



**In and out of school**

**Kathy Hirsh-Pasek**

Temple University  
Brookings Institution



# As Yuval Noah Harari wrote in 2021

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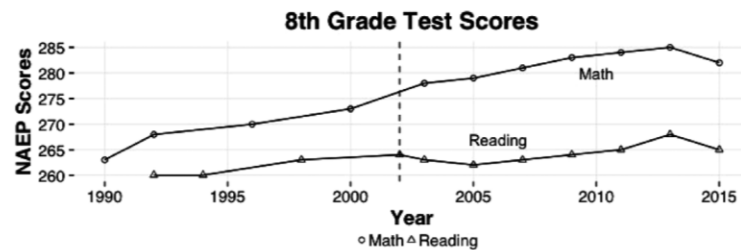
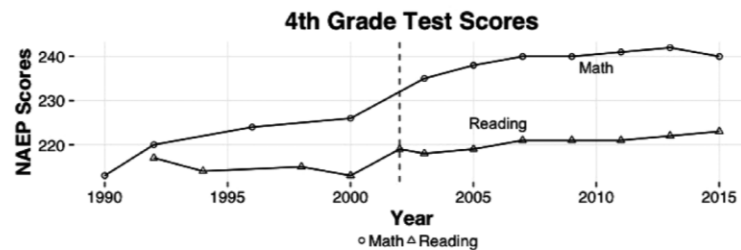
- *The Industrial Revolution has bequeathed us the production-line theory of education. ... almost everybody agrees that no matter its past achievements, it is now bankrupt.*

*What the Year 2050 has in Store for Humankind*

# Trying to reform within this production line model has not worked!

*No Child Left Behind* (2002) → A narrow focus on outcomes in reading and math with negative effects on students and teachers...

But little growth in assessment score outcomes...



(Berliner, 2009, 2011; Ladd, 2017; Markowitz, 2018; Reback et al., 2014)

Our work focuses on research in the science of learning to ask...

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What if we taught in a way that human brains learn?



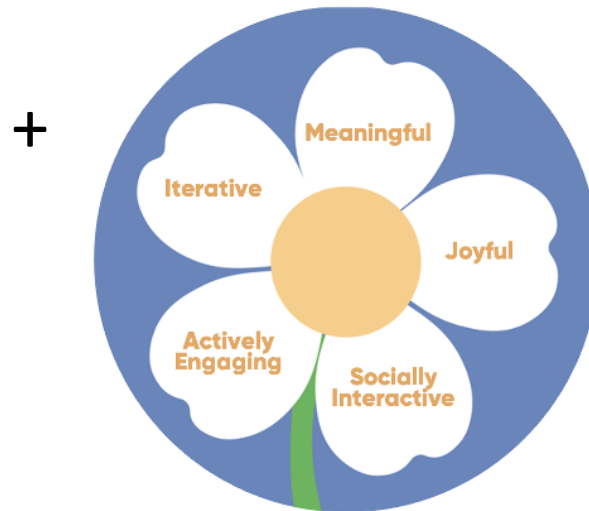
# Using the science of learning as a base, we came to a 3-part equation for re-imagining education

Cultural values



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+ The science of *how* children learn



With a learning goal

+

Playful Learning

+ The science of *what* children should learn  
The 6Cs

		Collaboration	Communication	Content	Critical Thinking	Creative Innovation	Confidence
	+						
	Level 4	Building it together	Tell a joint story	Expertise	Evidence	Vision	Dare to fail
	Level 3	Back and forth	Dialogue	Making connections	Opinions	Voice	Calculated risks
	Level 2	Side by side	Show and tell	Wide breadth / Shallow understanding	Truths differ	Means-end	Where do I stand?
	Level 1	On my own	Raw emotion	Early learning / Situation specific	Seeing is believing	Experimentation	Barrel on

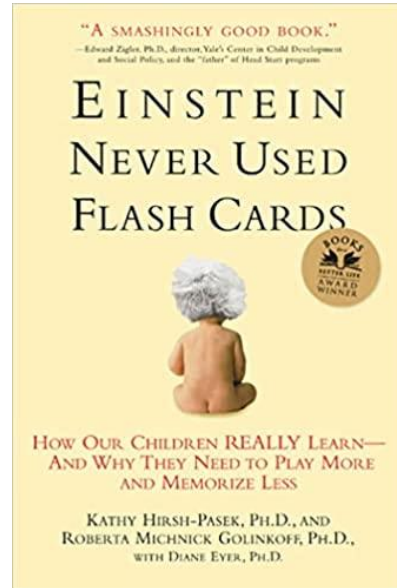
For this work,

We use co-constructed design process

That allows for diverse stakeholders and community members to design together – ensuring more inclusive intergenerational learning that incorporates cultural values

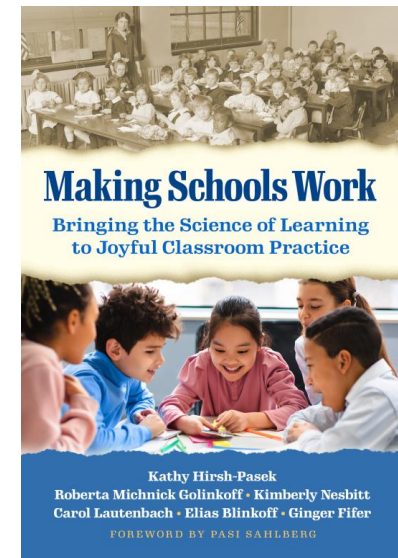


Then we add the science that shows us *HOW* children learn



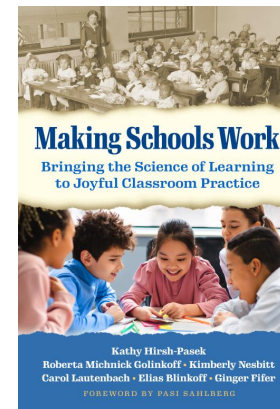
+ Learning Goal

5/9/2023



# Zooming in WHAT children need to learn : The 6Cs

		 Collaboration	 Communication	 Content	 Critical Thinking	 Creative Innovation	 Confidence
	<b>Level 4</b>	Building it together	Tell a joint story	Expertise	Evidence	Vision	Dare to fail
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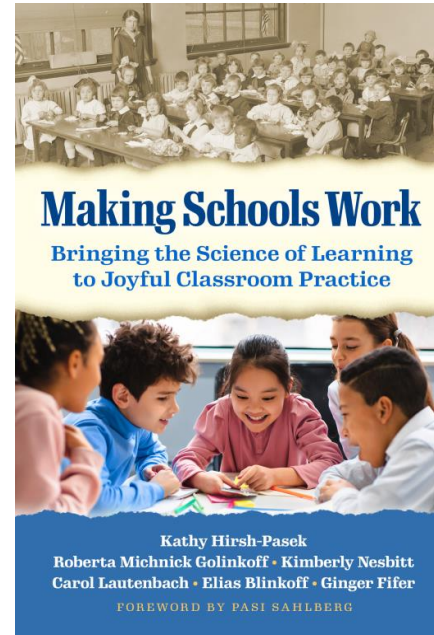




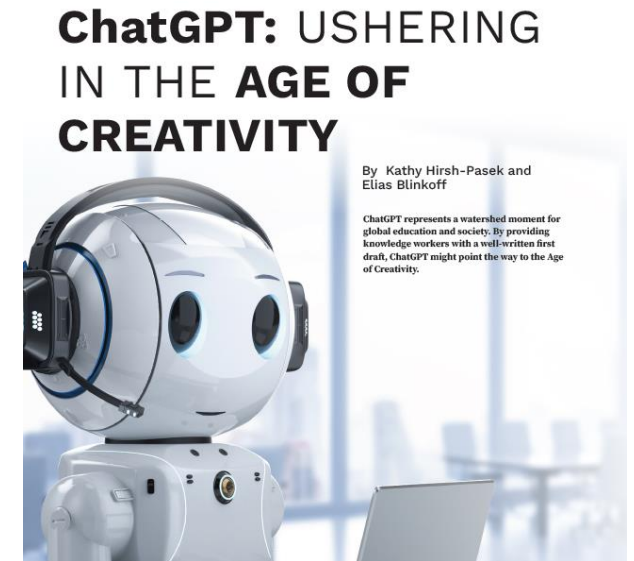
We are applying this model in and out of school learning environments...



COMMUNITIES



SCHOOLS



MEDIA

# All is backed by a strong research base!

Springer Link



Powering a Learning Society During an Age of Disruption pp 151-164 | [Cite as](#)

## Playful Learning Landscapes: Convergence of Education and City Planning

Authors [Authors and affiliations](#)

Helen Shwe Hadari<sup>1</sup>, Rebecca Winthrop, Kathy Hirsh-Pasek

Open Access Chapter  
First Online: 23 May 2021

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CHILD DEVELOPMENT PERSPECTIVES

## Learning Landscapes: Where the Science of Learning Meets Architectural Design

Andres S. Bustamante<sup>1</sup>, Brenna Hassinger-Das<sup>2</sup>, Kathy Hirsh-Pasek<sup>3,4</sup> and Roberta M. Golinkoff<sup>5</sup>

<sup>1</sup>University of California, Irvine, <sup>2</sup>Pace University, <sup>3</sup>Temple University, <sup>4</sup>The Brookings Institution, and <sup>5</sup>University of Delaware

MIND, BRAIN, AND EDUCATION

## Questions in a Life-Sized Board Game: Comparing Caregivers' and Children's Question-Asking across STEM Museum Exhibits

Caroline Gaudreau<sup>1</sup>, Andres S. Bustamante<sup>2</sup>, Kathy Hirsh-Pasek<sup>3,4</sup>, and Roberta Michnick Golinkoff<sup>5</sup>

ELSEVIER

Contents lists available at ScienceDirect

## Library and Information Science Research

journal homepage: [www.elsevier.com/locate/lisres](http://www.elsevier.com/locate/lisres)



## Play-and-learn spaces: Leveraging library spaces to promote caregiver and child interaction

Brenna Hassinger-Das<sup>1,\*</sup>, Jennifer M. Zosh<sup>1</sup>, Nicole Hansen<sup>2</sup>, Meghan Talarowski<sup>1</sup>, Kate Zmich<sup>3</sup>, Roberta Michnick Golinkoff<sup>4</sup>, Kathy Hirsh-Pasek<sup>5,1,6</sup>

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<sup>6</sup>University of Delaware, School of Education, Newark, DE 19716, USA

<sup>7</sup>Temple University, Department of Psychology, 1701 N. 13<sup>th</sup> Street, Philadelphia, PA 19122, USA

<sup>8</sup>Center for Universal Education, Brookings Institution, 1775 Massachusetts Avenue NW, Washington, DC 20036, USA



Journal of Cognition and Development

ISSN: 1524-6372 (Print) 1532-7647 (Online) journal homepage: <https://www.elsevier.com/locate/jcd>

## Urban Thinkscape: Infusing Public Spaces with STEM Conversation and Interaction Opportunities

Brenna Hassinger-Das, Itai Palti, Roberta Michnick Golinkoff & Kathy Hirsh-Pasek

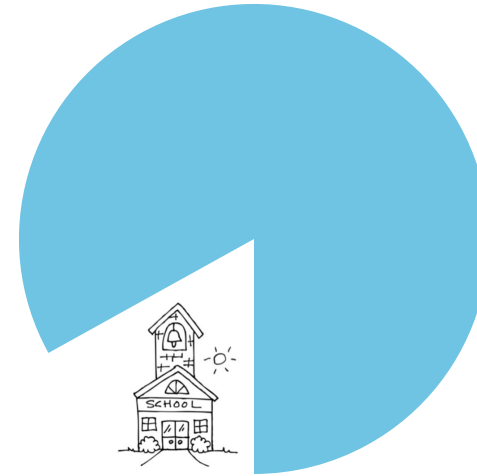
To cite this article: Brenna Hassinger-Das, Itai Palti, Roberta Michnick Golinkoff & Kathy Hirsh-Pasek (2020) Urban Thinkscape: Infusing Public Spaces with STEM Conversation and Interaction Opportunities. *Journal of Cognition and Development*, 21(1), 125-147, DOI: [10.1080/15246372.2019.1673753](https://doi.org/10.1080/15246372.2019.1673753)

To link to this article: <https://doi.org/10.1080/15246372.2019.1673753>

# Let's start with our work in community

Did you know that...

Children spend only **20%** of their waking time in school.



20%

What are we doing with the other 80%??



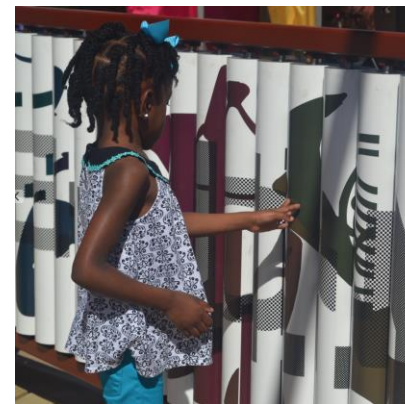
# Our work in Communities – Example 1: Urban Thinkscape

- Transforming a bus stop into a playful learning space
- Over 100 community members participated in building the site
- Community members trained as “data ambassadors” to collect observational data on use and learning from the site
- Results (N=280) 28% increase in adult/child language and in targeted spatial or number language use



5/9/2023

Hassinger-Das et al. 2019



Hassinger-Das et al., in press

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# How the bus stop changes in Santa Ana





## Example 2: Parkopolis

- The Human Sized Board Game designed to foster early mathematical skills and scientific reasoning. Pilot conducted in Switzerland in the summer of 2017 resulting in more math talk!

### RESULTS (N= 111)

- Parent-child interaction compared to control
- Adult and child language use and question use
- Targeted spatial/numeric language and fraction language

NEWPROFIT



Andres Bustemante

Thanks to Fei Xu, Silvia Bunge and all of our mathematic colleagues!

## Example 3: Playbrary

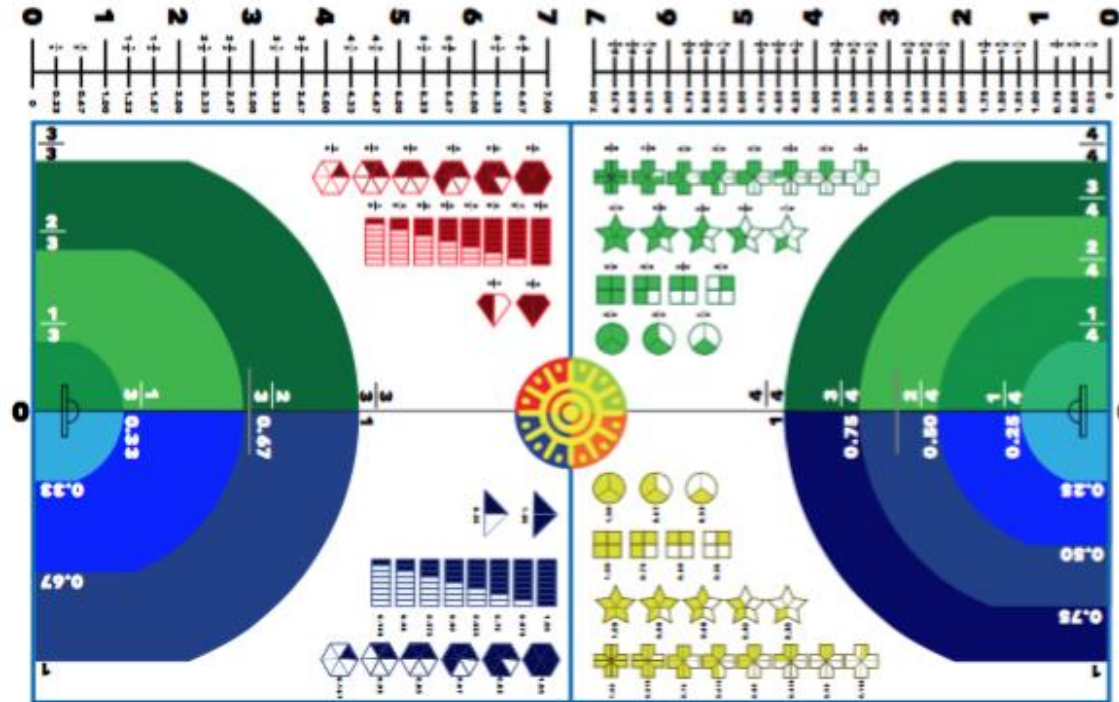
- Can we even change a library to enhance playful learning and conversation? You bet.

### RESULTS:

- Number of children using number, spatial, color, or letter language increased by 44% from pre to posttest.
- Adults and children' technology use decreased by 38% from pre to posttest.



## Example 4: Fractionball



Results? N=160, 4-6<sup>th</sup> graders; Increase in decimal to fraction conversions with just 4 PE sessions!

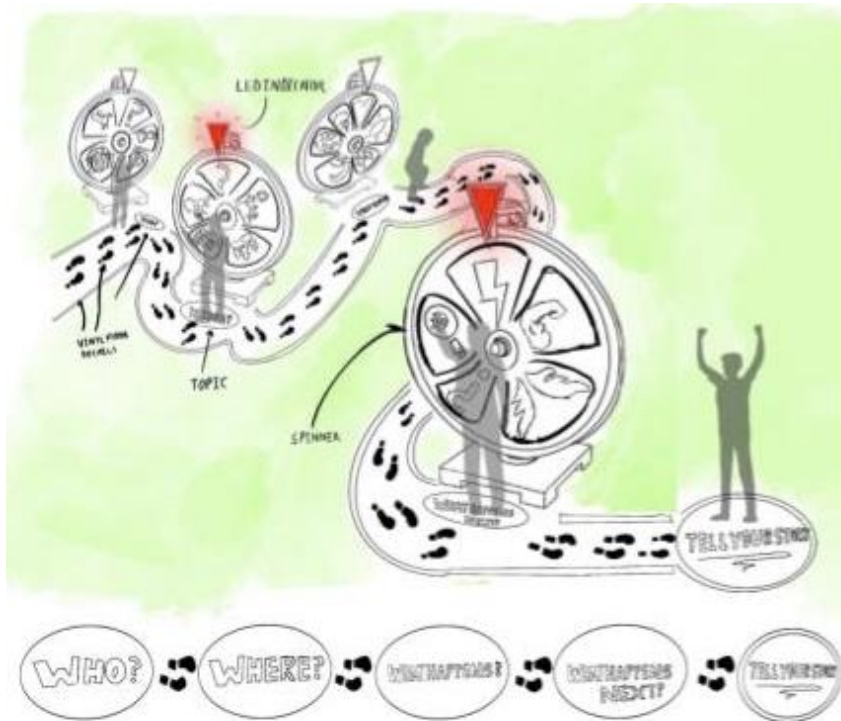
Bustemante et al., 2022



# Example 5: In the works

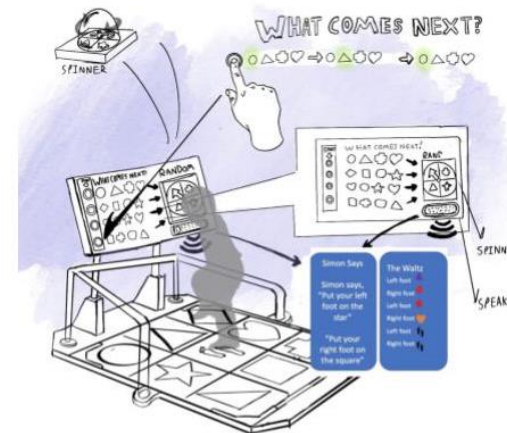
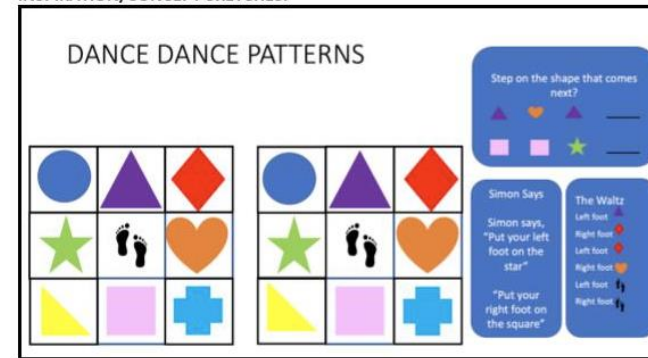


## LITERACY



## STEM

INSPIRATION/CONCEPT SKETCHES:



# Example 6: Murals in Santa Ana





# And through our work both at Brookings and Playful Learning Landscapes in Action

We have developed playbooks in multiple languages



## Nosso Playbook: The Portuguese Playbook

Apresentamos para você nosso *Playbook*! Use este guia para explorar a ciência por trás da aprendizagem lúdica, veja vários exemplos de projetos para aprender brincando, e descubra como você pode incorporar a aprendizagem pelo brincar na sua comunidade.

Clique no botão para baixar.

And soon to be in Chinese

Along with clear ways to measure the impact of the installations on interaction outcomes for families and for communities



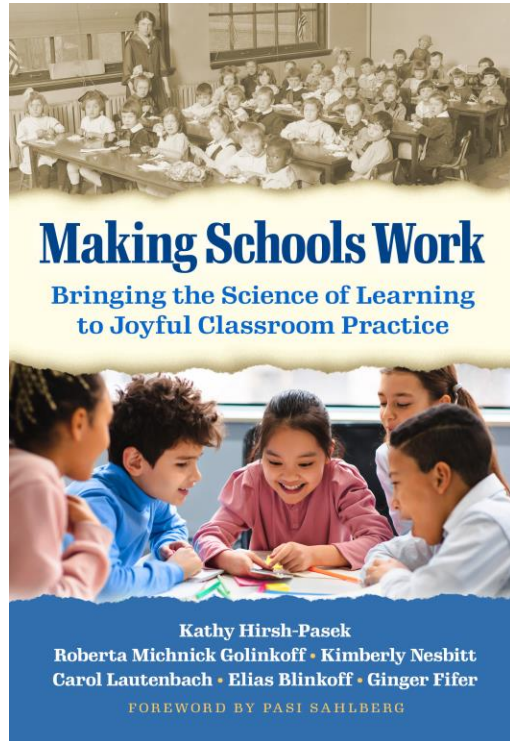
ANNE T. AND ROBERT M. BASS CENTER FOR  
TRANSFORMATIVE PLACEMAKING

B | Center for  
Universal Education  
at BROOKINGS

# Playful Learning Landscapes metrics framework



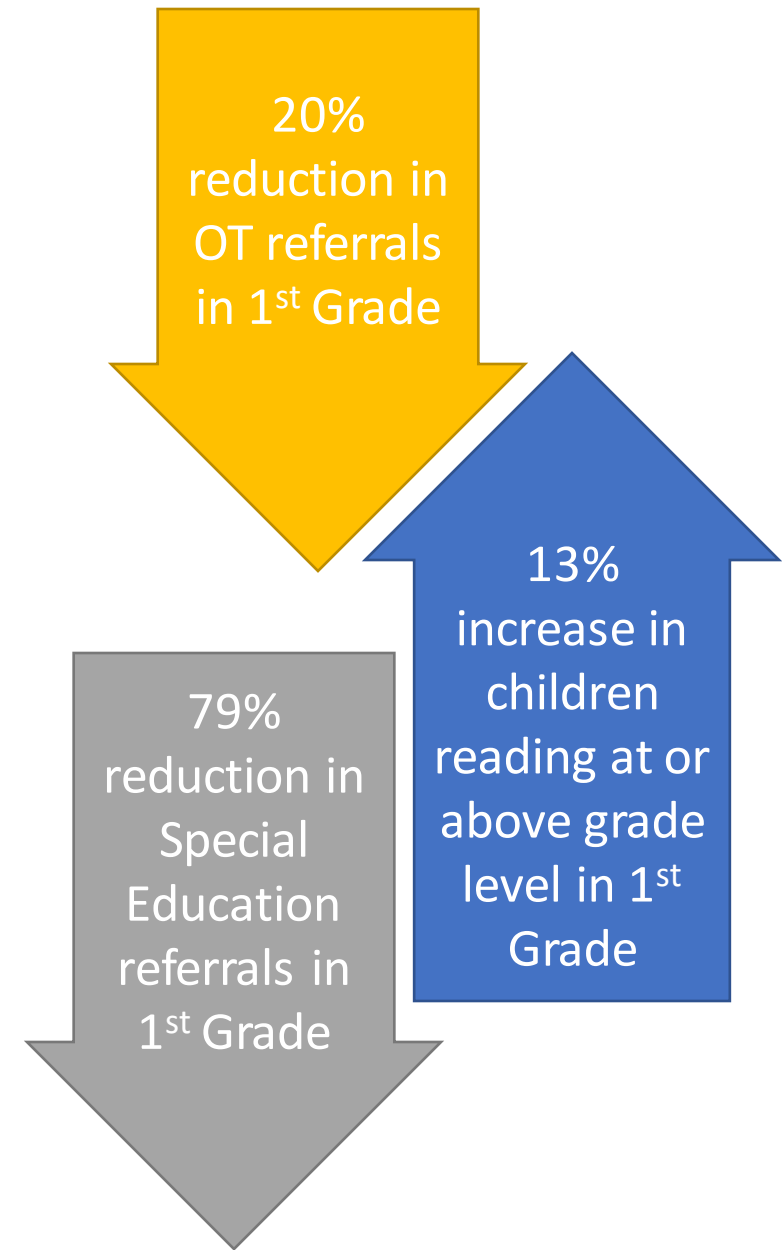
In schools, we are using use this 3-part equation to create a new pedagogical mindset



And so far, our pilot work offers promising results.

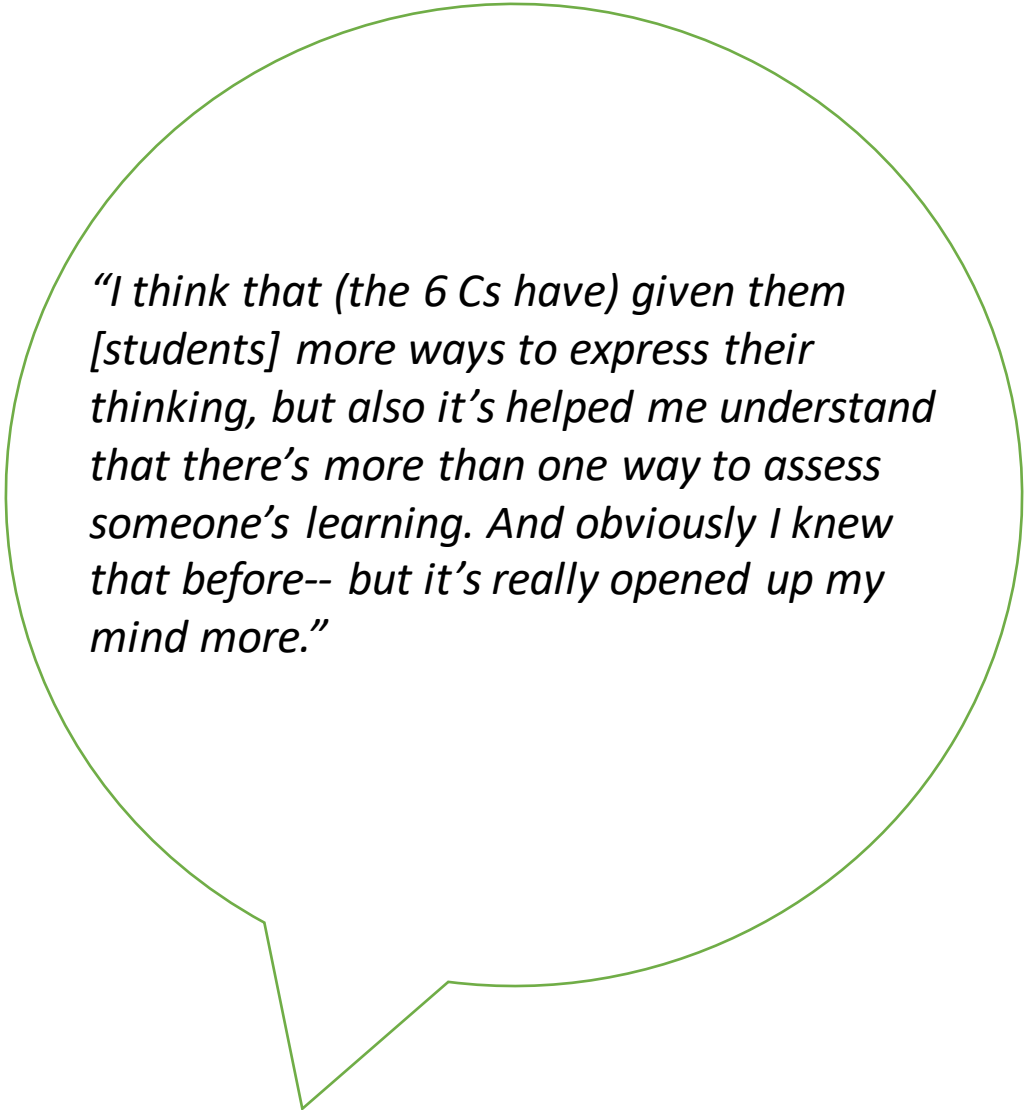
## Example 1: Suburban Philadelphia

- **Who:** Relatively affluent school district with a median household income of \$62,000
- **What:** District kindergarten teachers designed lessons around how children learn and the “6 Cs”
- **Impact:** Greater percentages of kindergarten and 1<sup>st</sup>-grade students demonstrated grade-level math and reading skills
- **Impact:** Decline in special education and occupational therapy referrals by 1<sup>st</sup>-grade



## Example 2: Western Michigan

- **Who:** Small community district, 78% Hispanic/Latino and 95% FRPL qualified
- **What:** Thematic instruction rooted in active playful learning and the 6 Cs district-wide with K-2 focus
- **Impact:** Benefits for students and teachers reported across the district
- **Impact:** Gains in 1<sup>st</sup>-graders' math and reading scores



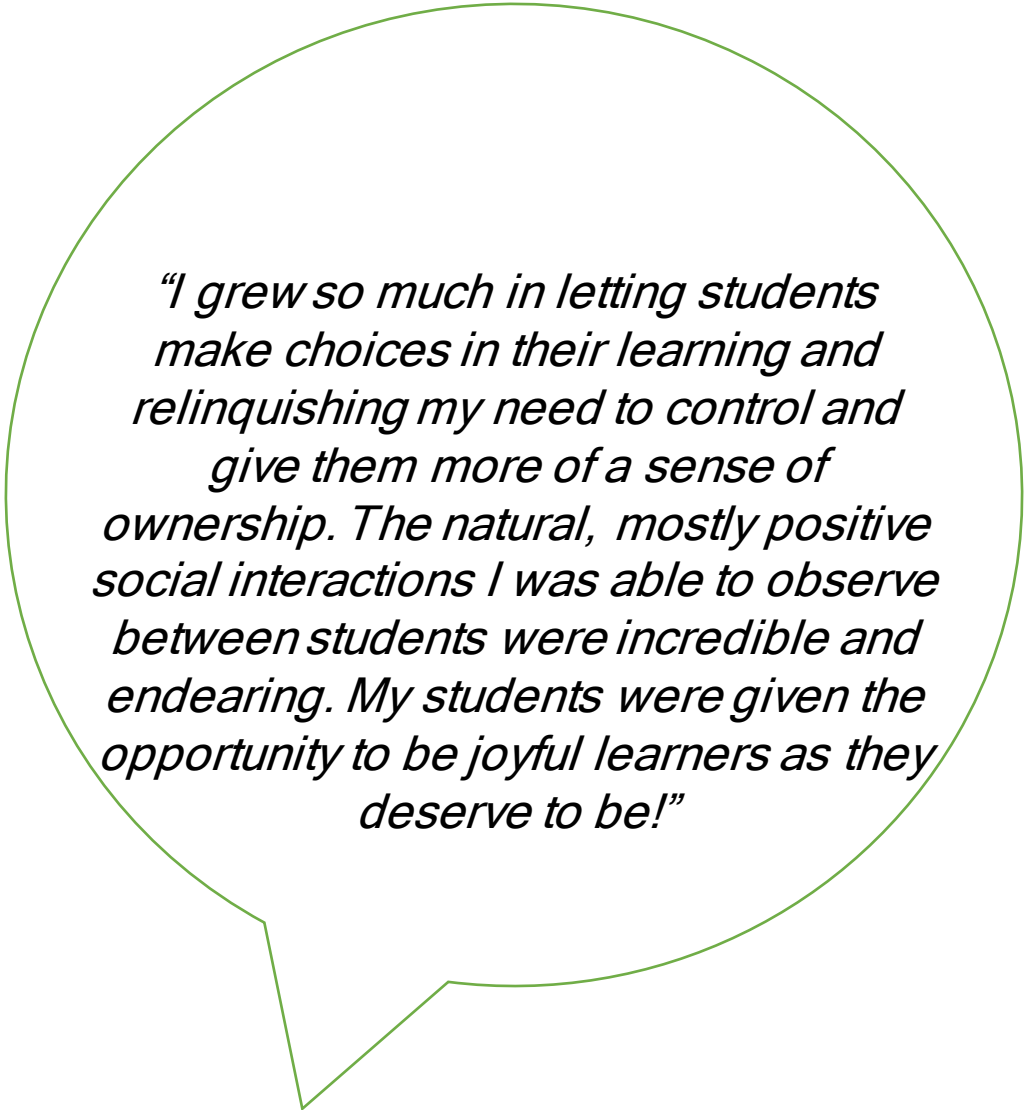
*"I think that (the 6 Cs have) given them [students] more ways to express their thinking, but also it's helped me understand that there's more than one way to assess someone's learning. And obviously I knew that before-- but it's really opened up my mind more."*



# Example 3:

## New Hampshire

- **Who:** 31 kindergarten classrooms across NH
- **What:** 6-month embedded coaching program to support 2018 play-based kindergarten mandate
- **Impact:** Significant gains in comfort, practicality, and importance of play-based learning ( $ps < .05$ )
- **Impact:** Significant retrospective increases across students' 6 Cs ( $ps < .001$ )



*"I grew so much in letting students make choices in their learning and relinquishing my need to control and give them more of a sense of ownership. The natural, mostly positive social interactions I was able to observe between students were incredible and endearing. My students were given the opportunity to be joyful learners as they deserve to be!"*

Variable	Guided Play (GP) Mean (SE)	Free Play (FP) Mean (SE)	Direct Instruction (DI) Mean (SE)
Collaboration	47.2% (2.0)	47.5% (1.6)	0.1% (0.1)
Talking	30.1% (1.9)	35.7% (1.4)	3.1% (1.3)
Asking Questions	2.0% (0.5)	1.4% (0.4)	0.3% (0.3)
Using Manipulatives	84.5% (2.0)	57.2% (1.5)	11.2% (1.4)
Level of Involvement (range 1-5)	3.35 (0.3)	2.98 (0.2)	2.38 (0.3)

# THEORY OF CHANGE

*The Industrial Revolution has bequeathed us the production-line theory of education...no matter its past achievements, it is now bankrupt.*  
*Yuval Noah Harari, 2018*

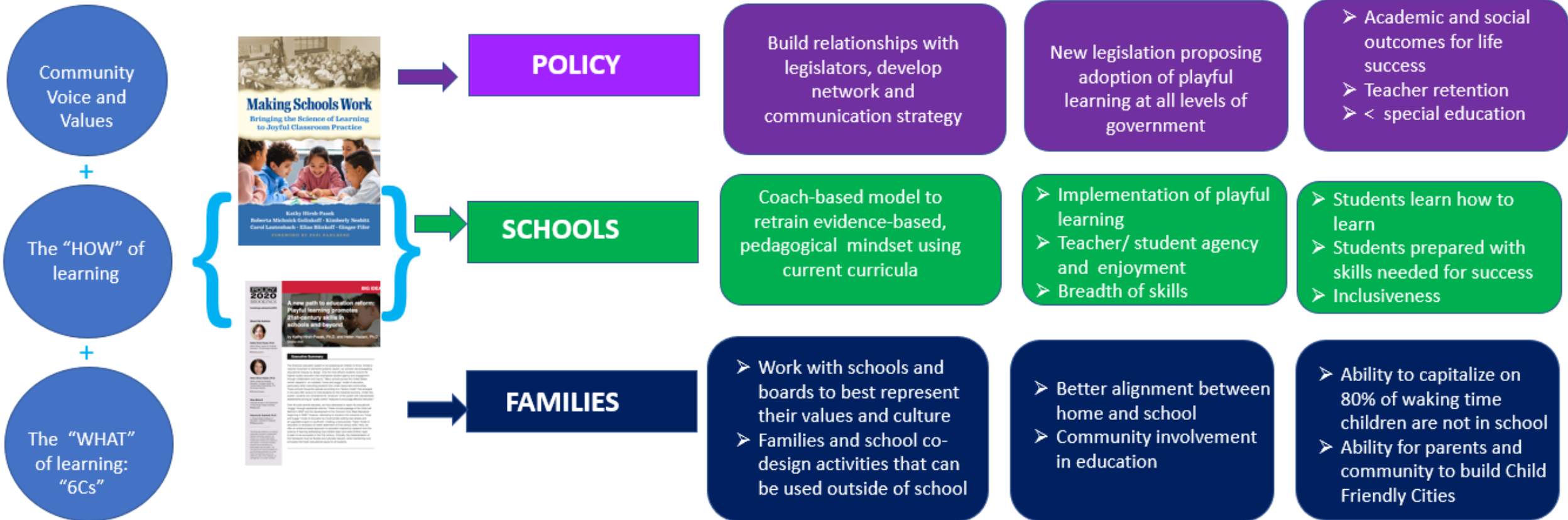
**Core activity**

**Level of intervention**

**Intervention**

**Outcomes**

**Impact**



# Active Playful Learning Scale-Up Study

The  
**LEGO**  
Foundation



- **School Districts** –  
20 schools (10 exp/ 10 control)/year  
~3 teachers per grade per exp school  
90 exp teachers across K to 2nd
- **3 Coaches** (work with 30 teachers)
- **Data Collector Team** (school assessments, coach feedback, observations)



Same breakdown as above



Same breakdown as above



Same breakdown as above

# Finally, we are using the 3-part equation to develop culturally rich "educational" in the media sector

**BROOKINGS**

CLIMATE AI CITIES & REGIONS GLOBAL DEV INTL AFFAIRS U.S. ECONOMY U.S. POLITICS & C

**REPORT**

## A whole new world: Education meets the metaverse

Kathy Hirsh-Pasek, Jennifer M. Zosh, Helen Shwe Hadani, Roberta Michnick Golinkoff, Kevin Clark, Chip Donohue, and Ellen Wartella  
Monday, February 14, 2022



# Again, we are publishing in the area of media



## Annual Review of Developmental Psychology Children and Screens

Brenna Hassinger-Das,<sup>1</sup> Sarah Brennan,<sup>1</sup>  
Rebecca A. Dore,<sup>2</sup> Roberta Michnick Golinkoff,<sup>3</sup>  
and Kathy Hirsh-Pasek<sup>4,5</sup>



Journal of Children and Media



ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/rchm20>



## Putting Education in “Educational” Apps: Lessons From the Science of Learning

Kathy Hirsh-Pasek<sup>1</sup>, Jennifer M. Zosh<sup>2</sup>, Roberta Michnick  
Golinkoff<sup>3</sup>, James H. Gray<sup>4</sup>, Michael B. Robb<sup>5</sup>, and  
Jordy Kaufman<sup>6</sup>

Psychological Science in the  
Public Interest  
2015, Vol. 16(1) 3–34  
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DOI: 10.1177/1529100615569721  
[pspi.sagepub.com](http://pspi.sagepub.com)  
SAGE

## How educational are “educational” apps for young children? App store content analysis using the Four Pillars of Learning framework

Marisa Meyer, Jennifer M. Zosh, Caroline McLaren, Michael Robb, Harlan  
McCafferty, Roberta Michnick Golinkoff, Kathy Hirsh-Pasek & Jenny Radesky



Contents lists available at ScienceDirect

Early Childhood Research Quarterly



Journal of Children and Media



ISSN: 1748-2798 (Print) 1748-2801 (Online) Journal homepage: <http://www.tandfonline.com/loi/rchm20>

## ChatGPT: USHERING IN THE AGE OF CREATIVITY

By Kathy Hirsh-Pasek and  
Elias Blinkoff

ChatGPT represents a watershed moment for  
global education and society. By providing  
knowledge workers with a well-written first  
draft, ChatGPT might point the way to the Age  
of Creativity.



## The parent advantage in fostering children’s e-book comprehension

Rebecca A. Dore<sup>a,4</sup>, Brenna Hassinger-Das<sup>c</sup>, Natalie Brezack<sup>c</sup>, Tara L. Valladares<sup>d</sup>,  
Alexis Paller<sup>a</sup>, Lien Vu<sup>b</sup>, Roberta Michnick Golinkoff<sup>a</sup>, Kathy Hirsh-Pasek<sup>b</sup>



Received: 19 November 2020 | Revised: 29 May 2021 | Accepted: 21 June 2021

DOI: 10.1111/disc.13148



SHORT REPORT

## Enhancing spatial skills of preschoolers from under-resourced backgrounds: A comparison of digital app vs. concrete materials

Corinne A. Bower<sup>1</sup> | Laura Zimmermann<sup>2</sup> | Brian N. Verdine<sup>2</sup> | Calla Pritulsky<sup>2</sup> |  
Roberta Michnick Golinkoff<sup>2</sup> | Kathy Hirsh-Pasek<sup>1</sup>

## Developer meets developmentalist: improving industry–research partnerships in children’s educational technology

Rebecca A. Dore, Marcia Shirilla, Brian N. Verdine, Laura Zimmermann,  
Roberta Michnick Golinkoff & Kathy Hirsh-Pasek

So you see, using the science of learning as a base, we can use a 3-part equation for re-imagining education in and out of school.

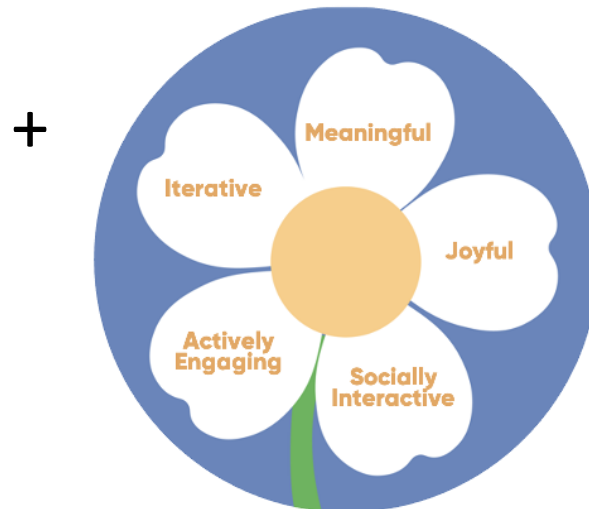
Cultural values



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# Thanks to our funders



Roberta Golinkoff, Ph.D.

The most wonderful postdocs, graduate students and undergrads.



And to the families who make the research we do possible!