

Bringing Science to Law and Policy: Panel Discussion

Panelists: Bradley Schlaggar, MD, PhD;¹ Katie Plax, MD²; Susan Block, JD;³ Timothy McBride, PhD;⁴ & Missouri Senator Jill Schupp⁵

INTRODUCTION

How should law and policy change, based on our current understanding of brain development? In turn, how can neuroscientists undertake research that would prove most useful in influencing law and policy? Such questions about the intersections of science, law, and policy provided the focus of a transdisciplinary conversation, led by Dr. Deanna Barch.⁶ Participants—physicians, an attorney and former Family Court judge, a state legislator, and a health economist—recounted their own experiences and recommendations with a view to bridging traditional divides and actualizing ideas from this conference and symposium, “The Developing Brain.”⁷ The program concluded with a question-and-answer

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2. Katie Plax, MD, is the Ferring Family Chair & Professor of Adolescent Medicine, Department of Pediatrics, Washington University School of Medicine.

3. Susan E. Block, JD, practices law with the firm of Paule, Camazine, & Blumenthal, P.C., in St. Louis, MO. Prior to returning to practice, she served as a judge in St. Louis County for 25 years, including as the Administrative Judge of the Family Court, managing the policies and practices of this division and maintaining a caseload of abuse, neglect, delinquency, and adoption matters.

4. Timothy McBride, PhD, is Professor at the George Warren Brown School of Social Work at Washington University in St. Louis and co-director of the Center for Health Economics and Policy at the Institute for Public Health at Washington University.

5. Jill Schupp is a state senator, representing Missouri’s 24th Senatorial District. Her previous experience includes serving in the State House of Representatives and serving as a member and as president of the Board of Education for Ladue Schools, a school district in St. Louis County, MO.

6. Deanna Barch is the Gregory B. Couch Professor of Psychiatry; Chair, Psychological & Brain Sciences; Professor of Psychological & Brain Sciences; and Professor of Radiology at Washington University in St. Louis.

7. The conference, “The Developing Brain: New Directions in Science, Policy, and Law,” took place at Washington University School of Medicine, on Sept. 26, 2017. For additional information, see NEUROSCIENCE & SOCIETY: A NEW INITIATIVE, <https://neuroscienceandsociety.wustl.edu/> (last visited May 27, 2018).

session. A slightly edited transcript of the panel discussion, with footnotes inserted by the conference organizers and editors, follows.

Bradley Schlaggar:

My research as an undergraduate and graduate student was in basic mechanisms of brain development. I was particularly interested in the question of specialization of functions of the brain—visual cortex, motor cortex, language cortex, and so on—how they develop and the extent to which intrinsic and extrinsic factors, either in isolation or in combination, could drive the development of the brain’s organization. In fact, that’s when I first met Pat Levitt.⁸ We were developmental neurobiologists working on these basic questions of what drives the regional and areal organization of the cerebral cortex. I’m still interested in those very same questions today, but for the past nearly twenty years now, I’ve been asking those kinds of questions in children using cognitive neuroscience tools, as you heard earlier this morning from Damien Fair⁹ and Cynthia Rogers.¹⁰

Part of my fascination with neuroscience, clearly, has to do with how naturally it intersects with concepts from other domains such as philosophy, law, policy, and education. Indeed, a major draw for me to come to Washington University in the first place was a fascination with the late John Olney,¹¹ who was a faculty member here for many years, and first described excitotoxicity.¹² For me, he was a role model for science and society intersecting because he worked hard from the 1960s through the 70s to get

8. See Pat Levitt & Kathie A. Eagleson, *The Ingredients of Health Brain and Child Development*, 57 WASH. U. J.L. & POL’Y 75 (2018).

9. Damien A. Fair, Alice M. Graham, & Brian Mills, *A Role of Early Life Stress on Subsequent Brain and Behavioral Development*, 57 WASH. U. J.L. & POL’Y 89 (2018).

10. Cynthia Rogers, *Addressing the Psychosocial Risk Factors Affecting the Developing Brain of the High Risk Infant*, 57 WASH. U. J.L. & POL’Y 117 (2018).

11. John W. Olney, MD, the John P. Feighner Professor of Psychiatry and Professor of Pathology and Immunology at Washington University School of Medicine. Dr. Olney passed away in 2015.

12. John W. Olney, *Brain Lesions, Obesity, and Other Disturbances in Mice Treated with Monosodium Glutamate*, 164 SCIENCE 719 (1969).

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monosodium glutamate out of baby food, but then eventually to try to prevent the FDA from approving the use of aspartame or Nutrasweet.¹³ I thought it was a great example of how one could live in those two worlds, and I came to Washington University partly to meet him.

I think that policy and decision-making related to policy should be informed by scientific data whenever possible or feasible. But my concern is that, at times, scientific data are wielded in a manner that has the potential to undermine the credibility of those who are using the scientific data to argue in favor of a policy decision.

For example, we've heard about this throughout the day, from those building an argument for early childhood programs as important for optimizing developmental and educational outcomes. You might have heard that in the first several years of life we humans have the peak of exuberance of synapses and that those early exuberant synapses are pruned over the course of those first years—observations first made just over thirty years ago in the laboratories of Pasko and Pat Goldman-Rakic.¹⁴ In the past, certain liberties were taken with those observations. They were of fundamental importance to the birth-to-three oriented policies that emerged in the 1990s, based on arguments that—if synapses are important for learning and if you have the most synapses you'll ever have in those early years—then those early years must be the crucial time for learning.¹⁵ And, so the arguments went, when that period is over, a window of opportunity closes and that's it. The arguments created a sense that, if you don't get to learning in those first three years, it's over for that child because the windows of opportunity are slammed shut.

Later, additional facts emerged based on studies of post-mortem human tissue, including that the process of synaptic

13. *Aspartame Approved Despite Risks*, 213 SCIENCE 986 (1981).

14. Pasko Rakic, Jean-Pierre Bourgeois, Maryellen F. Eckenhoff, Nada Zecevic, Patricia S. Goldman-Rakic, *Concurrent Overproduction of Synapses in Diverse Regions of the Primate Cerebral Cortex*, 232 SCIENCE 232 (1986).

15. See e.g., Sharon Begley, *Your Child's Brain*, NEWSWEEK, Feb. 19 1996, at 55.

pruning was more protracted than had been recognized initially.¹⁶ The idea of the non-malleable hard-wired adult brain of the 1960s and 70s started to give way to the emergence, in the mid 80s and onward, of plasticity.¹⁷ The notion of the plastic brain has continued to evolve such that we now understand our ability to remember anything from this conference sometime later is due to changes that occurred in our brains. This contemporary idea of plasticity was not part of the construct of plasticity in the early understanding of the phenomenon.

Facts about brain development and plasticity were either incorrect or were used as the basis for conclusions about education that constituted what John Bruer, who was the former president of the McDonnell Foundation here in St. Louis, terms “bridge too far” style arguments:¹⁸ The reason we have so many synapses as toddlers is that it is the most important time to learn and, if you miss the opportunity, the window slams shut. Clearly, early experience is important, but it’s wrong, I think, to build, for example, education policy on synapse count.¹⁹ So that’s one example of a problematic implementation of a scientific fact for the purpose of policy. Another version of this bridge-too-far kind of argument, in my mind, is exemplified by the Supreme Court’s 2005 landmark decision in *Roper v. Simmons*, a case with its home in Missouri, holding that it’s unconstitutional to impose capital punishment for crimes committed by an individual under eighteen years old.²⁰

I bring up this case, which figured in earlier sessions today, because the Court learned from the American Psychological

16. See e.g., Zdravko Petanjek, Judas Milos, et al., *Extraordinary Neoteny of Synaptic Spines in the Human Prefrontal Cortex*, 108 PNAS 13281 (2011).

17. See e.g., Michael M. Merzenich, Randall J. Nelson, Michael P. Stryker, Max S. Cynader, Axel Schoppmann & John M. Zook, *Somatosensory Cortical Map Changes Following Digit Amputation in Adult Monkeys*, 224 J. OF COMPARATIVE NEUROLOGY, 591 (1984).

18. John T. Bruer, *Education and the Brain: A Bridge Too Far*, 26(8) EDUCATIONAL RESEARCHER 4 (1997).

19. For example, a White House Conference on Early Childhood Development and Learning on February 4, 1997, led to several policy announcements including expansion of Early Head Start and distribution of Ready*Set*Read kits. <https://clintonwhitehouse3.archives.gov/WH/New/ECDC/Policy.html>.

20. 543 U.S. 551 (2005).

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Association and other sources²¹ that adolescent brains are underdeveloped in terms of decision-making, impulsivity, and risk-reward calibration²²—all things we’ve heard earlier today. Further, the Court learned about and used in reaching its conclusion research data that the prefrontal cortex is the home of executive function and is also late to develop.²³ Dr. Levitt showed a slide today, depicting a missing piece of dorsolateral prefrontal cortex from an advertisement by Allstate Insurance, and I used to use that slide all the time in talks.²⁴ That ad from Allstate came out just a year or two after *Roper v. Simmons* because of increased awareness of the absent prefrontal cortex in adolescence. Yet, it’s just not true. The vast majority of adolescents behave reasonably well, like adults. They might have some more challenges and impulse issues at times, but in general, adolescents—and this point was made earlier—they’re not committing a lot of crimes. They may be thinking about the potential to do something but then shutting it down. That’s the modal behavior for adolescence.

I take care of kids with impulse-control problems. Even these kids tend not to get into trouble. There are multiple important criticisms of the axiom that emerged, that the prefrontal cortex is absent in teenagers. The notion of a localization of function for the prefrontal cortex is a 19th century idea that dates back to Phineas Gage and other lesion-based behavior kinds of studies.²⁵ Our understanding of the organization of the brain systems for cognitive control has evolved quite a bit since then. We no longer think of control systems in that way. B.J. Casey developed a dual

21. See e.g., Brief for the American Psychological Association, and the Missouri Psychological Association as Amici Curiae Supporting Respondent, *Roper v. Simmons*, 543 U.S. 551 (2005) (No. 03-633), 2004 WL 1636447.

22. Elizabeth R. Sowell, Paul M. Thompson, et al., *In Vivo Evidence for Post-Adolescent Brain Maturation in Frontal and Striatal Regions*, 2 NATURE NEUROSCIENCE 859 (1999).

23. Nitin Gogtay, Jay N. Giedd, et al., *Dynamic Mapping of Human Cortical Development During Childhood Through Early Adulthood*, 101 PNAS 8174 (2004).

24. A 2007 ad campaign by Allstate Insurance Company showed a drawing of a brain that had a car-shaped hole in the dorsal region. The associated text stated, “Why do most 16 year olds drive like they’re missing a part of their brain? BECAUSE THEY ARE.”

25. Hanna Damasio, Thomas Grabowski, et al. *The Return of Phineas Gage: Clues About the Brain from the Skull of a Famous Patient*, 264 SCIENCE 1102 (1994).

model of hot and cold cognition and prefrontal cortex versus limbic.²⁶ That's a device, a model that does not incorporate more comprehensive understanding of how cortical systems are organized for top-down control.

In addition, the notion of a protracted development of the prefrontal cortex is also somewhat exaggerated. True, myelination of the subcortical white matter in the prefrontal cortex is laggard, but there are other independent measures suggesting that these frontoparietal occipital systems are coming together and are adult-like earlier than is typically described.²⁷ As noted, it's certainly not the case that underdeveloped decision-making characterizes all adolescents or even necessarily represents the central tendency of adolescents. The vast majority don't get into trouble. A lot of the discussion that we have, a lot of the science that we do, is centered around the central tendency of a distribution. Most of the bad behavior we're talking about is out on the skew of the distribution.²⁸ It's important to separate out, I think, the kinds of studies that are looking at the d-prime (average difference) between two populations versus what's happening on the skew (the extreme ends of a distribution or group).²⁹

That brings up my final point: Even if the central tendency of adolescents is immature decision-making, that does not mean that the particular individual standing before the judge has immature decision-making. That individual may have fully formed decision-making and reasonable impulse control, but might have other problems like sociopathy, resulting in a willingness to do things that adversely affect others. Some refer to this issue as the "group to individual" or "G2i" problem, that is, being able to move from

26. B.J. Casey, Rebecca M. Jones & Todd A. Hare, *The Adolescent Brain*, 1124 ANNALS N.Y. ACAD. SCI. 111 (2008).

27. Timothy T. Brown, Joshua M. Kuperman, Yoonhu Chung, et al., *Neuroanatomical Assessment of Biological Maturity*, 22 CURRENT BIOLOGY 1693 (2012).

28. In statistical studies of behavior, the more common behaviors would be within the bell of a bell curve whereas, as Dr. Schlaggar suggests, bad behavior would be on the skew or the "tail" of a bell curve.

29. The statistical measurement d-prime refers to the difference between the signal and the signal plus noise (or the average or mean difference between groups. Data points "on the skew" refer to those data points on the tail of a bell curve or the extremes of a group.

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group level central tendencies to application to the individual.³⁰

You heard that we are not really ready from a neuroscience standpoint to use our methods to make predictions about individuals, but that's what we and many others are working on, to move forward our neuroscientific approaches so that we can better predict, not just what's going to happen to somebody in terms of following the law or not, but also to make predictions about patient outcomes—who's going to do best with which treatment and so on, from a purely clinical standpoint.

To be clear, I am opposed to the death penalty, adolescent or not. My politics—that's where they are. Some ask me what difference does it make if the Court made the right decision in *Roper v. Simmons*—the right call even if the facts were not quite right. My fundamental worry is that, if the policy or a decision is predicated on a scientific fact, like timing of synaptic pruning or the myelination of the prefrontal cortex, and then those facts evolve or give way to a new understanding, can you really say that the decision that used them as predicates is based on firm footing? I worry that you cannot.

Katie Plax:

I am the Medical Director of The SPOT³¹ and also the Division Chief of Adolescent Medicine in the Department of Pediatrics, so thank you for mentioning us as pediatricians who want to be involved in children's lives and see ourselves as having an important role to play. The SPOT provides health and social

30. See David L. Faigman, John Monahan, & Christopher Slobogin, *Group to Individual (G2i) Inference in Scientific Expert Testimony*, 81 U. CHI. L. REV. 417 (2014).

31. The SPOT, a project of Washington University School of Medicine, provides comprehensive health and social services for youth in St. Louis. Its name stands for "Supporting Positive Opportunities with Teens," and its vision entails "youth partnering with community for social justice and health." See <http://thespot.wustl.edu/About-Us/Mission>. According to its website, at The SPOT youth can

1. access health and prevention services;
2. strive for positive educational and vocational outcomes;
3. have a voice and influence in their communities through leadership opportunities.

Id.

services free of charge in a youth-friendly space with a multidisciplinary team. We opened in 2008. We've served over 14,000 young people between the ages of thirteen to twenty-four. We intentionally went up to twenty-four, so until you turn twenty-five you can come to The SPOT. We intentionally did that because we thought that more attention needed to be paid to young adults, and we weren't finished yet at eighteen or twenty-one. We wanted to work under the belief that when you walk through our door, you're ours. We embrace you and we work really hard to create a safe space that respects you and values your input.

About eighty percent of the population we serve is African American; about twenty percent self-identify as lesbian, gay, bisexual, or transgender. About fifteen percent of our population is unstably housed. Over the years we've been able to expand our services to provide comprehensive primary care to youth infected with HIV and youth in the foster care system. In the last three years, as opposed to having youth come to us, we've moved our model to young people by starting a comprehensive school-based health center in Jennings. We're at the Jennings High School.

I will offer some policy suggestions I would like to see implemented. At The SPOT every day I see kids falling into the river of poverty, racism, and trauma, and I don't want to pick them up when they're bruised or crumpled by the rapids because it's much harder to swim upstream. If we can prevent these problems from happening to young people, I'm all for it. And we have heard many excellent examples of that today. Consistent with my core beliefs, at The SPOT we try to base our actions on science and, with all the caveats that Brad Schlaggar mentioned,³² we try to ask: What is the best evidence for the population that we are serving? I believe in the process of science, which means that we're always trying to identify, what is that elusive truth and for which populations does that truth work. We try to answer questions about who is this for and where does it work. We also are engaged in discovering what works better and what makes more sense, to do things in practical ways that help young people

32. See discussion *supra* at 151-52.

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be their best selves.

The second core value is one that I think was beautifully illustrated in the earlier discussion of “serve and return.”³³ I really like that. To me, serve and return exemplifies unconditional love. It demonstrates that, if you mess up, if you act up, if you serve me something, I am going to offer something in return back. I think this reciprocity comes into play when you’re interacting with young people who have experienced trauma.

I am going to use some cat analogies—I heard cats were popular on YouTube so I figured I’d try it. A lot of people imagine that young people who have experienced trauma act like the cat sitting in the corner—really shy, withdrawn, unwilling to come out. Some young people do respond this way. But others will act like a different kind of cat. They might have their hackles raised. They might have their hair standing up straight. Their teeth might be showing and they might be hissing. To me, with both of these presentations and everything in between, we need to convey that you belong here, we care for you unconditionally, we really believe in you, and we think there’s a path for you to heal and be successful. To me, whether you serve positive affect or you serve hissing, I want my return to convey caring. That is another core value for the work that we do.

Last, consider the notion of power. I think policy and policymaking and the law are really about using power—namely our ability to act and our ability to make a difference, so we can see change that we want for the young people whom I serve. This use of power can take many forms. You can act and make a difference by speaking out. You can make a difference in the court system. You can make a difference in policy change, in teaching, and in advocacy. You can make a difference by marching. And you can actually make a difference in responsive parenting. There are many ways for us to use our power as adults to take action and make a difference for kids.

In part, I want to speak out today about what happens to kids in

33. Levitt & Eagleson, *supra* note 8, at 82.

the foster care system because I see much disempowering and disenfranchising of young people in that setting. Many issues arise for young people in foster care that are important to me.

Here are some items on “the Katie Plax list.” Maybe I’m proposing the “go big” or “go home” philosophy here in terms of science, policy, and law and the ways they could intertwine, but my list, although perhaps long, actually is simple:

- I want increased options for accessible holistic healthcare, especially for the most needy kids.
- I want critical supports for families to prevent child abuse and neglect.
- I want real paths from cradle to a good job, in fact, lots of paths so that, if you get off the main path or you mess up, then you can get back onto the main path again, in whatever way we can make that happen.

Over the years I’ve been part of the care for over 400 youth in foster care. Often these young people amaze me with their resilience in the face of the adversity that they have experienced. And yes, sometimes they’re broken, and sometimes they’re brokenhearted, and sometimes I am broken, and sometimes I am brokenhearted by the brokenness. The work is hard. These kids are the most needy population in pediatrics with higher burdens of developmental issues, teen pregnancy, mental health needs, and educational issues. I want every kid in foster care to get to be first in line for every helpful opportunity for kids, whether it’s medical care or camp, scholarships or participating on the basketball team, trauma-focused mental health services or activities in the arts.

To start, every one of them should have a comprehensive exam that includes physical and mental health assessments within thirty days of entry into foster care, and the recommendations uncovered by these exams should be followed. Although we have this policy, there are real issues with implementation and follow-through, and the documentation that the exam took place is not even a required field. The computer tracking system is old, twenty-five years old. The child welfare system is significantly under-resourced, and

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there is no medical practitioner in child welfare in Missouri—no doctor, no nurse, to look after the more than 13,000 kids who have the greatest need. And there's no one to assist child welfare in understanding and meeting these needs.

We could change that. We have and can use more help from lawyers to ensure the policies are implemented for children and youth in foster care. We can advance the access to lawyers in the system who advocate for kids. Lawyers are there some of the time, and it would be nice if they could be there all of the time. Even better, we could use evidence-based strategies to prevent child abuse and neglect to lessen the need for these secondary prevention services.

I'm a big fan of a method that I haven't heard mentioned today, specifically providing access to the most effective contraception, so pregnancies are planned and spaced, helping people to become their best parenting selves.

I also think evidence-based home visitation programs or the amazing services that Dr. Cynthia Rogers presented,³⁴ where experts are meeting people very early on to prevent child abuse and neglect—all of these supports can be provided. I don't think any of these approaches are rocket science. I think they're supported by neuroscience research findings, and I'm grateful for that. We could put these policies in place and put them into action. I know the state budget alone will not fund such reforms, but there are other ways to get things done and implement effective programs for kids.

Susan Block:

I'm the lawyer on the panel. I'm the one who deals with the skew.³⁵ I'm the one who deals with a young, immature, peer-

34. See Cynthia Rogers, *Addressing the Psychosocial Risk Factors Affecting the Developing Brain of the High Risk Infant*, 57 WASH. U. J.L. & POL'Y 117 (2018)

35. As used here, "the skew" refers to Bradley Schlaggar's earlier remarks about adolescents with bad behavior, in which he noted that the incidence of such bad behavior is less frequent compared to behavior of the larger population of adolescents. See *supra* note 28 and accompanying text.

motivated child who sees huge pieces of construction equipment. He decides it might be fun to take some rocks and break the windows of these huge movers, bulldozers, and cranes. This kid comes from what we would call a “nice family.” He goes to what we would call a good school, and yet he and his friend are bored and don’t have any supervision. At fifteen, they probably could take care of themselves on the way home from school. I wonder what is it that makes that child who has not gone hungry, who has had good health care, do something like that.

I’m a lawyer now, but for twenty-five years, some years ago, I was a judge. Previously, I had been a lawyer for a few years. During my time on the bench, I never really understood how deep one’s well of sadness could be: how you could go from case one through case twelve and, by the time you got to case twelve, barely remember case one, because you had to focus on the intricacies and complexities of how a child and that child’s family or parent, or perhaps a child in court alone, came before you.

I was an outsider because I had never been a judge in the juvenile court. In juvenile court, we did things a certain way because that was the way they always had been done. We had two halls in court. One was for child protection. The other was for delinquency. In reading a delinquent’s history, I noticed that child had suffered from child abuse. Yet, there was no communication between the two halls. There was a population for whom I created the crossover unit: these kids in the juvenile delinquency system who had allegations that would be called charges if they were adults but who had also really belonged in the abuse and neglect system. The recognition of this kind of crossover, a great enlightenment, has just begun in the last decade or so.

The other point that I found was interesting and that Professor Scott raised³⁶ is this: I might have four kids in a row who all were individually charged with burglarizing a house and taking out some alcohol. Each set of parents, when asked if they had anything to say, said, “Well, that’s what he gets for hanging

36. Elizabeth Scott, Natasha Duell, & Laurence Steinberg, *Brain Development, Social Context, and Justice Policy*, 57 WASH. U. J.L. & POL’Y 13 (2018).

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around with those bad kids.” I wondered, “Well, which one was the bad kid? They were all together.” How does that peer motivation, that quest for excitement, play out, when we have all nice kids from “nice families” doing something that constitutes a very serious crime?

Like Katie Plax,³⁷ I propose that we start looking at these problems in a completely different way. When I retired as a judge, I went into private practice and I began representing kids who were charged with delinquency offenses. I began to ask the judge to look at them as individuals who needed rehabilitation and treatment and to be sure that they got the best they could. Now along the way, of course, I had much interaction with foster children. In fact, I’m still in touch with one of my foster children from my time as a judge, and she’s doing a fine job as a parent.

But the child welfare system was very protective of its own turf. I also represented a mom who was a foster parent to an infant, and that infant had lived with that foster parent his entire life—six months. Well, she decided to tell the story of the child welfare system on a blog. She wrote about how she wanted to adopt this baby but could not until state workers had ruled out as adoptive parents all the second cousins in Illinois. When state workers found out that she had that blog, on a state holiday four of them took that child away from her. She called me and I looked at the rules and regulations, and they erred. That child was returned to her in forty-eight hours, and he started first grade last year.

But what do we learn about a system that would remove a child—that would punish a child—because a foster parent had, let’s say, less than sophisticated thinking about what might happen with her freelance writing? Why should that bond be broken between that child and that parent? Why should children be moved from foster home to foster home when they are trying to develop attachments, maybe successfully for the first time in their lives?

Now, I also represent parents and grandparents, and the grandparents come to me and say, “Why isn’t Brittney getting

37. See discussion *supra* at 153.

counseling yet?” I said, “Well, because the court hasn’t taken jurisdiction yet.” Without jurisdiction, the court does not have the power to order counseling. The trial of her father for sexually molesting her is still pending and so I come to court representing the grandparents—not the child. The child does have a lawyer, but that lawyer knows that counseling won’t be provided, so she doesn’t ask the judge. I say, “Judge, she needs counseling—whether or not those allegations are true or not, she believes they are and she needs counseling.” It still takes three weeks to get into counseling, so it was four months from the time that that child was allegedly molested by her biological father that she got counseling services.

Now that is criminal, failing to provide services to a child coping with trauma.

My final comment focuses on the brain. I have a very strong interest in domestic violence, and the plasticity that Dr. Schlaggar has discussed plays a role in domestic violence situations. Because of this plasticity, domestic violence affects the infant’s brain. This effect occurs not only for the child in the arms of the victim, often the mother; it also occurs even for a child quietly in her crib during a violent encounter in the other room, whether it takes the form of verbal abuse that the child can feel or hear or physical abuse that is startling. All of that is affecting the brain of the child, causing unnecessary and unacceptable trauma. Removing that child from the mother is not necessarily the right answer either. Removing the perpetrator from the home is the right answer, and providing counseling to the non-offending parent is a better answer. These are all new concepts for law.

Timothy McBride:

I’m a health economist by training. I work in health policy, and I’m here to talk about the link between policy and this work on the brain and children with special needs. I’ve worked for twenty-five years in health policy—more than twenty-five years principally at the national level working mostly on the insurance issues—Medicare, Medicaid, and now the Affordable Care Act,

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considering issues of affordability, coverage, and access to coverage by people with special needs and low-income people. I also chair the Medicaid oversight committee in Missouri, called MO HealthNet.³⁸ I have served on the committee for seven years and chaired it since 2012, and I will discuss later how my academic role links to my policy role.

But I begin with a personal situation. My son PJ, who has autism, was diagnosed at eighteen months which is really quite remarkable and merits a shout-out to the pediatricians in the room, including John Constantino, who's been there providing us advice throughout PJ's entire life. Now PJ is enrolled in college in the Succeed Program at University of Missouri-St. Louis, and still every day is a challenge. We don't know what his future is going to be, and I will totally agree that we need policies that provide support from cradle to a good job; right now my one and only goal is to get him a job. And that's all he really wants. And he wants an apartment, and he wants a place for his cat. His life will be so much better with a job, but so much of the support that he's gotten has really made a big difference in his life.

I also say that I want to write a book someday about the yin and yang of fatherhood because not only do I have a son with autism; I also have a genius son who's now in graduate school at Georgia Tech and who is probably the smartest person I ever met in my life. How do you raise children like that? Think about how two parents who are both PhD economists could produce two children like that.

Let me now address the relevant science on which I've worked over the years and then how I translate it for a policy world. I want to mention two or three studies:

One study that I did with my wife examined the hypothesis that parents who have the greater ability to navigate through the healthcare system would be able to obtain higher levels of care and would have more effective care. I know that probably sounds really obvious when I say it. But we were able to find that that was

38. MO HealthNet is a division of the Missouri Department of Social Services. See *MO Health Net Division*, MO DEP'T OF SOC. SERVS., <https://dss.mo.gov/mhd/> (last visited May 27, 2018).

in fact the case. Parents who had higher education, higher literacy rates, were more likely to find access to care for their children with developmental disabilities, in a very strong way. That's something to keep in mind in the policy considerations: We really need to think about parents who don't have these resources, as my wife and I do, to navigate through the system to find outstanding care. It cost us \$20,000 a year for the first five years of PJ's life.

In another study, we focused on comorbidities of children with developmental disabilities. We looked at all the developmental disabilities and then we looked at what other physical and mental health conditions the children had. I was thinking like an economist, considering what happens to health costs when children have these comorbidities. Again, that might seem an obvious question. Well, of course, health costs go up, but how much do they go up? Do they go up in a linear way, or do they go up in a geometric way? How much is the burden accelerated for parents who have a kid with particular conditions? First of all, do we know that kids with, say, autism also have asthma and also have some other functional limitations? We found that they did. Then, how much do the costs go up? Is that sort of linear? Do you simply add the cost for autism plus asthma together, or is it even more expensive? It turns out to be complicated, as you would expect, and I think that matters a lot in how we think about policy.

A third line of work and probably threaded throughout all my work in my career asks, how do we get insurance coverage for children. How many uninsured are there? How many children obtain coverage? How do they obtain coverage through CHIP³⁹ or through the Affordable Care Act,⁴⁰ and what are their outcomes?

39. The Children's Health Insurance Program (CHIP) provides federal matching funds to states for health coverage to children in families with incomes too high to qualify for Medicaid, but who cannot afford private coverage. It is operated by the Center for Medicaid and CHIP Services (CMCS), under the U.S. Department of Health and Human Services. *See Children's Health Insurance Program (CHIP)*, MEDICAID.GOV, <https://www.medicaid.gov/chip/index.html> (last visited May 28, 2018); *see also* 42 U.S.C. § 1397aa (2012).

40. The Patient Protection and Affordable Care Act, also known as the Affordable Care Act (ACA) and nicknamed "Obamacare" because it was signed into law by President Barack Obama, is a federal statute enacted in 2010 that overhauled and expanded access to healthcare in the United States. *See* Pub. L. No. 111-148, 124 Stat. 119-1025 (2010).

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I'll use these questions as a transition to talk about my work on the MO HealthNet Oversight Committee. In that role, a role that a lot of academics don't play, we roll up our sleeves and try to take research to policy. In that committee, on which Senator Schupp⁴¹ serves as of this year, we tackle questions like the following: How do we manage the CHIP program? How do we deal with children with disabilities? How do we handle children on managed care plans—the quality of care, and access to providers? We ask questions, and we keep the agency's attention on issues. One of the most important points is that, actually, Senator Schupp has the power and the Governor has the power. We don't have the power, but on the committee we can turn on the bully pulpit and ask tough questions in public forums.

Before I finish here, I want to mention a couple of topics that arose earlier. I think it's really important that researchers speak to policy-makers, and it's been a mission of my career for a long time. We must think about translating research to policy because people like Senator Schupp need to have avenues for us to get the best policy work to her and to others in the legislature on both sides of the aisle. We must think about the best way that that information can reach them in a very timely and useful way and could be turned into very succinct legislative ideas, for example, in the way Katie Plax laid them out.⁴²

Also, I want to mention the importance of Medicaid—a very important topic as of right now, as we speak. If you don't know, Congress decided to pull the Graham-Cassidy bill.⁴³ That was a horrible bill that would have block-granted Medicaid, and it would have had a very negative impact on the Medicaid program in Missouri. More directly, the Medicaid program has an important

41. See discussion *infra* at 164.

42. See discussion *supra* at 156.

43. Senators Lindsay Graham (R-SC) and Bill Cassidy (R-LA) proposed a bill, Senate Amendment 1030, to repeal the Affordable Care Act. On the day of this conference (September 26, 2017), the Senate Majority Leader, Mitch McConnell (R-KY), announced that the Senate would not vote on the bill because it lacked sufficient votes to pass in the Senate. Thomas Kaplan & Robert Pear, *Senate Republicans Say They Will Not Vote on Health Bill*, N.Y. TIMES (Sept. 26, 2017), <https://www.nytimes.com/2017/09/26/us/politics/mcconnell-obamacare-repeal-graham-cassidy-trump.html>.

impact on children in this state. Even in a state like Missouri that has not expanded Medicaid under the ACA, while I've been sitting on the Medicaid Oversight Committee, the Medicaid program has grown by a hundred thousand people, and children account for 92% of that growth. That's really important, and we cannot go back on that. We now have good summaries in the literature on what the Medicaid expansion does for people. It improves financial security, it lowers debt, it lowers out-of-pocket costs, and it increases access to preventative care and to prescription drugs. For those with chronic disease, it increases access to diagnosis and treatments, and access leads to better depression outcomes. All those things I just cited are evidence-based outcomes in the literature.⁴⁴ We have put evidence out there on the impact of some of these expansions of Medicaid, but we in our state have not expanded Medicaid. We are throwing away two billion dollars a year. We could go even further than the hundred thousand kids that we have added because most of the expansion has helped kids, and it's made a big difference for those kids. But we could do more.

Jill Schupp:

Good afternoon. I am what you call a politician—what I like to call a public servant. I got into public service post-career. When my kids were young, my husband and I were in a position where I could actually afford to stay home with the kids and make sure I was there when they needed me. Not all people are in that position, but in that position, I became very involved in their school. And because of things I didn't like—in what some would characterize as one of the finest school districts not only in Missouri but in the nation—I saw that there were many problems and I wanted to make some changes. I ran for school board and two of the prongs of my platform were foreign language in the elementary schools beginning in kindergarten and smaller class

44. See Benjamin D. Sommers et al., *Sounding Board: Health Insurance Coverage and Health—What the Recent Evidence Tells Us*, 377 NEW ENG. J. MED.586 (2017).

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sizes, especially in the younger grades. Those things and four other things were actually completed in my tenure on the school board, and I found that, when you work together with people with different ideas and try to find common ground and try to envision what you want things to look like, you can sometimes get things done. Fast forward to the Missouri legislature.

I know this is a nonpartisan meeting, but I'm going to tell you who I am so that you know my biases and my frame of reference. I am a Democrat—probably no surprise given my applause that the federal healthcare bill didn't go forward, but there were some Republicans who helped with that.⁴⁵ I am, as a Democrat, part of a small elite group in the Missouri legislature. Let me give you the numbers. There are 34 elected senators in the State of Missouri. I am one of nine Democrats. Wasn't it Jeffrey Toobin who wrote *The Nine*?⁴⁶ I sort of call us "the nine," but we haven't risen to the level of the Supreme Court just yet. In the Missouri House, there are 163 elected representatives. Forty-five of those are Democrats. Statewide, serving in Jefferson City (Missouri's state capital), we have six elected officials including the Governor, and only one of those six is a Democrat. In the legislature in which I serve, we have a super majority of Republicans in the House and in the Senate, and a Republican Governor at the top of the ticket.

As a Democrat, I don't always get everything that I'd like to see done, as you might imagine. Part of my job is to try to stop or change what I consider to be the worst bills and try to make them a little bit less bad. I know that science and data have their place in decision-making, but let me tell you about our state. This is a place where climate change is discounted and where embryonic stem cells receive more protections than young children in unlicensed in-home daycare. This is a place where trauma-informed care is now being discussed in Jefferson City, but it's

45. Republican Senators John McCain (AZ), Rand Paul (KY), and Susan Collins (ME) have indicated that they are unwilling to repeal the Affordable Care Act. Thomas Kaplan & Robert Pear, *McCain Announces Opposition to Republican Health Bill, Likely Dooming It*, N.Y. TIMES (Sept. 22, 2017), <https://www.nytimes.com/2017/09/22/us/politics/mccain-graham-cassidy-health-care.html>.

46. JEFFREY TOOBIN, *THE NINE: INSIDE THE SECRET WORLD OF THE SUPREME COURT* (2008).

certainly not being acted on in any statewide effort or with money.

What you will find, or at least from my perspective, is that ideology trumps—pardon the expression—data and science. That’s something that we have to understand and frankly address because those are the realities of politics in the state of Missouri right now. When I was asked to speak today, I was asked to talk about how those with evidence can be most effective, how legislators gather information, and how this information moves forward through the process. I’m going to do my best to talk to you about the realities of your getting the data, the information, and the scientific evidence to policymakers in Jefferson City so that we can make informed decisions.

First, I want to be very realistic with you. Legislators are busy. We are pulled in many different directions, and we are expected and it is our job to know about a wide range of topics: from agriculture to education to healthcare to transportation to budget to reproductive rights to foster care to taxes to crime to pensions to the court system to labor issues and more. You heard many of those topics discussed here today, and each comes through a different committee in its own silo. Rarely, in my perception and experience, do we break out of these silos and look at those individual pieces as part of a greater whole. In Jefferson City these silos are different kinds of committees that deal with these different issues.

Getting a bill passed is generally not easy. In our last legislative session—so 2017—we filed 1,940 bills; seventy-four passed, including about fourteen budget bills. Of those seventy-four, sixty-five were signed by the Governor, eight were vetoed, and one passed without his signature. In the Senate, when you come up with a good idea for legislation, we turn it into the written word in bill form, which in and of itself can take years, frankly, to get right. But here’s what happens. Somebody is chosen or you talk to somebody or work with somebody who will file that bill, and who that person is matters. Right now, if you said I need to get a bill passed pretty quickly and you had an option to go to a Republican or Democrat, I would recommend that you go to a Republican, because Republicans have more of

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the power in Jefferson City to move a bill forward. The bill gets assigned to a committee, and which committee it goes to matters, and who chairs that committee matters. The chair schedules a hearing for your bill or the chair decides not to. The chair schedules a vote sometime after the hearing or the chair decides not to. The chair moves the bill to the floor or the President Pro Tem of the Senate decides that he does not want that bill moved to the floor. The bill does move to the floor and gets added to the calendar and then it may be heard on the floor and voted upon. It's either passed or it's not. If it is passed, it goes to the House for a similar process. Now you can see why there are so many obstacles, so many ways for your bill to get defeated. You must be persistent and you must be understanding; you must build alliances and relationships and you must make connections with people in the legislature.

I suggest always that you figure out your natural allies. If you were to say to me that, especially in low-income areas, early childhood education is something that's really important, that is, kids need access to education through a quality preschool, I would say to you, first of all, I agree. More importantly, here are some of your allies. The Missouri Chamber of Commerce believes in early childhood education. Why? It wants a strong work force to support the businesses that it is representing, so bring it in as an ally. Make sure that these people understand what your legislation does, and make sure that they are going to testify in support of it. Sometimes you may want to hire a well-respected lobbyist. Washington University has a lobbyist who works in Jefferson City. He happens to be one of my favorites and he is very well respected on the other side of the aisle. Why? Because he's a person who pays attention to the details, who understands and can explain the bills and positions that he is supporting in Jefferson City.

Get to know the legislators. Anticipate the problems that your bill is going to create in some people's minds or in reality and address them. Make no assumptions about whether we will understand what you're talking to us about—even if you come into our offices and sit down with us for fifteen minutes. Even if

you come to a committee and you give brilliant testimony, sometimes we get pulled out and sometimes our minds are wandering. You must assume that that's going to happen and that, frankly, I need to hear you talk about your idea and your bill more than once.

The most effective way to figure out how I learn best about what you're trying to put in front of me, in my view, is to ask me. I will tell you exactly how you can get your information to me well. I like succinct, understandable, one-page bullet points with the background information that I ask you for later. But get it to me in a form, first of all, that helps me get at the key points, the topic sentences of each of the paragraphs that you might write. Getting those topic sentences gives me the opportunity to look at the back pages to see the details of how you've arrived at that conclusion. And it allows me to take that information to the floor, hopefully, when the time comes and to talk about what you have taught me about why your bill is important to pass. Always, feel comfortable asking legislators how they best learn, because I can tell you that the person across the hall from me may have a totally different perspective on how he (in most cases "he") wants to receive the information that you're going to provide.

If you can get to know legislators before you need to ask them to do something for you, that's really helpful. You need to be nimble and flexible with your bill and with your information. You need to have reasonable expectations. Bills often take several years to make it through the process. When I say be nimble and flexible, someone will bring up something that will change your bill and you must be able to decide whether it is more important to get this bill passed in its pure form or whether that would mean letting the perfect be the enemy of the good. What do you need and what do you stand for at the end of the day? Where are your lines of compromise?

I just have one more thing I want to mention in this conference about the brain. A lot of people have been talking about what the President of the United States has been saying to our sports

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players and calling them out for taking a knee and maybe not being patriotic.⁴⁷ I heard something else in those discussions that troubled me greatly. According to our President, who was the former owner of the New Jersey Generals, the National Football League's referees and league officials are ruining the game by telling people not to hit other people too hard and not to bang them in the head and create concussions that down the road will change a person's life. Our President, instead, is calling for harder hits: "Let's not ruin the game."⁴⁸ This is the environment in which I am working and in which all of us are working, so I think we must pay attention to that, and we must take a stand and determine our own best ways forward.

Deanna Barch:

At this point in time I would like to open it up for questions from the audience.

Joan Luby:⁴⁹

I'm a child psychiatrist involved in research with my collaborator Deanna Barch on the effect of poverty on brain development.⁵⁰ This conference has underscored that there's a certain way in which the evidence base is already clear and

47. President Donald Trump used social media (Twitter) to criticize professional athletes such as Colin Kaepernick and others in the National Football League who knelt during the National Anthem to protest racial and social injustice. See e.g., Ken Belson, *Fueled by Trump's Tweets, Anthem Protests Grow to a Nationwide Rebuke*, N.Y. TIMES, (Sept. 25, 2017), <https://www.nytimes.com/2017/09/24/sports/trump-national-anthem-nfl.html>.

48. See, e.g., Marissa Payne, *Congresswoman: Trump Endangering NFL Players with 'Reckless' Comments about Safety*, WASH. POST (Sept. 26, 2017), https://www.washingtonpost.com/news/early-lead/wp/2017/09/26/congresswoman-trump-endangering-nfl-players-with-reckless-comments-about-safety/?utm_term=.0584922a96fa.

49. Joan Luby, MD, is the Samuel and Mae S. Ludwig Professor of Child Psychiatry and Director, Early Emotional Development Program at Washington University School of Medicine in St. Louis.

50. See e.g., Deanna Barch, David Pagliaccio et al., *Effect of Hippocampal and Amygdala Connectivity on the Relationship Between Preschool Poverty and School-Age Depression*. 173 AM. J. PSYCHIATRY 625 (2016).

sufficient to influence public policy. As we have heard, there is a very complicated trajectory from facts to public policy, and the question is how we make the public care about these matters. I recently attended a conference in Italy about poverty and neuroscience, and the presentations included findings about how to enhance the development of altruism in our society. That's another developmental target that we might need to work on—and the use of public relations—to make people care about these issues.

Jill Schupp:

Well thank you for the question, Joan. What I've noticed now, more than ever, is that more people and particularly many young people are willing to get involved in the realm of politics—stepping out and saying that they want to do something. I think it's an opportune time. How do you connect with those groups and how do you get people to understand and to say, yes, I want to get involved and to work on some of these policy issues? It's not easy, and I try to use my voice through electronic newsletters and through holding meetings in the district to get out information to people.

For example, in November, through my legislative office, I'm holding what we call the third "Care Fair," which provides free health care services for people in one of the communities in my district with lower income, so it takes place in the city of Overland.⁵¹ Last year we had 250 people come, and we provide services like free flu shots, vision screenings, and dental screenings as well as information about access to resources for when you have family members with Alzheimer's. We have people who provide trigger locks and teach you how to use them so your guns are locked up safely in your homes. Those are the kinds of things that we can get out there and do.

51. See, e.g., Kelly Moffitt, *Free-to-All Health-Care Fair in Overland Slated for this Weekend*, St. Louis on the Air, ST. LOUIS PUBLIC RADIO (Oct. 4, 2016), <http://news.stlpublicradio.org/post/free-all-health-care-fair-overland-slated-weekend#stream/0>.

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In October, there's a lot of communication about whether the City of St. Louis should reenter the County of St. Louis and whether the ninety-two municipalities in the County should join together, so we're having a discussion on that question. I would suggest in this moment of time, when people are so energized, that you contact one or several legislators and to ask us to help you because we do have a voice and a forum to help you go before the public. If I could add together the degrees of the people in this room and the tuition dollars that it took to get them, we'd have some money! Anyway, you are not the rank-and-file members of the public; you spend your time doing good research. There are people out there who are spending time trying to make sure that they have food on the table for their kids, that their kids get to school, and that they live a decent life if they can. So sometimes those are the people whom we need to reach because you will need to bring to the legislature individual stories about how what you have learned and what you know impact real people whom we represent.

Timothy McBride:

We teach students how to write a one-page, succinct fact sheet, of the type Jill mentioned. We've learned over the years that policymakers don't want more, by any means, than four pages or two at best. One is really good.

I'll tell you a story. We went to Washington, DC when I was writing a policy briefing with one of my colleagues. He took the whole brief on Medicare or whatever and he put it into bullet points. I said you can't do that. It's bizarre. But the first thing the staff said to us was that this was the best brief they ever received, and the reason, they said, is that usually the brief is in prose, and they have to convert the prose into bullets for their boss. They said that we had already done it. That was a really important lesson.

Second lesson, just to pitch our Center for Health Economics

and Policy here at Wash U:⁵² If you have a policy finding you want to convert into a policy brief, we will help you. We've done that with several of the researchers here and we will put it up on our website and we'll disseminate it for you.

Susan Block:

I want to add something too. Some of this comes from getting older and some comes from life experience: Every state senator, every state representative, the Governor, they all want to be reelected. This service is what they have chosen for their calling. Sometimes it's really important to find somebody within their constituency who cares or has a need for something, that one person with that one child or that grandparent who will help make a case for their grandchildren. I was at a meeting of Promo,⁵³ which is a LGBT advocacy organization, and the young lobbyist told a story about how she connected with an openly gay Republican representative from St. Charles (typically a very conservative area). She brought him constituents from St. Charles. He is now sponsoring the MONA bill that would protect LGBT persons from discrimination.⁵⁴ I think we must put our biases aside and do what Senator Schupp says. Go to somebody and say, this is what I would like you to do. What do you need from me to help you get that done?

Deanna Barch:

Here is a written question from the audience: What are your thoughts about a universal basic income and how it would affect

52. For information about this Center, see CTR. FOR HEALTH ECON. AND POL'Y, <https://publichealth.wustl.edu/centers/health-economics/> (last visited May 27, 2018).

53. For information about PROMO Missouri, see PROMOONLINE.ORG, <https://promoonline.org/> (last visited May 27, 2018).

54. MONA stands for the proposed Missouri Nondiscrimination Act, which would amend the Missouri Human Rights Act to cover sexual orientation and gender identity. See Katie Stuckenschneider, *The Missouri Nondiscrimination Act Is Introduced in the House & Senate for the 19th Year in a Row*, PROMOONLINE.ORG (Feb. 9, 2017), <https://promoonline.org/news/the-missouri-nondiscrimination-act-is-introduced-in-the-house-senate-for-the-19th-year-in-a-row/>.

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families and brain development? Thoughts from the panel or any of the other speakers?

Timothy McBride:

Speaking for economists, we've thought long about the issue of universal basic income.⁵⁵ I'm old enough to have talked about it in graduate school over thirty years ago, and it was discussed in the 1960s and 1970s. Actually, Milton Friedman, conservative libertarian economist, was one of those who first put this idea forward. Remember to mention these roots when this topic comes up, because one aspect we liked about the universal basic income is that, by lifting people above the poverty line, we could sweep out many of the difficult programs that people must navigate, with the multiple forms required to be part of the housing program, the food program, and the Medicaid program. These programs don't talk to each other. Many people do not realize that recipients of benefits from multiple public assistance programs (for example, TANF,⁵⁶ housing, SNAP,⁵⁷ and so on) will have their benefits from each reduced with every dollar of wages earned. Because of the very high cumulative benefit reduction rate across these different programs, the poor pay a higher tax rate by going to work than I do.

We're very much in favor of the universal basic income. With the increasing inequality that we're facing right now, it's getting discussed more than I ever would have thought. Frankly, it's

55. See Noah J. Gordon, *The Conservative Case for a Guaranteed Basic Income*, THE ATLANTIC (Aug. 6, 2016), <https://www.theatlantic.com/politics/archive/2014/08/why-arent-reformicons-pushing-a-guaranteed-basic-income/375600/>.

56. TANF, or Temporary Assistance for Needy Families, is a federal program aimed to help families achieve self-sufficiency, through dollars provided to states in the form of block grants. See OFFICE OF FAMILY ASSISTANCE, U.S. DEP'T OF HEALTH & HUMAN SERVICES, <https://www.acf.hhs.gov/ofa/programs/tanf> (last visited May 27, 2018).

57. The federal program SNAP, or the Supplemental Nutrition Assistance Program, offers nutrition assistance to low-income individuals and families. See SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM (SNAP), U.S. DEP'T OF AGRICULTURE, <https://www.fns.usda.gov/snap/supplemental-nutrition-assistance-program-snap> (last visited May 27, 2018).

something we should consider, and I think it really could help the people we've been talking about today.

Pat Levitt:

There currently is an NIH-funded study by Greg Duncan and Nathan Fox, a pair of economists—they're actually providing cash in a randomized clinical trial to test the effects of an arrangement like the universal basic income.

I have a comment. First, personal stories sometimes sound great, but I have found a great forum in working with the NCSL, the National Conference of State Legislatures,⁵⁸ which is very effective in partnering scientists, economists, and others with state legislators to talk about a lot of the issues that we've talked about today. I agree with you that the chamber of commerce and business leaders have made enormous differences in facilitating policy changes in states because the bottom line is that economics talks. And all the other stuff that we discuss in terms of brain sciences is window dressing to some extent, but they like what we have to say.

I also have a question, which relates to training the workforces that deal with young children, infants, pregnant women, early daycare programs, and the like. How have you been thinking about creating a workforce that actually understands and acknowledges what we have discussed today in terms of brain and child development, foundational information that every lawyer should have—particularly those who are working in the areas addressed by family courts? How do we ensure that they understand the basics of child development (which I would suggest now is minimal)?

Nurses, pediatricians, and physicians learn very little about the social origins of disease in their medical educations. I don't know if the Brown School of Social Work here has a part of the curriculum devoted to teaching about the basics of fundamental neuroscience principles. Certainly, they don't have the detail that a

58. NAT'L CONF. OF ST. LEGISLATURES, <http://www.ncsl.org/> (last visited May 14, 2018).

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neuroscientist would learn. Law school raises the same question: Why don't we have this information incorporated into the curricula in the various professional schools so that their graduates, who are working with families, can understand these basic concepts?

Katie Plax:

Many of my colleagues and I here at Washington University are deeply invested in training pediatricians. I've been very involved in the Community Pediatrics Training Initiative,⁵⁹ a national effort to engage both faculty and pediatric residents in better understanding the social determinants of health, largely through projects in which they have a community-based organization partner. We specifically are trying to address toxic stress. Once pediatricians understand toxic stress, then they see it everywhere. It speaks to them in a way that they really embrace. We've seen just incredible uptake actually, an incredible interest in pediatrics. There are about 200 pediatric residency training programs in the country, and over the last five years we've reached nearly half of them, including many big ones. I think that this is really important work in pediatrics. I hear you, though. I think there's much work to be done and lots of skills to be developed around what such collaboration really means and how to develop a path to collaboration.

Early on, information sharing characterizes such efforts, whereas true collaboration requires shared decision-making. There's much work to be done on how to collaborate in earnest to make a difference for kids by respecting and valuing the perspectives of those professionals outside of medicine and maybe also those non-professionals. To Mary McKay's⁶⁰ point, the

59. "The Community Pediatrics Training Initiative (CPTI) is a national program of the AAP [American Academy of Pediatrics] that aims to improve child health by strengthening community health and advocacy training in pediatric residency programs." See COMMUNITY PEDIATRICS TRAINING INITIATIVE, AMERICAN ACADEMY OF PEDIATRICS, <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/CPTI/Pages/default.aspx> (last visited May 27, 2018).

60. Mary M. McKay & Mary Acri, *A Conversation on Building Resilience and Protecting*

parents have a lot to say about how to make these partnerships work. I think we're in a process to try and figure out how to improve collaborations, but we're not there yet.

Pat Levitt:

My suggestion about the workforce includes educators, teachers, and childcare workers. About 80% of the child care workers in California come out of the community colleges. They're starting to enrich the curricula there and, ultimately, these reforms are going to change the way we value the people who are working with children. The statistics are horrifying. The average wage nationally, 2015 national statistics for child care workers, is \$10.72 an hour. If you're a funeral attendant, your average hourly wage for moving the bodies around is \$12.42 an hour. If you go to certain states it's unbelievably bad, which says something about the value that we're placing on the people who spend most of the time with our young children.

Bradley Schlaggar:

I will plug a very interesting and effective local program called Ready Readers, which is a volunteer-driven organization that's celebrating its 20th year now.⁶¹ Volunteers go into low SES preschools at least once a week and read to the children in that preschool; then, at the end of that reading session the children get to choose their favorite book from that session to take home and, as a consequence, they build a library at home. There are over 500—I think it's getting close to 700 volunteers—in the St. Louis region who are participating in this program. There's some outcome work that's demonstrating improved literacy of the graduates of this program.

But an incidental effect of the program is modeling the dyadic

Children: An Evidence-based Family Strengthening Approach, 57 WASH. U. J.L. & POL'Y 133 (2018).

61. See *Kids Who Read Succeed*, READY READERS, <http://www.readyreaders.org/> (last visited May 27, 2018).

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reading experience to the preschool teachers, who for the most part prior to that intervention were not incorporating reading to children as part of the classroom experience. I don't know, I can't argue that that aspect is doing what you're really asking about, but I hope it is. I hope it's part of an acculturation of the importance of reading, that shared experience of reading. I'm also hoping that something similar is happening at home although we don't know exactly that outcome yet.

I became involved because I happen to study reading development. But really, in my thinking, literacy is a healthcare issue. For parents to be able to advocate for their children, in this world, they must have literacy, and for the children to grow up and take care of themselves, they must have literacy as well. I think it's a highly motivating argument to support this reading program. But it's also a way to address what you're urging, which is to get the front line more in tune with an evidence-based approach to reading development.

Deanna Barch:

Following up on that, one of the questions/comments from the audience was about Parents As Teachers,⁶² which is another organization in St. Louis that will work with parents to teach them some of that “serve and return” and ways to work effectively with children.

Let me raise another question from the audience: There is growing evidence that kids in the U.S. are taking longer to do things like drive and gain independence from parents.⁶³ How do you think this cultural change might affect adolescent development and/or impact juvenile justice policies? And there

62. “Parents as Teachers National Center is an international nonprofit organization that promotes optimal early development, learning and health of young children by supporting and engaging their parents and caregivers.” *See About Parents As Teachers*, PARENTS AS TEACHERS <https://parentsasteachers.org/about/>. It was founded in Missouri in 1984. *Id.*

63. *See* Jean M. Twenge & Heejung Park, *The Decline in Adult Activities Among U.S. Adolescents, 1976–2016*, CHILD DEVELOPMENT (forthcoming 2017), <http://onlinelibrary.wiley.com/doi/10.1111/cdev.12930/epdf>.

was a recent news article citing data that kids are driving later, doing drugs later, having sex later,⁶⁴ and I thought all those were good things. But actually, the perspective in the article was that this reflected a kind of immature development.

Susan Block:

I would take issue with that. I think those kids aren't getting their licenses because they don't have cars. There's a price to pay for that. I do think they are having sex, and not later, because I see young pregnant girls in the juvenile court. I do think that, in terms of sexual abuse (and again, I'm dealing with the skew), I have represented kids as young as ten who have had deviant sexual intercourse with their cousins or their younger brothers.

Elizabeth Scott:⁶⁵

As I understood, from the news article and the issue on the table today, brain science shows us that adolescence or that maturation of the brain's executive function continues into the 20s, into young adulthood, and so one response to that evidence has been to say that we should treat young adults as juveniles. My colleague Larry Steinberg⁶⁶ and I and Richard Bonnie,⁶⁷ who was the author of an NRC report on young adults,⁶⁸ wrote something last year basically taking the position that Brad is taking, namely that the evidence at this point is pretty thin as to how much young

64. See Tara Bahrapour, *Not Drinking or Driving, Teens Increasingly Put Off Traditional Markers of Adulthood*, WASH. POST (Sept. 19, 2017), https://www.washingtonpost.com/local/social-issues/never-drinking-nor-driving-more-teens-are-putting-off-traditional-markers-of-adulthood/2017/09/18/b46027a0-93f1-11e78754d478688d23b4_story.html?utm_term=.b37c755a68f7.

65. Scott et al., *supra* note 36.

66. Laurence Steinberg, Ph.D., is the Distinguished University Professor and Laura H. Carnell Professor of Psychology at Temple University.

67. Richard J. Bonnie is Harrison Foundation Professor of Law and Medicine, Professor of Public Policy, Professor of Psychiatry and Neurobehavioral Sciences, and Director of the Institute of Law, Psychiatry and Public Policy at the University of Virginia.

68. NATIONAL RESEARCH COUNCIL, NAT'L ACADS. REFORMING JUVENILE JUSTICE: A DEVELOPMENTAL APPROACH (Richard J. Bonnie et al. eds., 2013).

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adults are like juveniles.⁶⁹ But young adults clearly are engaged in a lot of risk-taking. Anyone who hangs around a university campus knows that young adults eighteen to twenty-one are not fully mature individuals. At least that's my impression. From that evidence, at least some advocates want to leap on this brain science research and expand the age of juvenile court jurisdiction to age twenty-one or beyond. The news article was considering alternative responses that take into account that young adults aren't fully mature and that respond to their crimes in a way that keeps their options open to become mature adults. Still, that isn't saying young adults are just like kids and therefore they should be in the juvenile justice system because we don't have the evidence to say that young adults are just like kids.

But having said that, I still want to defend the Supreme Court's use of brain science research. I'll just say one thing about that issue: What the Court did and what this fascination with adolescent brain science has done in juvenile justice policy is to shift the focus from the crime to the offender. That is, here's a category of offenders who really are not the same as adults, and the system should respond to them differently from adults—even acknowledging that there's a lot of variation and that not all juveniles are immature. I don't think Justice Kennedy actually said that children don't have a prefrontal cortex.

Bradley Schlaggar:

I don't think he said that either. The way the message was distilled and presented is quite another matter. I'm sympathetic to the position, but I think it's important to clarify and push back. Pat brought up the Go/No-Go task or, for example, an anti-saccade task,⁷⁰ where subjects are asked to prevent themselves from doing

69. Elizabeth S. Scott, Richard J. Bonnie, & Laurence Steinberg, *Young Adulthood as a Transitional Legal Category: Science, Social Change, and Justice Policy*, 85 *FORDHAM L. REV.* 641 (2016).

70. See Levitt & Eagleston, *supra* note 8, at 87. A Go/No-Go task in a scientific study is aimed to measure impulse control, for example, by observing whether research participants are able to press a button under certain conditions and avoid pressing that same button under other conditions. In an anti-

a reflexive response. We can use those sorts of tests to demonstrate that an adolescent is more impulsive, say, than an adult, but does anybody think that the ability to suppress a reflexive eye gaze movement is an index for committing a capital crime or the likelihood of doing so? So that's another one of the bridge-too-far arguments. It's taking a physiological measure that's highly reproducible in the lab and calling it "impulse control" and then taking "impulse control"—that same appellation—and applying it to a capital crime and saying ipso facto, anti-saccade produces this kind of behavior. I'm really worried about the willingness of the neuroscientists' side to allow concepts to bleed over in this way.

Pat Levitt:

The problem, Brad, is that most of you all who go out as neuroscientists and talk to policy makers and others present information. The point of the neuroscience is to point out what is and what exists, and what exists is a lot of evidence that there are measurable components in an adolescent brain. This evidence says that adolescents are neither old children nor young adults—that there are differences and there are things going on that create instability because things are changing. That's not saying such instability is bad; it's just saying that it's different. Maybe that could challenge our thinking that they must go into one bin or another, if there's no constitutional law that says they must be categorized as either an older child or a young adult. Could we do that?

There are components based on the neuroscience and on other factors that say there are some differences. This is not just a gradual sort of maturation process. Some things gradually mature, but other components of what we measure don't. There is some

saccade task, participants are asked to avoid the reflexive behavior of looking at a visual signal in their peripheral vision. The ability to suppress this reflex is thought to be a measure of mature function of the frontal lobes of the brain. See, e.g., Douglas P. Munoz & Stefan Everling, *Look Away: The Anti-Saccade Task and the Voluntary Control of Eye Movement*, 5 NATURE REV. NEUROSCIENCE 218 (2004).

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uniqueness about adolescence, which means that we now must be much more thoughtful in determining judgments that follow from an adolescent's actions.

I don't have an answer to how to do that. I just think that the evidence belies efforts to be categorical. Categories in general don't work very well. What's useful is understanding the nature and the character of the individual.

Bradley Schlaggar:

I agree. The end product is getting to the individual, and if you use the information to help frame how to think about getting to the individual, then that's an excellent use of the information. Our job is to make sure, as you pointed out earlier in your comments, that we communicate it effectively and to not allow the information to be misapplied by making it sound as if there are distinct categories or sharp boundaries that don't really exist.

Joan Luby:

I just can't help but add to this discussion that I think this is where we use the neuroscience as if it is the king. But we could look at maturation of moral development. That applies a lot more to the commission of crimes, so we have to keep the neuroscience tied to the actual phenomenological behaviors and emotions.

Deanna Barch:

I want to take a prerogative for a minute of thanking so heartfelt-fully all the very different speakers today. I will admit that I found myself at times very moved and frustrated today—frustrated because I heard all this wonderful science about what we can do to improve the health and welfare of our children. Yet, we don't always see these actually instantiated in policy. We have a lot of work to do. We've heard good suggestions about how to try to translate findings from neuroscience studies into policy.

Our vision for this conference was to start conversations about

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how to make these translations and how to move forward, through an even stronger initiative at Washington University. The Brown School is already making great strides in this regard. But there are many other people here who have science, who have data, and who want to help advocate for policies that we think will be good for children and families. Hopefully, this is just the very beginning of these conversations on how to move forward. We hope this has been an energizing call-to-arms day. We hope to keep interacting going forward.