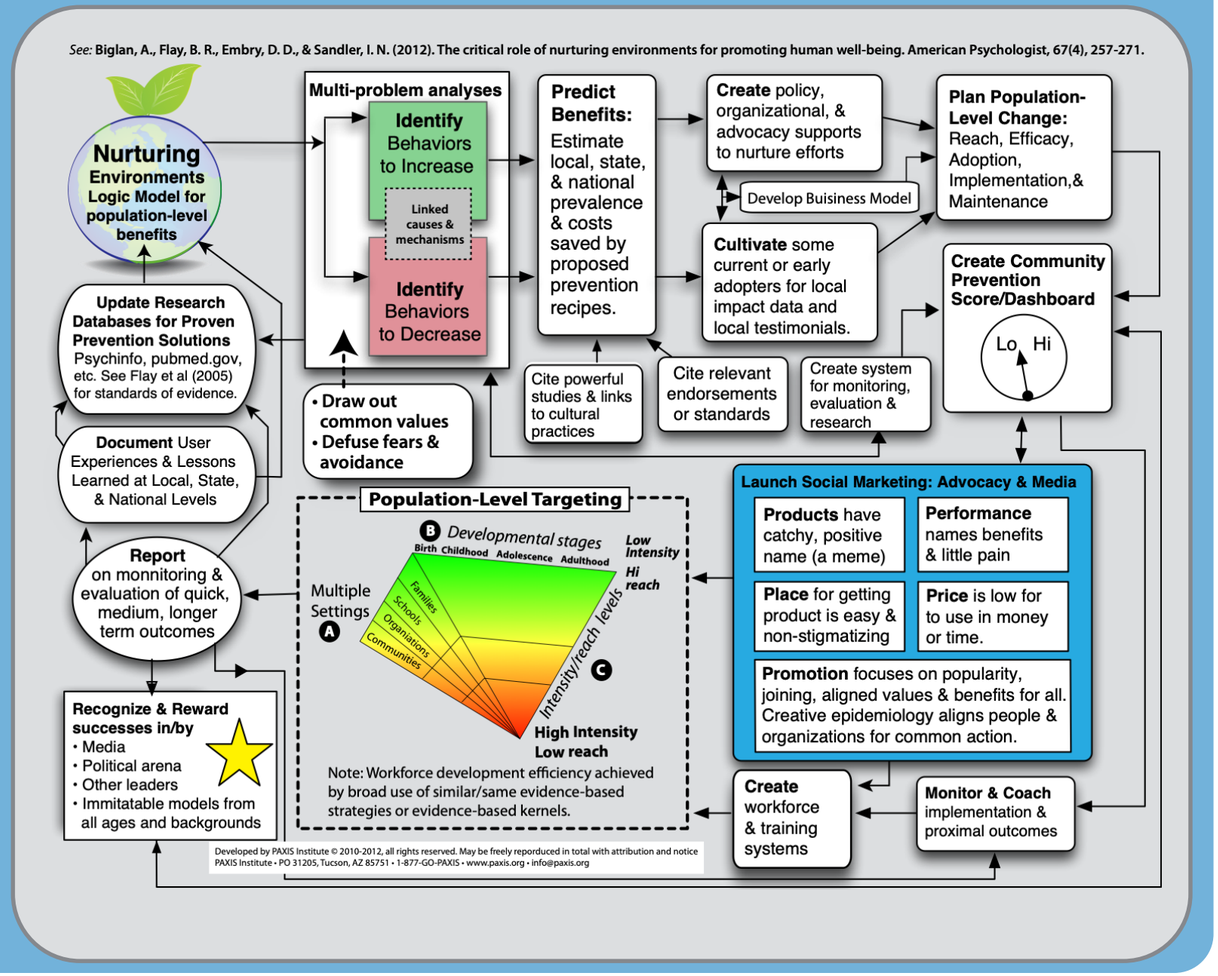
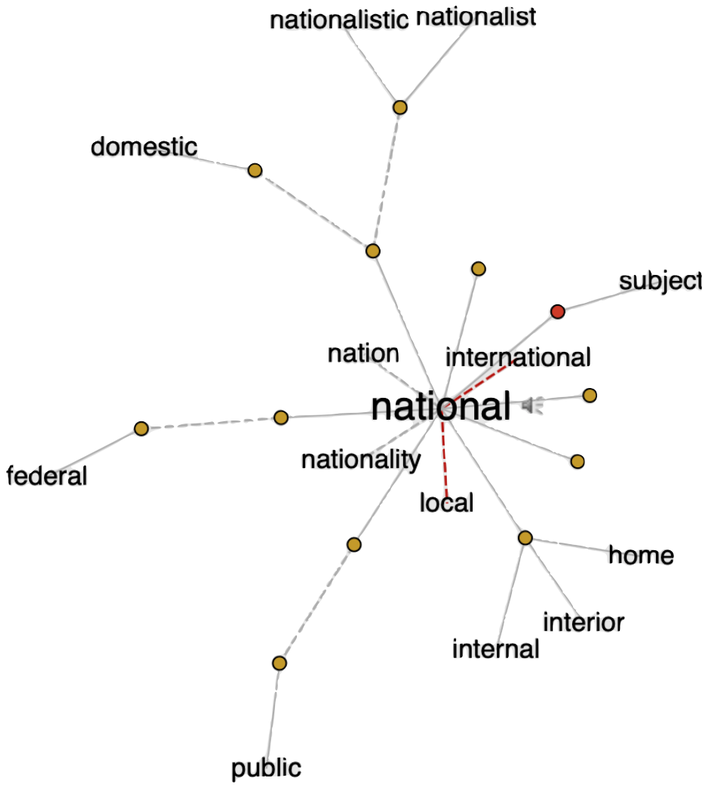
Initiating Population-Level Prevention with:

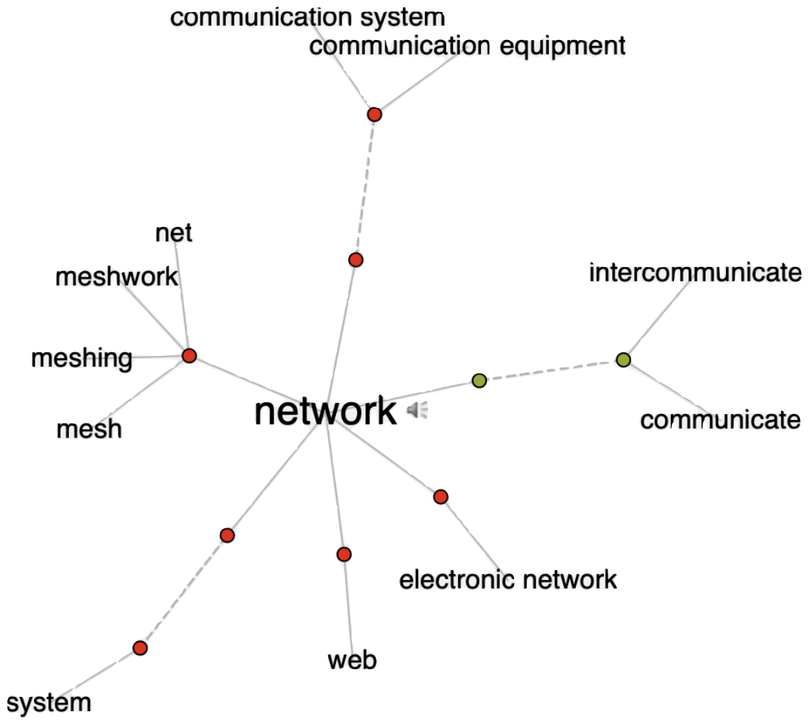
pax Good Behavior Game



Dennis D. Embry, Ph.D., president/senior scientist • dde@paxis.org

PAXIS Institute • Tucson, AZ • www.goodbehaviorgame.org





National Prevention Network

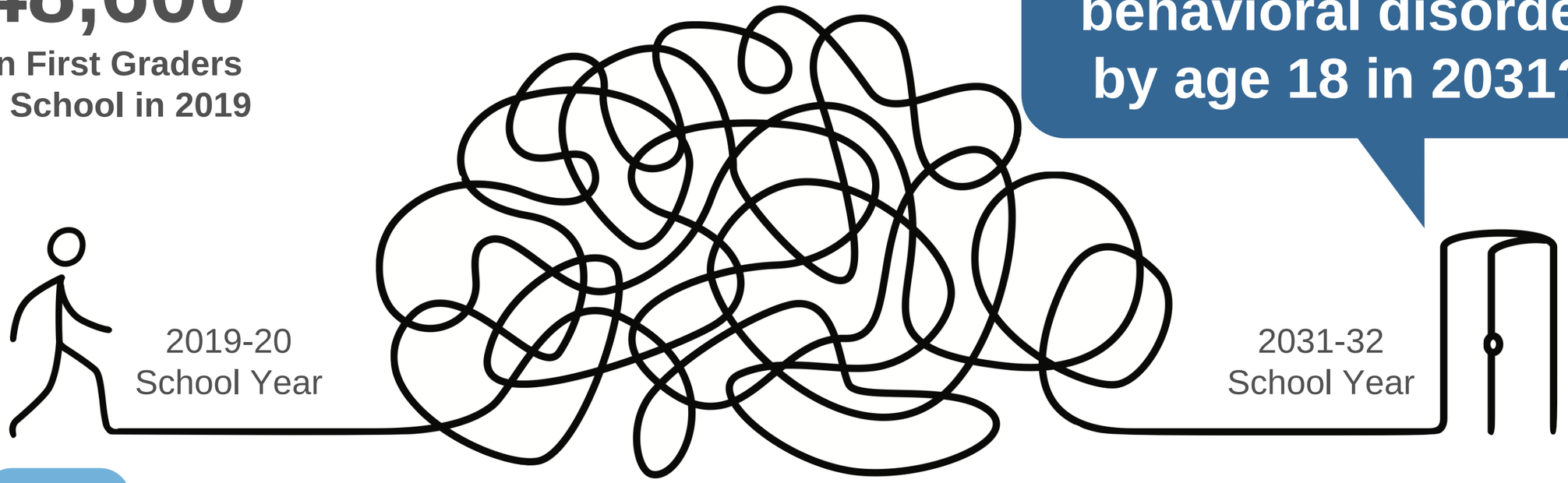
Purpose & Conflict of Interest Statement

- The Good Behavior Game® and the PAX Good Behavior Game® are registered trademarks of PAXIS Institute, incorporated in 1998. PAXIS Institute is wholly owned by Dennis D. Embry;
- PAXIS Institute requires that all findings—good, indifferent, and especial negative results—be reported to improve the well-being of children;
- PAXIS Institute was founded to prove that doing measurable good for children, families and communities ought to be the purpose prevention science;
- No organism nor organization can survive and thrive without “profit” from effort;
- If doing evil is more “profitable” than doing good, then evil prevails; and
- If measurable good is widely spread across people and places, then we better the world and better ourselves now and in the future.

4,048,600

American First Graders Entering School in 2019

What % will have a mental, emotional, or behavioral disorder by age 18 in 2031?



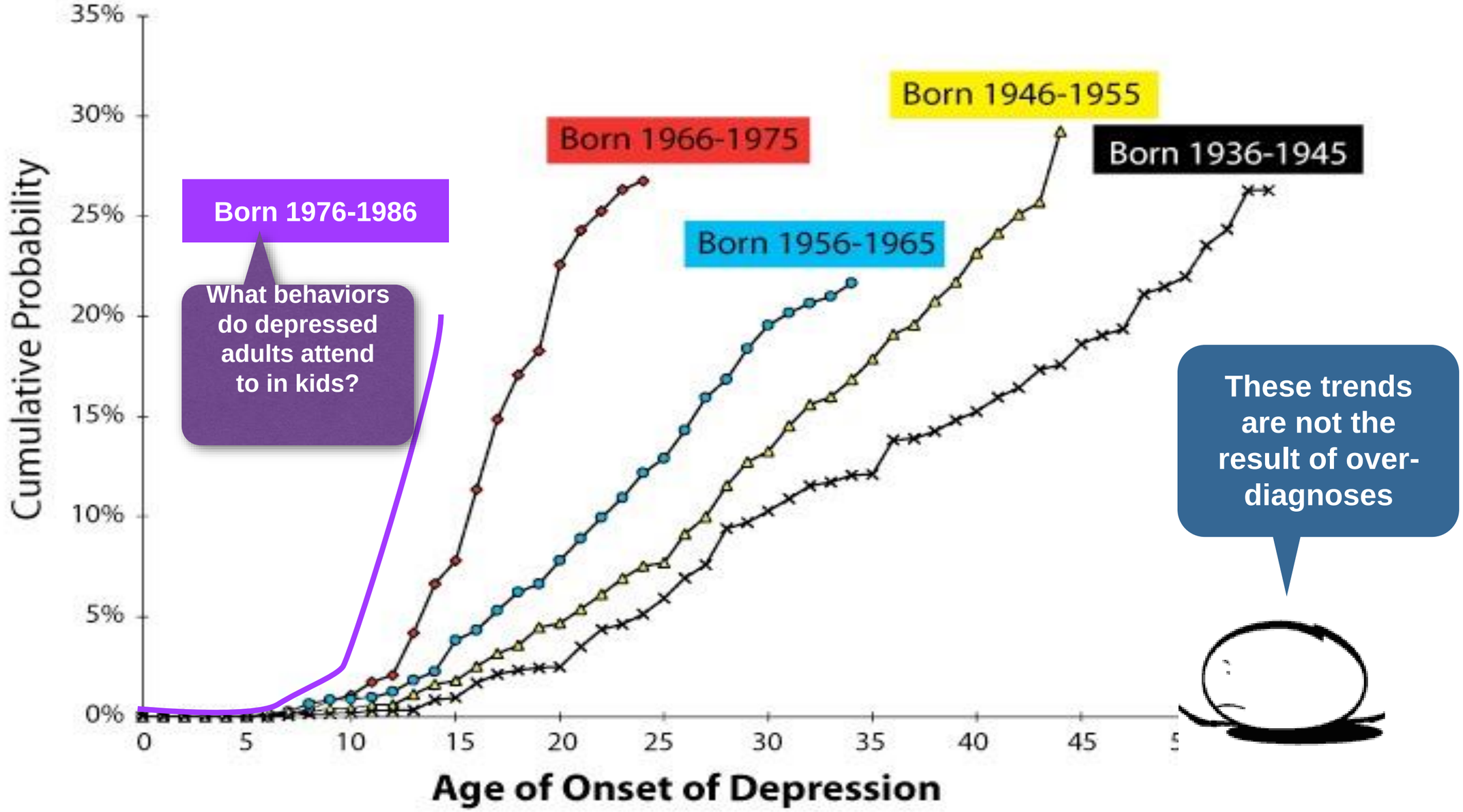
4

Ages 6-7

age 18

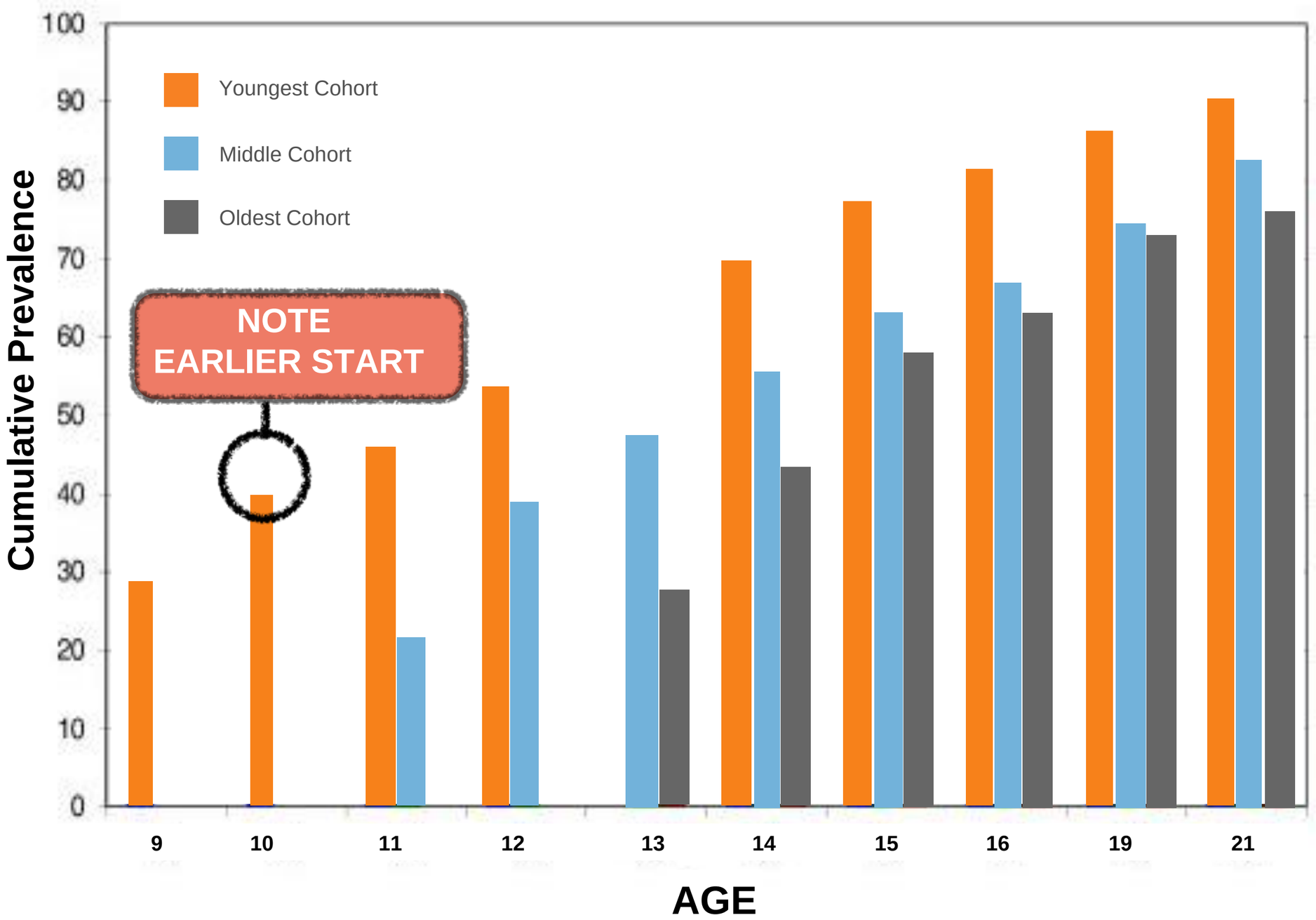
> 50%

How will this affect your state, territory, or community safety, health, and economy?



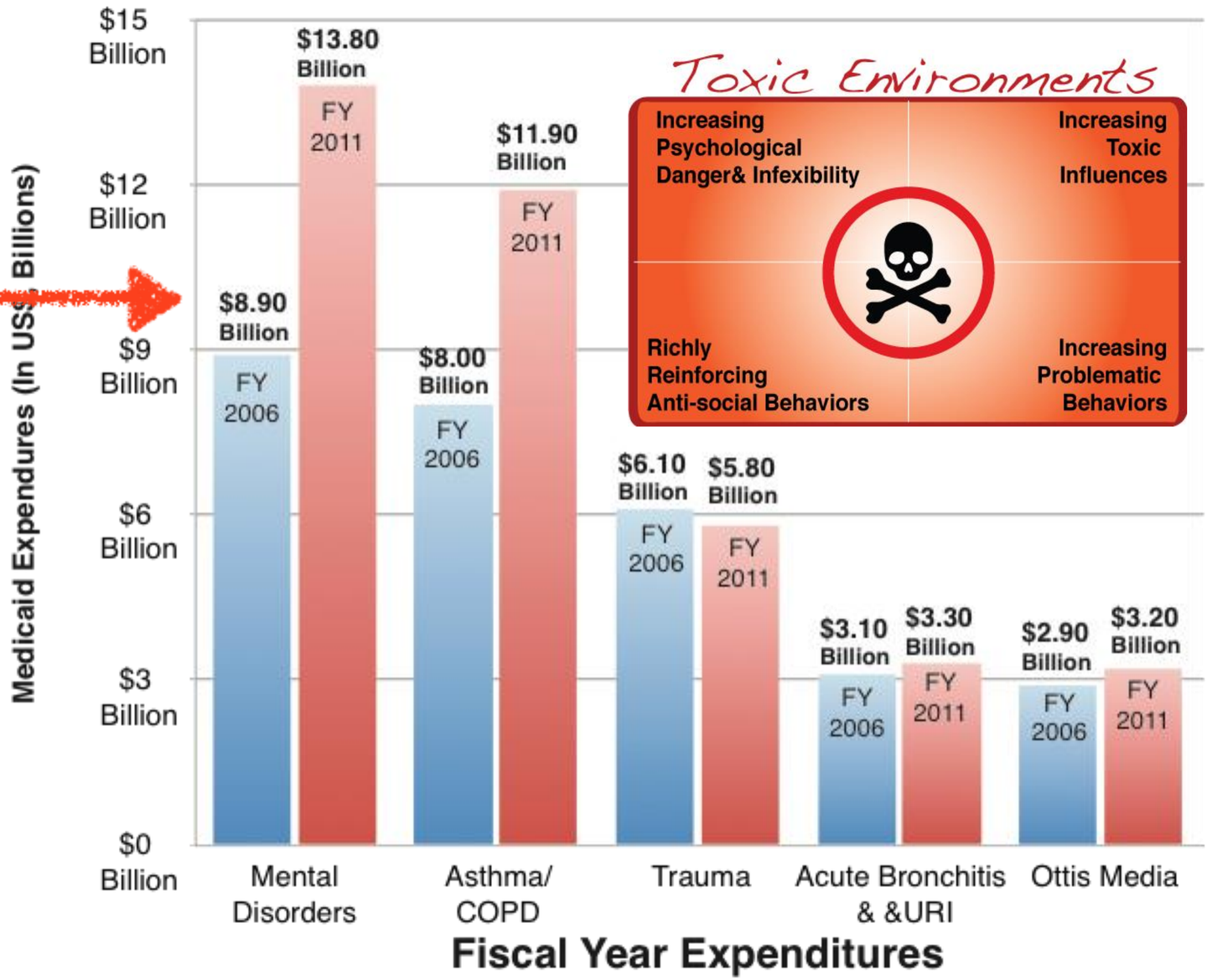
Use Hashtag: **#SaveAllKids**

Cumulative prevalence of psychiatric disorders by young adulthood: a prospective cohort analysis from the Great Smoky Mountains Study.



The cost of Mental Disorders is increasing $1 billion per year

Medicaid Expenditures for the Five Most Costly Conditions in Children



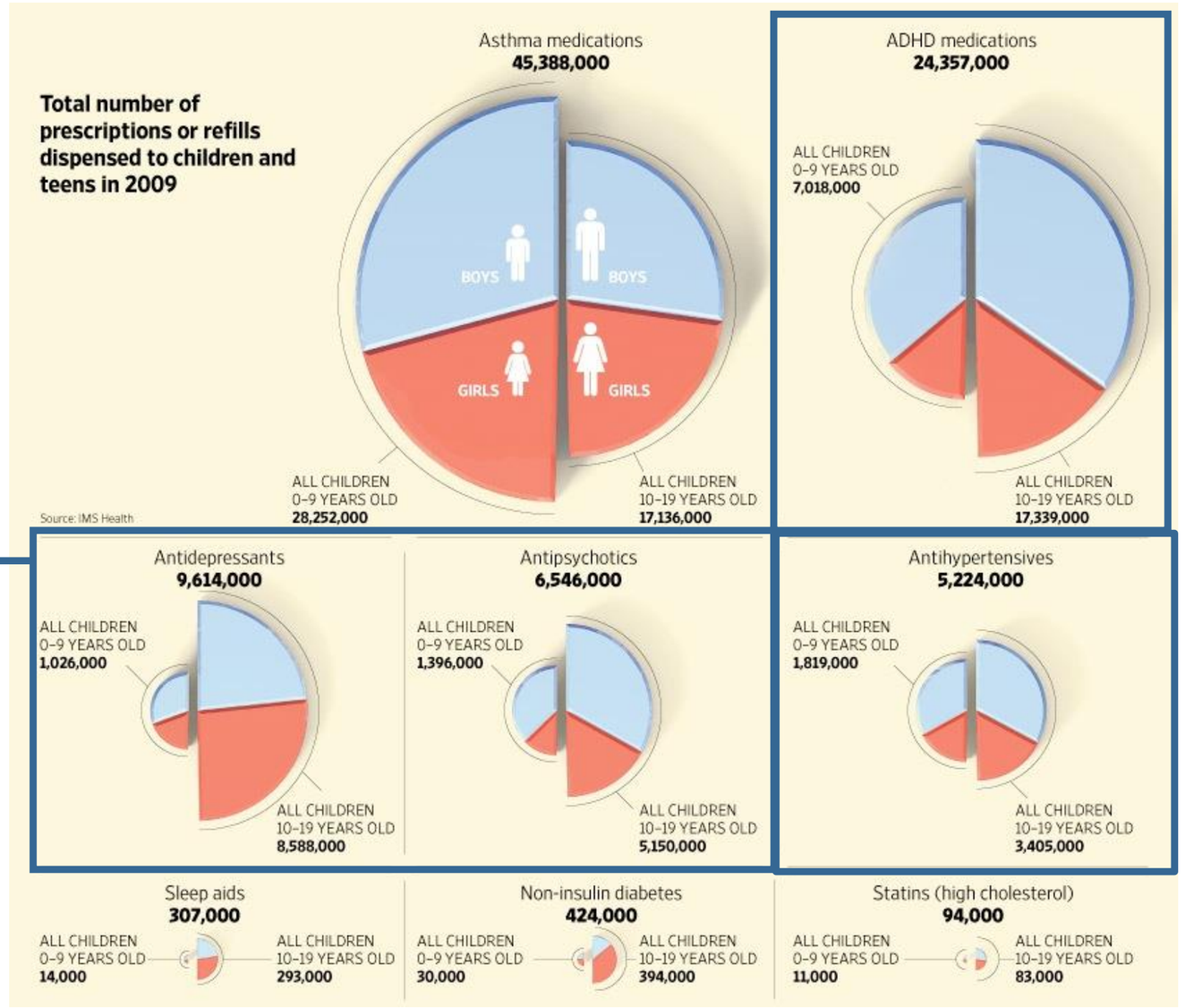
Source: Center for Financing, Access, and Cost Trends, Agency for HealthCare Research and Quality, 2006, 2011

The US had 75 million children and teens 2009

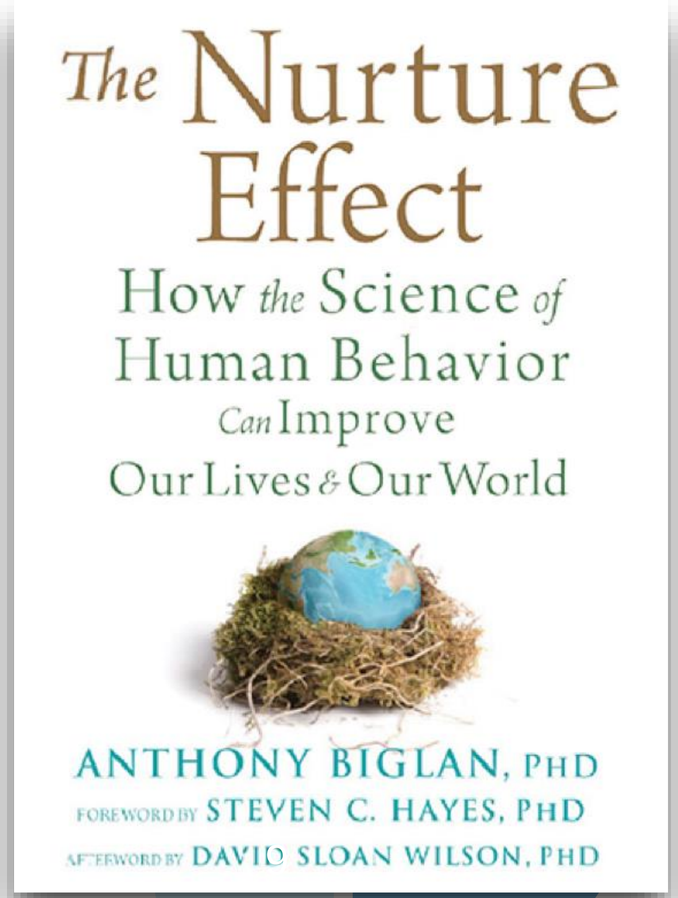
45.6 million kids had *one* psychotropic med in 2009

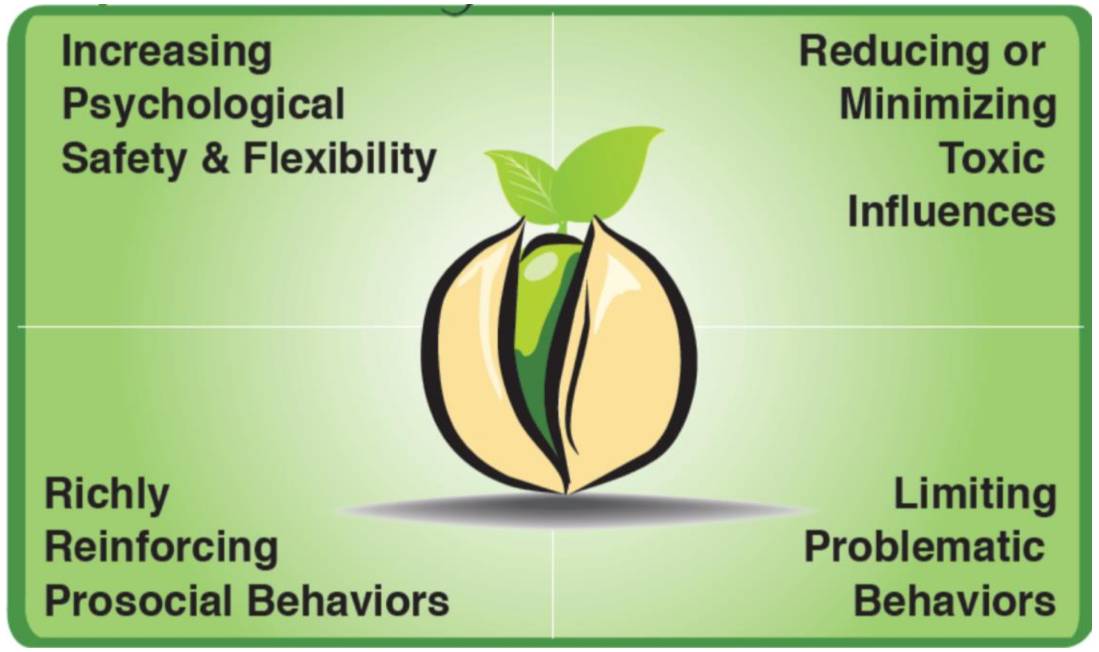
60.8%

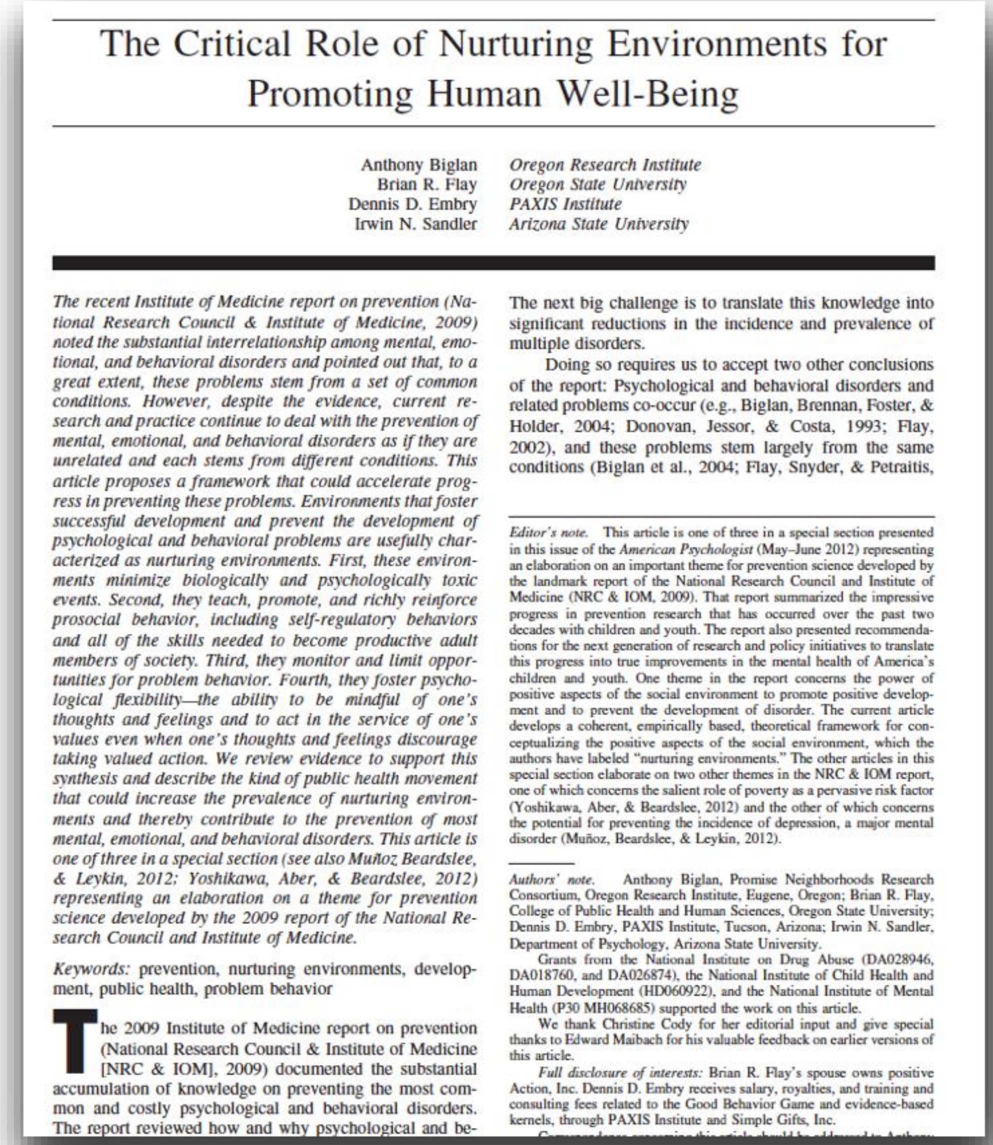
Wall Street Journal, 12-28-2010



PAX helps (school staff, parents and students - Create Nurturing Environments avoid Toxic Environments







The Critical Role of Nurturing Environments for Promoting Human Well-Being

Anthony Biglan — *Oregon Research Institute*
Brian R. Flay — *Oregon State University*
Dennis D. Embry — *PAXIS Institute*
Irwin N. Sandler — *Arizona State University*

The recent Institute of Medicine report on prevention (National Research Council & Institute of Medicine, 2009) noted the substantial interrelationship among mental, emotional, and behavioral disorders and pointed out that, to a great extent, these problems stem from a set of common conditions. However, despite the evidence, current research and practice continue to deal with the prevention of mental, emotional, and behavioral disorders as if they are unrelated and each stems from different conditions. This article proposes a framework that could accelerate progress in preventing these problems. Environments that foster successful development and prevent the development of psychological and behavioral problems are usefully characterized as nurturing environments. First, these environments minimize biologically and psychologically toxic events. Second, they teach, promote, and richly reinforce prosocial behavior, including self-regulatory behaviors and all of the skills needed to become productive adult members of society. Third, they monitor and limit opportunities for problem behavior. Fourth, they foster psychological flexibility—the ability to be mindful of one's thoughts and feelings and to act in the service of one's values even when one's thoughts and feelings discourage taking valued action. We review evidence to support this synthesis and describe the kind of public health movement that could increase the prevalence of nurturing environments and thereby contribute to the prevention of most mental, emotional, and behavioral disorders. This article is one of three in a special section (see also Muñoz Beardslee, & Leykin, 2012; Yoshikawa, Aber, & Beardslee, 2012) representing an elaboration on a theme for prevention science developed by the 2009 report of the National Research Council and Institute of Medicine.

Keywords: prevention, nurturing environments, development, public health, problem behavior

The 2009 Institute of Medicine report on prevention (National Research Council & Institute of Medicine [NRC & IOM], 2009) documented the substantial accumulation of knowledge on preventing the most common and costly psychological and behavioral disorders. The report reviewed how and why psychological and be-

The next big challenge is to translate this knowledge into significant reductions in the incidence and prevalence of multiple disorders.

Doing so requires us to accept two other conclusions of the report: Psychological and behavioral disorders and related problems co-occur (e.g., Biglan, Brennan, Foster, & Holder, 2004; Donovan, Jessor, & Costa, 1993; Flay, 2002), and these problems stem largely from the same conditions (Biglan et al., 2004; Flay, Snyder, & Petraitis,

Editor's note. This article is one of three in a special section presented in this issue of the *American Psychologist* (May–June 2012) representing an elaboration on an important theme for prevention science developed by the landmark report of the National Research Council and Institute of Medicine (NRC & IOM, 2009). That report summarized the impressive progress in prevention research that has occurred over the past two decades with children and youth. The report also presented recommendations for the next generation of research and policy initiatives to translate this progress into true improvements in the mental health of America's children and youth. One theme in the report concerns the power of positive aspects of the social environment to promote positive development and to prevent the development of disorder. The current article develops a coherent, empirically based, theoretical framework for conceptualizing the positive aspects of the social environment, which the authors have labeled "nurturing environments." The other articles in this special section elaborate on two other themes in the NRC & IOM report, one of which concerns the salient role of poverty as a pervasive risk factor (Yoshikawa, Aber, & Beardslee, 2012) and the other of which concerns the potential for preventing the incidence of depression, a major mental disorder (Muñoz, Beardslee, & Leykin, 2012).

Authors' note. Anthony Biglan, Promise Neighborhoods Research Consortium, Oregon Research Institute, Eugene, Oregon; Brian R. Flay, College of Public Health and Human Sciences, Oregon State University; Dennis D. Embry, PAXIS Institute, Tucson, Arizona; Irwin N. Sandler, Department of Psychology, Arizona State University.

Grants from the National Institute on Drug Abuse (DA028946, DA018760, and DA026874), the National Institute of Child Health and Human Development (HD060922), and the National Institute of Mental Health (P30 MH068685) supported the work on this article.

We thank Christine Cody for her editorial input and give special thanks to Edward Maibach for his valuable feedback on earlier versions of this article.

Full disclosure of interests: Brian R. Flay's spouse owns positive Action, Inc. Dennis D. Embry receives salary, royalties, and training and consulting fees related to the Good Behavior Game and evidence-based kernels, through PAXIS Institute and Simple Gifts, Inc.

What about the

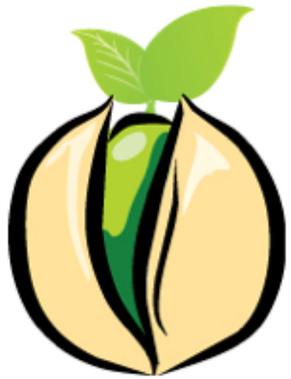
teachers?

More Strategies to Spread Self-, Co- and & Group-Regulation

Use PAX GAME 3x-5x per day

10. OK / Not Ok
9. PAX Hands-Feet
8. PAX Voices
7. Tootles
6. PAX Stix
5. Beat the Timer
4. Wacky Prizes
3. PAX Quiet
2. PAX Leader
1. PAX Vision

All Evidence Based Kernels Well Taught & Learned

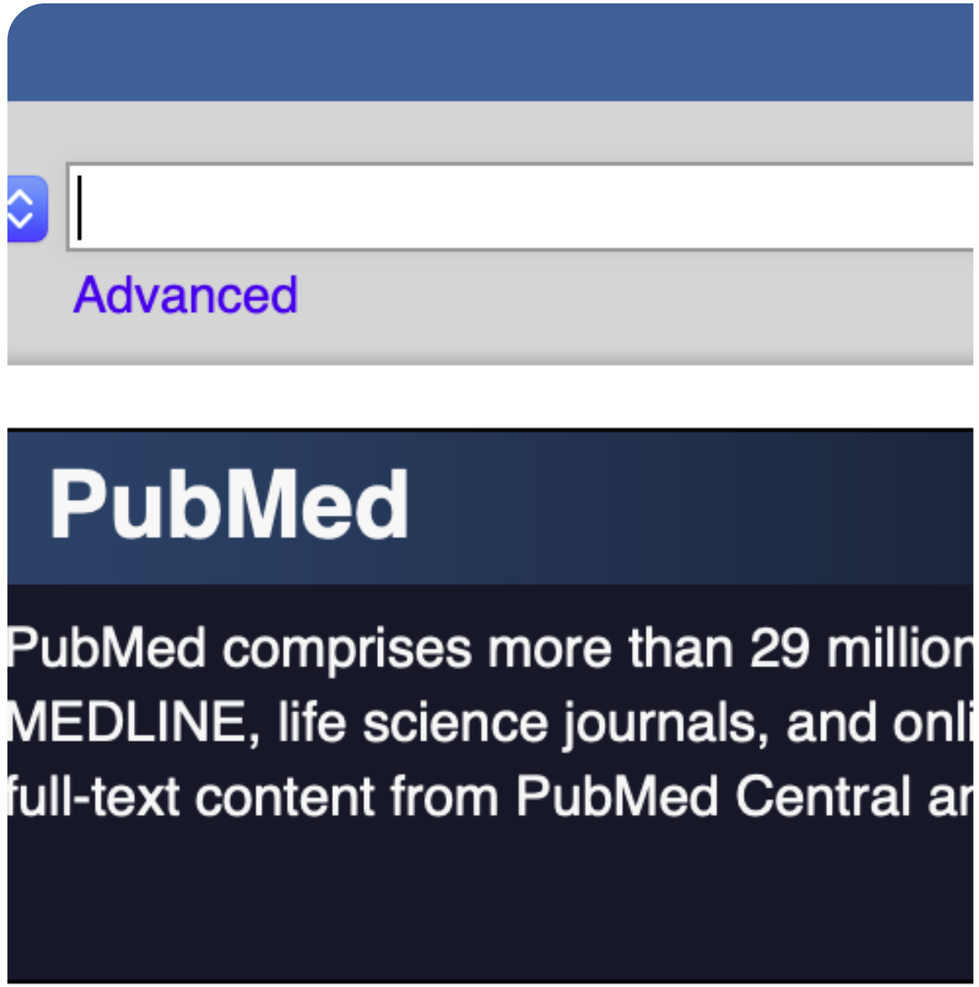


Key Science & Rationale

Development and provision of the pilot program training and materials were funded by resources provided by the New York State Education Department

New York State
EDUCATION DEPARTMENT

Knowledge › Skill › Opportunity



What is PAX GBG?

- A Nurturing Environment, NOT a curriculum.
- Students and their teachers are heroes of creating more Peace, Productivity, Health, and Happiness each day.
- ACEs/Trama Reduction
- Changes peer and teacher interactions in days
- Has more than 50 high-quality studies/publications in the U.S., Canada and Europe—accessible at www.pubmed.gov

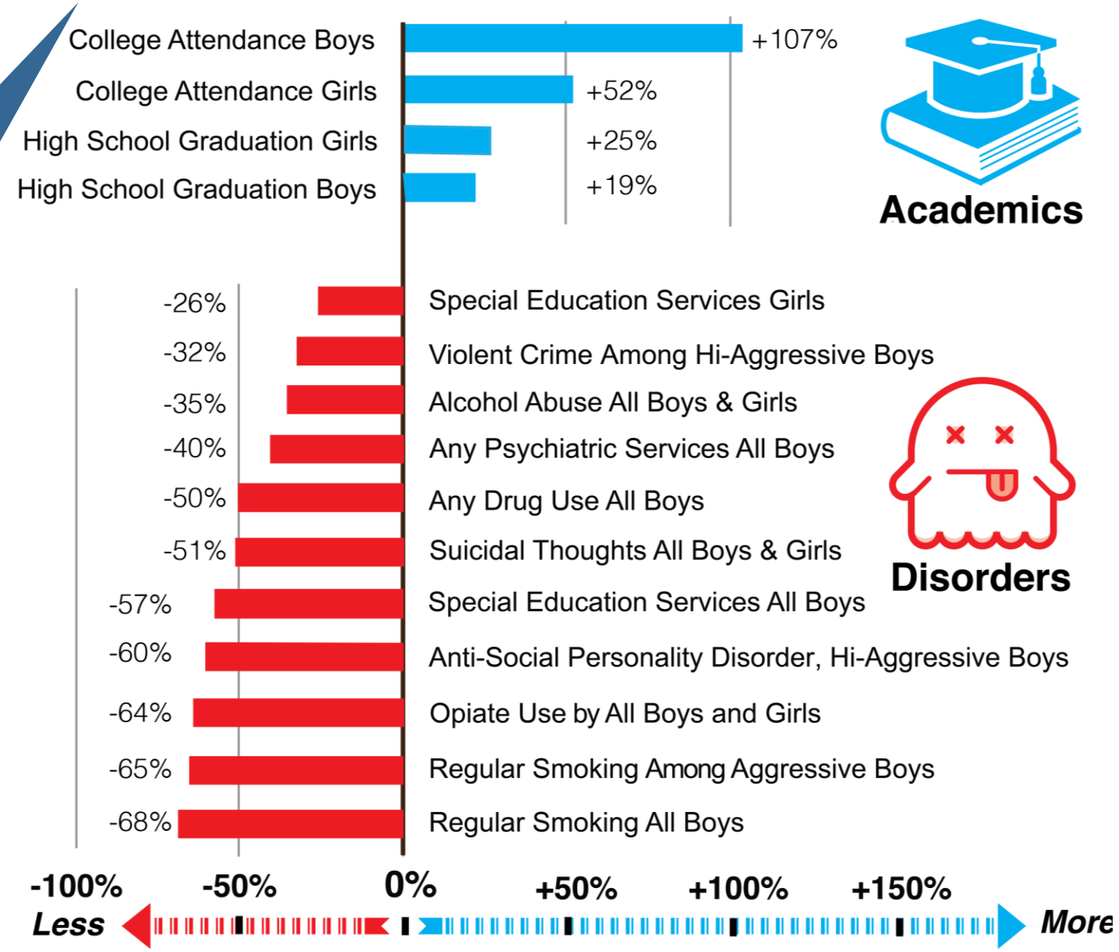
www.pubmed.gov

Search: *“good behavior game” or “pax good behavior game”*

Snapshot of Good Behavior Game® Benefits

Computation of Relative Difference = (GBG/Control)-1

PAXIS has an estimate for every state, and one that can estimate for any population.



Note: These calculations are based on two prior studies of 1,500 students byJohns Hopkins with long-term follow up. Please visit www.goodbehaviorgame.org for study results and publications. PAXIS Institute is the official provider of Good Behavior Game® bas on Johns Hopkins' studies and current replications at Hopkins. Relative difference calculation takes into account that some groups ma have higher or lower "risk"changing the absolute numbers of students who may benefit from a preventive strategy. The graph illustrat the potential widescpread benefits of the strategy. Two new longitudinal studies, involving 10,000 students, have significant positive initial outcomes. Another ranodmized study shows positive bendefits in afterschool settings. Also note that the "recipe" used in the pa and current replications at Hopkins are much more sophisticated than the simple descriptions in journals or in the early applied behavi analysis studies. Further, some enities construed the Hopkins recipe as rigid rules (e.g. sit in your seat, only speak with permission fro teacher) with tokens, stickers, and tangible rewards. That conception is wrong and yields no positive or lasting results.

pax Good Behavior Game

NREPP National Registry of Evidence-based Programs and Practices

Predicted Benefits of PAX GBG in Your School, District, Tribe or Community When First Grade Students Reach Adulthood After 1-2 Years of PAX GBG Exposure*

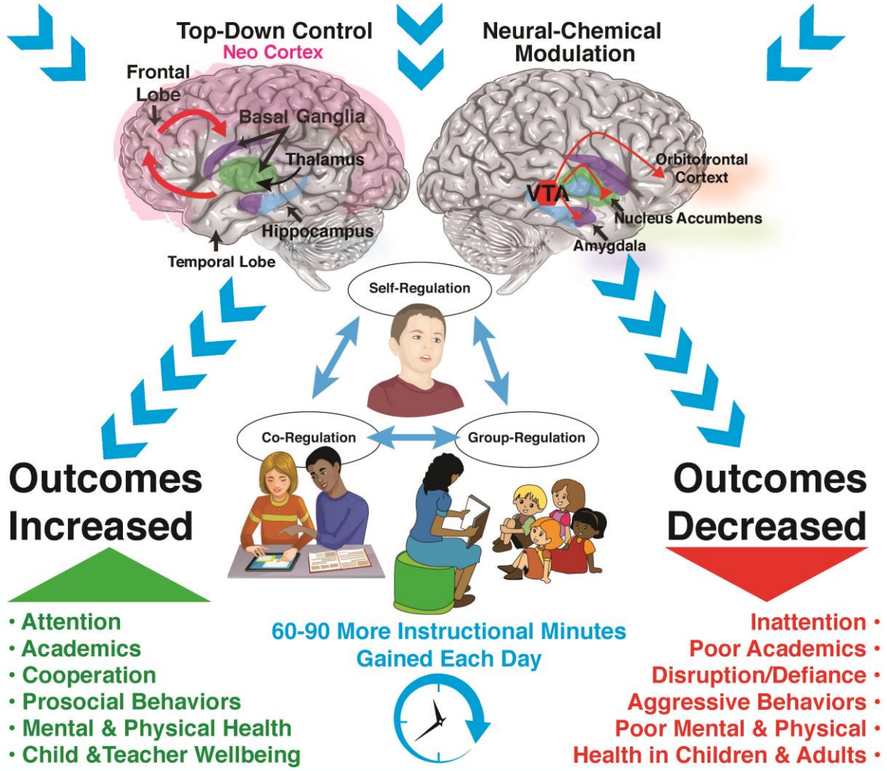
Site Estimate for: **Enter number of First Graders at school, district, Tribe or community>>>>>>**	***What Three (3) Teachers Used PAX GBG*** 75	**<<< Enter number of First Graders**

6	Fewer young people will need any form of special education services
4	More boys will likely graduate from high school.
5	More boys will likely enter university
7	More girls will likely graduate from high school
5	More girls will likely enter university
1	Fewer young people will commit and be convicted of serious violent crimes
7	Fewer young people will likely develop serious drug addictions
5	Fewer young people will likely become regular smokers
3	Fewer young people will likely develop serious alcohol addictions
4	Fewer young women will likely contemplate suicide
5	Fewer young men will likely attempt suicide
$976,500	**Predicted financial net savings to students, families, schools, communities, state/federal governments**
$23.67	**Estimated Cost of PAX GBG Materials Per Child for Lifetime Protection**
$22.00	**Estimated Cost of External Training & Technical Supports Per Teacher Prorated per Child's Lifetime**
$26.80	**Estimated Cost of Internal Supports for Implementation and Maintence by Teachers Prorated per Child's Lifetime**

Note: The forecasts are based on multiple randomized, longitudinal control trials of the active ingredients of this evidence based practice. Benefits will vary as consequence of the quality of implementation, training, supports, commitment, and other variables; the predicted impact is greater for first-grade children with higher entering risks for internalizing and externalizing disorders. The cost-savings and lifetoime benefits increase if trained teachers use this evidence-based based strategies in succeeding years for new entering cohorts of grade one children. While PAX GBG has well-documented immediate benefits for students, teachers and schools in other grades, limited randomized longitudinal data exist to forecast similar benefits for other grades at this time.

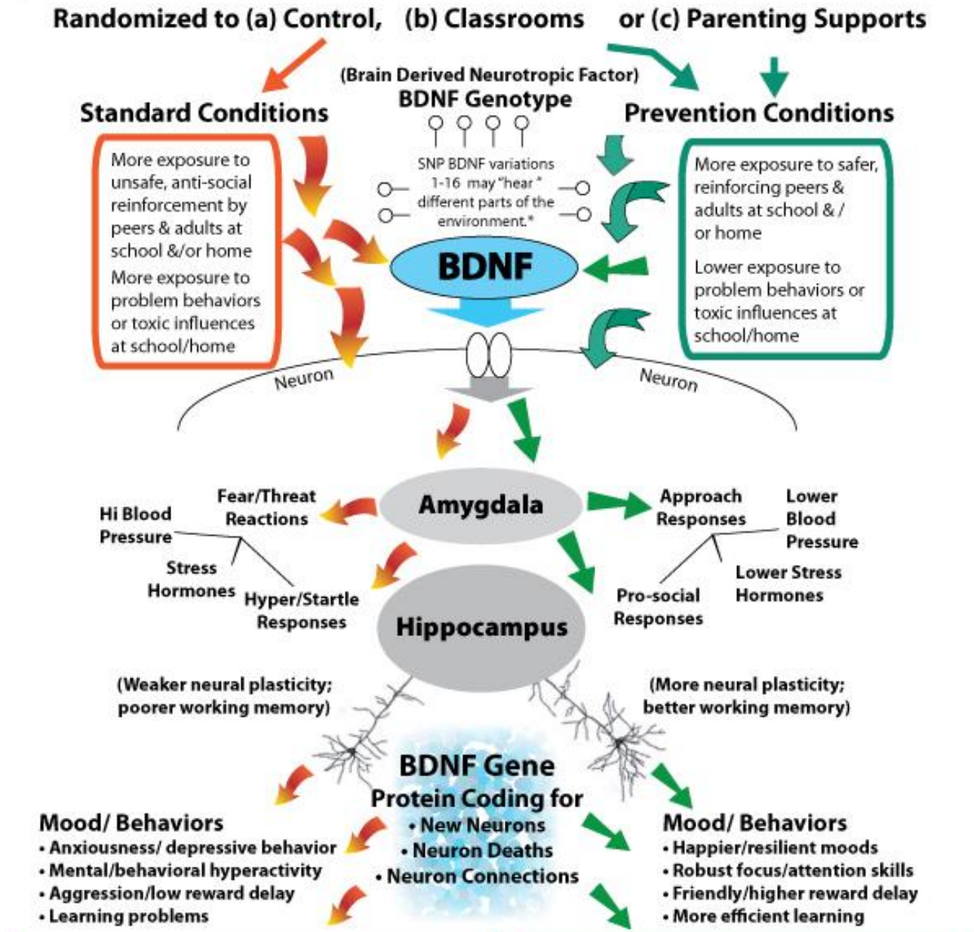
How Daily Use of PAX Kernels & Game Affects Brain Systems of Students in Your Classroom & School

PAX Active Ingredients	Type of Evidence Based Kernels Used Many Times p/day	Inhibitory Control IC	Exec. Cog. Function ECF	Emotional Regulation ER	Error Monitoring EM	Reward Sensitivity RS
1. PAX Vision	Relational Frame	X	X		X	X
2. PAX Leader	Relational Frame	X	X		X	
3. PAX Quiet	Antecedent / Physiological	X		X		
4. Granny's Wacky Prizes	Reinforcement	X		X		X
5. Beat the Timer	Antecedent	X	X		X	
6. PAX Sticks	Antecedent	X		X	X	
7. Tootle Notes	Reinforcement		X	X		X
8. PAX Voices	Antecedent	X	X	X		
9. PAX Hands & Feet	Antecedent	X		X		
10. OK/NOT OK	Relational Frame	X	X	X	X	X
PAX Game Recipe	Played 3-5 Times daily	XXX - XX	XXX - XX	XXX - XX	XXX - XX	XXX - XX

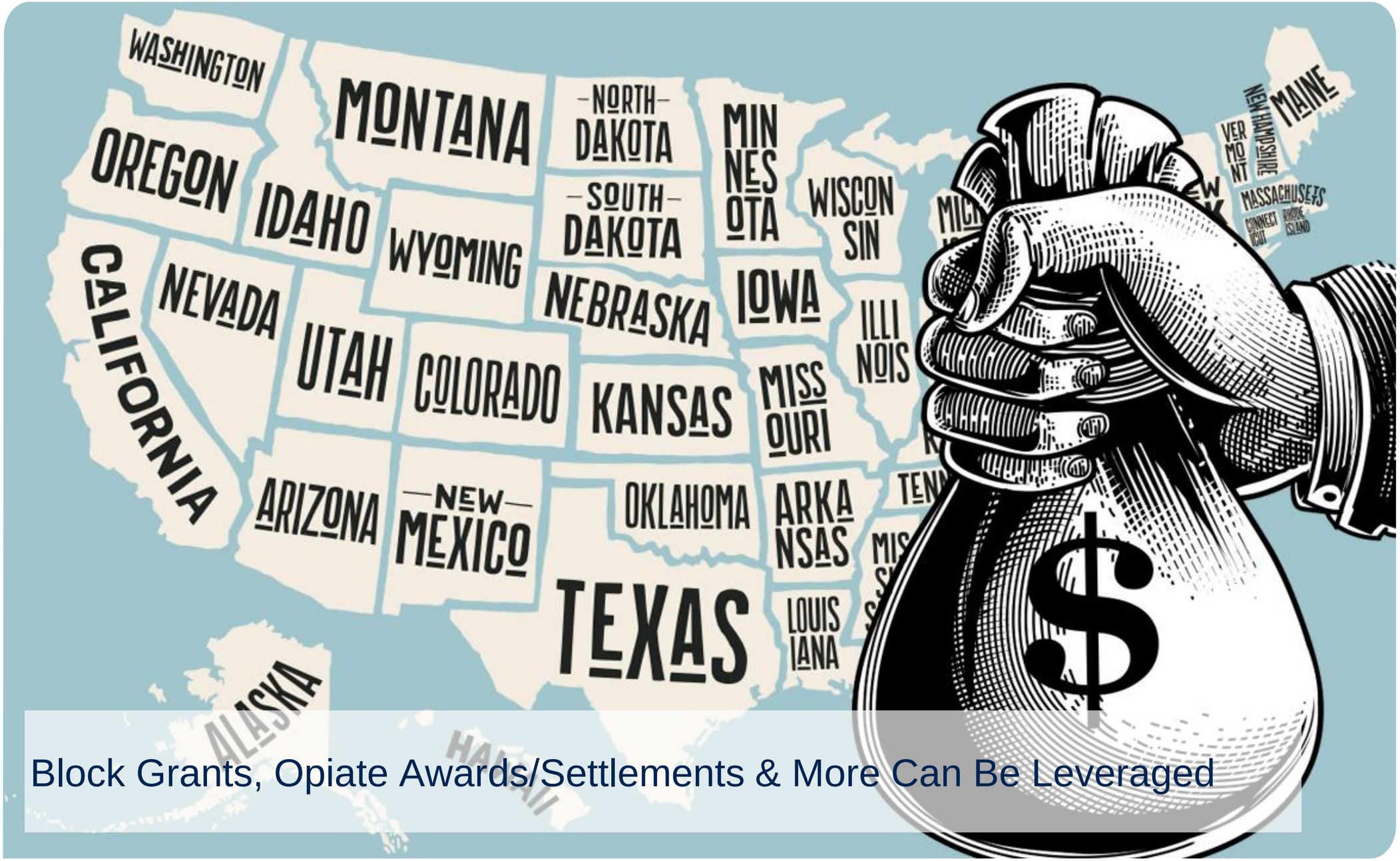


Caution: These skills cannot be successfully learned through punishment and force.
To learn more about the significant science about cognitive control and regulation, please download and read the 2017 article by neuroscients Petrican and Grady entitled, *"Contextual and Developmental Differences in the Neural Architecture of Cognitive Control"* at http://www.jneurosci.org/content/37/32/7711

How the Social Environment Affects Expression of Genes Associated with Mental and Behavioral Disorders from Recent Experimental Results Following Children for Two Decades*

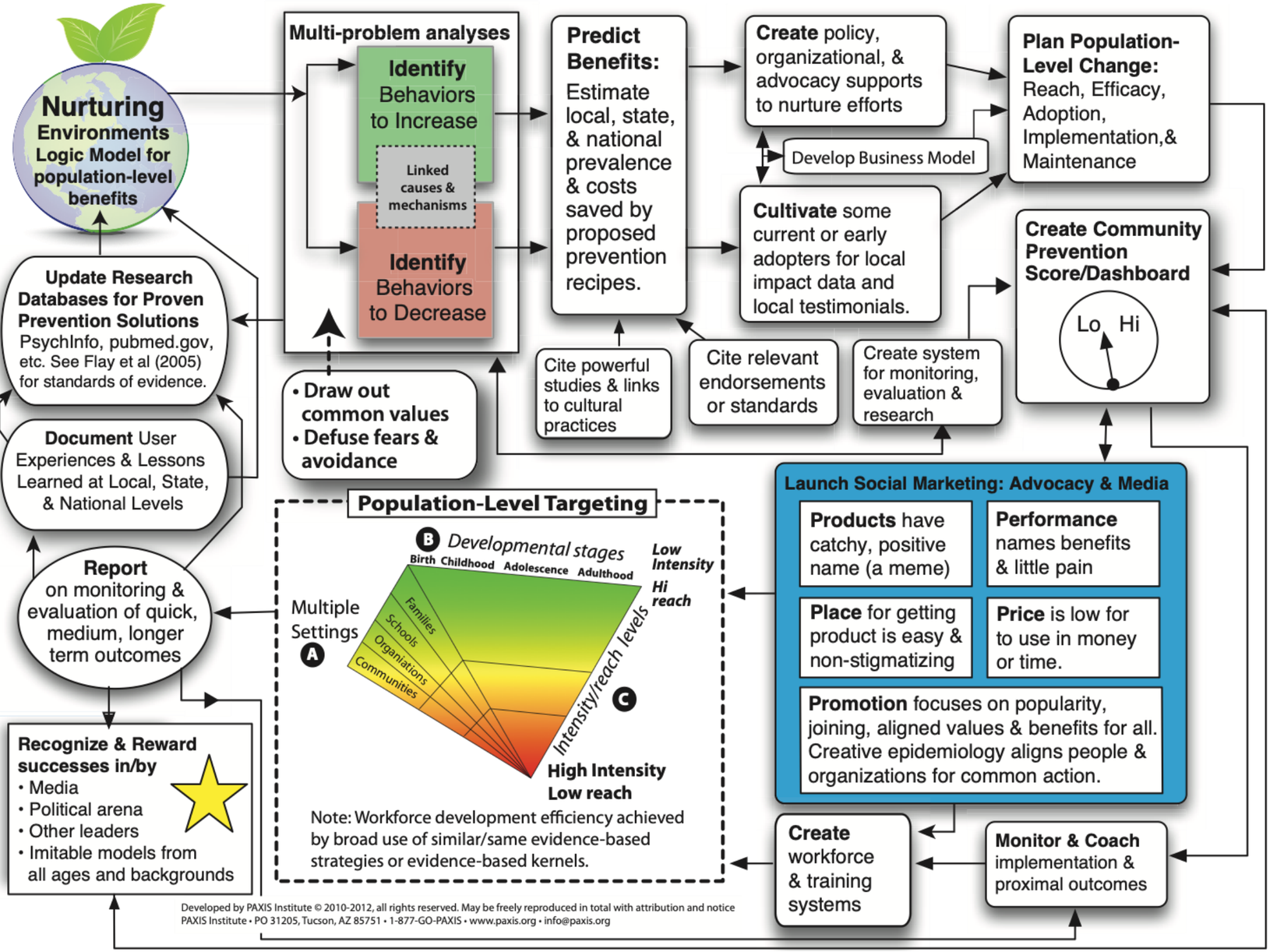


*Graphic visualizatiion ofthe findings from: Musci, R. J., Bradshaw, C. P., Maher, B., Uhl, G. R., Kellam, S. G., & Ialongo, N. S. (2013). Reducing aggression and impulsivity through school-based prevention programs: A gene by intervention interaction. Prevention Science, No Pagination Specified. doi: 10.1007/s11121-013-0441-3.
Note: The beneficial effects were twice for the classroom strategy compared to the parenting supports.



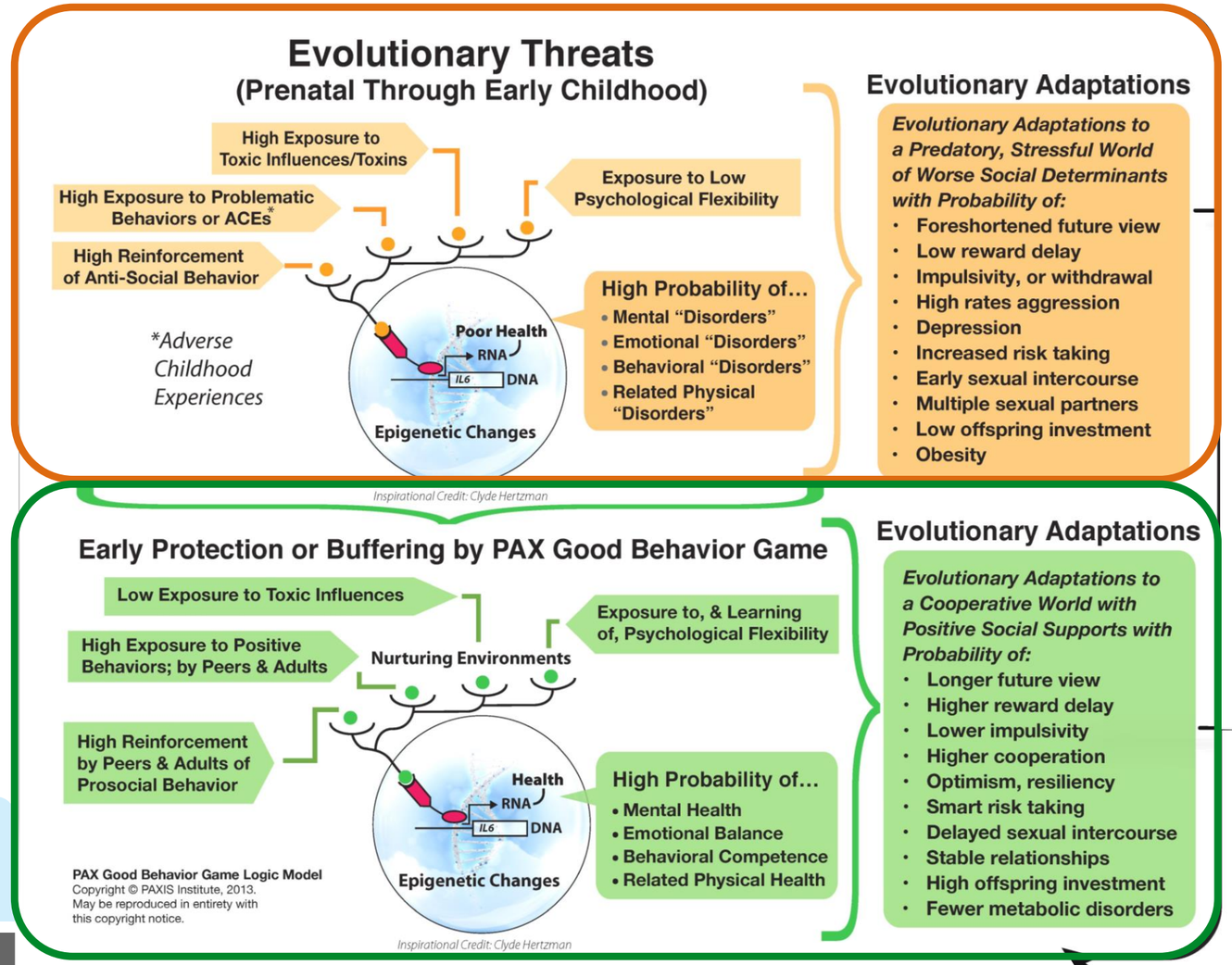
Block Grants, Opiate Awards/Settlements & More Can Be Leveraged

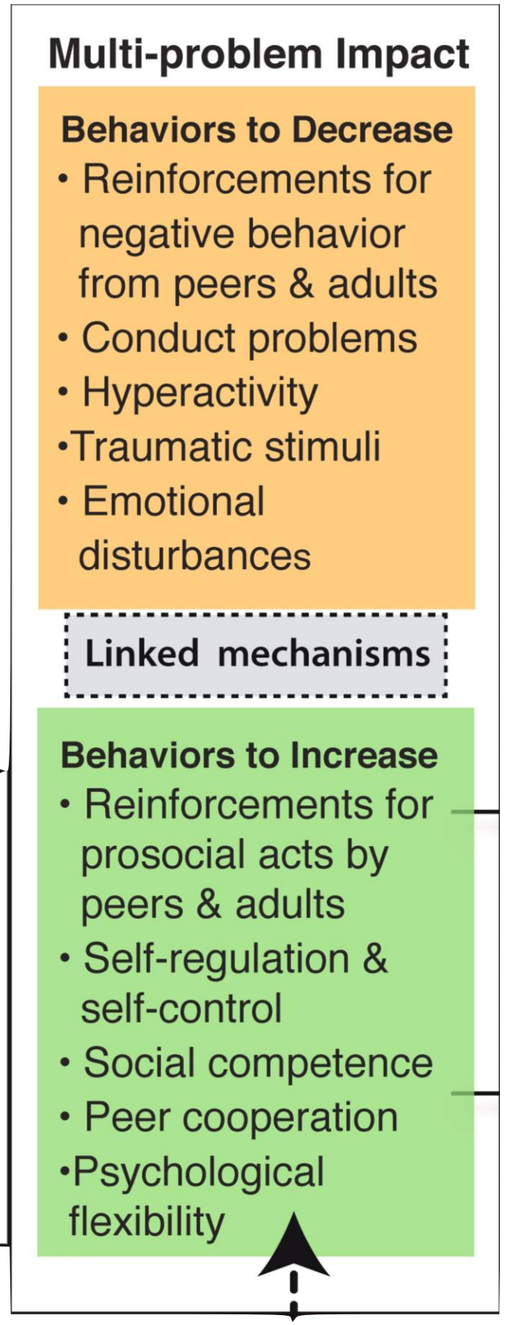
See: Biglan, A., Flay, B. R., Embry, D. D., & Sandler, I. N. (2012). The critical role of nurturing environments for promoting human well-being. American Psychologist, 67(4), 257-271.

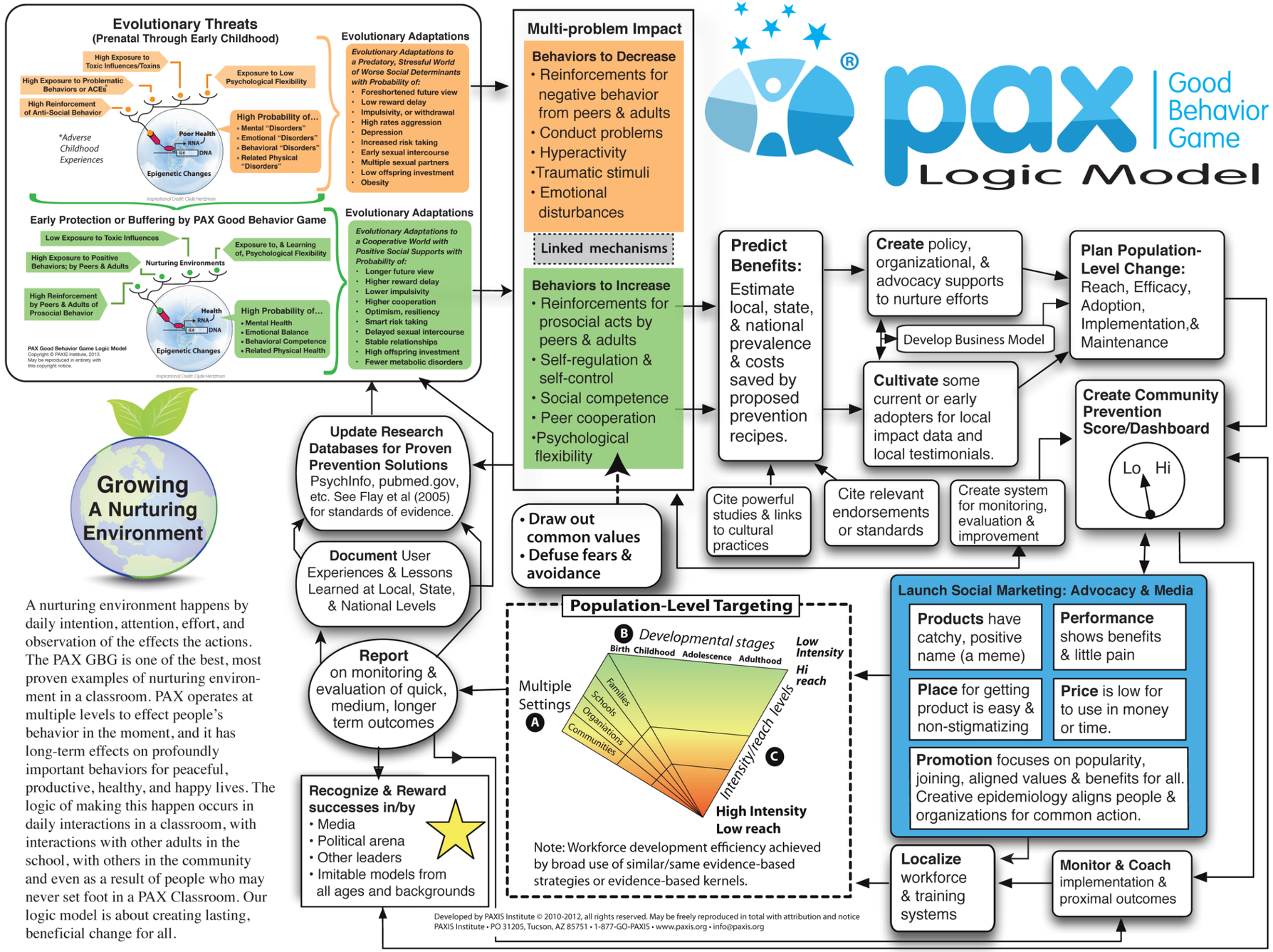


Short Life, High Risk

Long Life, Low Risk







A nurturing environment happens by daily intention, attention, effort, and observation of the effects the actions. The PAX GBG is one of the best, most proven examples of nurturing environment in a classroom. PAX operates at multiple levels to effect people's behavior in the moment, and it has long-term effects on profoundly important behaviors for peaceful, productive, healthy, and happy lives. The logic of making this happen occurs in daily interactions in a classroom, with interactions with other adults in the school, with others in the community and even as a result of people who may never set foot in a PAX Classroom. Our logic model is about creating lasting, beneficial change for all.

See: **Biglan, A., Flay, B. R., Embry, D. D., & Sandler, I. N. (2012). The critical role of nurturing environments for promoting human well-being. American Psychologist, 67(4), 257-271; Wilson, D. S., Hayes, S. C., Biglan, A., & Embry, D. D. (2013, in press). Evolving the Future: Toward a Science of Intentional Change. Brain and Behavioral Sciences.**

About 6,000 Teachers being trained in Aug, affecting about 150,000 new students this school year.

Where are large scale efforts happening?

- **Arizona**
- **Ohio**
- Oregon
- **Montana**
- **New York**
- **New Mexico**
- **Texas**
- Washington State
- Oklahoma

- **Manitoba**, Canada
- Treaty 8, Alberta, Canada
- Republic of Ireland
- Estonia
- Sweden
- Australia (starting)

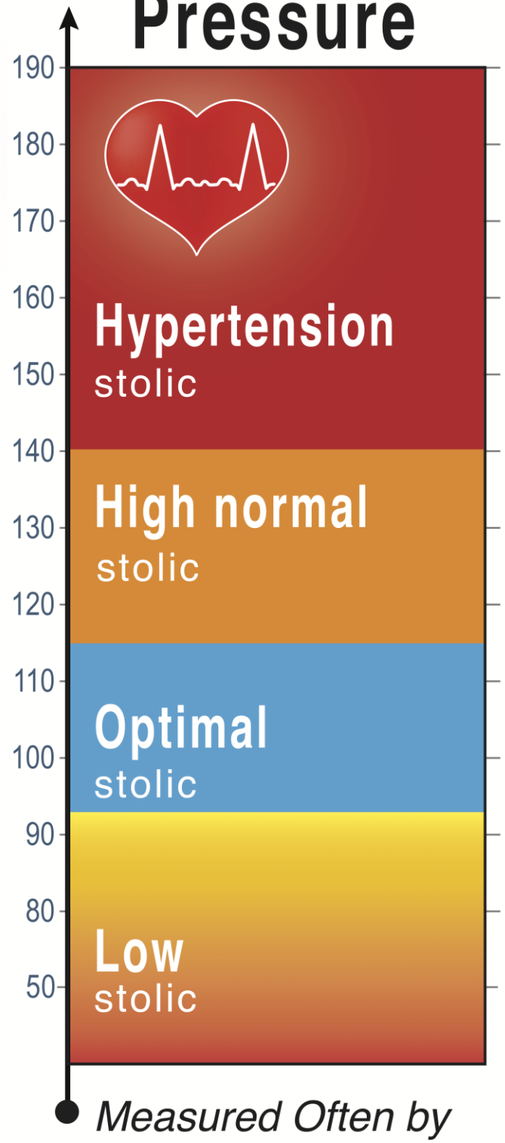
More than 1 million children affected since CMHS/SAMSHA funded GBG in 2010

Too high or too low blood pressure can disable or kill humans.

High or very low "behavioral pressure" in classroom and schools impairs both children and teachers, with adverse effects on peace, productivity, health and happiness for all.

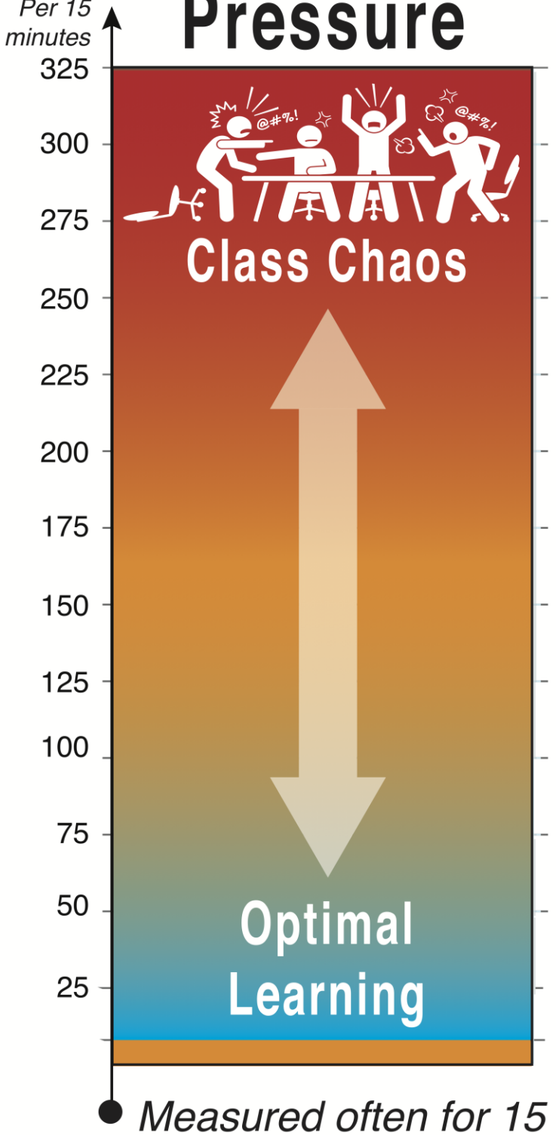
PAX optimizes "behavioral pressure" in classrooms and schools.

Individual Blood Pressure



Measured Often by Blood Pressure Cuff

Classroom Behavioral Pressure



Measured often for 15 minutes with PAX Up!™ App, included for PAX Trained Teachers & Pax Partners

Classroom behavioral pressure counts students' off-task, inattentive or problematic behaivors using 1-minutes intervals for 15-minute observations using the PAX Up! App. Such behaviors are not neessarily "bad" but can distract or worsen learning, academics, behavior, and health.

Criminal Activity, School Closure, Lawsuits, Assaults, Weapon Use, Violent Injuries, Drug Use

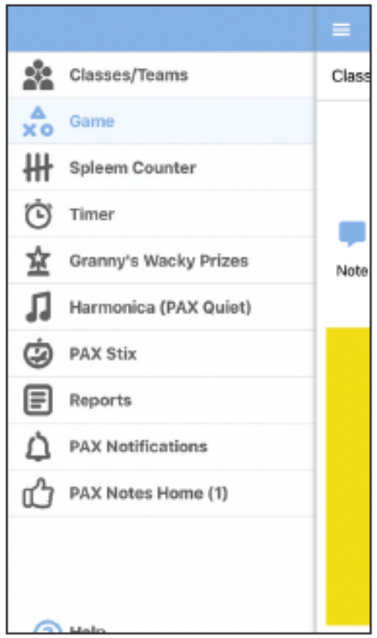
Academic Failure, Violent Injuries, Anxiety Attacks, Maletreatment, Vandalism, Theft, Sickness

Discipline Problems, Referral Increases

Peace, Productivity, Health & Happiness
(for students, staff and families)

Fear, Freezing, Numbing

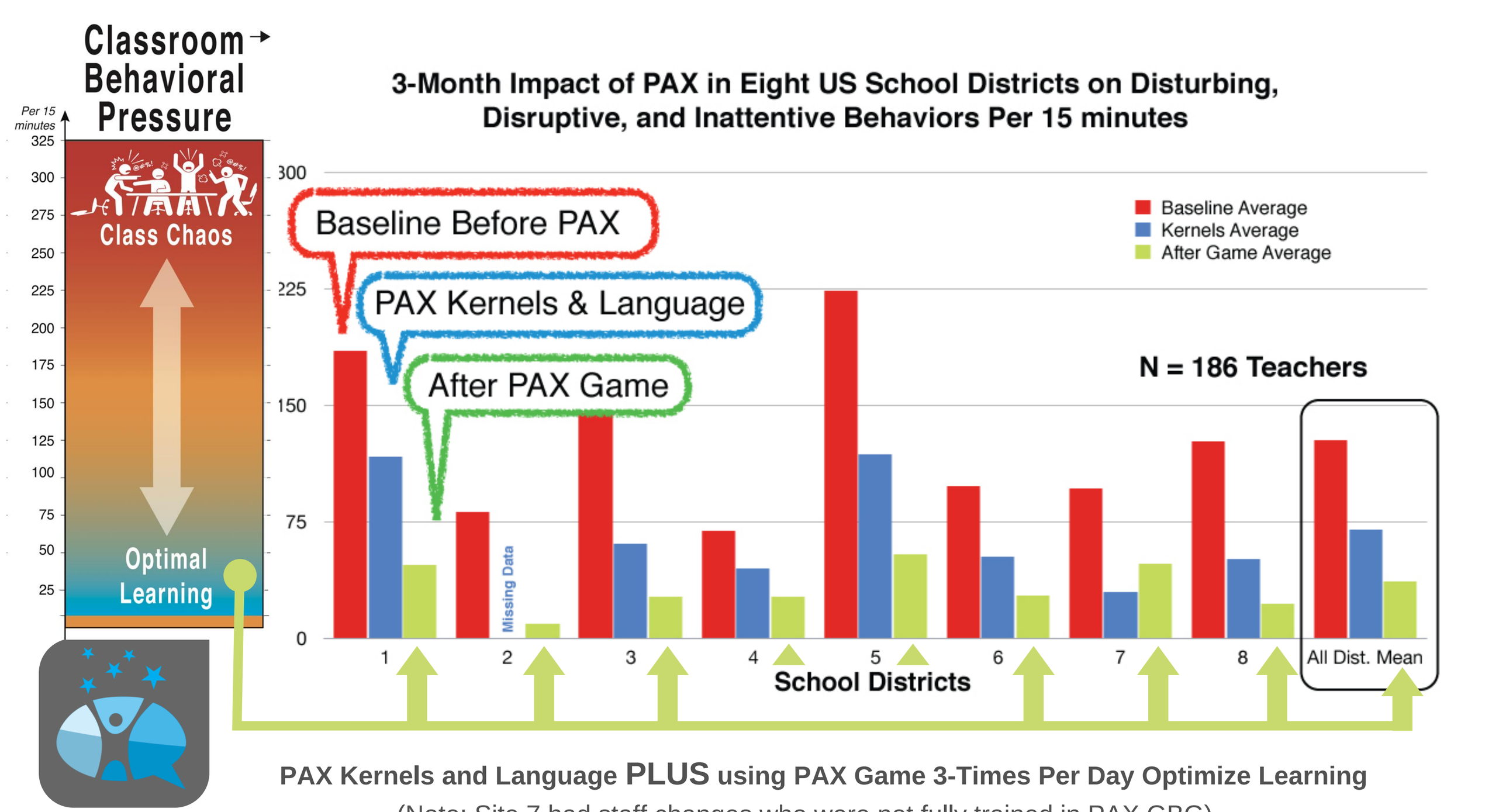
PAX UP! Is an iOS, Android & Web App for implementing, measuring & supporting implementation



Main Menu

Access the Main Menu by tapping on the menu symbol in the upper left corner of the screen. The app has ten main areas:

- **Classes/Teams**, where you set up your classes and teams;
- **Game**, where you start the game timer and count spleems;
- **Spleem Counter**, where you conduct baseline and progress-monitoring spleem counts;
- **Timer**, where you can use a stopwatch or timer to play Beat the Clock or PAX Timer Surprise;
- **Granny's Wacky Prizes**, where you can access and customize a wacky prize database;
- **Harmonica (PAX Quiet)**, where you can play a harmonica sound;
- **PAX Stix**, where you can use random calling to conduct a classroom discussion;
- **Reports**, where you can see tabular and graphical representations of game and spleem-count data;
- **PAX Notifications**, where you can see messages from PAXIS and from the app itself; and
- **PAX Notes Home**, where you can communicate with students' families.

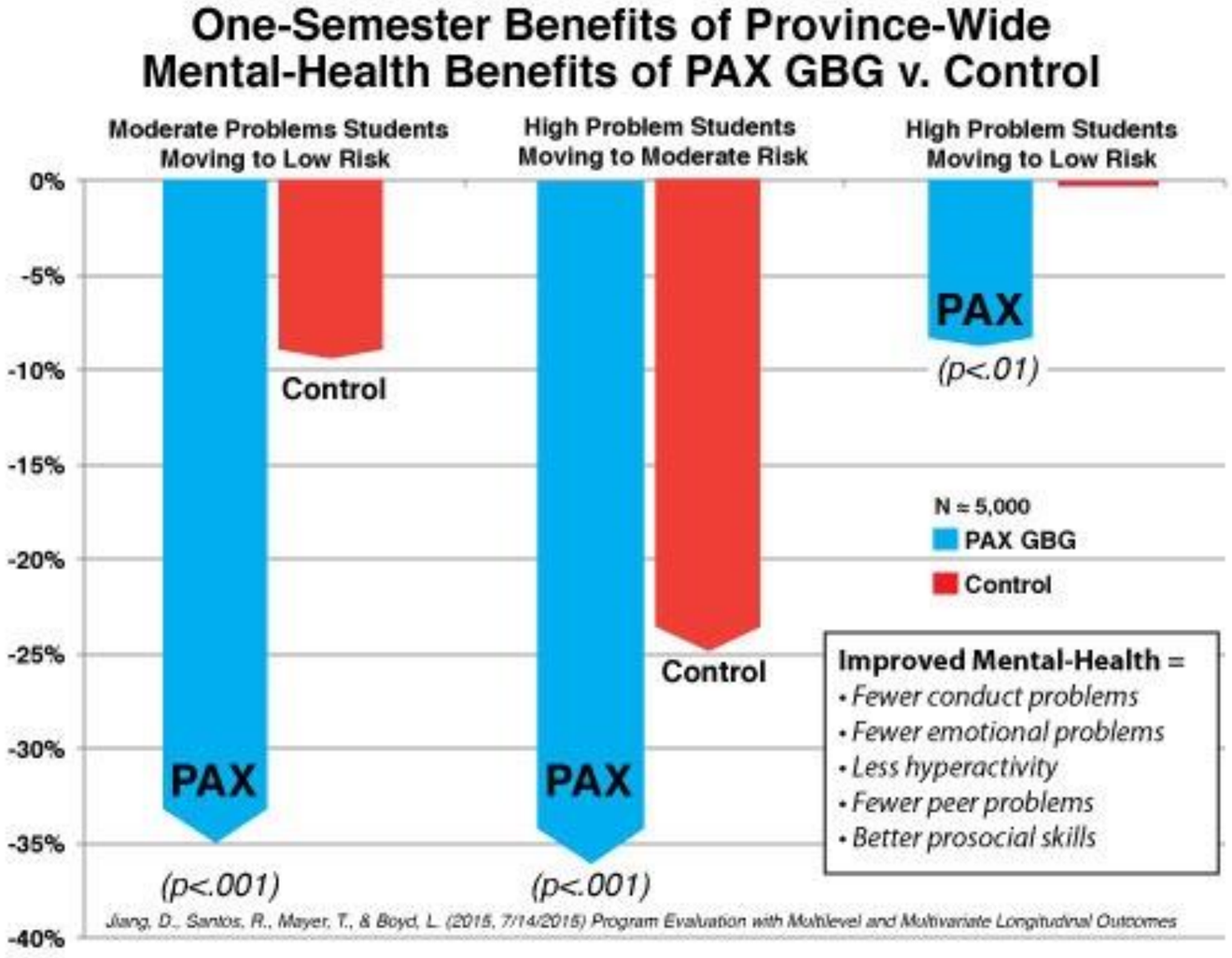


PAX Kernels and Language PLUS using PAX Game 3-Times Per Day Optimize Learning

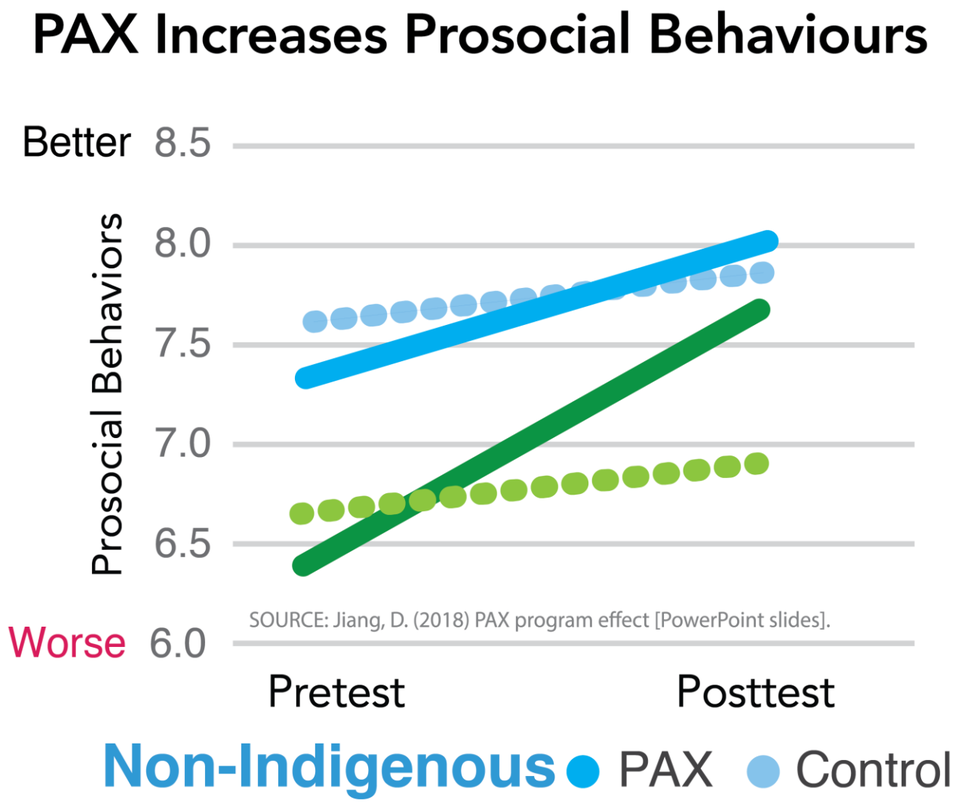
(Note: Site 7 had staff changes who were not fully trained in PAX GBG)

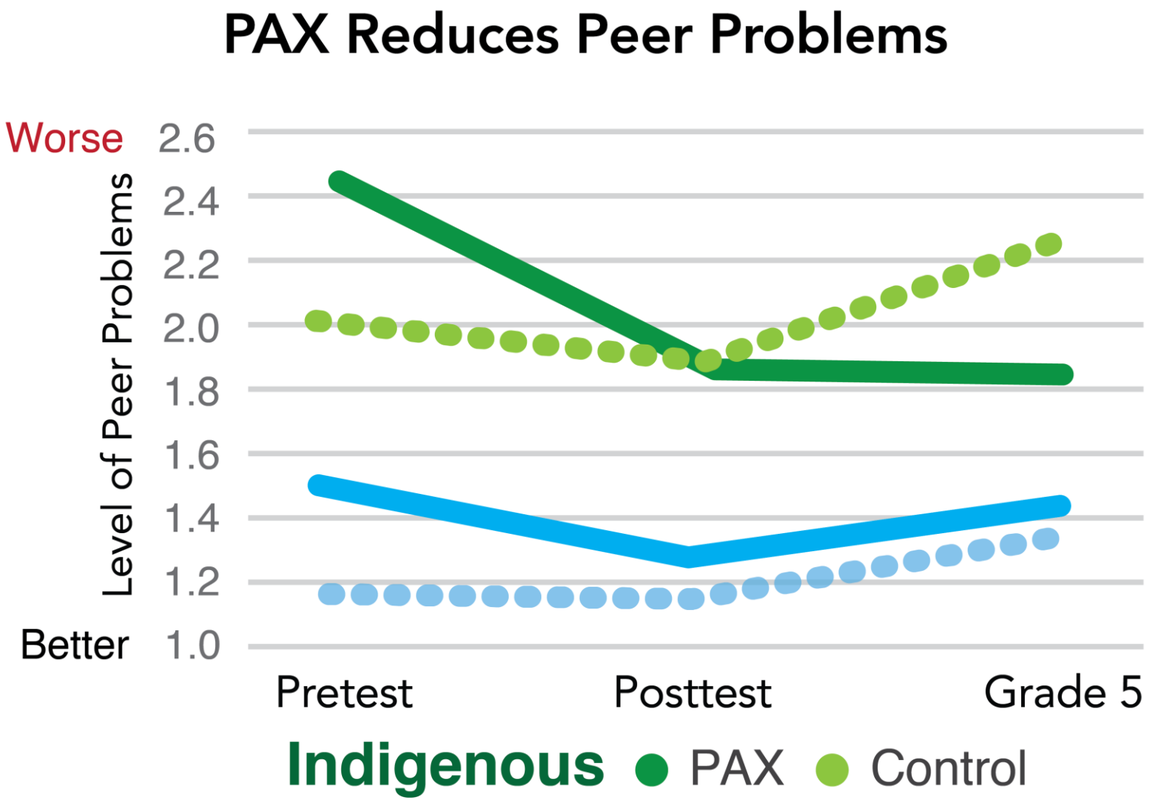
Reduced Risk Probability for Psychiatric Disorders

Improved environment and fewer problematic behaviors reduces risk of mental, emotional, behavioral disorders



One-Semester Training and Exposure to PAX GBG Reduces Lateral Violence



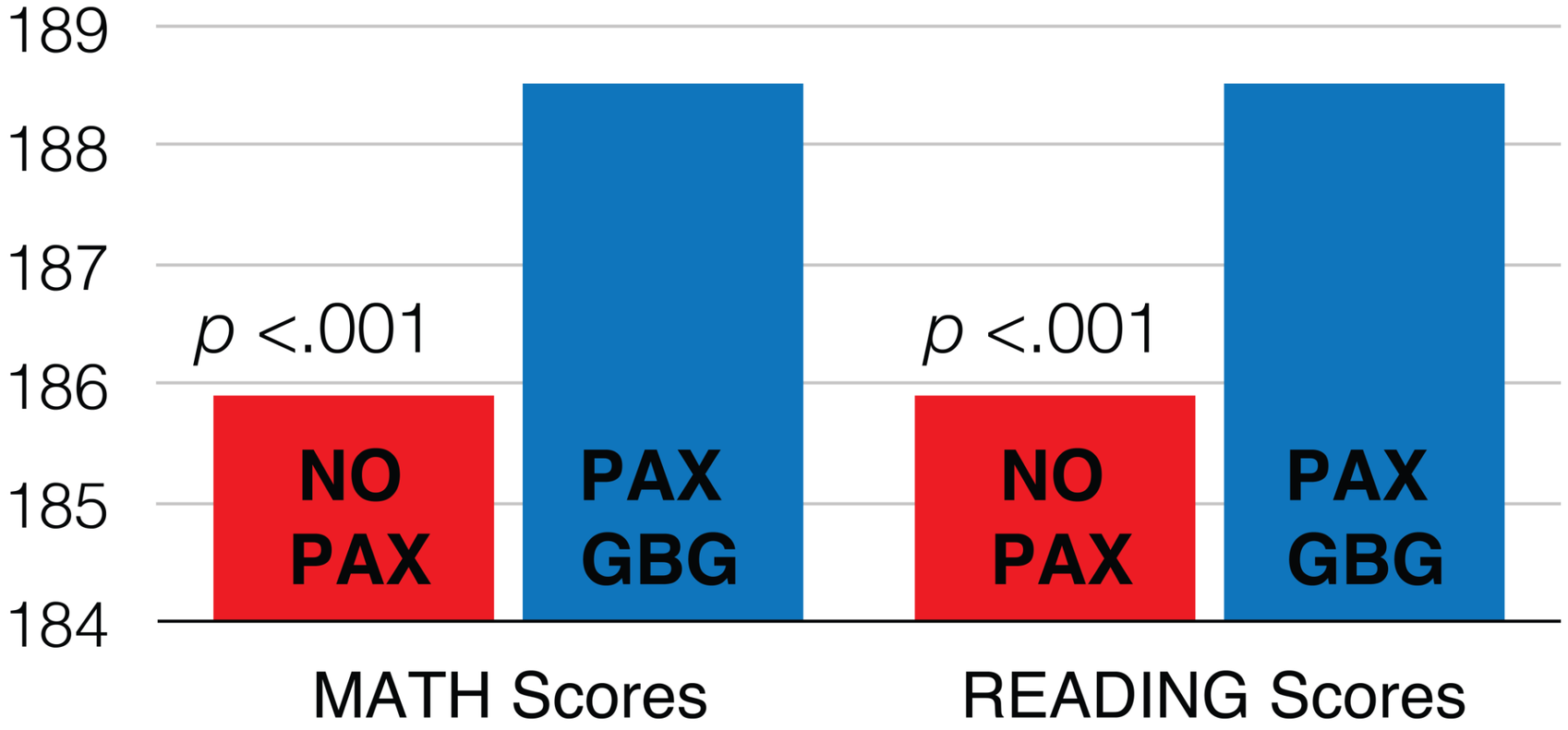


Typically children who need the most (e.g. historic disparities) protection benefit the most...

ACES

Improvements on Standard Measures of Academic Progress in Six Districts in High Poverty Schools in Ohio

Source: Weis, Osborne, & Dean, 2015



The statistical difference favoring PAX GBG is highly significant (greater than 1 chance in 1,000).

Predicted Benefits of PAX GBG in Your School, District, Tribe or Community When First Grade Students Reach Adulthood After 1-2 Years of PAX GBG Exposure*

Site Estimate for:	***1,000 Teachers in Your Area Start Using PAX GBG***	
Enter number of First Graders at school, district, Tribe or community>>>>>>	**25,000**	**<<< Enter number of First Graders**

2,151	Fewer young people will need any form of special education services
1,392	More boys will likely graduate from high school.
1,670	More boys will likely enter university
2,219	More girls will likely graduate from high school
1,734	More girls will likely enter university
243	Fewer young people will commit and be convicted of serious violent crimes
2,404	Fewer young people will likely develop serious drug addictions
1,645	Fewer young people will likely become regular smokers
886	Fewer young people will likely develop serious alcohol addictions
1,213	Fewer young women will likely contemplate suicide
1,645	Fewer young men will likely attempt suicide

$325,500,000	**Predicted financial net savings to students, families, schools, communities, state/federal governments**
$23.67	**Estimated Cost of PAX GBG Materials Per Child for Lifetime Protection**
$22.00	**Estimated Cost of External Training & Technical Supports Per Teacher Prorated per Child's Lifetime**
$26.80	**Estimated Cost of Internal Supports for Implementation and Maintence by Teachers Prorated per Child's Lifetime**