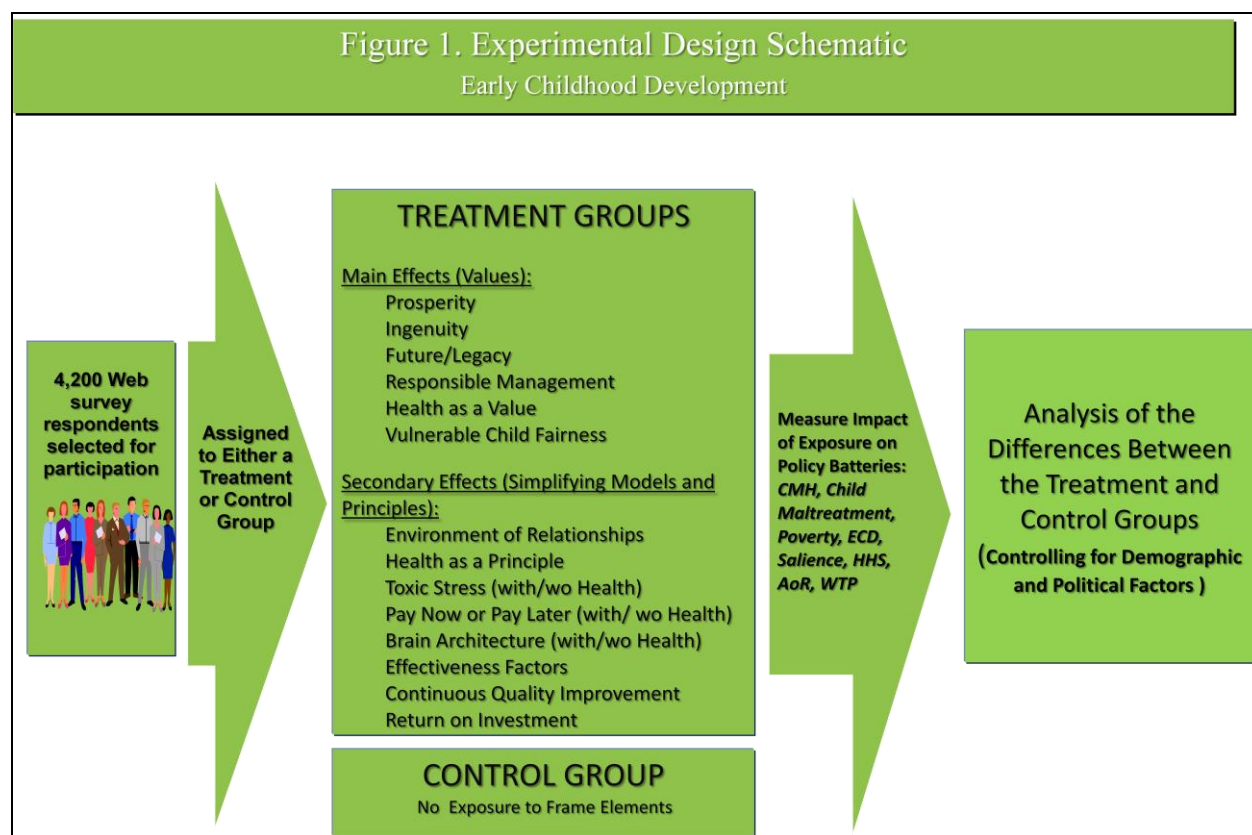


Table 1 summarizes all 17 frame elements tested in these experiments. The frames are categorized according to a typology of Values, Principles and Simplifying Models developed by the FrameWorks Institute. The specific narrative executions of these concepts (as given to survey respondents) can be found in Appendix A.

**Table 1. Values, Simplifying Models, and Principles
Used as Treatments in the Experimental Tests**

Table 1. Values, Simplifying Models, and Principles Used as Treatments in the Experimental Tests		
Values Prosperity Ingenuity Future/Legacy Responsible Management Health as a Value Vulnerable Child/Fairness		
<i>Simplifying Models and Principles</i>	<i>Potential Principles of the Core Story</i>	<i>Promising Principles from ECD Literature</i>
Toxic Stress (with and without Health) Pay Now or Pay Later (with and without Health) Brain Architecture (with and without Health)	Environment of Relationships Health as a Principle	Effectiveness Factors Continuous Quality Improvement Return on Investment

The Study Sample

In October 2008, we gathered a nationally representative sample of 4,200 registered voters using a Random Digit Dial (RDD) sampling frame weighted on the basis of gender, age, race, education, and party identification.⁴ The theory of random assignment in evaluation research design suggests that any variation between the control and the treatment groups not stemming from exposure to the stimuli of the treatments should be negligible or nonexistent. To test this proposition more specifically in our research, we conducted a series of overall F-tests to determine if there were any systematic differences in the race, gender, education and party affiliations between the treatment and control groups. We found no differences significant at the $p > .10$ level.

Table 2. Selected Demographic and Political Interest Characteristics of the Sample
(N=4,200)

Demographic Characteristics		Political and Civic Interest	
Has Attended a Church in Recent Months	55%	Registered to Vote	100%
Age		Partisanship	
0 to 24 yrs.	7.3%	Democrat	38.8%
25 to 39 yrs.	32.3%	Republican	30.7%
40 to 55 yrs	33.7%	Independent	25.5%
56+ yrs.	34.1%	Other	5.0%
Race/Ethnicity		Ideology	
White	77.2%	Very Liberal	8.5%
Black	11.1%	Liberal	17.7%
Hispanic	6.5%	Moderate	31.8%
Asian	1.1%	Conservative	23.3%
Native American	1.2%	Very Conservative	13.1%
Other	2.8%	Not Sure	5.7%
Income		Political Interest	
Less than 70K	53.6%	Very Much Interested	70.2%
More than 70k	43.7%	Somewhat Interested	24.8%
		Not Much	5.1%
Education			
Less than High School	3.7%		
High School	35.6%		
Some College	23.2%		
2 year Degree	7.4%		
4 year Degree	19.8%		
Post- Graduate Degree	10.4%		
Marital Status			
Married/Dom. Partnership	63.6%		
Single/Widowed/Divorced	36.4%		
Gender			
Male	47%		
Female	53%		
Region			
South	34.0%		
Northeast	20.1%		
Midwest	18.2%		
West	27.7%		

Representativeness of the Sample

Selected demographic and political interest characteristics of the sample are detailed for review in Table 1.⁵ The median age of respondents in the sample was 49. Fifty-three percent were women, 77 percent were white, and approximately 30 percent were college graduates (high school graduates made up about 35 percent). In terms of partisan affiliation, 39 percent were Democrats, 31 percent Republican, and 30 percent non-partisan.

Data Collection and Measures

In the analysis that follows, we report the findings from our experiments testing the effects of 17 frame elements (classified as Values, Simplifying Models, and Principles, according to definitions used by the FrameWorks Institute) against four general outcomes of interest related to children's development and economic wellbeing. These four outcomes are: (1) levels of support for policies meant to address child development by improving the economic stability of low-income families, (2) the overall salience of those policies, (3) the level of support for funding those policies and, more generally, (4) the extent to which people attribute responsibility for advancing children's development and wellbeing to collective, rather than solely to individual, action.

The first and most important of these outcomes (policy preferences), was assessed using a fairly exhaustive method focused on several policy batteries that tapped the approval/disapproval dichotomy of a series of policy proposals related to early childhood development. The second of these outcomes (policy salience) was assessed using a set of questions that asked respondents to rank poverty, education, child abuse and other issues on a scale ranging from "most important" to "least important" after being exposed to our test frame elements. Willingness to pay, a much more difficult concept to capture, was assessed using a set of questions that asked respondents to rank their preferred way to address the financial costs of policies that seek to advance children's development and wellbeing. Finally, attribution of responsibility was evaluated using a series of attitudinal indices that solicited respondents' viewpoints on the role of government in addressing a set of more general child development related issues.

In addition to the cultivation of the current iteration of these frame elements, we also collected a list of corresponding public policies against which we could test the usefulness of the frame elements. The policies chosen were selected from policy proposals advocated by child development experts or advocates for the purposes of improving children's developmental faculties and/or overall wellbeing. We collected and categorized these policies into five discrete policy groupings that we refer to in this paper as "policy batteries". The policy batteries used in the experiments are: (1) child and family mental health, (2) child abuse and maltreatment, (3) poverty/work/income, (4) health, and (5) early care and education. The batteries used in the

experiments largely form the basis of one of our primary outcome measures – policy preferences. That is, we expose survey respondents to one of the frame elements and then ask about their preferences and support for policies in each of these batteries. The specific policies that we used to develop the batteries are detailed in Appendix B.

These policies were tested in several ways to ensure their appropriateness in evaluating our frame elements. First, we pre-tested each of the policy batteries with a small pilot sample of 125 people. We then checked the inter-item correlations between the questions within the batteries and subsequently performed a factor analysis to confirm that they were, in fact, distinct. The results of our statistical tests indicated that the policy batteries represented distinct underlying factor structures. We then performed a Cronbach's Alpha test for the fidelity of the scales in the batteries to gauge their general reliability. All tests demonstrated that the respective scales displayed coefficients of .86 or higher; well above the range of acceptability. Assured of their reliability as independent scales, we collapsed the questions within each battery into a series of index variables that were subsequently used as primary outcome measures in most of the statistical analyses that follow. In addition, for ease of interpretation, these index variables were rescaled to range from 0 to 1.

In terms of the format of the experiments, respondents were first asked to respond to a series of introductory questions where they rated their level of concern about a short series of unrelated political issues. To avoid contamination of testing effects, the series of political issues offered to respondents was rotated each time the survey was administered and was quite broad in subject matter. Immediately following this series of questions, respondents were shown their assigned treatment (essentially, the narrative expression of one of the frame elements as shown in Appendix A) and subsequently, they were asked to answer questions related to their support for the policies in each of the policy batteries, attitudinal questions about the role of government, policy priorities, and then, questions about willingness to support public funding. Questions within each of these outcome areas were also rotated to mitigate any contamination of the tests.

Statistical Model Specification and Estimation

The statistical models used in this study essentially test the experimental hypothesis that support for child development policies will be higher or lower for those exposed to the frame elements than for those who receive no such exposure (or the control condition). To estimate support for policy, we used a generalized linear regression model. The regression analysis (as a technique) is useful because it measures the strength of the relationship between multiple variables of interest simultaneously (in this case, between the various frame elements and our measures of policy support). In addition, to increase the precision of the effect measurements, a limited number of covariates were added to the regression models (such as race, income, education, etc...), as noted in the text. A detailed specification of the functional form of the model used to

generate the findings in this report, along with a list of covariates used, and an explanation of the presentation format of these findings, can be found in Appendix C.

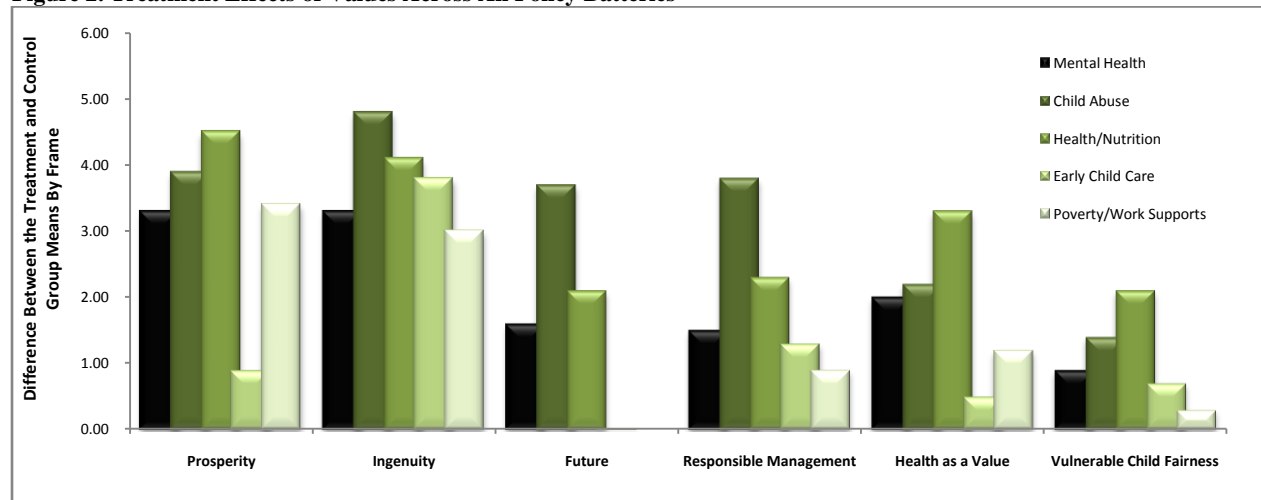
THE FINDINGS

The Frame Effects of Values on Policy Preferences

Over the last several years, significant attention has been focused on the development of a compelling “core story” that could usefully advance public understanding of key concepts within the body of science on early childhood development. In the process of identifying and refining this “story”, FrameWorks has used a wide variety of qualitative and quantitative measures to empirically measure various components of the story that are especially key to the translation of the scientific and social messages embedded within it. The experimental research findings summarized in this section of the report are not meant to replace our earlier work on these issues but rather to test several additional hypotheses with respects to three of the central frame elements in a core story: **Values, Simplifying Models, and Principles.**

Given the extraordinary role that Values play in the communication of social messages, we begin the presentation of the experimental research findings at the level of Values. The articulation of the Value is paramount for many reasons, not the least of which is that people tend to reason about policy issues from deeply held moral values rather than from the inherent appeal of the policies themselves. In this way, Values facilitate the connection to powerful cultural models that ultimately shape public understanding of the source of social problems, the efficacy of efforts to solve those problems, and notions about who is responsible for development and implementation of those remedies. As such, Values are indispensable as gatekeepers in any effective delivery of the message and the fundamental nature of the problem it addresses.⁶

Figure 2. Treatment Effects of Values Across All Policy Batteries



Recall that we took six discrete Values into experimental testing as a way to evaluate the efficacy of their use in communicating to the public about the fundamental nature of policies related to children's development and wellbeing. Figure 2 summarizes the results from the statistical model estimating the treatment effects (the difference between the treatment and the control group mean) for each of the Values tested in our experiments. Results suggest that Prosperity and Ingenuity exert positive, demonstrable, statistically significant influence on the extent to which people favor policies related to early childhood development. The treatment effects associated with both Prosperity and Ingenuity Values suggest that they have the effect of raising support for policies across the batteries by an average of about 4 point increase on the dependent score variable.

The strength of these frames in lifting policy support – almost across the board – suggest that either way of talking about children's development and wellbeing are likely to offer improvements over other frames in the survey generally. Prosperity as a Value (in the way it was narrated in the survey we administered) focused the message on investments in early childhood development as an engine for the sustainable growth of the nation. Ingenuity as a Value focused on generating innovation to solve problems in early childhood development and the notion that the result of that ingenuity would be broadly shared across society.

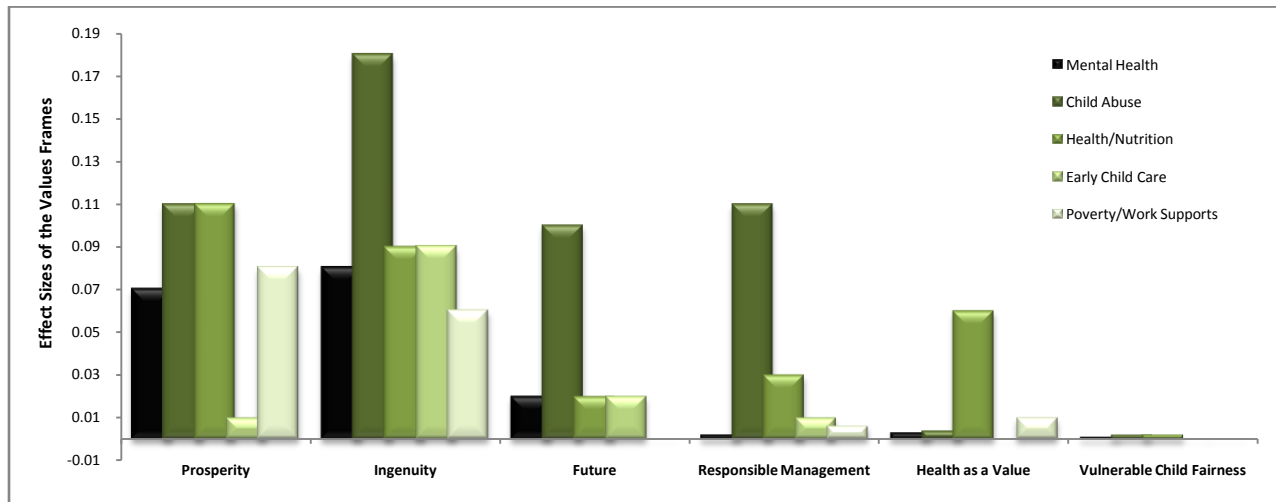
Although we find that only the Values of Prosperity and Ingenuity have a robust impact across the various policy domains, several other Values appear to exert isolated impacts on particular policy batteries. More specifically, both the Future and Responsible Management Values are statistically significant on the Child Abuse Battery. Health as a Value also has a statistically significant impact on policy support for the Health/Nutrition Battery. This suggests that talking about the Future and/or government as responsible manager has a positive impact on the extent to which the public supports policies related to child abuse. Similarly, these findings confirm the positive impact that Health as a Value has on policies related specifically to Health.

In all of the Values we tested, only one seemed to have no demonstrable impact on any of the policy domains tested – Vulnerable Child/Fairness. The latter is particularly important because it represents the way in which much of the scholarly literature and advocate materials on child development are framed. In a fairly compelling way, these findings suggest that framing the need for policies that address child development and wellbeing from the standpoint of 'fairness to the most vulnerable children in our society' is unlikely to produce significant expansions of policy support.

To provide more depth as to the frame effects of the Values tested, we also present their effect sizes as they relate to each policy domain in Figure 3. Effect sizes represent that amount of the variation in the dependent variables (in this case, of each policy domain) that is explained solely by a frame. As indicated in Figure 3, the effect sizes are most pronounced on the Prosperity and

Ingenuity Values – moving support on child abuse as high as .18 when respondents were exposed to Ingenuity. This indicates that both of these frames do much more to explain the difference between the treatment and control groups than do other frames tested.

Figure 3. Effect Sizes for Values Treatments Across All Batteries



We should note that these effect sizes would be considered fairly small as experimental impacts but given the modesty of the experiments themselves (one exposure to a framed narrative just before thinking about policy preferences, in which frames are distinguished from one another by a relatively small number of words varied), the strength of the effects makes intuitive sense. Thus, the results show statistically significant but modest differences across the treatments on policy preferences. Moreover, they should be examined not only for their performance in these models but for their capacity to serve as potential predictors of how social messages about children's development and wellbeing would likely be received by the broader public if they received ongoing and/or concentrated exposure.

Finally, we present a data table that summarizes both the treatment effects and the effect sizes as outlined in the previous figures but also adds the levels of significance across all policy domains. The shaded areas represent statistically significant findings and their levels of significance. The data tables tell us that most of the statistically significant results we found are highly significant at the level of $p < .05$ or lower.

Table 3. Values Treatment Effects Across All Policy Batteries in the Experiments						
Frame Element		Mental Health Interventions	Abuse/ Neglect Prevention	Health/ Nutrition	Early Child Care	Poverty/ Work Supports
Values Frames						
Prosperity	<i>Treatment Effect</i>	.033	.039	.045	.009	.034
	<i>Effect Size (by point increase)</i>	.07	.11	.11	.01	.08
	<i>Level of Statistical Significance</i>	.087*	.040**	.019**	.671	.054*
Ingenuity	<i>Treatment Effect</i>	.033	.048	.041	.038	.030
	<i>Effect Size</i>	.08	.18	.09	.09	.06
	<i>Level of Statistical Significance</i>	.082*	.010**	.034**	.069**	.086*
Future	<i>Treatment Effect</i>	.016	.037	.021	.018	.02
	<i>Effect Size</i>	.02	.10	.02	.02	.00
	<i>Level of Statistical Significance</i>	.416	.051*	.271	.408	.925
Responsible Mgmt	<i>Treatment Effect</i>	.015	.038	.023	.013	.009
	<i>Effect Size</i>	.002	.11	.03	.01	.006
	<i>Level of Statistical Significance</i>	.419	.041**	.230	.559	.589
Health as a Value	<i>Treatment Effect</i>	.020	.022	.033	.005	.012
	<i>Effect Size</i>	.003	.004	.06	.00	.010
	<i>Level of Statistical Significance</i>	.290	.226	.083*	.820	.482
Vul Child/Fairness	<i>Treatment Effect</i>	.009	.014	.021	.007	.003
	<i>Effect Size</i>	.001	.002	.002	.000	.00
	<i>Level of Statistical Significance</i>	.628	.442	.270	.747	.862

Statistically Significant Differences * $p \leq .10$; ** $p < .05$

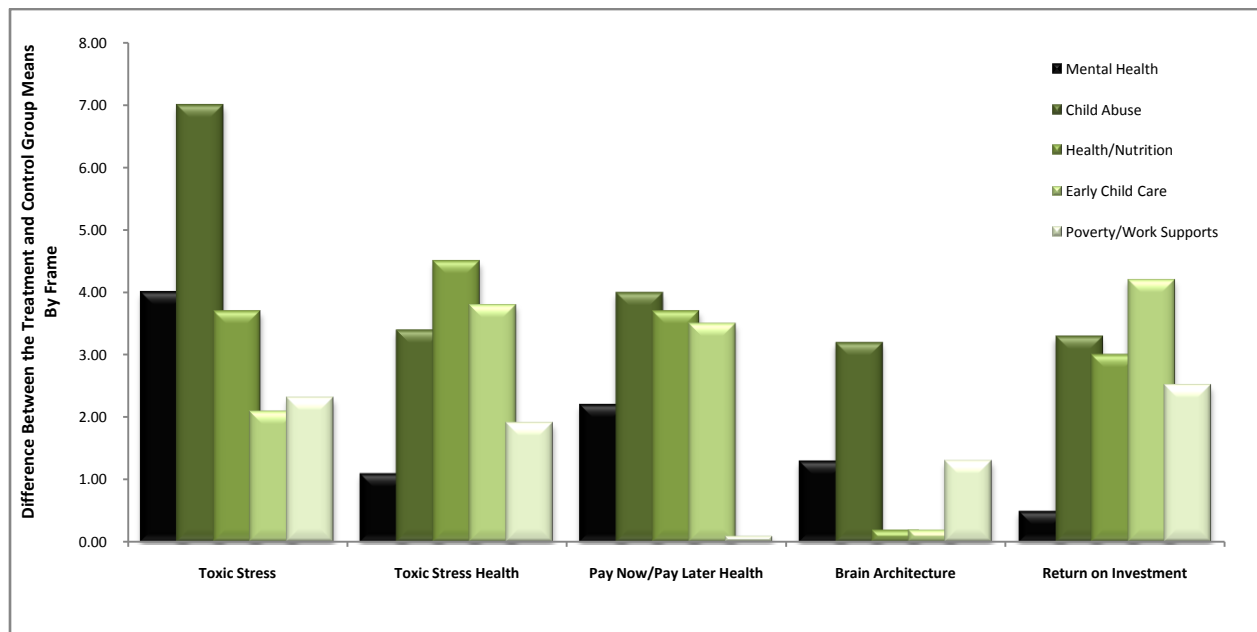
The Frame Effects of Simplifying Models and Principles on Policy Preferences

Simplifying Models can be especially useful to the core story in that they can help articulate key components of the science of ECD in ways that potentially improve comprehension of the policy issue and often enhance policy support as well. Although lifting support for policies is not their primary responsibility in a frame (we suspect that theirs is much more about filling cognitive holes and aiding in comprehension of an issue⁷), we tested them in this context to see if adding health information to them would have the impact of lifting policy support. In particular, the Simplifying Models included in these experiments (Toxic Stress and Brain Architecture) have already been empirically tested for their effectiveness in previous iterations of our work, and we include them with and without health information to help us fully evaluate the contribution of health as a concept.

Several general Principles are tested in this study as well. We define Principles as those aspects of child development science that arise from the body of scientific evidence or social policy research and, on the whole, constitute a process or problem that, in the estimation of experts, warrants explanation to the public. In effect, there are a limited number of these Principles on any issue but they can be said to help form the context and foundation for understanding the issue. We test three specific Principles that emerge from the work of the Center on the Developing Child: Effectiveness Factors, Continuous Quality Improvement, and Return on Investment. We also test the following Principles that have emerged in prior iterations of our experimental work: Pay Now/Pay Later (with and without health), Environment of Relationships, and Health (as a Principle).

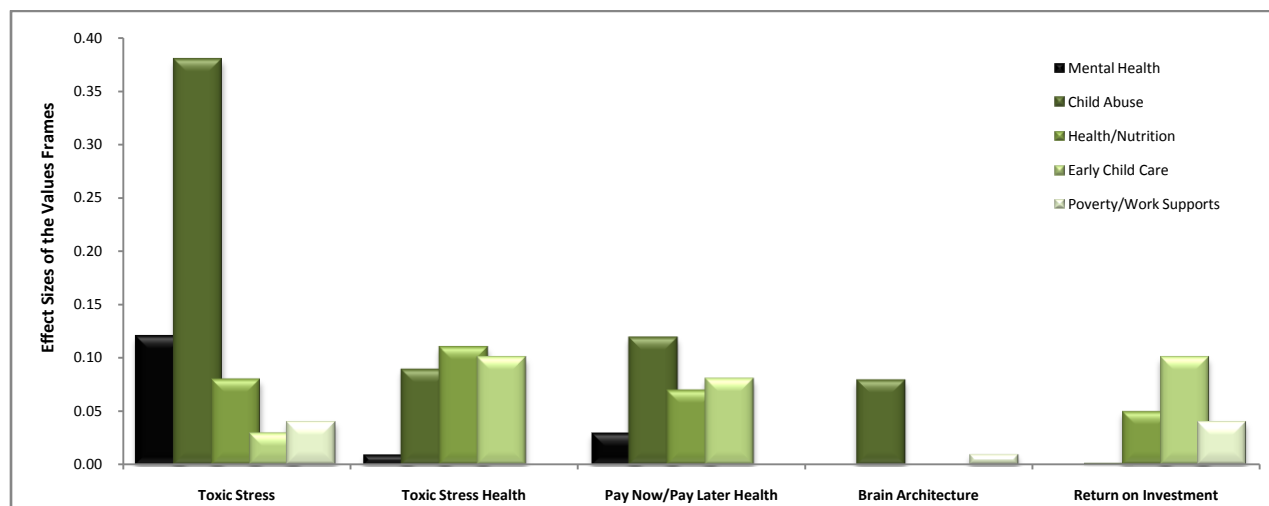
Figure 4 presents the treatment effects (which we define as the difference between the treatment and control group means) across a selected group of the Simplifying Models and the Principles tested. In particular, Figure 4 only presents the five Simplifying Models and Principles shown to exert statistically significant effects on one or more of the policy domains: Toxic Stress, Toxic Stress with Health, Pay Now/Pay Later with Health, Brain Architecture and Return on Investment. An examination of the treatment effects show that in most policy domains, Toxic Stress (with and without Health) produced larger gains in public support for policies than other Simplifying Models and Principles. The largest gains in public support came from Toxic Stress without Health on the issue of child abuse (with a 7 point-increase on the dependent score).

Figure 4. Treatment Effects of Selected Simplifying Models and Principles Across All Policy Batteries



To aid in our evaluation of the performance of these frame elements, Figure 5 presents the effect sizes for the Simplifying Models and Principles. Although generally modest, the effects sizes are strongest and most readily apparent in the Toxic Stress frames (with and without Health). In fact, it is the iteration of Toxic Stress in relationship to mental health issues that provides the strongest showing in terms of frame effects. This suggests that Toxic Stress is not only statistically significant but does much more to explain the difference between the treatment and control groups than do other frames with statistically significant results.

Figure 5. Effect Sizes for Selected Simplifying Models and Principles Across All Batteries



To evaluate the performance of all of the Simplifying Models and Principles tested, Table 4 provides a complete summary of treatment effects, effect sizes, and levels of statistical significance. The shaded areas represent statistically significant findings and their levels of significance. In examining these results, we especially highlight the fact, that although Return on Investment has two areas shaded to demonstrate its statistical significance in two policy domains (Child Abuse and Early Child Care), two other areas within ROI are fairly close to significance as well – Health/Nutrition and Poverty/Work Supports.

The findings in Tables 3 and 4 help us to evaluate the proposition that Health should be incorporated more robustly and explicitly into the ECD core story. Data presented in those tables suggests that the addition of the health message had mixed effects across various aspect of the ECD frame. For example, although the addition of health as a concept to Toxic Stress demonstrated statistical significance in three areas, when it was excluded in the iteration of Toxic Stress, we found equally compelling results that Health was unnecessary to lift public support with this frame element. Concomitantly, it is clear that the health message significantly strengthened the effects of Pay Now/Pay Later – enabling it to capture a greater proportion of policy support for ECD than without it. In fact, Pay Now/Pay Later with Health was significant in three of the five policy domains examined – child abuse, early childhood care, and health/nutrition – and the average treatment effect was three to four points on the dependent score.

When, however, we examined health as a part of other components of the frame, we found very modest results. Brain Architecture without Health demonstrated some significance, Health as a

Value was only able to elicit policy support for health-related policies, and Health as a Principle was unsuccessful in moving public support for any policy domains.

Table 4. Simplifying Models and Principles - Treatment Effects Across All Policy Batteries					
Frame Element	Mental Health Interventions	Abuse/ Neglect Prevention	Health/ Nutrition	Early Child Care	Poverty/ Work Supports
Env of Relationships <i>Treatment Effect</i>	.012	.024	.019	.007	.018
<i>Effect Size (by point increase)</i>	.01	.05	.02	.00	.02
<i>Level of Statistical Significance</i>	.516	.194	.325	.747	.318
Health as Principle <i>Treatment Effect</i>	.018	.024	.021	.017	.024
<i>Effect Size</i>	.02	.04	.02	.02	.04
<i>Level of Statistical Significance</i>	.339	.203	.276	.408	.167
Toxic Stress Health <i>Treatment Effect</i>	.011	.034	.045	.038	.019
<i>Effect Size</i>	.01	.09	.11	.10	.002
<i>Level of Statistical Significance</i>	.570	.069*	.020*	.063*	.285
Toxic Stress <i>Treatment Effect</i>	.040	.070	.037	.021	.023
<i>Effect Size</i>	.12	.38	.08	.03	.04
<i>Level of Statistical Significance</i>	.031*	.000**	.051*	.294	.182
PN/PL Health <i>Treatment Effect</i>	.022	.040	.037	.035	.001
<i>Effect Size</i>	.03	.12	.07	.08	.00
<i>Level of Statistical Significance</i>	.242	.037**	.056*	.098*	.963
PN/PL <i>Treatment Effect</i>	.009	.024	.014	.034	.002
<i>Effect Size</i>	.01	.04	.01	.08	.00
<i>Level of Statistical Significance</i>	.646	.212	.469	.100	.911
Brain Arch Health <i>Treatment Effect</i>	.007	.021	.017	.00	.009
<i>Effect Size</i>	.00	.04	.002	.00	.01
<i>Level of Statistical Significance</i>	.722	.251	.379	.981	.614
Brain Arch <i>Treatment Effect</i>	.013	.032	.002	.002	.013
<i>Effect Size</i>	.00	.08	.00	.00	.01
<i>Level of Statistical Significance</i>	.505	.083*	.916	.909	.460
EFF Factors <i>Treatment Effect</i>	.008	.013	.004	.002	.005
<i>Effect Size</i>	.00	.01	.00	.00	.00
<i>F Level of Statistical Significance</i>	.678	.478	.832	.938	.753
Cont Improvement <i>Treatment Effect</i>	.004	.016	.009	.009	.002
<i>Effect Size</i>	.00	.08	.00	.00	.00
<i>Level of Statistical Significance</i>	.824	.418	.634	.679	.897
Retn on Investment <i>Treatment Effect</i>	.005	.033	.030	.042	.025
<i>Effect Size</i>	.00	.002	.05	.10	.04
<i>Level of Statistical Significance</i>	.789	.081*	.117	.071*	.155

Statistically Significant Differences * $p \leq .10$; ** $p < .05$

As such, the experimental frames that include health in some way allow us to evaluate the efficacy of employing health as a concept at various parts of the frame. Notably, we find that health is unlikely to increase public support when it is placed at the Values level of the frame (given the lack of statistically significant findings on Health as a Value as indicated in Table 3). The performance of Health as an addition to one or more of the Simplifying Models was mixed – augmenting policy support in some but demonstrating more negligible results on other Simplifying Models. Perhaps the strongest presentation of health was in its attachment to Principles and especially on Principles where the emphasis tends to be on funding and also, where health has the advantage of a robust public debate over the cost of transforming a system. Furthermore, our analysis of the public’s willingness to support public funding (in the next section of the paper) offers a bit more evidence to substantiate the latter.

Other Measures of Policy Support

In addition to the measures on policy preferences, we also examined a set of secondary policy related outcomes to evaluate the performance of the frames. Those measures are: (1) policy salience, (2) attribution of responsibility; and (3) support for public funding of policies that address children's development and wellbeing.

Public Salience

As a second set of analyses, we examined the extent to which the frame elements tested could demonstrate measureable agenda-setting effects across all (or any) of the policy domains we examined. In practice, we ascertained answers to both these queries by evaluating responses to a question asking respondents to rank the importance of the policy areas discussed in the policy batteries. More specifically, respondents were asked to rank six areas of policy (mental health, education, abuse/neglect, early child care, health/nutrition and poverty)⁸ in the order that they thought policymakers should address the problems associated with them.⁹ We scaled their answers on each policy domain from 1 to 6 (that is, we recorded where each policy domain appeared in their priority list) and used this as a dependent measure to ascertain whether respondents exposed to any particular frame elements were subsequently more likely than those in the control group to raise the standing of any particular policy domain in relation to the others listed.

To analyze these policy rankings we used a nonparametric test (Kruskal-Wallis) and then examined the mean rankings from the test across the groups. (A more thorough description of the methods used to determine frame effects on policy salience as derived from these rankings can be found in Appendix C).

When we examined salience across policy domains in the study by evaluating the rankings from the Kruskal-Wallis tests, we found that none of the frame elements proved sufficiently strong to lift the policy salience of *all* policy areas, in the way that we observed in the tests of policy support. We also found the pattern of statistical results to be much more scattered on policy salience experimental tests than we had observed in policy supports test. Even so, we did find support for the Environment of Relationships frame in lifting the policy salience of several policy domains. Although Environment of Relationships was not quite as robust as Prosperity and Ingenuity on issues of policy preferences, it did prove to be the most demonstrative in moving policy salience.

These tests also suggest that although no particular frame element was sufficiently robust to lift policy salience across all (or most) policy areas, quite a few of them show general promise in lifting specific policy areas. The results from the Kruskal-Wallis tests do not lend themselves very well to the same types of statistical data tables as produced for the policy support measures

but they do provide good general evidence about the performance of the frames with respect to the policy domains. As a result, we summarize in bulleted form the results of these tests in terms of the general direction of the mean rankings. The following bullets reflect the frames in each policy domain that exerted some agenda-setting impacts:

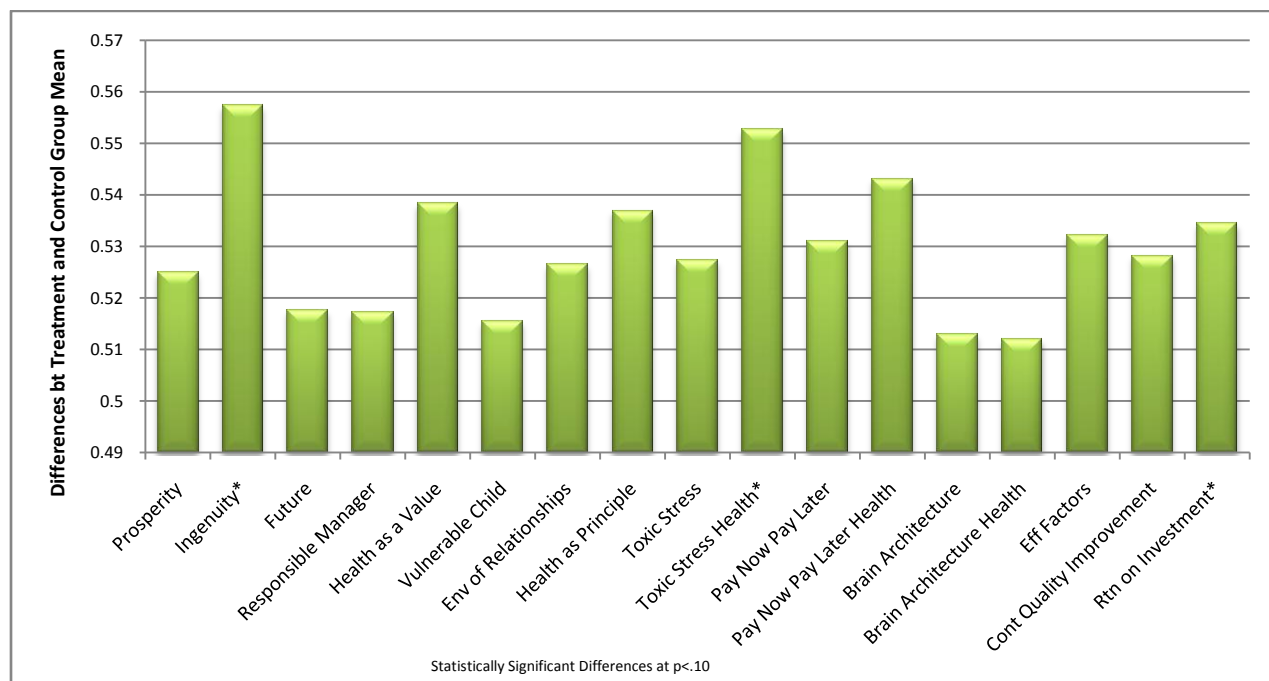
- *Child Abuse Battery*: Prosperity, Future and Pay Now/Later
- *Health Battery*: Health as Principle, Brain Architecture, and Return on Investment.
- *Poverty and Work Supports*: Ingenuity, Environment of Relationships, Toxic Stress (with Health), Effectiveness Factors and Return on Investment
- *Early Child Care Battery*: Responsible Management, Environment of Relationships, and Return on Investment
- *Mental Health Battery*: Pay Now/Pay Later (with Health), and Continuous Quality Improvement.

Attribution of Responsibility

A third outcome of interest is related to assessing public attitudes about the role of government in advancing children's development and wellbeing. In the experiments, participants' attitudes in this regard were evaluated using a series of questions that asked them to consider children's wellbeing and then to locate themselves on a scale of popular viewpoints about the role of government. Using these questions, we created a summary variable (or what we call an Attribution of Responsibility Battery) to further evaluate the impact of the frame elements on how respondents see the role of government. The idea behind this series of questions was to provide a more general sense of whether the frame elements could affect the extent to which people would assign responsibility for providing solutions for child development issues to society in general and to policymakers in particular.

Data reported in Figure 6 summarize the findings in this line of inquiry. Figure 6 suggests that three frame elements were positively and significantly related to support for a more active governmental role: Ingenuity, Toxic Stress with Health, and Return on Investment. We also note that Health as Principle was close to the level of significance and, therefore, might also be usefully added to the evolving arsenal of promising frame elements that seem to transform how the role of government is conceptualized on children's issues.

Figure 6. Treatment Effects on Attribution of Responsibility



Public Funding

A final outcome of interest, and certainly the most difficult of the outcomes to assess, is the willingness of respondents to express support for public funding of the policies in the survey. Since it is certainly plausible that respondents could express general support for a policy but revoke that support when they believe it to require action or resources on their part, we asked some basic questions at the end of the policy batteries that we felt would speak to these issues. Our ultimate goal in asking this set of separate policy support questions was to see how our framing elements would fare when respondents had to consider the potential financial costs associated with the policy remedies for which they expressed support as well as when they had to make explicit trade-offs between different funding mechanisms to pay for those remedies. With regard to the latter, we examined whether respondents supported a strong policy response to the children's issues in our policy batteries when they were told that such a response would necessitate one or more of the following funding trade-offs: a higher tax obligation, cuts to other social programs, regulation of the private sector, and/or additional government resources provided to community and nonprofit groups to leverage their ability to address children's development and wellbeing. In a separate question, we also specifically asked respondents about their support for recent Congressional budget cuts to a host of social programs such as Medicare, child care programs, federal student programs and others.

In terms of our analysis, we focused our analyses on three separate but related aspects of the public funding question: (1) frame effects on *whether respondents support any* governmental funding in our policy batteries, (2) frame effects on the *strength* of any expressed commitment to public funding in these policy areas, and (3) frame effects on the *types* of public funding most supported by respondents.¹⁰

On the first and second lines of inquiry, we found that there were no consistent frame effects across all of the policy domains. Although, similar to the outcomes on policy salience, we did observe isolated statistically significant impacts on the decision to support public funding in the policy domains of child abuse and health/nutrition: (1) Ingenuity and Pay Now/Pay Later were shown to increase support for child abuse policies; and (2) Health as a Principle had a similar effect on health care funding support.

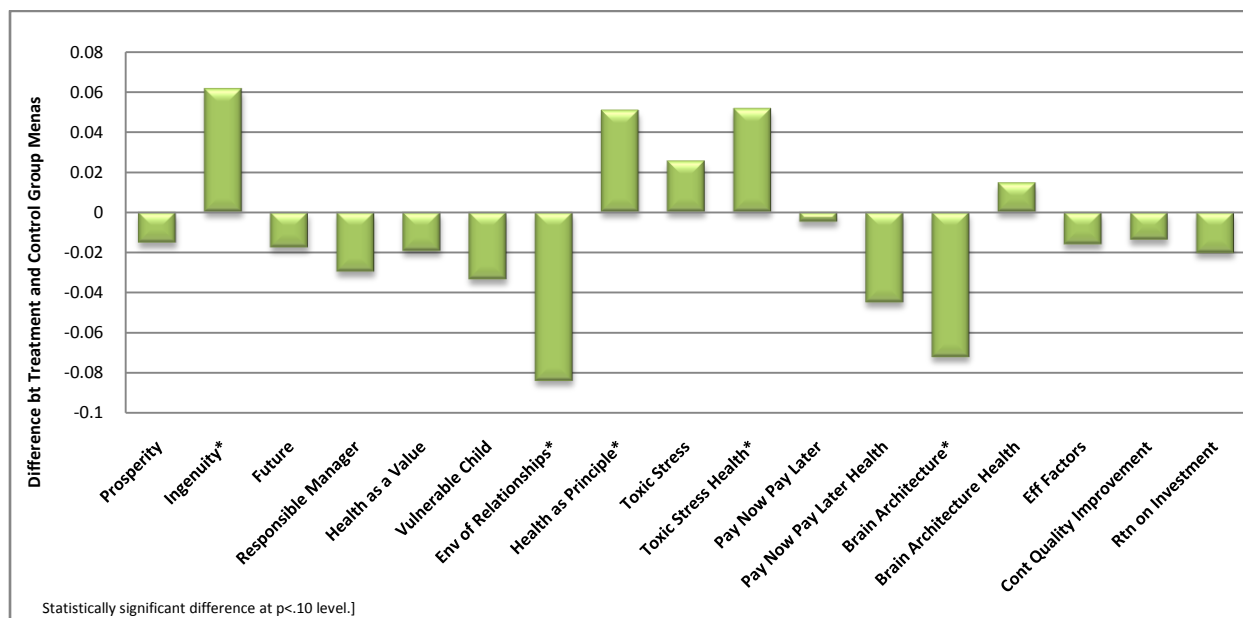
The third component of our analysis (types of funding supported) yielded a slightly larger harvest in terms of moving a step closer to understanding the effects of various frames on the public's appetite for funding policies targeted at children's development and wellbeing. To begin to examine the impact that our frames have on the types of public funding supported by respondents, we examined our funding trade-off question in more detail.

Basic results from the means tests suggest that, to the extent that respondents supported public funding, most preferred additional taxation to other types of funding and the statistical means associated with taxation proved to be statistically significant. While we intentionally designed the wording of the question on taxation to signify a nominal amount (we asked if they would support an additional \$1 tax obligation), the fact that people supported taxation as a funding mechanism literally across the board on all policy issues was remarkable.

Clearly this finding will require additional testing with much steeper (and more realistic) dollar amounts associated with the tax obligation but it is an interesting finding – especially given its consistency across the policy areas.¹¹

Figure 7 investigates the taxation finding in a bit more detail; it summarizes the treatment effects for all of the frame elements as they relate to support for taxation. Figure 7 presents evidence that several of the frame elements lift public support for taxation as a funding mechanism: Ingenuity, Health as a Principle, and Toxic Stress (with Health) all demonstrate statistically significant impacts on the willingness to support additional taxation funding mechanism. We also note that several frames demonstrate statistically significant negative results in terms of their effects on willingness to support additional taxation.

Figure 7. Treatment Effects on Support for Taxation



We should also note, just in passing, that several of the frame elements – specifically those that would seem to specifically address financial costs and obligations, such as Return on Investment, Pay Now/Pay Later and Prosperity -- were all conspicuously ineffective in relationship to taxation support. At the same time, it is important to recognize that other frame elements – Environment of Relationships and Brain Architecture, for example -- were not designed for this specific purpose, so it is little surprise that they have the effects they do. Moreover, none of the other funding mechanisms (regulation, cuts from existing social programs or government resources to organizations) were significantly related to any of the frame elements.

Given the difficulty of assessing willingness-to-pay (question wording is always the most thorny part of the analysis), we present these results as an exploratory foray into the field of contingent valuation which has developed more advanced measures of willingness to pay and plan to refine these measures in subsequent iterations of experimental research.

CONCLUSIONS TO DRAW ABOUT THE EFFECTS OF FRAME ELEMENTS

In the effort to continually refine the early childhood development core story, we set out in this experimental research to evaluate a series of modified Values, Simplifying Models and Principles that complement components of the existing message. We were especially interested to see if, and under what frame conditions, the concept of health could be usefully added to the

core story (i.e. as a Value, Principle or addition to an existing Simplifying Model). It was our contention at the outset of this work that the addition of health as a component of the core story would be difficult to incorporate because we have found in other research on the topic that health tends to individualize rather than broaden thinking about the prospects of policies.¹² The findings from this report bare this out, for the most part, albeit in fairly complex ways.

More than anything, these data show that framing the content of social messages on a wide variety of children's policy issues matters a great deal, since we can show improved policy support between the treatment and control groups on at least one frame element across all of the policy domains examined.

Drilling more deeply, we found the performance of several of the frame elements to be fairly consistent in empirically validating their effectiveness: Prosperity, Ingenuity, Environment of Relationships, Toxic Stress (with and without Health), Pay Now/Pay Later with Health, and Return on Investment. While other frames demonstrated some impact on policy support, these frame elements were much more central in affecting the policy outcomes of interest.

Moreover, these experiments give us a strong indication about the magnitude of the effects of these frame elements. To the extent that they were successful in extending the reach of our outcomes of interest (i.e. policy salience, support, etc...), they typically did so to the tune of about 3 to 5 point-increases on the dependent score. While the magnitude of expansion of these outcomes may seem modest, this modesty should be no surprise given: (1) the relatively brief nature of exposure to the frame elements as treatments (amounting to a paragraph read immediately before answering policy question); (2) the fact that rankings of initial salience accorded to children's issues were already quite high and as a result, the marginal rate of return on exposure to the frame elements at that level is much lower; and (3) what we know about the origins of individuals' political agendas and the difficulty of transforming those agendas means that we recognize this effort as a process of long-term rather than short-term exposure.

As a result, we present these result findings as a strong validation of several particular frame elements that have the potential to offer up guidance to child development researchers and advocates about the social messages they create to educate the public and policymakers about these issues. We demonstrate that attention to framing (especially in choosing the right combination of appropriate frame elements) can broaden the base of support needed to successfully pursue policies that attend to the developmental needs of young children.

APPENDIX A: VALUES, SIMPLIFYING MODELS, AND PRINCIPLES

After the selection of the frame elements, FrameWorks researchers then developed a narrative paragraph as a representative of how that element might be discussed in a media report or some other form of advocacy materials to which informants might routinely be exposed. Although these narratives may (or may not) represent how they might be presented in practice, each of the frame elements tested reflects FrameWorks' best execution of that idea. The specific narratives that respondents were exposed are listed below. Each respondent in the survey was exposed to one of these narratives unless they were in the control group (where they would receive no exposure to anything except the policy batteries).

Values Frames

1. Prosperity Frame. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that early childhood development is important for community development and economic development. According to this view, skills and capacities that begin developing in early childhood become the basis of a prosperous and sustainable society -- from positive school achievement to work force skills to cooperative and lawful behavior. Have you heard of this explanation of why we should allocate societal assets to young children, because they predict our society's prosperity?

2. Ingenuity Frame. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that society needs to invent and replicate more effective policies and programs for young children. According to this view, innovative states have been able to design high quality programs for children. These programs have solved problems in early childhood development and shown significant long-term improvements for children – but many counties don't have access to these innovations. Have you heard of this explanation of why we should allocate societal resources to creating better solutions for young children?

3. Future Frame. Lately there has been a lot of talk about the role of children in society. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that, because children are our future, we need to give to them now so they can give back to society later. According to this view, society makes an investment in its' own future when it invests in quality early childhood programs because these children will be better able to inherit our institutions and steward our nation. Have you heard of this explanation of why we should allocate societal resources to children as our future?

4. The Responsible Management Frame. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that it is irresponsible to ignore new findings about child development that should be used to improve our health and education systems. According to this view, we now know that important child development happens earlier than previously thought, and that early adversity has life-long effects on learning, behavior, and health. So we need to update our major preventive systems to incorporate this new

knowledge about early childhood. Have you heard of this explanation of why we should allocate societal resources to better management of systems affecting young children?

5. Health Frame. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that investments in better children's health result in economic and health benefits for all of society. According to this view, children's health potential is influenced earlier than we thought because we now know that early adverse experiences can have life-long health consequences. This can affect the health of the heart and immune system, so if society wants to lower health care costs, we should invest in early childhood development. Have you heard of this explanation of why we should allocate societal resources to improve our nation's health through young children?

6. The Vulnerable Child Fairness Frame. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that society needs to invest in programs that help the most vulnerable children whose families struggle to make ends meet. According to this view, one way to level the playing field for children who suffer from poverty and discrimination is to financially support their access to the same high quality early childhood programs that wealthier families can afford. Have you heard of this explanation of why we should allocate societal resources more fairly for vulnerable young children?

Potential Principles of the Core Story

7. Environment of Relationships. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that young children grow up in an environment of relationships that affects all aspects of their development. According to this view, healthy development depends upon the quality and reliability of a child's relationships with adults. The support and interaction of trusted adults shapes a child's brain circuits, and can affect academic performance and interpersonal skills later in life. Have you heard of this explanation of why we should allocate societal resources to provide consistent and stimulating environments for young children?

8. Health as Principle. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that adverse experiences get built into the child's body early in life and can predispose a child to later illness. According to this view, children exposed to early adversity can develop an exaggerated stress response that, over time, weakens their defense system against diseases, from heart disease to diabetes and depression. That exaggerated response may never go away, with lifelong consequences. Have you heard of this explanation of why we should allocate societal resources to preventing long-term health problems in young children?

Simplifying Models and Principles of the Core Story

9. Toxic Stress. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that “toxic stress” in early childhood is associated with such things as extreme poverty, abuse, or severe maternal depression and damages the developing brain. It is important to distinguish among three kinds of stress. We do not need to worry about positive stress (which is short-lived stress, like getting immunized). But toxic stress lasts longer, lacks consistent supportive relationships and leads to lifelong problems in learning, behavior, and both physical and mental health. Please tell us if you have heard this explanation of why we should allocate societal assets to young children.

10. Toxic Stress (with health information, in italics). Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that “toxic stress” in early childhood is associated with such things as extreme poverty, abuse, or severe maternal depression and damages the developing brain. It is important to distinguish among three kinds of stress. We do not need to worry about positive stress (which is short-lived stress, like getting immunized). But toxic stress lasts longer, lacks consistent supportive relationships and leads to lifelong problems in learning, behavior, and both physical and mental health. *Children exposed to toxic stress develop an exaggerated stress response that, over time, weakens their defense system against diseases, from heart disease to diabetes and depression. That exaggerated response never goes away, with lifelong health consequences.* Please tell us if you have heard this explanation of why we should allocate societal assets to young children.

11. Pay Now or Pay More Later. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe trying to change behavior or build new skills on a foundation of brain circuits that were not wired properly when they were first formed requires more work and is less effective. According to this view, remedial education, clinical treatment, and other professional interventions are more costly and produce less desirable outcomes than the provision of nurturing, protective relationships and appropriate learning experiences earlier in life. Please tell us if you have heard of this explanation of why we should allocate societal assets to young children.

12. Pay Now or Pay More Later (with health information, in italics). Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe trying to change behavior or build new skills on a foundation of brain circuits that were not wired properly when they were first formed requires more work and is less effective. According to this view, remedial education, clinical treatment, and other professional interventions are more costly and produce less desirable outcomes than the provision of nurturing, protective relationships and appropriate learning experiences earlier in life. *We now know that children who are exposed to serious early stress develop an exaggerated stress response that, over time, weakens*

their defense system against diseases, from heart disease to diabetes and depression. That exaggerated response never goes away, with costly consequences for them and the society. Please tell us if you have heard of this explanation of why we should allocate societal assets to young children.

13. Brain Architecture. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that the basic architecture of the brain is constructed through an interactive process with early experiences. Like the construction of a home, the architecture of the developing brain begins with laying the foundation, and continues with the incorporation of distinctive features that enable increasingly complex skills over time. As it emerges, the quality of that “brain architecture” establishes either a sturdy or a fragile foundation for all of the development, behavior, and health that follows. Please tell us if you have heard this explanation of why we should allocate societal assets to young children.

14. Brain Architecture (with health information, in italics). Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that *the basic* architecture of the brain is constructed through an interactive process with early experiences. Like the construction of a home, the architecture of the developing brain begins with laying the foundation, and continues with the incorporation of distinctive features that enable increasingly complex skills over time. As it emerges, the quality of that “brain architecture” establishes either a sturdy or a fragile foundation for all of the development, behavior, and health that follows. *Early child experiences also get built into the body. Children exposed to serious early stress develop an exaggerated stress response that, over time, weakens their defense system against diseases, from heart disease to diabetes and depression. That exaggerated response creates a weakened foundation for health and has lifelong consequences.* Please tell us if you have heard this explanation of why we should allocate societal assets to young children.

Promising Explanations from Forum Literature

15. Effectiveness Factors. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that we can measure “effectiveness factors” that often make the difference between programs that work and those that don’t work to support children’s healthy development. For 3 and 4 year olds, these would include the level of teacher training, a language-rich environment, and a safe and regulated place that supports a variety of learning experiences. Without these effectiveness factors, some children can spend just as many hours in a program, but not show many positive outcomes. Please tell us if you have heard this explanation of why we should identify effectiveness factors when we allocate societal assets to young children.

16. Continuous Quality Improvement. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe

that we need to use principles from business, like continuous quality improvement, to strengthen programs for young children. According to this view, we should hold programs accountable to what we know works for children by using objective data repeatedly to analyze and continually improve important processes. Many children's programs are seldom evaluated. The result is that some children can spend just as many hours in a program, using outdated methods, and not show the positive outcomes that other programs exhibit. Please tell us if you have heard this explanation of why we should allocate societal assets to repeatedly evaluating programs for young children.

17. Return on Investment. Lately there has been a lot of talk about the role of society in supporting children. In particular, people have offered various explanations of why it is important to devote societal resources to children at the very earliest stages of life. For example, some people believe that we need to use principles from business, like return on investment, to make smart investments for society. According to this view, we can evaluate the efficiency of programs for young children by comparing the benefit of the investment to the cost. This allows a reliable comparison between programs that don't improve child development and those that show real results. Many early childhood programs are seldom evaluated according to their benefits to the child and the society. Please tell us if you have heard this explanation of why we should allocate societal assets to calculating the return on investment in programs for young children.

18. Control Group. (This group received nothing except exposure to the policy batteries).

APPENDIX B: POLICIES RELATED TO CHILD DEVELOPMENT AND WELLBEING

The index variables used to evaluate policy preferences in the analyses were based on a series of questions in five different topical areas. On each question, the respondent was asked to state their support for the policy on a five point scale ranging from 'strongly favor' to 'strongly oppose'. The questions for each battery were tested for internal consistency and were judged to be consistent by the conventionally accepted levels of a Cronbach's Alpha coefficient.

MENTAL HEALTH BATTERY

1. Mental health and substance abuse services should be available and affordable for all parents, caregivers and children who need them.
2. Victims of child abuse should receive priority in the allocation of mental health funds so that appropriate treatment can be given to prevent the cycle from continuing when they reach adulthood.
3. Sufficient numbers of well-trained professionals with expertise in mental health services should be recruited, trained and licensed to serve the documented needs of families with young children.
4. Early care and education professionals should be required to receive training in mental health screening to aid in their early detection of mental health concerns in young children.
5. Culturally and linguistically appropriate screening services for early detection of mental health concerns in young children and their families should be available to all who need them.

CHILD MALTREATMENT BATTERY

1. Provide additional resources to community programs that work to prevent child neglect.
2. Conduct more research and program evaluation to make existing child abuse prevention programs more effective.
3. Make life education part of every school's curriculum, including information on age-appropriate child development, as well as child abuse and neglect prevention.
4. Ban physical punishment in all schools and institutions that serve kids.
5. Make it easier for judges and courts who deal with family issues related to abuse and neglect or custody of young children to order intervention programs as early as possible.
6. Forgive federal loans for students who become trained and work for at least five years as child welfare workers.
7. Improve foster care and adoption systems by minimizing multiple placements and disruptions in relationships for very young children.

POVERTY AND WORK SUPPORTS BATTERY

1. Provide income supplements for low-wage working parents to make work pay, such as tax credits and wage supplements.
2. Expand existing paid parental leave programs for low-income parents.

3. Offer opportunities to parents with limited education and low incomes to increase their skills through job training and adult education.
4. Ensure that services provided to children are delivered by professional staff with expertise and skills to deal with the effects of poverty on families, such as severe depression.
5. Make poor families that can demonstrate proof of full-time work (30+ hours per week) eligible for subsidized child care and health insurance.
6. Increase access for poor families to Early Head Start and other comprehensive, high-quality settings for poor infants and toddlers.
7. Provide services to address the needs of teen parents such as programs to help them graduate from high school and college, so they can successfully raise their children.

EARLY CARE AND EDUCATION BATTERY

1. Increase the quality of center-based care by investing more resources in small class sizes, low teacher-child ratios, and highly skilled teachers who can develop age-appropriate curricula and stimulating materials.
2. Make high quality early care and education programs more broadly available in a variety of settings and affordable for lower-income families through subsidies and sliding fee scales.
3. Create high quality care and education programs that offer services for both parents and children in one program
4. Forgive federal loans for students who become trained and work for at least five years as in early care and education programs in low-income areas.
5. Restrict child care subsidies to home-based or center-based settings that are licensed, regulated, and monitored by the states, which are not required currently by federal child care legislation.

HEALTH AND HEALTH SERVICES BATTERY

1. Require paid sick days be provided to all workers so they are not forced to choose between losing a day of work or caring for themselves or a sick child.
2. Provide health care for all pregnant women and women in child-bearing years.
3. Make these child health care services available for all children: well-child visits, oral health care, neonatal screening and follow-up, and vision and hearing screening.
4. Increase investments in the Women, Infant and Child nutrition program so that it can provide food vouchers for nutritious food to all poor pregnant women and children and expand their access to health programs that monitor mothers' and children's growth and development.
5. Develop family resource centers in communities to encourage social networking, provide parenting education and make referrals for social services.
6. Provide economic supports and quality child care services to help very young parents successfully raise their own children.

APPENDIX C: MODELS ESTIMATION TECHNIQUES

The Estimation of Models Used to Derive the Frame Effects on Policy Support

To estimate the effects of the treatments on policy support, we used a generalized linear regression model. The specific functional form of the model used is given in Equation 1.

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik} + \varepsilon_i \quad [1]$$

Where:

Y_i	=	the policy outcome measure for study participant i ($i = 1, 2, \dots, N$)
β_0	=	coefficient for the <i>intercept</i>
β_1 , and B_2 , and B_k	=	mean differences or slope coefficients
X_{i1}	=	vector of demographic characteristics (<i>race, gender, marital status, household income, etc...</i>)
$X_{i2} \dots X_{ik}$	=	vector of the treatments (dummy variables that take the value 1 if in the treatment group; 0 otherwise)
ε_i	=	error or disturbance for the i^{th} unit

In this model, the regression coefficients associated with the treatment conditions (i.e. β_2 through β_k) estimate the independent impact of each treatment condition on the policy related outcome measure in question, after adjusting for the effects of the covariates. Because the policy battery is scaled on a 0-1 metric, the regression coefficients associated with the 17 conditions indicate the point difference in the dependent score that represents policy support between participants assigned to each condition and those assigned to the control condition. A β_2 coefficient of .05, for instance, means that the effect of treatment amounts to a five-point increase in the dependent measure. The estimated value of β_2 therefore provides an estimate of the frame effects on the policy related outcome measure being examined.¹³

For each of the outcome measures tested (i.e. policy support, salience, etc..), an extension of the statistical model in Equation 1 and the estimation techniques described here was used to evaluate the frame effects of the Values, Simplifying Models, and Principles of interest. Statistical estimation techniques that depart more considerably from this basic model are noted and discussed in the text.

Also, to increase the precision of the effect measurements, a limited number of covariates were added to the estimation models. In particular, we added the following into the models as covariates: gender, marital status, race, party affiliation, religious attachment, household income, education, region of residence, and news attentiveness. Thus, most of the statistically estimated differences between groups in this report are regression-adjusted using ordinary least

square techniques that allowed us to control for a series of relevant covariates (as identified in the discussion of each outcome measure in the findings).

More generally, the experimental hypothesis that we tested is summarized in Equation 2 - such that the definition of the expected value of the outcome measures is as follows:

$$E(Y_i | X_{2\dots k}=1) > E(Y_i | X_{2\dots k}=0) \quad [2]$$

Additionally, the random assignment of our groups means that we can test the frames against the “counterfactual” or the proposition that the expected value of the outcome (policy support) is greater for those exposed to the frame elements than for those with no exposure. This inherently also tests the null hypothesis that $E(Y_i | X_{2\dots k}=1) = E(Y_i | X_{2\dots k}=0)$ or essentially, that there is no difference between the treatment and control groups in terms of policy support. *The combination of random assignment and specification of the model are expected then to produce an unbiased estimate of the average treatment effect of our frame elements.*

Finally, statistically significant findings at the conventional 0.10 probability level¹⁴ are denoted in the text with an asterisk (*). In addition to the statistically significant results, we also present effect sizes (or eta-squared parameter estimates). The effect size is a metric used to convey the explanatory power of the treatments in relationship to the control and the tables/figures in this report use eta-squared for this task.¹⁵ We present effect sizes here, in addition to the statistically significant results, because significance tests do not represent the size, meaning, or importance of an effect in terms of policy relevance. Statistical significance merely conveys the probability that the differences between the treatment and control groups were not simply the result of chance but rather, the result of exposure to the treatment. On the other hand, lack of a statistically significant result does not mean that there is no impact, it simply means that we cannot reliably distinguish the result from zero at the level of confidence that we have chosen for the statistical tests. As a result, although we base our recommendations on the statistically significant results, as well as those indicated by higher effect sizes, we sometimes point out promising directions that emerged from the overall direction of the means related to the treatments. Finally, unless otherwise noted in the text, two-tailed significance tests are used to evaluate the frame elements.

The Estimation Models Used to Derive Frame Effects on Policy Salience

To examine the frame effects on participants’ rankings of child development policy domains as priority areas for policymakers, we used a nonparametric test (Kruskal-Wallis) and then examined the mean rankings from the test across the groups. The broad number of groups makes the likelihood of finding significance on the Kruskal-Wallis test much more difficult to achieve; even so, the rankings that the statistic produces, offers a measure of how well the frame elements impact public views of the importance or salience of child development as an issue.

More generally, the Kruskal-Wallis one-way analysis of variance by ranks is a non-parametric method for testing equality of population medians among groups. Intuitively, it is identical to a one-way analysis of variance but in this test, the data is replaced by their ranks. Since it is a non-parametric method, the Kruskal-Wallis test does not assume a normal population, unlike the more traditional method, one-way analysis of variance. In this method, all data are ranked from all groups together (i.e. ranked from 1 to 6 ignoring what treatment or control group they belong to). The test statistic is then given by:

$$K = (N - 1) \frac{\sum_{i=1}^g n_i (\bar{r}_{i\cdot} - \bar{r})^2}{\sum_{i=1}^g \sum_{j=1}^{n_i} (r_{ij} - \bar{r})^2} \quad [3]$$

where:

- n_i is the number of observations in group i
- r_{ij} is the rank (among all observations) of observation j from group i
- N is the total number of observations across all groups

About the Institute

The FrameWorks Institute is an independent nonprofit research organization founded in 1999 to advance the nonprofit sector's communications capacity by identifying, translating and modeling relevant scholarly research for framing the public discourse about social problems. It has become known for its development of Strategic Frame Analysis™, which roots communications practice in the cognitive and social sciences. FrameWorks designs, commissions, manages and publishes multi-method, multi-disciplinary communications research to prepare nonprofit organizations to expand their constituency base, to build public will, and to further public understanding of specific social issues. In addition to working closely with scientists and social policy experts familiar with the specific issue, its work is informed by communications scholars and practitioners who are convened to discuss the research problem, and to work together in outlining potential strategies for advancing public understanding of remedial policies. The Institute publishes its research and recommendations at www.frameworksinstitute.org.

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Please follow standard APA rules for citation, with FrameWorks Institute as publisher. Manuel, Tiffany. (2009). *Refining the Core Story of Early Childhood Development: The Effects of Science and Health Frames*. Washington, DC: FrameWorks Institute.

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¹ At FrameWorks, a simplifying model helps to bridge the gap between expert and lay understandings of an issue. Empirically tested, it explains complex ideas using metaphors that facilitate thinking and understanding on an issue by helping individuals conceptualize information. As such, it is considered a critical frame element.

² See, for example, Aubrun and Grady, 2002 2003; Bales, 2005; Bostrom, 2002; Gilliam, 2006.

³ More specifically, 220 respondents were randomly assigned to each of the 17 treatments and 420 to the control group.

⁴ We specifically made use of the national web-based surveys conducted by Polimetrix at Stanford University. Polimetrix requires its two million panelists to participate in weekly studies in exchange for free Internet access. A two-stage sampling procedure is utilized to create a “matched” sample. First, a conventional random sample is drawn utilizing a RDD sampling frame. At the second stage Polimetrix mirrors the conventional sample by selecting panelists who most closely resemble each member of the random sample.

⁵ Data in Table 1 are not weighted so that the raw characteristics of the sample can be appreciated. However, in the analyses that follow, the data are weighted by the appropriate sample weights.

⁶ See our webinar on The Role of Values in Communications for Social Change, which can be found here:

<http://www.frameworksinstitute.org/webinars.html>

⁷ While much of the literature on the use of metaphors in framing suggests this is likely the case, we will be taking this proposition up more explicitly in the next round of experimental research.

⁸ To avoid contamination, we rotated the response category here to ensure that respondents did not respond similarly because the response categories were ordered in a static manner.

⁹ More explicitly, respondents were asked the following: *Thinking about the issues discussed in this survey, rank the policy topics in the order that you think policymakers should address them, with 1 being most important and 6 being the least important.*

¹⁰ Note that the funding choices that survey participants were exposed to were not experimentally assigned.

¹¹ Note that the response category to this question was rotated so that as not to privilege one response in the set.

¹² Bales, S.N., “Framing Community Health as if Food and Fitness Mattered: A FrameWorks Message Memo,” Washington, DC: FrameWorks Institute, 2008.

¹³ We should also mention that the key assumption of the model is that the error is randomly distribution such that $E(u / x_1, x_2, \dots, x_k) = 0$.

¹⁴ The $p < 0.10$ standard for statistical significance implies that if a true impact is zero, there is only a one-in-ten chance that the estimate will be statistically significant.

¹⁵ The specification for the Eta-squared estimates is as follows: $\eta^2 = SS_{\text{between}} / SS_{\text{total}}$