From Science to Policy

a strategy to communicate
the science of early
childhood to Pennsylvania
policymakers

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From Science to Policy:

a strategy to communicate the science of early childhood to Pennsylvania policymakers

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Abstract

This thesis project recommends a communication strategy for the University of Pittsburgh's Office of Child Development (OCD). It supports OCD in the development of evidence-based communication that targets state policymakers about early childhood issues. The proposed strategy assembles a set of communication materials and heuristics to help OCD educate and inform Pennsylvania legislators about child policy issues statewide. The strategy uses scientific evidence—*the latest studies on pre-kindergarten care environments and neuroscientific research on early childhood development*—in order to accurately depict the current state of early childhood care in Pennsylvania, as a means of encouraging legislators to make informed policy decisions. The strategy consists of a set of audience-specific, visual-verbal communication guidelines, along with specific recommendations for the timing of communication and selection of content. It serves as a template that can be used to address state lawmakers for a wide range of communication projects. The strategy is shaped by several factors: OCD's focus on evidence-based communication practices, an understanding of the current science behind early childhood development, research on the target audience's communication practices, and the shared intention to create a lasting yet flexible set of materials for OCD's use in addressing early childhood policy issues.

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Acknowledgements

Introduction

This thesis is a collaborative project between the University of Pittsburgh's Office of Child Development (OCD) and myself. The project was conceived by OCD's Director of Policy Initiatives, Ray Firth, as a means of communicating the science behind early childhood development to Pennsylvania's policymakers. The intention of this communication strategy is to educate state policymakers about the importance of early care, intervention, and education in achieving healthy outcomes for at-risk children and their families, and to encourage them to make wise investments in care programs and policies for children.

This project stems from the recognition of a particular inertia in policymaking for early childhood programs. This inertia results, in part, from a two-fold problem. The first is confusion in the policymaking community about which programs and policies have shown measurable, positive results for at-risk children. And secondly, that recent neuroscientific research on early childhood has "outpaced" the design and implementation of some of these programs and policies. Mr. Firth illustrated this discrepancy as a case of "the science of early childhood leapfrogging policy": that despite scientific findings which support the importance of investing in early childhood, many of the existing policies and programs do not put this research to practical use in serving at-risk children. Consequently, one of the goals of this project was to bring policymakers "up to speed" about which policies and programs are proven effective in fostering the healthy development of at-risk children, using the findings of current scientific research.

This predicament of policy lagging behind current scientific knowledge has also been compounded by additional factors. One is a continuing decrease in funding for programs and policies that support at-risk children in Pennsylvania. And another is that policymakers tend towards "short-term mindsets" and the use of anecdotal, rather than scientific, evidence when developing policies for children.

In this thesis project, I propose a solution to these problems. In particular, the proposed solution addresses the following factors:

(a) A tendency for early childhood policies and programs to be both underfunded, and to lag behind current scientific knowledge by varying degrees.

(b) How to effectively communicate which programs and policies are proven effective in serving at-risk children.

(c) An acknowledgment of particular communicative tendencies in the policymaking audience.

The proposed solution is a strategy that uses evidence-based communication to inform and educate policymakers about the science of early childhood development, in order to bring them "up to speed" with current scientific knowledge, and to encourage them to invest wisely in the programs that are proven effective in serving at-risk children.

In order to develop the strategy, I used Head Start as an example of an early childhood care program whose efficacy in fostering the development of at-risk children could be demonstrated through evidence-based communication. This program served as an example of how to communicate about a complex and politically "hot" childcare program, using the evidence of its success in serving at-risk children and their families. Consequently, the project used Head Start as one instance of an evidence-based strategy to describe how we might communicate with policymakers using the science of early childhood to make a case for the program's continued funding.

During my initial research phase, I began by developing my understanding of the science related to early childhood development, and the context of policy making. I then conducted a series of interviews with staffers of policy makers at both federal and state level. Based on my research, I explored and iteratively generated a series of prototype solutions. Finally, I conducted a

second round of interviews with staffers to test the communicative efficacy of my solution, and to receive feedback on several types of communication materials that might serve to further implement the strategy.

The following sections of this thesis provide an overview of my research, design explorations, and the final solution. I will conclude with recommendations of how OCD might wish to further implement the communication strategy.

Research:
Science of Early Childhood Development

Due to an explosive growth in neuroscientific research over the past two decades on how the human brain develops, we now have a wealth of knowledge that demonstrates the importance of a child's early years in fostering their positive developmental outcomes. These neuroscientific findings provide significant evidence to support the argument that providing appropriate, quality care for at-risk children—*who may or may not otherwise receive appropriate care*—is critical to their healthy development and later successes. This section provides an overview of the current scientific findings in early childhood development, which were then used as content for my design prototype.

The essential findings I learned about the science of early childhood are summarized below:[1, 2]

- Child development is integral to community and economic development, as healthy children become the foundation of a prosperous and sustainable society.

- A child's brain architecture is constructed through an ongoing process that begins before birth, and continues into early adulthood. The quality of this architecture, be it strong or fragile, establishes a foundation for all the capabilities and behaviors that follow.

- Brains are built in a hierarchical manner, from the bottom up. Increasingly complex neural circuits and skills build on simpler circuits and skills over time.

- The interaction of genes and experience shapes the circuitry of a child's developing brain. Young children offer frequent invitations to engage with adults and caregivers, who are either responsive or unresponsive to their needs. This "serve and return" process is an essential part of a child's development, especially in the early years.

- A child's cognitive, emotional, and social capacities are inextricably intertwined. Learning, behavior, and both physical and mental health are highly interrelated throughout the course of their development.

- Although manageable levels of stress are normal, "toxic stress" in a child's early years can damage their developing brain architecture. Toxic stress can result from severe poverty, parental mental health impairments such as maternal depression, child maltreatment, or family violence. This can lead to problems in learning and behavior, as well as increased susceptibility to physical and mental illness.

- "Brain plasticity" and the ability to change behavior decrease over time. Consequently, "getting it right early" leads to better outcomes for children, and is less costly to society and to individuals than retroactive fixes. Investing in quality early care not only promotes positive developmental outcomes for children, but has proven to be a wise long-term economic investment as well.

- Factors that determine an early childhood program's efficacy make the difference between programs that work and those that do not work in supporting children's healthy development. These factors can be measured, and can inform wise investments in effective policies and programs.

These findings provided me with the core set of evidence that can be used to present the importance of early care, and put the science into a cultural and political context that informed my communication strategy.

Research:
Existing Efforts to Communicate the Science of Early Childhood Development

The communication problem that drives this project is not a new one. The need to translate and effectively communicate scientific findings about early childhood has been an ongoing effort for many research and advocacy organizations, including the National Head Start Association,[3] Zero to Three,[4] and the National Center for Children in Poverty,[5] among many others. These organizations have used varying combinations of current scientific findings, policy recommendations, program evaluation studies, census data, and personal stories to shape their ongoing information campaigns advocating for investment in early childhood programs and policies. These campaigns are directed not only towards policymakers as an audience, but the public as well—as a means of educating and informing people about the importance of early intervention, education, and care.

One particular communication campaign, however, served as an inspiration for this thesis project. This work is an ongoing collaborative effort between Harvard University's Center on the Developing Child and the Frameworks Institute, a strategic communications group, to communicate the science of early childhood to the public and policymakers. These collaborators examined public attitudes about early childhood issues, and used their findings to "tell the story" of early childhood development to an audience unfamiliar with the science. This work is important to my project's communication strategy for several reasons: its intensive research into public perceptions about early childhood, and analysis of how these perceptions determine shared cultural attitudes about childcare; its effort to "reframe" the science in ways that are easily understandable to non-scientists; and its impact on actual policy change.[1]

I found this group's research on public perceptions of early childhood and its work on reframing scientific concepts helpful as a conceptual place to begin with my own communication strategy. Whereas Harvard's Center on the Developing Child and the Frameworks Institute's work focuses on a broad strategy to change public perceptions about early childhood, my project

focuses its communicative efforts on a specific audience who is already partially (or very) familiar with early childhood issues: Pennsylvania policymakers who are responsible for crafting early childhood policies and program budgets. My project then uses knowledge of this particular audience to guide its evidence-based communication strategy, which allows OCD to relay information to these policymakers about specific early childhood programs over an extended period of time—thus allowing for the creation and maintenance of a communicative relationship between OCD and state policymakers.

Research:
Understanding the
Policymaking Process

In order to develop an understanding of current early childhood policy in Pennsylvania, I researched the policymaking process in two ways: from a larger, macro-scale examination of the processes and rhetorical practices of policymaking, and a localized scale that identified the "key players" in Pennsylvania's policy hierarchy and the current political climate with regard to early childhood issues.
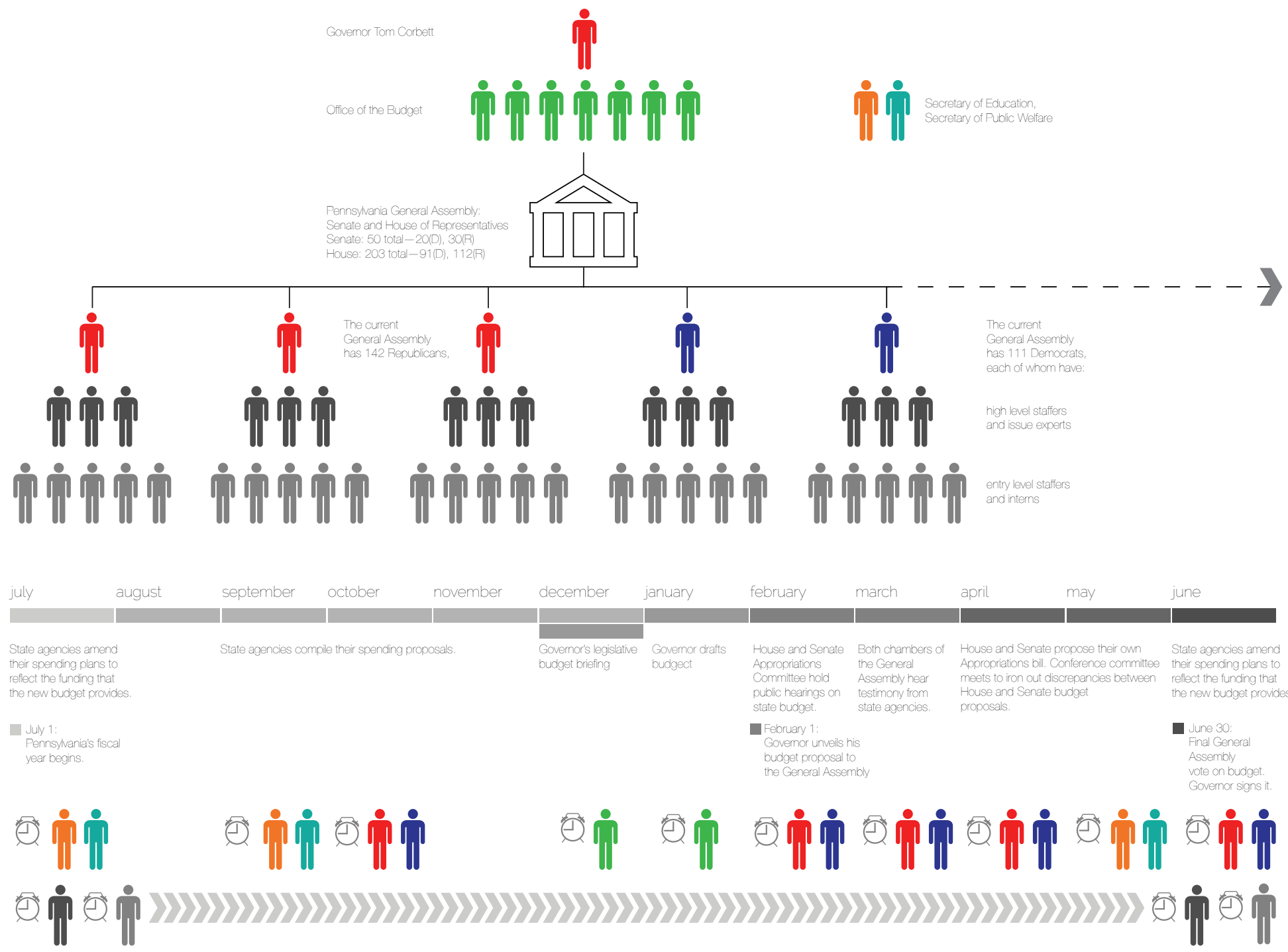
Because policymaking is often a complex and opaque process that involves many stakeholders, it is necessary to examine both the stages of its evolution, and the language that defines it. This is achieved through the employment of analytical models that examine the policymaking process, and through rhetorical analysis of policy documents.[6] These tools allow for understanding policy as a process that is crafted through ongoing discourse between the public and its representatives. Because there are myriad ways to analyze and deconstruct the policymaking process, this project is predicated on current findings that demonstrate policymaking as an inherently subjective and values-driven process—*one that can be better understood by examining the rhetoric of public deliberation*—rather than applying rationalist economic models of analysis.[7]

This higher-level understanding of policymaking as a values-driven process, defined by the language of public deliberation, helped shed light on how policies and programs for children are crafted on the localized state level, and guided my design solution as a rhetorical process.

As a means of further understanding the local-level "policymaking scene" of early childhood, I discussed Pennsylvania's current political climate with Mr. Firth, and then identified the "key players" of Pennsylvania's political hierarchy that have purview over childhood policies and programs (figure 1).

A general movement towards more conservative viewpoints on family and childhood issues characterizes the current political climate in Pennsylvania—and this shift in values has led to budget cuts for publicly funded programs that serve children.[8] It became

figure 1: which policymakers, and when do we communicate with them?

Governor Tom Corbett

Office of the Budget

Secretary of Education,
Secretary of Public Welfare

Pennsylvania General Assembly:
Senate and House of Representatives
Senate: 50 total—20(D), 30(R)
House: 203 total—91(D), 112(R)

The current
General Assembly
has 142 Republicans,

The current
General Assembly
has 111 Democrats,
each of whom have:

high level staffers
and issue experts

entry level staffers
and interns

july	august	september	october	november	december	january	february	march	april	may	june

State agencies amend
their spending plans to
reflect the funding that
the new budget provides.

State agencies compile their spending proposals.

Governor's legislative
budget briefing

Governor drafts
budget

House and Senate
Appropriations
Committee hold
public hearings on
state budget.

Both chambers of
the General
Assembly hear
testimony from
state agencies.

House and Senate propose their own
Appropriations bill. Conference committee
meets to iron out discrepancies between
House and Senate budget
proposals.

State agencies amend
their spending plans to
reflect the funding that
the new budget provides.

July 1:
Pennsylvania's fiscal
year begins.

February 1:
Governor unveils his
budget proposal to
the General Assembly

June 30:
Final General
Assembly
vote on budget.
Governor signs it.

apparent then, that in order for the project to address this shift in values, I needed to identify the key "political players" that have a direct impact on the crafting of policy and state budgets for early childhood programs. These key policymakers: the Governor's Office of the Budget, the Secretaries of Education and Public Welfare, and individual policymakers in the General Assembly associated with budget and appropriations have direct influence over what policies and programs for children get implemented and funded in the state.

By identifying these policymakers and understanding how the current shift in values has shaped policymaking for children in the state, I was able to focus my design exploration on how to communicate with this particular audience.

Research:
Policymakers as an Audience

To understand policymakers as the audience of this project, I conducted interviews with people involved in policymaking to understand how they receive, interpret, and communicate the information that guides their policymaking. I spoke with several staffers that worked for policymakers at the state and federal levels, a special interest group leader involved with early childhood issues in the state, and a speech writer and former staffer of a local policymaker. These interviews shed light on how policymakers communicate, and how practices of communication and information sharing shape their legislative decision-making. The key findings from my interviews are summarized below:

- **Hierarchy of Information:** Policymakers communicate by proxy, often through several layers of low- and high-level staffers. Low-level staffers and interns vet all of the communications that come through their policymaker's office. Information that these staffers deem appropriate or pertinent is then passed along to higher level staffers, or "issue experts," who then read through the content of the communication, and either translate, consolidate, or directly pass this information along to their policymaker.

- **Channels of Communication:** In addition to commonly used media, policymakers use channels of communication that are unique to them. These are often memos, white papers (policy papers), issue meetings, and "dear colleague" letters. Policymakers will rely on "trusted sources" of information, like special interest and research groups, and other policymakers who share their viewpoints on legislative issues.

- **Personal Connection to the Issues:** Policymakers often become involved with issues because of their personal experiences. One staffer told me that the policymaker he worked for became involved in early childhood issues because he had a family member whose child died of SIDS. This tragedy catalyzed his advocacy for early childhood issues.

- **Selective Listening:** Policymakers gravitate to information that supports their existing value systems and world views. Staffers who vet the communication materials that come through policymakers' offices further reinforce this selective filtering process.

- **Finding the Balance of Voices:** Policymakers want to know the full range of opinions on issues, especially within their own districts. They will often task their staffers with interviewing stakeholders and constituents to understand what they feel are important about an issue, and will often base their legislative decisions on these voices.

- **Policymakers are Busy People, So Be Brief, and Ask for What You Want:** Because policymakers have so many demands on their time and attention, it is important to contact them using their preferred means of communication, remember that their staffers are the ones doing the communicating for them, and understand that communication must be brief, succinct, and to the point.

These findings turned into a set of simple heuristics about how to communicate with policymakers as an audience, and provided much of the foundation for my communication strategy (figure 2). These heuristics are a series of directed questions I formulated from the results of my interview findings that helped me focus on key characteristics that define policymakers as an audience.

figure 2: heuristics for policymakers as an audience

Hierarchy of information	Channels of communication	Personal connection to issues	Selective listening	Balance of voices	Policymakers are busy people
Can you specify the policymaker you'd like to communicate with? Do these policymakers have "issue expert" staffers that work on early childhood policy? Can you establish contact with these staffers to get information passed along to their policymaker?	Do you know the policymaker's preferred means of communication, based on your contact with their staffers? Do you know if this policymaker works on special committees—or has personal connections with—other policymakers?	Do you know if this policymaker is involved with early childhood issues because of his or her experience? Does this policymaker have a "personal cause," or a policy issue that he or she is involved with?	Do you know this policymaker's political or ideological stance? Are they interested, or could they be interested, in early childhood policy? Or, do they think government should stay out of policies involving families and children?	Does this policymaker represent your own district? Do early childhood policy issues or programs exist in this policymaker's district?	What is the best way to communicate quickly and succinctly with this policymaker?
Consider how to establish communication with a policymaker's staffers, and how to get information passed up the hierarchy.	Allow your knowledge of this policymaker's preferred means of communication to guide the flow of information.	Learn as much as you can about a policymaker's "personal causes," and use this to guide the way you craft your communication.	Find out if a policymaker is interested in early childhood, or can be motivated to make policy decisions about it.	Use your power as a constituent to communicate about early childhood policy in your own district.	Craft your communication in a way that allows for a quick and succinct transfer of information.

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Research:
Communication Planning

In conjunction with the interviews, I did research on communication planning to both clarify my own emerging strategy, and to see how this particular audience might compare with, or be different from, a more generalized audience.

This research on communication planning helped me to identify some essential components for my strategy, outlined basic audience psychology, theories of persuasion and argument, and design considerations for different communication materials. In addition to these essentials, the research confirmed much of what was anecdotally relayed to me in my interviews: in particular, the idea that audiences selectively listen to information that supports their belief systems, the importance of being a credible source of information for an audience, and that the relative length, succinctness, and design of information all have an impact on whether or not information will be retained.[9]

Design Process

Based on my research on the science of early childhood, the policymaking process, policymakers as an audience, and communication planning, I explored potential solutions through an iterative design process. Many stages of the design process overlapped and informed each other, gradually building the strategy and the communication materials. As I learned more about my audience, the research behind Head Start, and the issues that surround early care programs in the state, my strategy grew, and the communication materials grew along with it.

Narrowing the Scope

The decision to use Head Start as the subject of communication was based on several reasons: the wealth of research that has been conducted on the program over its nearly fifty year lifespan, its current predicament of losing both federal and state funds, and because of current political debates surrounding Head Start's efficacy in serving at-risk children.[10] These reasons made Head start an interesting and challenging case study for developing a strategy for evidence-based communication. Hence the goal of the project was to develop a general strategy for evidence-based communication through the process of developing a particular communication strategy for Head Start.

Narrowing the communication subject to Head Start allowed me to maintain focus on the overarching goal of the project: to use evidence-based communication demonstrating program efficacy to encourage policymakers to make wise investments in these programs. This decision enabled me to make the case for investment in quality care in a specific way: it allowed Head Start to serve as exemplary program that could be put into context with other care programs in order to illustrate the existing state of childcare policy in Pennsylvania. In short, my idea was to use one example of care to argue for improving the larger system of childcare programs and policies in the state.

Crafting the Strategy

After deciding on Head Start as an example of effective childcare programming, I began to shape the solution through the exploration of three core questions:

> Which policymakers are we are communicating with?
> When do we communicate with them?
> Whose "voice" do we use when we communicate?

Answering these questions allowed me to define the target audience of the communication, decide how the strategy could be used in a time-based manner to effectively communicate with this audience, and shaped the particular message of the communication.

By finding the policymakers who have purview over childcare program funding and policies in the state, I was able to answer my question of which policymakers I would need to communicate with. These specific groups of policymakers became the target audience for the project, and were comprised of members of the Governor's Office of the Budget, policymakers who serve on Appropriations Committees, and the Secretaries of Education and Public Welfare (figure 1, page 11).

Additionally, finding policymakers who are currently advocates for early childhood, and who could be counted upon to "spread the word" amongst their legislative colleagues became another group of focus. These policymakers could benefit from evidence-based communication about early childhood, and potentially pass this information laterally amongst their colleagues.

There was also a question of how to communicate with policymakers who are not currently advocates for early childhood. These policymakers fell into two groups: those who are opposed to government involvement in childcare, and those who "are on the fence." I decided that policymakers who are opposed to

government involvement in childcare would not form part of the project's target audience, as it was unlikely that any communication, evidence-based or otherwise, would change their minds about early childhood. This decision came from the understanding gleaned from my interviews and communication research, which demonstrated that policymakers legislate based on their world view and existing value systems.[9]

Those policymakers considered "on the fence," however, became the core archetype of the project's audience. These are the policymakers who, through understanding the scientific evidence behind early childcare, could potentially be convinced to make wise investments in programs that support children.

After these target audiences were specified, I was able to define at what times it would be most effective to communicate with them about Head Start. Because Head Start relies partially on state funding to operate, the question of when to communicate about the program became tied to the state's budget timeline: it would be important to communicate with policymakers about Head Start before and during their process of crafting the state budget (figure 1, page 11). This would give policymakers key information about the program at the time they would be deciding on its budget.

In addition to acknowledging the budget timeline for the "when" of communicating, the strategy also relies on the hierarchy of information in policymakers' offices: because staffers are largely in control of the information coming into policymakers' offices, the strategy relies on a steady stream of evidence-based communication about Head Start with these staffers. The intention of this is to keep the issue "in their minds," and to deepen their level of knowledge about the program.

The question of "voice" was centered on designing materials as instances of evidence-based communication that use OCD's established reputation as a reliable source of information for policymakers about early childhood. This definition of voice was

figure 3:
Initial "introduction" using arguments for Head Start. This design was revised to be more concise when opening the conversation.

As a policymaker, you are probably already aware of some of the reasons why:

Head Start children become successful adults:
Children who participate in Head Start are less likely to repeat a grade, need special education and remediation in school, and are more likely than their peers to finish high school, and move on to college. Head Start graduates are also 12% less likely to be charged with a crime.

Head Start helps create—and save—jobs:
Parents who participate in their children's Head Start programs are much more likely to participate in job training programs and more likely to have a job. At a time when unemployment is so high, Head Start provides important pathways to employment.

Head Start families are healthy families:
Because of Head Start's emphasis on medical screenings and nutrition, it helps reduce infant mortality rates by as much as 50% for 5 to 9 year olds. Head Start children are 19% - 25% less likely to smoke as adults, and Head Start families receiving health literacy decreased annual Medicaid costs by up to $232 per family. Not only is this good for Pennsylvania's at-risk population, it's also good for it's economy.

## But do you know the science behind why Head Start programs work?

First, a child needs a solid foundation to grow on:

This 'foundation' is an inseparable combination of genes, a nurturing environment, and interaction with caregivers, which work in tandem to form the necessary, **physical** connections that enable a child's healthy development.

This combination of genetics, environment, and interaction helps form **literally trillions** of neural connections that provide the 'essential architecture of a child's brain. In fact, during the first few years of a child's life, over 700 neural connections are made every second.

This architecture is built over time, and allows for **"sensitive periods"**—or developmental milestones—to be met over the first few years of a child's life. These sensitive periods are times when the brain is building the connections that allow for things like: vision and hearing, language, response to social cues, and many other critical **cognitive, emotional, and social** developments.

Following are some of the important stages that a child goes through in her first few years of life...

limbic system
mid-brain
brain stem
cortex
limbic system
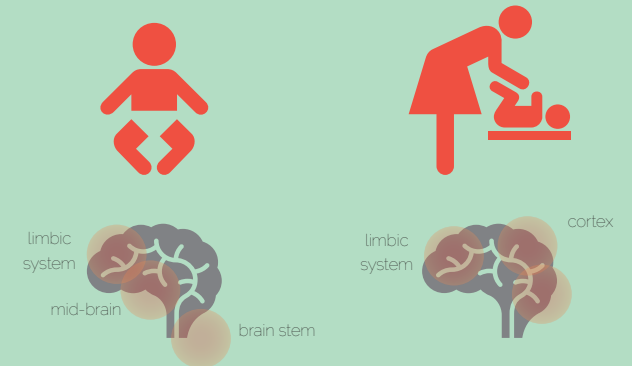
0 to 2 Months

At birth, a newborn's mid-brain and brain stem, which regulate **basic life activities**, including blood pressure and body temperature, motor activity, appetite and sleep, are hard at work. During this time, babies use their body movements, vocalizations, and facial expressions to **communicate their feelings and needs**. Newborns use different cries to let you know they are hungry, tired, or bored. They will ask for a break by looking away, arching their backs, frowning, or crying. They socialize with you by watching your face and exchanging looks.

2 to 9 Months

Babies at this age are beginning to develop **language** skills—which happens in the brain's cortex. They will smile, coo, babble, and begin to form the basic units of language. **Imitation** also happens at this stage, which is another form of interaction that the child needs to build new skills. Babies are developing **motor skills** during this period, due to their developing cerebellum, which coordinates movement and balance. At about 3 months, babies begin to reach for things and try to hold them. By 4 to 6 months, they may be able to roll both ways, become better at reaching and grasping and will begin to sit with assistance.

12 to 18 Months

Toddler time! During this time, children are learning **new words daily**, and use them, along with their gestures, to communicate what they are **thinking and feeling**. At this point, toddlers are beginning "pretend" play, a major developmental milestone, which helps develop important intellectual skills and creativity. During this stage of development, toddlers **motor skills** are developing quickly. They begin to walk and run, opening up a whole new world of exploration.

18 to 24 Months

Toddlers' **language** skills at this stage are growing exponentially. They are very independent and eager to be in control at this point—among their favorite words are "Me" and "Mine!" Toddlers are able to **play and explore** in more complex ways. They like toys that they can play with in many different ways such as blocks, cars and stuffed animals that lend themselves to imaginative play. Toddlers love to move. In just a matter of months, children go from crawling to walking to practically running! Practicing their new moves strengthens the brain connections that help with **coordination**. Children learn a lot from active play.

24 to 36 Months

Two-year-olds typically can speak between 200 and 250 words. By the age of 3 years, their **vocabulary** is much larger still and they are able to put together 3- and 4-word sentences. **Play** is essential for the 2-year-old. It builds all areas of his development. Through play, he interacts more with friends, uses pretend play to understand things in more complex ways and learns important concepts such as big and small and up and down.more complex ways and learns important concepts such as big and small and up and down.
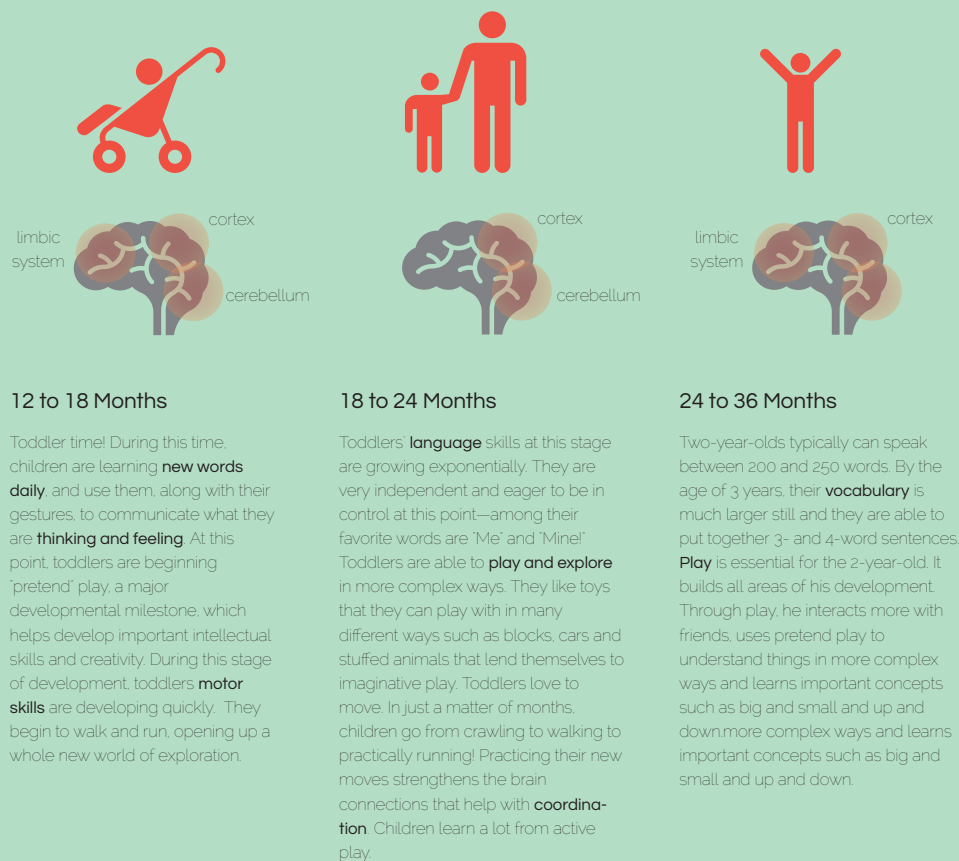
figure 4:

Initial attempt to illustrate the developmental process. This was redesigned to include the developments of the first five years (as opposed to the first three), and to "humanize" the science.

a way of both focusing the content of the communication as evidence-based information about Head Start, and reinforcing OCD's goal to communicate reliable, research-based information.

Forming the Arguments

With these questions answered, I began crafting the content and design of the initial communication prototype. This stage of the process was concerned with defining the arguments to be made for Head Start using program evaluation studies and neuroscientific research.

I began designing the content of the prototype by first outlining what Head Start is, and how it serves at-risk children and their families (figure 3). This content was designed to acknowledge policymakers' existing knowledge of Head Start, and supplement it with evidence of Head Start's long-term educational, health, and economic benefits.

Secondly, I used neuroscientific data to describe a child's developmental process (figure 4). This portion of the prototype was intended to show the "hard science" behind child development, and demonstrate the importance of a child's first years in achieving healthy outcomes.

After this neuroscience argument, I then visualized data found in the 2010 Head Start Impact Study,[11] which showed minor gains for children in areas of cognitive development, and substantial gains in social and behavioral outcomes (figure 5).

Finally, the initial prototypes used data about at-risk children in Pennsylvania to come up with the "ask," a specific policy recommendation:[12] that policymakers use this newfound knowledge about Head Start and early childhood development to make wise investments in the state's at-risk children (figure 6).
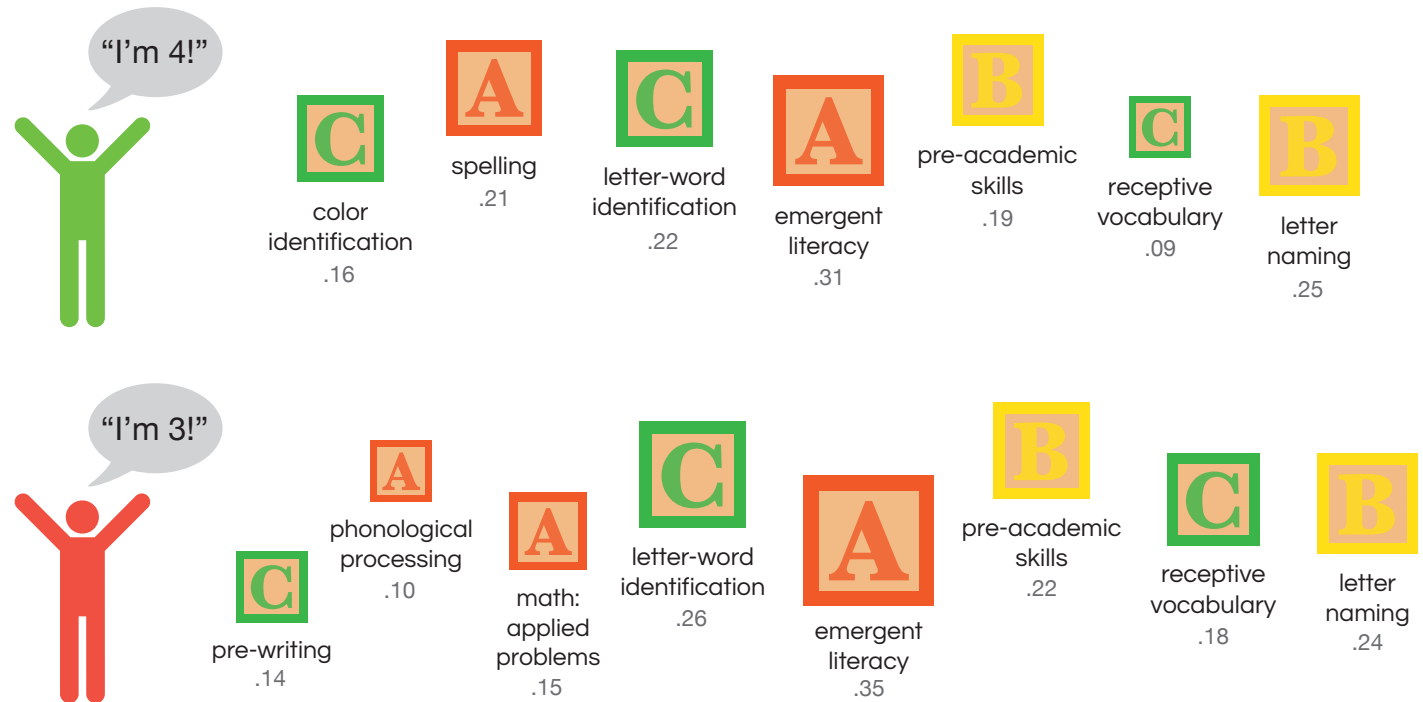
figure 5:

Using research from the Head Start Impact Study to make a case for
its cognitive and social gains for children. This graphic was redesigned
because of questions about the study's design.

But, how does Head Start help foster a child's development?

There are many cognitive, social-
emotional, and health benefits that
Head Start provides to at-risk children
and their families. In addition to early
education, Head Start provides a
range of comprehensive health,
nutrition, parent involvement, and
family support services.

Mandated by Congress in 1998, the
Head Start Impacts Study evaluated
he effects of Head Start on children
and families through the childrens' first
year of school. The study followed a
nationally representative sample of
nearly 5,000 children in 84 Head Start
programs. Findings of the study, which
began in 2002 and ended in 2006,
were released January 13, 2010.

Here are the some of the statistically
significant results of this research
study on the four-and three-year old
Head Start students. In each of the
following areas, the study group
scored higher (as indicated by the
number under the blocks) than their
control-group peers.

"I'm 4!"

C color identification .16

A spelling .21

C letter-word identification .22

A emergent literacy .31

B pre-academic skills .19

C receptive vocabulary .09

B letter naming .25

"I'm 3!"

C pre-writing .14

A phonological processing .10

A math: applied problems .15

C letter-word identification .26

A emergent literacy .35

B pre-academic skills .22

C receptive vocabulary .18

B letter naming .24

As we've seen, Head Start promotes the necessary parental interactions that are critical to a child's healthy development.

Please help us solve this problem of quality care for children in Pennsylvania. 60% of Pennsylvania's children are currently in Head Start. 30% are in other center-based care programs. 10% are in parental, or other non-center based care. And finally, 60% have no care at all. Let's put these puzzle pieces together, so that all of Pennsylvania's children get the quality care that they need. We are asking you to invest state funds wisely—based on your knowledge of these new scientific findings—to help place children in the care situations that best serve them.
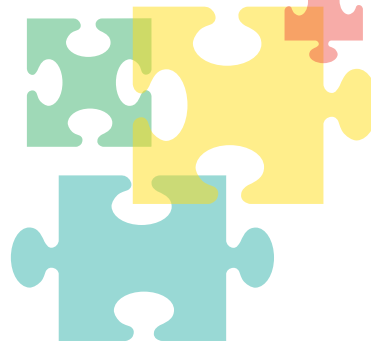
figure 6:

The first "ask," or way of making a case for what we would like from policymakers. This was edited drastically when I found that the data I was looking for about children in Pennsylvania were unavailable.

These initial designs began to shape the form and content of the final prototype, which evolved over several iterations. As the prototype evolved through these generative iterations, so did the strategy.

Does Head Start *Actually* Work?

As I refined the content of the prototype, I delved deeper into the research studies Mr. Firth provided on Head Start and found that much of this material contained either anecdotal arguments in support of Head Start or inconclusive findings about the program's efficacy. In particular, the 2010 Head Start Impact Study findings raised doubts about the study's protocol and design.[13] These doubts surfaced when I found that the control group in the impact study included a large proportion of children who attended Head Start and other center-based care. Consequently, I realized that the impact study was not intended to compare Head Start children with children who did not receive center-based care. This accounted for why the study did not show significant differences between the study and control groups. As a result, I looked for more recent research that compared children in Head Start with children in non-center based care environments.

I discovered two recent studies[14,15] that were designed with protocols that differentiated between the Head Start study group and the (non-Head Start) control groups. These studies demonstrated that Head Start did indeed show significant positive results for children in measures of cognitive, social, and behavioral gains. These studies also measured increases in parental involvement, which, as research has shown, is essential to a child's healthy development.

As these new data were found, the content of the communication prototype changed as a result. I now had a solid base of evidence from which to communicate Head Start's efficacy to policymakers.

Let's talk about Head Start

New evidence based research has shown us that Head Start is the gold standard of early childhood programs.

figure 7:

The "introduction," used to open the conversation with policymakers. The design is bright and colorful, to draw the audience in—and it tells a policymaker that we are using research to make the case for Head Start.

Solution

The Final Communication Prototype

Newly armed with reliable research on Head Start's efficacy, and having further refined the design, the prototype began to take its final form. The final prototype was designed as a print document to be sent to (staffers of) policymakers, and is comprised of several elements: the introduction, arguments demonstrating Head Start's efficacy, the "ask," the neuroscience of early childhood development, and "episodic narratives" that tell personal stories of people involved with the program.

The cover of the print prototype (figure 7) is intended to draw a staffer into the document using colorful imagery, and recognizes that he or she will need to know immediately what issue this document is addressing. It tells them that we are "talking about Head Start," and informs them that this document is using scientific evidence to show why Head Start is the "gold standard" of early care programs.

This portion of the document became "the introduction," or a way of opening up the conversation about Head Start. Because of the necessity to communicate succinctly with policymakers, and to get to the point quickly, much editing of the introduction was done from the first prototypes to this one. The introduction assumes that a policymaker already has a cursory knowledge of what Head Start is and does, and chooses to focus quickly on the purpose of the communication: to show how scientific evidence has demonstrated the program's efficacy.

In the following pages, the document leads into the evidence: arguments that demonstrate Head Start's success using program evaluation studies and research. The first section uses the studies comparing Head Start programs with other center-based, and non-center-based pre-kindergarten care environments (figure 8). These studies evaluated children's social, cognitive, and behavioral outcomes, and demonstrated evidence of increased parental involvement.[14,15]

Head Start and other center-based care is more effective than non-center-based care

> " Head Start had substantially larger effects on children's cognitive development compared with parental care ... Head Start tended to increase children's social competence when compared with ... other center-based care." [1]

	social competence	cognitive development	reduced attention problems	reduced behavior problems	parental involvement
Head Start	★	★	★	★	★
other center based care	⯪	★	⯪	⯪	⯪
non-center based care: parent & non-parent	☆	☆	☆	☆	⯪

figure 8:

Design showing how Head Start "measures up" to other center-based, and non-center based care environments.

Children should be raised by their parents.
Head Start promotes parental involvement.

> " Head Start causes a substantial increase in parental involvement both during and after participation." [2]

Increases were found in the time that:

- Parents spent reading to their children.
- Families spent doing math activities together.
- Children spent with their non live-in dads.

figure 9:

Research that demonstrates increased parental involvement to make a values-based argument for Head Start.

The design of these comparative data is intended to be visually simple, so that they may be easily read and understood by a staffer paging quickly through the document. The purpose of this particular argument is to briefly (but concisely) illustrate how Head Start "measures up" against other childcare environments, so that a staffer does not have to parse large amounts of technical information in order to translate this message to the policymaker she works for.

The second graphic (figure 9) uses the findings of a study showing increased parental involvement for children and families enrolled in Head Start programs. The intention of this graphic is to appeal to a policymaker's value system using research that supports an argument for the importance of parental involvement in a child's healthy development. The intention of constructing the graphic this way came from my communication planning research, which showed that policymakers are more likely to listen to information that supports their existing value and belief systems.[9] Because this communication is targeted at policymakers that may be "on the fence" about early childhood, and potentially about government involvement in childcare issues, the strategy for this part of the document centered on appealing to a policymaker's family values.

The research study used for this graphic showed increased parental involvement for children in Head Start programs.[15] It found that parents spent more time reading to their children and doing math activities with them, as well as increases in time Head Start children spent with their non-live-in fathers. The design of the image used in this section, a son and his father sharing time together, illustrates the positive feelings associated with familial closeness, and further reinforces the notion of family values.

The next graphic talks about data found from longitudinal (long-term) study following the outcomes of children enrolled in Head Start (figure 10). This study found that participation in Head Start reduces the incidence of behavioral problems, serious health problems, adolescent obesity, and engagement in criminal activities for young adults.[16]

Center-based care has long-term benefits:

- Increased high school graduation rates, employment, and earnings
- Reduced crime and incarceration rates and teen pregnancies.
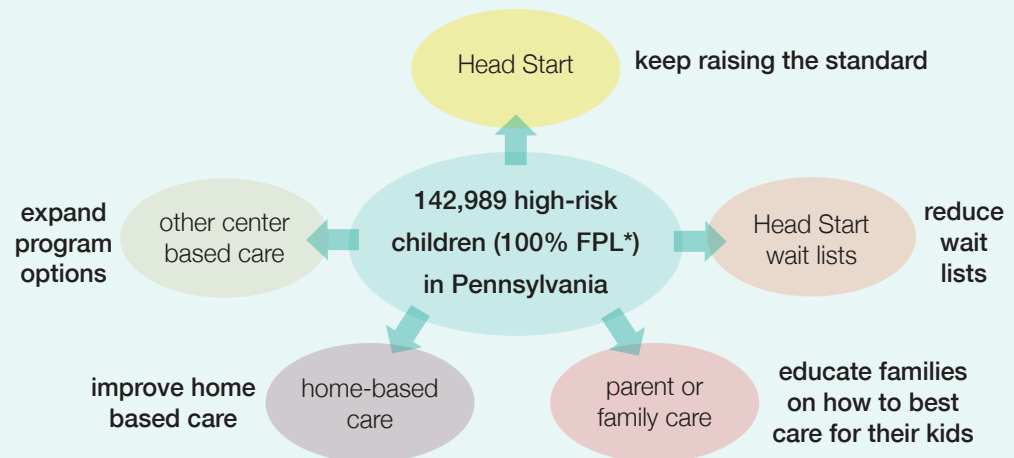- Less special education referrals and grade repetition

" Perry School participants were less likely to be placed in a special education program. Over 65% of participants graduated from regular high school compared with 45% of nonpartici-pants. At age 27, four times as many program participants ... earned $2,000 or more per month." [3]

figure 10:

Using research to demonstrate the long-term benefits of Head Start. This was later revised to reflect data from a more recent study.

5 ways you can help Pennsylvania's at-risk children

Head Start — **keep raising the standard**

142,989 high-risk children (100% FPL*) in Pennsylvania

expand program options — other center based care

reduce wait lists — Head Start wait lists

improve home based care — home-based care

parent or family care — **educate families on how to best care for their kids**

*Federal Poverty Level

figure 11:

The "ask": placing Head Start in context with other care programs to encourage policymakers to invest wisely in Pennsylvania's children.

This graphic is designed to show policymakers both the societal and economic benefits that can come from investing in Head Start and other center-based care programs. By illustrating how program graduates become healthy and successful members of their communities, the graphic makes an argument for the long-term benefits of center-based care.

The "ask" portion of the document concludes the section that outlines the program research studies supporting Head Start (figure 11). The "ask" is an essential component of the communication strategy, as it makes an explicit but concise request from a policymaker for increased investment in a particular program (or set of programs), a policy recommendation, or both.[12]

The "ask" of this communication prototype makes specific policy recommendations for five different care (or non-care) situations: Head Start, Head Start waiting lists, family or parent care, home-based care, and other center-based care (non-Head Start). In addition, the "ask" demonstrates how policymakers can improve these care environments to support positive outcomes for at-risk children. It uses the current number of children in the state that are considered at "high-risk" for school failure (100% of the Federal Poverty Level),[17] and illustrates what pre-kindergarten care environments are available to them. Finally, it makes recommendations to policymakers on how to improve each of these programs, to further improve the larger system of childcare in the state.

The "ask" illustrated in the final prototype proved a difficult message to craft. This was because of a decision not to argue solely for Head Start as a model of quality childcare, and instead make a more complex case for improving the whole system of care for at-risk children in the state. The decision to address improving the state's childcare system as a whole came from my understanding of OCD's primary goal: to focus on improving outcomes for all of Pennsylvania's at-risk children, rather than advocating for one program or policy above another.

The science: illustrating the importance of a child's developmental process.

## Early experiences help shape a child's growing brain.


Science

The past two decades have seen explosive growth in our knowledge about the brain. Neuroscientists have discovered how our brains develop from birth to age five—and have found that this time is critical for a child's healthy development. Here are some key concepts:

Brain development is continuous, ongoing, and critical during the first five years of a child's life.

The combination of genes and environment contributes to a child's healthy and timely development—the "secret ingredient" to this development is frequent, loving, language-dense, and consistent interaction with parents.
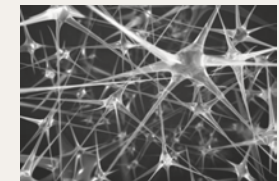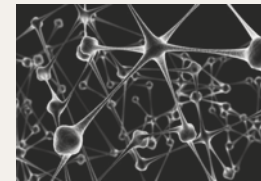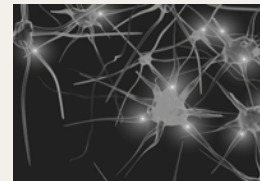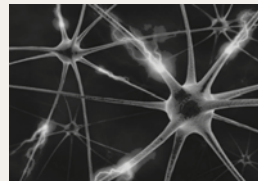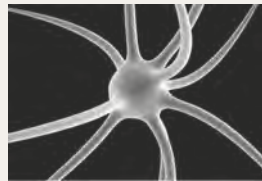
0 to 2 Months
At birth, a newborn's brain is working overtime, regulating blood pressure, body temperature, motor activity, appetite, and sleep. Babies use their body movements, vocalizations, and facial expressions to communicate their needs and feelings. These expressions are the beginnings

2 to 12 Months
Babies at this age will smile, coo, babble, and begin to form the basic units of language. They begin to imitate adults at this age, which is a form of interaction that the child needs to build new skills. They develop motor skills during this period, which coordinate their movement and balance.

1 to 2 Years
Children are learning new words daily—and they use them along with gestures to communicate. During this time, children are beginning "pretend" play, which helps them develop important intellectual and creative skills. A child's motor skills are developing quickly: they begin to walk and run, opening up a new world of exploration and learning.

2 to 3 Years
2 year olds typically know between 200 – 250 words. By 3 years, their vocabulary is much larger, and they can put together 3 and 4 word sentences. Play is essential for toddlers—it builds all areas of their development. Playing helps toddlers interact with friends, understand things in more complex ways, and learn important concepts.

3 to 5 Years
Between 3 and 5 years, children show more complex social behaviors, emotional capacities, problem-solving abilities, and pre-literacy skills. By 4 and 5, many children have learned the basics of grammar, can understand simple emotions in themselves and others, have learned how to negotiate with others to achieve common goals, and can sit quietly and pay

What happens if a child's development is delayed?

Children who grow up in conditions of poverty are at a higher risk of developmental delays. Maternal depression, domestic abuse, parental neglect, and poor nutrition can all lead to delays in development. In these situations, a child will produce stress hormones—like cortisol—which will, over time, lead to a condition called "toxic stress." Toxic stress impedes a child's healthy cognitive, emotional, and social development.

An additional challenge in crafting the "ask" came from my search (and failure) to find specific numbers of children enrolled in each of the five care environments described in the graphic. The purpose of using exact numbers of children in each of these environments was to illustrate the magnitude and gravity of at-risk children not getting the care they need for their healthy development. Additionally, these numbers would serve to personalize and "drive home" the data for policymakers—to show them an accurate portrait of what is happening in their own state with at-risk children.

The document then illustrates the neuroscience of child development, as a means of explaining how important a child's first years are in providing a foundation for her healthy development and later success (figure 12). These pages show the images of neural development coupled with images and text that describe a child's related physical, emotional, and social development. The purpose of this juxtaposition is to "humanize" the science, and to show that a child's brain development is inseparable from, and foundational to, her emotional and social development. Additionally, these pages describe how the effects of poverty-related conditions can delay a child's development. This description of the science behind "toxic stress" is used to emphasize the importance of early intervention and care, thus making an argument for policymakers to support programs that promote early development.

The prototype closes with "episodic narratives," or personal stories, of two women who were involved with Head Start as parents and volunteers, respectively (figure 13).[18] These narratives are included to contextualize and personalize Head Start for policymakers. These types of appeals, though not based on scientific research, serve both to "put a face" on Head Start, and to put the argument for Head Start into a social context that a policymaker can relate to.

Meet Sonya

Sonya fondly remembers pink eyeglasses, yellow grits and love. Sonya, a Head Start Alumni, credits the Head Start Program with providing both a loving environment and her first eyeglasses. She is legally blind and stated that Head Start staff were the first to identify a vision problem.

Sonya graduated from South Carolina State University and was the first college graduate in her family. She now works at a Head Start Center. Sonya has a special perspective on the value of education for children and services for their families. The classroom brings back her fond memories of playing in the "house" area and learning to write her name. Her triumphs over life's struggles has made working for Head Start very important. Sonya maintains that many families still benefit from the Head Start Program.[5]

Meet Mary

Mary, a mother of 10 children and 28 grandchildren, was a former Head Start parent. Eight of her children were enrolled in the Head Start Program. Mary served as a classroom volunteer, bus monitor, and policy council member from 1968 until 1974. She was also a Head Start Teacher's Assistant from 1973 to 1974. Mary was awarded the Neighborhood Volunteer of the Year Award and received Congressional commendation from U.S. House of Representative, Corrine Brown, 3rd District.

Her eight children are now working as professionals in the following positions: State Trooper, Secretary, Math Tutor, Head Start Assistant, Body Builder, Credit Union Representative, Sales, and Operations Manager. She truly believes that "all parents and children can learn and succeed." She knows that "if a child was in the program and stayed there every day...they were ready for public school."[5]

figure 13:

Episodic narratives, which put a "face" and a story onto Head Start for the audience.

The Strategy

The generative process that drove the design of the final prototype in turn helped solidify the project's larger communication strategy, which prior to the design phase had remained nebulous. Through finalizing the prototype, and then testing its communicative efficacy with staffers, I understood how it could fit into a larger strategy and process of evidence-based communication with policymakers. I will discuss the components and process of this strategy in the following sections:

> **Using the Components**
> Introduction
> Program research / evaluation studies
> Neuroscientific research
> The "Ask"
> Episodic Narratives
>
> **Evaluation**
> Opening up the conversation about early childhood
> Following up with detailed, "personalized" data
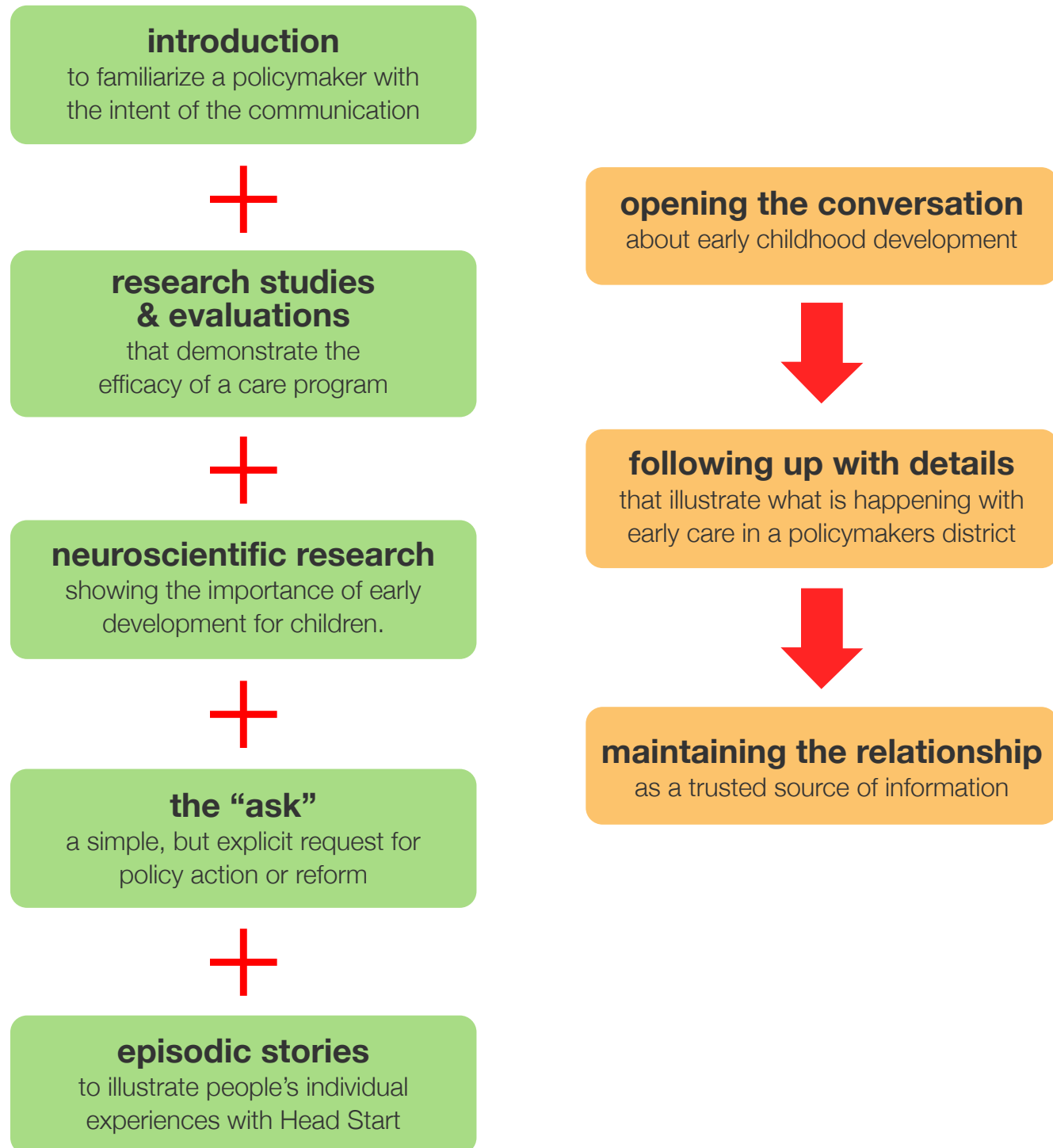> Maintaining the relationship as a trusted source of information

Using the Components

Working through the prototype's final design allowed me to define the essential components that are likely to be useful for a broad range of evidence-based communication: an introduction, program research and evaluation studies, neuroscientific research, the "ask," and episodic narratives. Although some of the components in the final prototype I designed (the program evaluation studies, the "ask," and episodic narratives) were customized to a specific message about Head Start, they are nonetheless essential "ingredients" for evidence-based communication on early childhood.

Depending on the particular program or policy that OCD would like to communicate about, either the program research studies or the

Components and
process of the strategy

introduction
to familiarize a policymaker with
the intent of the communication

+

**research studies
& evaluations**
that demonstrate the
efficacy of a care program

+

neuroscientific research
showing the importance of early
development for children.

+

the "ask"
a simple, but explicit request for
policy action or reform

+

episodic stories
to illustrate people's individual
experiences with Head Start

opening the conversation
about early childhood development

following up with details
that illustrate what is happening with
early care in a policymakers district

maintaining the relationship
as a trusted source of information

neuroscientific research will become the prominent argument of the communication, and the other components will serve to support this central argument. In the case of Head Start, I found that translating the program's research and evaluation studies became the focus of my central argument to illustrate the program's efficacy, and the description of the neuroscience became a secondary argument. However, when discussing other childhood programs and policies, especially those that involve prenatal, infancy, and health issues, OCD may find that the neuroscientific evidence would become the more prominent argument.

Thus, determining which component of the communication best supports the central argument: either the program research and evaluation studies or the neuroscientific research, becomes an important factor in constructing new instances of the communication strategy. The combination of the remaining components then serves to support this larger argument.

Evaluation

The communication strategy follows an ongoing process of introduction, following through, and relationship maintenance (figure 14). This process allows for the communication of deeper and more complex information to a policymaker, in an effort to expand their knowledge of early childhood issues and encourage them to make wise investments in programs and policies. This process was conceived from the evaluation of my user interviews and testing.

After finalizing the communication prototype, I sent the document to several of the staffers I had previously interviewed in the research phase of the project. The intention behind these interviews was to get a sense of whether or not the prototype served its purpose in communicating the evidence of Head Start's efficacy in serving at-risk children. The feedback I received was positive with regard to the prototype's design intent, and its clarity in translating the research behind Head Start. The prototype was largely understood by the
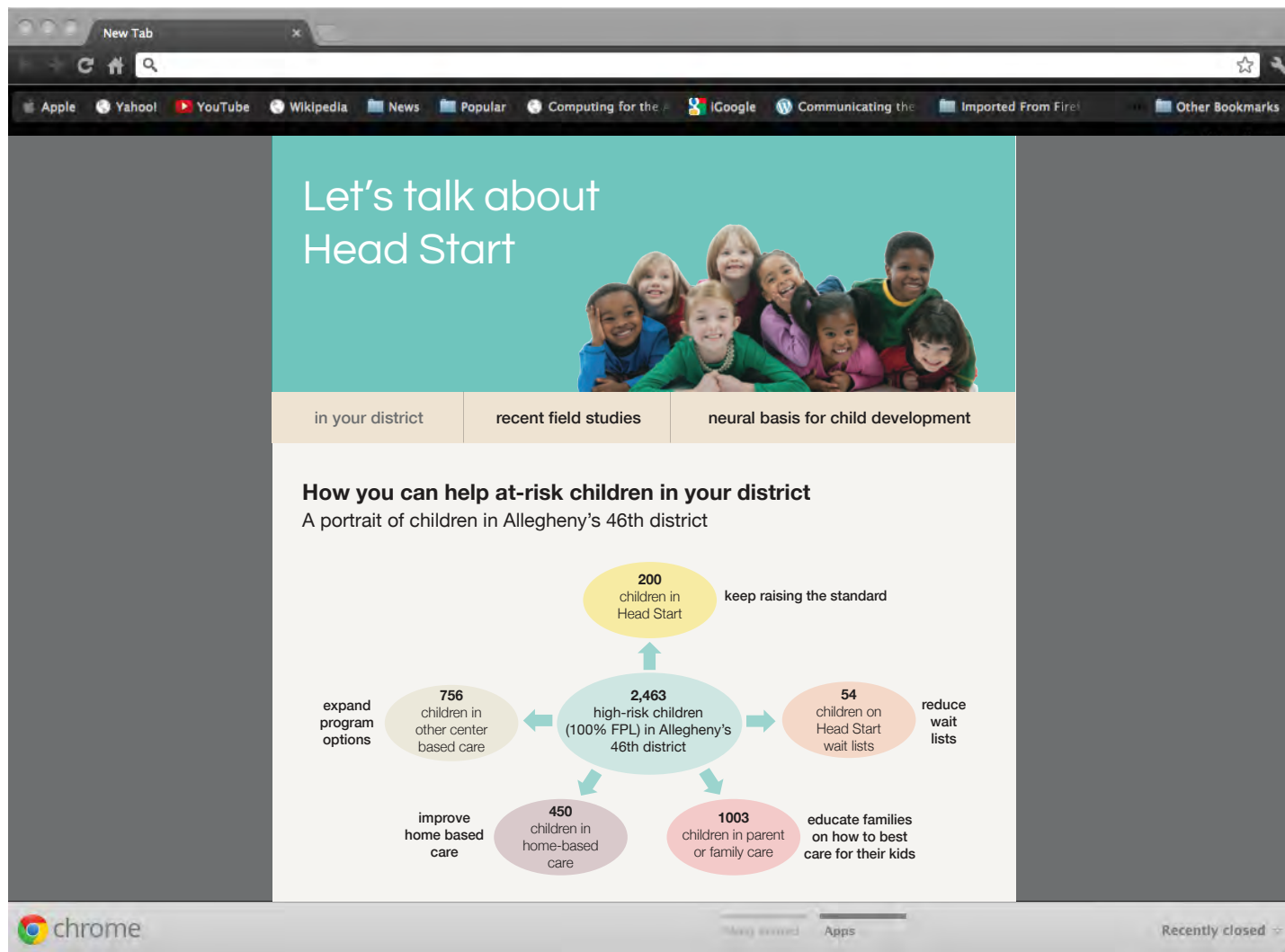
figure 15:

Website used to follow up with detailed information about childcare programs in a specific policymaker's district.

audience to be an "opening salvo" to a larger conversation about Head Start.

This feedback confirmed that the prototype could be used as an instance of "opening the conversation" about early childhood: that it was one part of an ongoing process of evidence-based communication. The staffers I spoke to felt that the level of detail for this "conversation opener" was appropriate, but agreed that they would welcome more detail about how the program is currently serving children in their own legislative districts.

This desire for more detailed information led to an idea of how I could "follow up" with more granular information about what is happening with childcare programs in a policymaker's legislative district. This idea manifested itself in an initial web-based design prototype and consequent elaboration of the strategy: a "follow-up" email and website that a staffer would get after the initial communication (figure 15). The email would contain a link to a website that has detailed information outlining the exact number of at-risk children in a specific policymaker's legislative district, and include information about which programs are serving (or not serving) these children.

The purpose behind this follow-up communication is two-fold: to keep the initial conversation with policymakers open, and to give them specific information about what is happening in their own legislative districts with early childhood programs and policies. This makes use of the idea that policymakers are more likely to respond to information that is pertinent to them, and which reflects what is happening within their own area of influence.

In addition to giving policymakers customized data about childcare in their own districts, the strategy allows OCD to maintain a continued, evidence-based conversation about early childhood with policymakers. This reinforces OCD's reputation as a source of trusted information for policymakers who wish to learn more about early childhood. This relationship can be sustained through a

consistent and timely flow of information to policymakers, using the components of communication described.

These ongoing communications are both audience-specific and time-specific. In the case of Head Start, the communication materials would give policymakers who are in charge of program funding pertinent information about the program at key moments along the budget timeline to inform them of how Head Start "measures up" to other childcare programs in the state. And consequently, this information would allow them to make informed decisions about program funding while they are crafting the budget. In short, the purpose of this time- and audience-based communication is to give policymakers the information they need about a program at the time they need it, to help them make wise investments in early childhood.

Strategic Recommendations

With the components and process of the strategy outlined, I will suggest ways in which OCD might further implement this strategy to communicate with policymakers. These suggestions involve identifying specific policymakers to communicate with, finding data on the children in these policymakers' districts, and designing communication materials with increasing levels of information.

Because this strategy relies on giving policymakers specific information about children in their own legislative districts, identifying the specific policymakers who have involvement in, and legislative power over, childcare programs in the state becomes integral. Using Head Start as an example, the target audience to identify would be: policymakers who have legislative purview over Head Start funding, policymakers who are currently advocates for early childhood (and who can be relied on to pass information laterally amongst their colleagues), and policymakers who are currently "on the fence" about the program.

Although identifying these individual policymakers may seem daunting, OCD is fortunate to have Mr. Firth's considerable knowledge of the "policymaking scene" in Pennsylvania, which allows for an already-existing understanding of which policymakers can be considered open to conversations about early childhood issues. With respect to the legislators in charge of crafting the budget, there are a discrete number of these people in the Governor's Office of the Budget and Congressional Appropriations Committees, so identifying these specific policymakers becomes an easier task.

One of the challenges in taking this strategy forward lies in finding specific data about children in these identified policymakers' districts. Although there is a considerable amount of existing information about at-risk children in Pennsylvania, my attempt to find data at this more granular level of detail was unsuccessful. It would be useful to obtain these data from researchers at the Office of Child Development and Early Learning (OCDEL), because having this information would not only be helpful in constructing a portrait of early childhood care in the state, but it would also encourage policymakers to take action within their own districts.

Finally, the strategy can be further implemented through the design of materials that allow OCD to follow up with increasingly detailed information and research about early childhood. In addition to an interactive website that gives policymakers specific information about childcare in their own districts, other materials can be designed to continue and deepen the conversation about early childhood. Some of these materials could be: documents that translate and illustrate current program and neuroscientific research in deeper detail as a means of following up and maintaining the conversation with policymakers; policy recommendations (white papers) designed to make a more elaborate "ask" argument for policy change; and "take away" documents that allow OCD to leave bulleted information behind with policymakers after in-person meetings.

Conclusion

In this project, I have designed a strategy for evidence-based communication between the University of Pittsburgh's Office of Child Development and Pennsylvania's policymakers about early childhood issues. The purpose of this strategy is to educate policymakers about the science of early childhood, and encourage them to invest wisely in quality care programs for at-risk children in the state. The strategy employs a set of heuristics to develop an in-depth knowledge of policymakers as an audience. This knowledge of the audience then defines customized communication materials that allow for timely, succinct, and increasingly deep levels of research-based information about early childhood programs and policies to be communicated to policymakers.

In the future, OCD can use the components and processes developed in this strategy to communicate with policymakers about a wide range of issues concerning early childhood. Through an ongoing process that opens the conversation about the science of early childhood, gives policymakers specific data about programs in their legislative districts, and follows up with detailed information and policy recommendations, OCD can further reinforce their reputation as a trusted source of information about early childhood issues in the state. This may be done in a number of ways: through the visualization of district-specific data about children in a policymaker's district, maintaining an ongoing flow of information that translates current program and neuroscientific research in increasing levels of detail, and designing "take-away" documents that make evidence-based policy recommendations for policymakers.

To conclude, I would like to thank Ray Firth for the time, information, and support he provided, which aided me greatly in the development of this project. It is my sincere hope that this strategy will, in turn, help his ongoing effort to communicate the science of early childhood to Pennsylvania's policymakers.

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