pax Good Behavior Game

# Responding to Risk and Protective Factors

## Active Ingredients, Implementation & Measures

PAXIS Institute

passion into action • science to practice • promoting solutions

NREPP
Included in SAMHSA's National Registry of Evidence-based Programs and Practices

# PAX Good Behavior Game®
# Responding to Risk and Protective Factors:
# Active Ingredients, Implementation, and Measures


PO BOX 31205, Tucson, AZ  85751

1-877-GO-PAXIS • Info@paxis.org

Visit www.GoodBehaviorGame.org and www.paxis.org

PAX Good Behavior Game® is listed on the National Registry of Evidence-Based Programs and Practices, which has the following description

*The PAX Good Behavior Game (PAX GBG) is an environmental intervention used in the classroom with young children to create an environment conducive to learning. The intervention is designed to reduce off-task behavior, increase attentiveness, and decrease aggressive and disruptive or shy and withdrawn behavior. The intervention also aims to improve academic success and reduce mental health and substance use outcomes later in life. PAX GBG evolved from the original Good Behavior Game, which was developed and studied with fourth graders in the 1960s.*

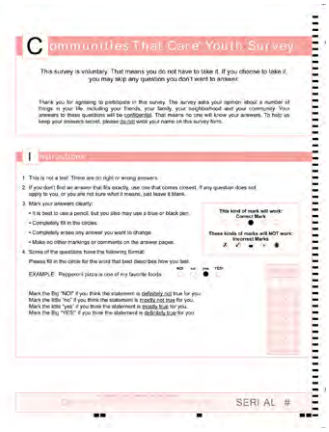
*The intervention includes a set of evidence-based strategies called "kernels" and a classroom game intended to increase self-regulation and cooperation and decrease unwanted behaviors called "spleems." The teacher first applies the kernels in the classroom. These kernels, some of which were developed for another NREPP-reviewed intervention, PeaceBuilders, include transition cues (PAX Quiet); written notes (Tootles) praising positive behavior; use of a timer to decrease the time needed for task completion (Beat the Timer); random calling of students during lessons (PAX Stix); and rewards in the form of brief and fun activities that are normally not allowed in the classroom, such as tapping a pencil on the desk or throwing paper balls (Granny's Wacky Prizes). The teacher also works with the students to establish a shared language and expectations about classroom behavior.*

*After integration of these kernels into classroom activities, the game is played in two to five teacher-selected heterogeneous teams that change on a regular basis. Each day, the teacher announces the game, which is played three times. Initially, the game lasts for only a few minutes at a time when the children are engaged in simple tasks. As students improve at the game, they play it for longer periods and during different activities and times of day. During the game, the teacher identifies and counts each unwanted behavior. At the end of the game, the teams with three or fewer infractions receive a reward, typically an activity selected from Granny's Wacky Prizes. In addition to the three announced games, one unannounced game is played each day. Roles (e.g., captains, coaches) can be assigned to children on each team. A booklet for parents and children explains the game and provides guidance on how parents can use elements of the game at home.*

*The study reviewed for this summary provided the foundation for the version of PAX GBG currently disseminated. Since the study was conducted, the game has been modified (e.g., it is played at different times, some games are unannounced, students can have roles) and elements have been added (e.g., parent booklet, kernels) to foster the generalization of self-regulation and peer cooperation across people, places, time, and activities. And in this study, PAX GBG was used throughout first grade along with weekly classroom meetings to promote group problem solving, curriculum enhancements in language arts and mathematics, and additional support for children who did not respond adequately to the intervention. Although the study was conducted with first-graders, PAX GBG has been used with children of different ages.*

In 1992, Hawkins, Catalano, and Miller published their famous paper on risk and protective factors [1]. It was not the first high-quality scientific paper on the notion of risk and protective factors, as scientists had examined various risk and protective factors in longitudinal studies of child development on what was called developmental psychopathology [2-6]. Another key figure in understanding development risk from early years to adolescence was Dr. Sheppard Kellam [7], who found that first-grade behavior predicted teenage drinking, drug use, and smoking. He next launched the first randomized, longitudinal trial of the Good Behavior Game (invented by a fourth-grade teacher), which proved that changing the environmental context of first grade prevented these distal problems [8, 9].

## Risk and Protective Factor Surveys




Today, most prevention providers and policymakers think about Risk and Protective Factors in terms of the Communities That Care or similar surveys, with which communities survey cross sections of students in 6th, 8th, 10th, and 12th grade about the prevalence of alcohol, tobacco, and other drugs—along with the percentages of students with individual risk and protective factors from the survey.

Risk and Protective Factor Surveys used for prevention policy and practice are rarely longitudinal: the research they are based on in the beginning likely surveyed each student using a unique ID every year in order to track trends for each child or student.

Today, most political divisions in the US and Canada using such surveys take a cross-sectional approach, perhaps every other year. The students might be surveyed in sixth grade and eighth grade, but they do not link the surveys from year-to-year, which would show causal relationships. This causes much confusion about cause and effect among lay users of such surveys.

For instance, cross-sectional surveys of risk and protective factors show a correlation of say .3 to .5 on the relationship between ATOD use and favorable attitudes toward ATOD. This makes many users of such cross-sectional surveys think that the reason students starting using is because their attitudes changed first. The result is the common reaction of focusing community programs around attitudes.

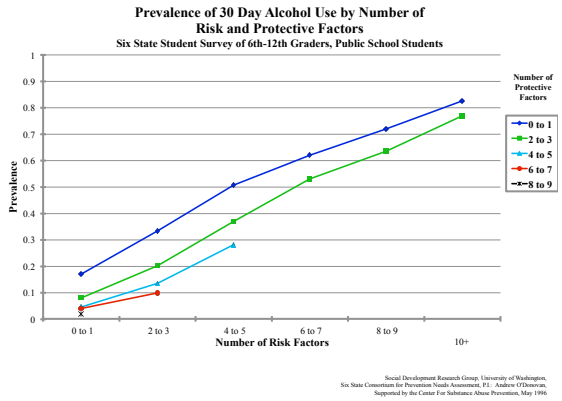
If one uses a longitudinal approach measuring the same kids and tracking their data as they move from childhood, to early adolescence, to high-school years (and as young adults as in the PROSPER studies), the predictive power of subsequent use of alcohol, tobacco, and other drugs is far less about attitudes [10].

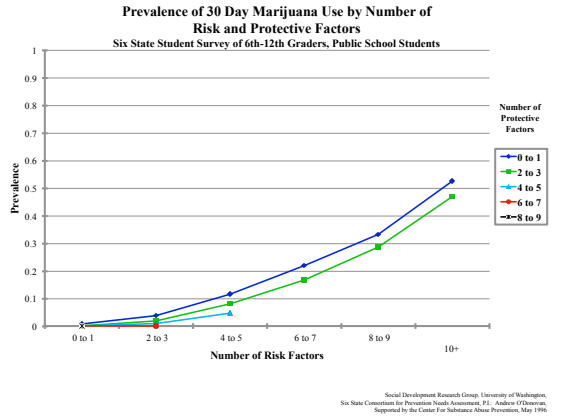
## Prediction of ATOD Prevalence Rates Using Surveys

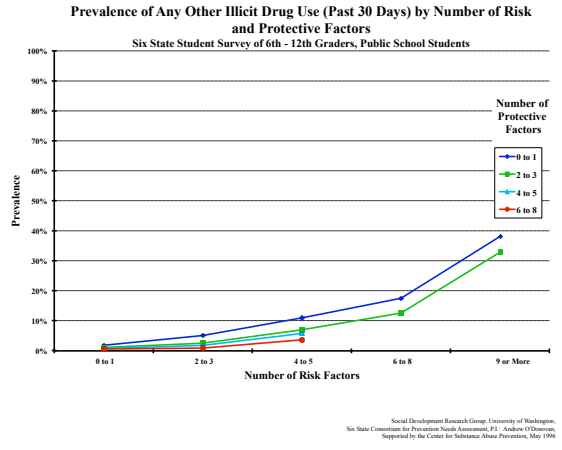
As the survey is in the public domain, many provide scanning and summaries of these surveys, such as Pride Surveys, quite economically. Communities tend to make policy decisions based on attempts to address a particular risk or protective factor that might be high or low in their community, compared to cut-off scores from the original six-state study or other norms.

Choosing programs, practices, or strategies based on one or two single, aberrant risk or protective factor cut-off scores at a community level is statistically unlikely to result in any measurable, population-level change. This comes as a surprise to many.

Why is this so? All risk and protective factors combined (excluding actual ATOD use) predict about 40% of alcohol, tobacco and other drug use. So take just one specific item in a risk or protective factor from family, community, school, or personal domains. Perhaps your community is high or low on one item of factors such as neighborhood attachment or rewards for prosocial behavior, etc. That *one* item in the factor predicts or accounts for a small percentage of the alcohol, tobacco, or illegal drug use by the young people. Most *items* in a factor predict a relatively small percentage of variance in the future change. Big change in prevention and protection outcomes *typically* requires of multiple risk and protective factors for lasting prevention and protection. This can be easily seen in graphs from Seattle's famed Social Development Research Group (SDRG), responsible for many of the studies on these risk and protective factors and prevalence rates in the original six-state study. We reproduce some of those graphs on the next page.




What do these figures show? If students have many protective factors and 0-3 or so risk factors, they are very unlikely to develop problems of alcohol, marijuana, or illegal drug use. After a while, though, lots of risk factors swamp out protective factors.

What is the implication of this finding, which is highly congruent with longitudinal studies? First, minimize as many risk factors as possible in your prevention and protection, which can be structured as multi-level strategies beginning with powerful environmental strategies at critical developmental stages AND protective strategies that can be deployed for children who might need more than the universal, protective environmental strategies.

## Environmental Strategies

What is an environmental strategy? An erroneous view is that it means *only* policies and laws AGAINST the problem. A good example of that is Zero Tolerance of various types of behavior (bullying, aggression, drugs, etc.) in schools. That has resulted in racial and ethnic disparities, in children and adolescents being suspended or expelled for behaviors, and other unintended adverse consequences. For example, one large study found "school disciplinary action places youth at risk for involvement in the juvenile justice system and this may be especially true for less risky youth," who were then more likely to be involved in the juvenile justice system [11].

Environmental strategies can reinforce positive or protective behaviors or harm reduction. For, example, Reward and Reminder, which rewards clerks and publicizes stores that do not sell tobacco or alcohol to minors reduces any tobacco use or 30-day tobacco use by minors, even if taxes have been substantially increased on a package of cigarettes (see the NREPP summary at http://bit.ly/RewardReminder) and fines are in place for illegal sales.

Environmental strategies can mean that evidence-based practices or programs are made universally accessible. For example, virtually every prevention provider knows that child maltreatment is a significant predictor of lifetime ATOD use and other problems. States have laws and serious penalties for child maltreatment, yet maltreatment exists and is widely prevalent.

The Centers for Disease Control tested an environmental strategy to reduce indicators of maltreatment at the population level. Specifically, the CDC funded a project to provide access to previously proven, brief, easily implemented parenting supports universally accessible to ALL families. The results of that study showed that multiple indicators of maltreatment decreased in two years in a study of 18 counties [12].

Environmental strategies — even in the context of laws — involve changing individual behaviors amid other people's behavior. For example, making a law for protective car seats for infants and young children

involves making seats available that work, getting adults to put the child in the seat AND correctly use the restraints, and for the child to be reasonably cooperative so that the adults don't give up dealing with aversive tantrums. In the case of laws against selling tobacco to minors, clerks must actually not sell, even if a youth is threatening the clerk.

## PAX GBG as an Environmental Strategy

For more than 30 years, scientists have known that a roomful (an environment) of disruptive and inattentive young children actually creates an elevated lifetime risk of alcohol, tobacco and illegal drug use as well as other problems [13]. That is, one year of exposure to an environment of negative peers in early childhood has serious adverse consequences for a lifetime. Passing a law that being disruptive in first grade is illegal is not likely to change first graders' behavior. Expelling or suspending first graders is not likely to be effective as a policy either.

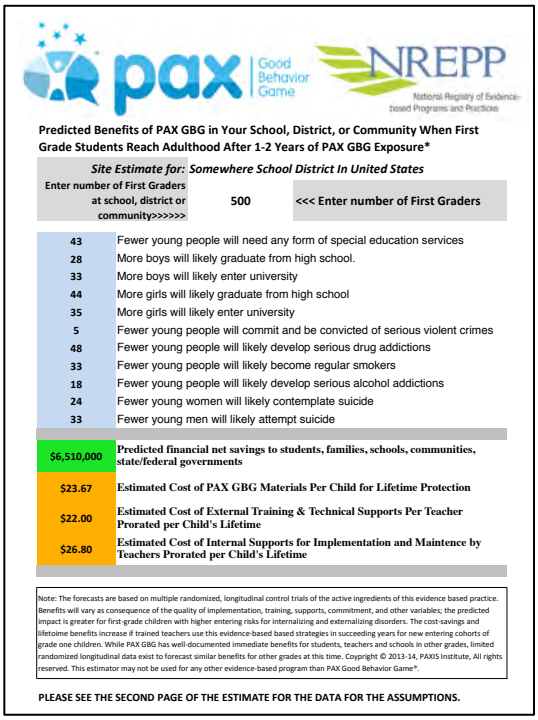
Classroom environments nest inside a larger prevention policy umbrella. If teachers receive the practical, proven tools that reduce those behaviors, substantial, immediate improvement emerges in those student behaviors [14-16]. If a whole school receives such practical, proven tools, there can be similar, rapid reductions in problematic behaviors [17, 18].

If those proven, practical tools are implemented in primary grade classrooms, there are long-term reductions of problem behaviors, including ATOD use, when the children reach adolescence [19, 20]. If similar strategies are used throughout a school [21], there are major reductions in serious problems that result in lifetime risk of incarceration, substance abuse, etc. [22-24].

Universal access to practical, longitudinally proven classroom environment supports can become a public policy, which has happened in the entire province of Manitoba (http://www.gov.mb.ca/healthychild/pax/) and whole school districts and counties in the United States (California, New York, Ohio, Washington State, Oregon, and several Native American Tribes) for the adoption and implementation of PAX Good Behavior Game. In Ohio, county voters in three counties have voted for a levy to provide PAX GBG to all schools in three counties. Several states are exploring third-party reimbursement of PAX GBG and prevention and intervention treatment policy.

## Potential Impact of Universal Access to PAX GBG

Because of multiple longitudinal studies, it is possible to estimate the population-level impact of a policy of providing universal access to PAX GBG by teachers in a school, district, community or other political unit. Potential users and policymakers can use an estimator developed by PAXIS Institute to predict longer term impact of providing well implemented PAX GBG in a school, a district, a county, region or in other political units such as states, provinces, or even countries. The figure below provides an example of an estimate for a hypothetical school district with 500 first graders.



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

| | |
|---|---|
| *Site Estimate for:* | *Somewhere School District In United States* |
| Enter number of First Graders at school, district or community>>>>>> | 500 <<< Enter number of First Graders |
| 43 | Fewer young people will need any form of special education services |
| 28 | More boys will likely graduate from high school. |
| 33 | More boys will likely enter university |
| 44 | More girls will likely graduate from high school |
| 35 | More girls will likely enter university |
| 5 | Fewer young people will commit and be convicted of serious violent crimes |
| 48 | Fewer young people will likely develop serious drug addictions |
| 33 | Fewer young people will likely become regular smokers |
| 18 | Fewer young people will likely develop serious alcohol addictions |
| 24 | Fewer young women will likely contemplate suicide |
| 33 | Fewer young men will likely attempt suicide |
| $6,510,000 | 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 |

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.  This estimator may not be used for any other evidence-based program than PAX Good Behavior Game®.

PLEASE SEE THE SECOND PAGE OF THE ESTIMATE FOR THE DATA FOR THE ASSUMPTIONS.

## Adopting PAX GBG as an Environmental Approach to Improving Risk and Protective Factors

What are the key elements required to use PAX GBG as an environmental policy at a school, district, or community level? We suggest the following key considerations:

- Developing accredited local PAX GBG Partners who can mentor and support teachers' high-quality implementation of PAX GBG.
- Developing a few teachers who are skilled and willing to be champions in speaking about PAX GBG and in allowing others to visit their classrooms.

- Regularly collecting observational data on disturbing, disruptive, destructive, inattentive, or unengaged behaviors ("Spleems") on a routine schedule on an approved data system for graphing and feedback to stakeholders, including teachers, student, administrators, and funders. The same data are used to mentor the self-regulatory skills of the students, and to help teachers identify strategies from PAX GBG that work best in doing so.
- Regularly calculating, graphing, and posting improvements and accumulation of PAX Minutes (sum of average number of minutes won in the Good Behavior Game).
- Regularly using the Purrfect PAX Rubric to provide timely and helpful feedback supports to teachers and others using PAX GBG, so that generalization of student self-regulatory skills increases across activities, time, places, behaviors, settings, and people.
- Regularly celebrating, recognizing, and reinforcing the successes of staff, students, and sites implementing PAX GBG, as well as publicizing those successes to parents, administrators, policymakers, funders, and the general public.
- Assuring that new teachers and students receive appropriate training and supports, as identified by ongoing studies and monitoring of PAX GBG in the US and other countries.
- Developing commitments for sustainable funding of materials, trainings, and supports (including PAX Partners who mentor) so that effective implementation sustains over time.
- Developing and experimenting with strategies to improve results and sharing those results with the broader learning community of PAX GBG users in the world.

### *Recommendations for Baseline Observations*

Every year a new baseline of "Spleems" is taken for that class or cohort, even if they had PAX GBG the previous year. This is similar to your doctor taking blood pressure when you go have annual check-up. Since Spleems vary by activity, time of day, or other circumstances, just as blood pressure does, PAX Partners or others assisting are advised to test three different 15-minute periods (different days, activities, etc.) at the start of the school year or a new teacher. During those three different times, observe and record Spleems using standard protocols (see Appendix A). This baseline or "pulse taking" allows estimates of generalization across time and indicates what might assist the children to maximize self-regulation in this new school term, year, or context. One great benefit of this is that it allows stakeholders to see how young people are improving over time, and it is extremely helpful in securing future funding. Typically, in previous efforts, young people returning to a new school year are 20% or so BETTER and more skilled than kids the previous year in the first few weeks of school who have NOT had PAX in prior years. There seems to be a cumulative benefit across years.

In some cases, PAX Partners may collect additional baseline data because of a need to understand a particular class or circumstances, as a way of better mentoring the students and staff.

Data should be entered and summarized by a PAXIS Institute approved data system, since such data are collectively used for continuous improvement.

### *Recommendations for Spleem Data Observations after Staff Training During Early Implementation*

After initial training by an accredited National PAX GBG trainer, initial mentoring by an accredited PAX Partner, or booster events for previously trained teachers, it is important to implement monitoring and mentoring using the Purrfect PAX Rubric, which has multiple studies demonstrating its relationship to students' change and distal outcomes [16, 25-27].

During early implementation, teachers and the class are learning or practicing after summer the language and evidence-based kernels of PAX GBG that are critical for success. A new teacher may require two to five visits from the PAX Mentor, in which observational data are collected on Spleems and the Purrfect PAX Rubric (see Appendix B). A teacher previously skilled in PAX will benefit from two to three such observations during the new students' acquisition phase, and for the PAX Partner to impart refinements in implementation learned from the previous year and the broader learning and research community using PAX GBG in the world. It is important for the PAX Mentor to praise high quality implementation, prompt improvements, or additions, and to provide rationale kernels and language — especially if the teacher is new, has wobbly implementation, or may have some more challenging students.

### *Recommendations for Spleem Data Observations during and after Classroom Implementation of the Good Behavior Game*

During the first month of implementation of the actual Good Behavior Game by a teacher new to PAX, it is recommended that a PAX Partner (mentor) visit the classroom at least once a week to observe Spleems and the implementation rubric, to provide reinforcement for successive approximation of good implementation, and to notice and give feedback to the teacher on actual improvements in the class and on smooth implementation of PAX GBG.

A teacher previously skilled in using PAX GBG does not typically need as many visits, unless there are specific problems with some unique students or other challenges. Still, it's advisable to make a couple of data observation visits during the 30 to 45 days of implementing the Game itself. PAX Partners are likely to have learned tweaks and strategies from the broader learning community, which will be useful. Again, monitor both the student behavior and the Purrfect PAX Rubric for praise and encouragement.

### *Recommendations for Continuous Improvement in Monitoring and Mentoring of PAX GBG*

PAX GBG is a living, dynamic environmental rather than curricular strategy. That means the environment should be monitored for the presence of conditions and strategies that create measurable PAX outcomes, based on many studies involved in its creation and evolution. Just as one monitors a house for temperature and comfort, as well as for maintenance necessary to keep the home in good working order, classrooms and schools benefit by the frequent walkthrough measures of indicators of the presence of PAX and the absence of Spleems.

The Purrfect PAX Rubric and other tools cover some of the ongoing "pulse-taking" and maintenance of high-quality implementation and responsive adaptation to challenges or trends. Remember, PAX is not a written strategy but a responsive living strategy to improve the wellbeing of adults and children. Thus, visiting and recording PAX-related data on Spleems, PAX minutes, and the rubric several times a month are very useful in maximizing the benefits of the PAX Good Behavior Game. Here are issues to heed:

- Posting and graphing of PAX Minutes by classrooms, grades, and/or the school(s). PAX Minutes are highly related to academic success, and a measure of engaged learning, not just the absence of problem behaviors. PAX minutes are the number of teams who won a game multiplied by the number of minutes played and divided by the number of teams playing that the time. Thus, if four teams were playing a 10-minute game, and three teams won, that would be 3 x 10 = 30 minutes, and then divided by 4 = 7.5 PAX minutes earned that game. These can be tracked on a cumulative thermometer. Please read the attached PAX Minutes appendix.
- The numbers of fresh Tootle Notes or PAX It notes posted per week.
- Square feet of new PAX related at work, posters or other artifacts posted per week.
- Use of PAX language in communications with families and others.
- Stories, letters, comments, etc. in the public about PAX in the community or schools.

## PAX GBG Rubric for Risk and Protective Factors Implementation

The next few pages break out meticulous details on the integration, implementation, and progress measures for PAX GBG in the context of the famed Risk and Protective Factors. These details are not meant to prohibit or constrain creative thinking. Rather the details are designed to evoke creativity on the part of end users of PAX GBG to find new ways of enhancing the life-giving benefits of PAX for students, their families, their teachers, and their communities.

Table 1: Application of PAX GBG® and related evidence-based Kernels to Hawkins & Catalano Risk and Protective Factors

| **Community domain risk factors** | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Community and personal transitions and mobility | Neighborhoods with high rates of residential mobility have been shown to have higher rates of juvenile crime and drug selling, while children who experience frequent residential moves and stressful life transitions have been shown to be at higher risk for school failure, delinquency, and drug use. | Based on prior research on with PAX GBG and its earlier studies, that transitions and mobility can be reduced by implementing PAX in schools and districts that might be involved in the mobility patterns of the most students. This was done in the community wide study [21], since some of the students with the highest risk moved 5-6 times a year. A best practice for very high needs children (children in care, children with multiple behavioral problems, etc.) is to make PAX part of their IEP, so that their new classrooms get PAX GBG. This has started in Canada. Promotion of the integral evidence-based kernels or PAX GBG to community settings or after-school settings can improve outcomes. | • Procedures established for use of PAX in IEP's for high-risk children with high conduct problems and/or exposure to Adverse Childhood Experiences (ACEs),<br>• Scaling up plan of PAX around mobility patterns<br>• Secure third-party billing for relevant child SPED/DSM-V diagnoses for implementation of PAX for special needs. | ○ Reduction in clinical severity of externalizing and internalizing symptoms of very high-risk children with mobility issues. Suggested instruments include Strengths & Difficulties Questionnaire (SDQ) and Child-Behavior Checklist<br>○ Reduced suspensions and expulsions of high-risk students over time. |
| Community disorganization | Research has shown that neighborhoods with high population density, lack of natural surveillance of public places, physical deterioration, and high rates of adult crime also have higher rates of juvenile crime and drug selling. | The original CDC study that tested what are now PAX components (Embry et al., 1996) took place in such neighborhoods. Once weekly, sites held neighborhood events in which children engaged in community action to praise (Tootle) residents making their dwellings nicer, gave out donated seedlings, picked up trash, or carried signs like, "Honk if you want peace/PAX in the neighborhood. These actions caused greater engagement in the schools and contributed to prevention impact measured in the studies [22-24]. Perceived community benefits were reported in national media [28]. | • Training and Implementation of appropriate kernels (e.g., PAX language, tootles, cues, Granny's Wacky Prizes, beat the timer) in nearby community settings<br>• Student and staff presentations about PAX & Kernels to boards, media, clubs, funders, organizations, etc. | ○ Stories in local media, such as column inches, broadcast minutes, letters to editor, etc.<br>○ Volunteers to help<br>○ Contributions to support implementation and expansion<br>○ Requests to see PAX in action by others |

| **Community domain risk factors** | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Low neighborhood attachment | A low level of bonding to the neighborhood is related to higher levels of juvenile crime and drug selling. | Communities in Ohio, Washington State, Montana, and California have used the successes of PAX in the schools to diffuse to the larger community by engage families [29], putting Tootles in local media, organizations and businesses [30], and spreading some of the evidence-based kernels that work with children in community programs, adults, businesses, and treatment programs [31]. | • Majority of students from PAX classrooms participate in presentations, skits, plays, & performances about kernels that families, organizations, and others can adopt that provide community protective factors<br>• Adults in implementing schools send an average of two NCR Tootles or PAX-IT notes to home per week. (If 50 staff, an average of 100 notes per week)<br>• Each classroom collectively writes a "community tootle" to adult or organization in community each week which can be in media and other formats | ○ Local organizations start to use one or more evidence based kernels that potentially reduce community domain risks and indicate social bonding and civic engagement.<br>○ Vandalism, thefts on campus or nearby community decreases<br>○ Pride Survey or similar surveys that can be used with elementary students show impact on perception of neighborhood. |
| Laws and norms favorable toward drug use | Research has shown that legal restrictions on alcohol and tobacco use, such as increasing the legal drinking age, restricting smoking in public places, and increasing taxation, have been followed by decreases in consumption. Moreover, national surveys of high school seniors have shown that shifts in normative attitudes toward drug use have preceded changes in prevalence of use. | PAX GBG includes a kernel at a school level of "reward and reminder" (on the NREPP list separately and created by PAXIS [32]) wherein adults and students are recognized for doing the right thing AND not doing the wrong thing. Some communities used the community-wide version to recognize stores, clerks, bars, etc. for NOT selling tobacco or alcohol to minors. This strategy measurably reduces state or community access to tobacco or alcohol, reduces perceived access, and reduces any 30-day or everyday use [32, 33]. | • Students nominate and recognize an adult PAX Leader at school, neighborhood, or community each week and why in written, large Tootle Note. Pictures taken and media invited.<br>• Presentations to community leaders that may include participating students about evidence-based kernels that can influence norms.<br>• Advocacy by outside groups calling for the adoption of such evidence-based kernels. | ○ Media stories about student recognized adult PAX Leaders for Peace, Productivity, Health, and Happiness who Better The World<br>○ Frequent recognition of stores, clerks and others on frequent basis for doing the right thing by not selling alcohol or tobacco minors.<br>○ Decrease in public stories about stories and clerks that sold to minors (this increases favorable attitudes, perceived access, and use by minors, opposite of the intent). |

| Community domain risk factors | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Perceived availability of drugs and handguns | The availability of cigarettes, alcohol, marijuana, and other illegal drugs has been related to the use of these substances by adolescents. The availability of handguns is also related to a higher risk of crime and substance use by adolescents. | See above about Reward & Reminder regarding alcohol and tobacco.<br><br>Previous studies of PAX GBG components, when used school wide, and not just in classrooms shows that it reduces perceptions of weapons (guns and knives) at school and self-reported carrying of such weapons [21-23], as well as medical coded violent injuries measured by the Centers for Disease Control [22]. This happens NOT by talking about the dangers of drugs, violence, and weapons. Rather this happens by the DAILY demonstration of PAX, reduction in PERCEIVED aggression by students and adults and use of the PAX language and tools that demonstrate different norms and increase students' sense of individual and collective agency of daily life at school that they help create that signals peace, productivity, health, and happiness.<br><br>While not immediate, the earliest precursors of PAX GBG at Johns Hopkins where it continues to be studied averted conduct disorder, anti-social personality disorder and lifetime violent crime by program participants as they transitioned from childhood, to adolescents and then young adults [34, 35]. Community based trainings of adult-oriented versions of the evidence-based kernels for reducing child behavior problems have adult versions that are highly effective in reducing poly-drug use, and difficult-to-treat additions, such as opiate, heroin, and methamphetamine addictions, listed separately on NREPP [36]. Such cross training is happening in Ohio for home visiting programs in the US and Canada. | ▪ PAX minutes (see PAX Minutes Instructions) publicly posted in classrooms and public spaces of the school or other programs using PAX GBG.<br>▪ Soft competition happens between classrooms, grades or whole schools to increase PAX Minutes.<br>▪ Students use the identity label of being a PAX Leader.<br>▪ Adults notice and praise PAX behavior in public spaces.<br>▪ Tootle Notes or PAX-IT notes fresh and publicly visible in the building.<br>▪ Adults can recount stories about children talking about PAX and how they feel about PAX.<br>▪ Families talk about students spreading PAX strategies to home. | ○ Monthly or quarterly Spleem counts (disturbing, disruptive, distracting, destructive, inattentive, off-task, or unengaged learning behaviors decline and stay at low rates in implementing classrooms<br>○ Returning students the following year show lower baseline rates of Spleems and faster return of PAX skills in newer grades when teachers implement PAX in those grades<br>○ Rise in attendance<br>○ Fewer violent injuries recorded at school office, nurse's office or health log<br>○ Lower vandalism costs<br>○ Fewer police calls to school or near school<br>○ Fewer thefts at school<br>○ Better student, staff, and family ratings of school climate and perceived safety<br>○ Lower staff absenteeism and sick days, with reduced need for substitute teachers |

| **Community domain protective factors** | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Opportunities for prosocial involvement | When opportunities are available in a community for positive participation, children are less likely to engage in substance use and other problem behaviors. | See Opportunities for Prosocial Involvement in Schools to understand necessary pre-requisites to increase prosocial opportunities in the larger community from implementation of PAX in classrooms and whole schools.<br><br>Example story from the precursor project funded by the Centers for Disease Control [21]. At the time, a school enrolled a recent immigrant 2nd grader whose English was poor and who was somewhat ostracized in the research school, and was referred for "counseling," The child was withdrawn naturally and somewhat depressed. He was not sick, but his peer environment was. Rather than "therapy", he was taught to be the school photographer, got to carry the camera the whole day, and his pictures were printed and posted all over the school and online. This made him popular with the students, staff and families. The Chamber of Commerce had its leadership training at the school for up and coming young business people, and he was their photographer—which astonished the Chamber members and got them to write this up in the Chamber of Commerce newsletter, of course featuring a picture of him and the leadership class. The school received donations from those young leaders. | • Mentor or coach teachers/staff to make sure students have the relevant job roles for implementing PAX GBG in their classrooms (see Ch. 18)<br>• Expand the roles related to Tootling so that students are Tootling OUTSIDE their immediate classroom to the broader school then to other settings as fitting<br>• Have students teach their families to use Tootles<br>• If school has adopted PAX GBG school-wide, request and implement the School Wide Job Roles Module from PAXIS (it's free)<br>• Have students present PAX and evidence-based kernels to broader community such as | ○ Reduction in vandalism on campus and near campus<br>○ Better attendance<br>○ Improved academic test scores [37], [38]<br>○ Reduction in bullying [39]<br>○ Improved friendship network among students, and less exclusion<br>○ Increased donations of goods and services for prevention programs<br>○ More column inches in newspaper and blogs about positive child and youth behaviors in the community or schools |
| Rewards for prosocial involvement | Rewards for positive participation in activities helps children bond to the community, thus lowering their risk for substance use. | Please see Rewards for Prosocial Involvement in Schools to understand foundation of that to spread community rewards for prosocial behavior.<br><br>After success has been established in classrooms or schools, then opportunities arise to expand to the larger community. Please visit GoodBehaviorGame.org and PAXIS.org or PAX Good Behavior Game site on FaceBook for spontaneous examples from the US, Canada and other places.<br><br>Here is example from one community that uses PAX GBG: http://bit.ly/TOOTLES-PAX-IT | • Have community trainings on spreading Tootle notes community programs in churches, afterschool programs, little league, 4-H, etc.<br>• Ask local media to dedicate time or space for Tootles for young people such as the local radio station, community newspaper, or TV station. There are examples of these | ○ Use Communities That Care Survey or Pride Survey to monitor results<br>○ Develop annual enrollment survey to be included in school packet.<br>○ Track column inches or "hits" in community for the use of Tootle or PAX-IT notes. |

| **Family domain risk factors** | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Family history of antisocial behavior | When children are raised in a family with a history of problem behaviors (e.g., violence or ATOD use), the children are more likely to engage in these behaviors. | PAX GBG is not a family intervention per se, specifically designed to be implemented by therapists with parents or in homes to alter family history of current family adults regarding their current violence and drug use. That said, the long-term data on PAX GBG shows that it increases the age first vaginal intercourse, reduces violence and aggression in adolescence and young adulthood, and reduces or averts alcohol, tobacco or drug use at the time when young adults form families 10-20 years after elementary school [40]. It also improves the protective expression of Brain Derived Neurotropic Factor genes against those lifetime problems [41]. Thus, PAX GBG changes family histories of antisocial behavior.<br><br>One evidence-based kernel [42], however, used in PAX GBG (Granny's Wacky Prizes) has an adult analogue in the National Registry of Evidence-Based Practices, funded by NIDA, that has exemplary and cost-effective impact on this serious risk factor that can be and has been integrated at a community level to reduce serious addictions and related violence [43]. For more info on this NREPP strategy please see: http://bit.ly/payforsober and http://bit.ly/PrizeBowlManual. | • Please follow the standard "Purrfect PAX" implementation rubric for PAX GBG in classrooms and schools.<br><br>For more information about integrating the adult treatment strategies, please contact PAXIS Institute | ○ Unless communities create their own longitudinal research and monitoring projects in cooperation with prevention scientists and local entities, this is beyond the scope of implementation of PAX GBG to measure and monitor, as it requires more than 10 years of forward monitoring systems and planning.<br>○ If communities implement the evidence-based kernels for family adults, it is possible to measure such changes in two or more years. |

| Family domain risk factors | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Family conflict | Children raised in families high in conflict, whether or not the child is directly involved in the conflict, appear at risk for both delinquency and drug use. | Both PAX GBG and some of its embedded evidence-based kernels have research-based evidence of reducing family conflict related to delinquency and drug use<br><br>Specifically, well implemented PAX GBG for 1-2 years per student reduces rejection of children by parents and increases their reinforcement of positive behavior [25, 44], even without the added evidence-based kernels in the commercially available version<br><br>The positive notes home kernel (Tootles and 3-part No Carbon Required PAX-IT or Tootle Notes) has demonstrable impact on reducing conflict between children and adults [45-50] | • Mentor teachers with feedback on the Rubric, Spleems and PAX Minutes to achieve stable implementation scores of 36 or better, with regular 2-3 games per day<br>• Expand so that most children receive two years of exposure to PAX to maximize benefits<br>• Elevate school to provide two PAX Home Notes per adult per week as goal Implement PAX-to-the-MAX protocols, with positive notes for children with poor response to generic implementation of PAX; or for children with high ACE scores or high-screening scores for conduct problems on such reliable and free instruments as the Strengths and Difficulties Questionnaire (see www.SDQ info.org) | ○ Consider adding the Strengths and Difficulties Questionnaire to the enrollment package of all students at the start of the year, to be filled out by parents or guardians. This provides an ongoing monitoring system and pre-emptory alerts for child children who benefit by classrooms with high implementation of PAX.<br>○ Parent versions of the Strengths and Difficulties Question are available at www.SDQinfor.org, in virtually every language and are free. Online version available at wwwyouthinmind.info |

| | | | | |
|---|---|---|---|---|
| Parental attitudes favorable toward antisocial behavior and drugs | In families where parents use illegal drugs, are heavy users of alcohol, or are tolerant of children's use, children are more likely to become drug abusers during adolescence. The risk is further increased if parents involve children in their own drug (or alcohol) using behavior, for example, asking the child to light the parent's cigarette or get the parent a beer from the refrigerator. | PAX GBG is a universal classroom strategy (with Level II and III RTI or PBIS adaptations) with long-term impact on this type of risk factor. But PAX GBG is not designed to provide treatment or high-intensity parent supports to reduce these behaviors via the changes in the child's behavior at school. Yet such behavior changes provide a resiliency and protective factors for the child and the child's peers.<br><br>For addiction treatment, strategies such as the previously mentioned contingency management protocol are among the more effective and easiest to implement cost-effectively. For more info on this NREPP strategy, see: http://bit.ly/payforsober and http://bit.ly/PrizeBowlManual. Two specific parenting interventions that can be useful: Level 5 Parenting Supports via the Triple P program (http://www.triplep.net/glo-en/home/)and Family Check-Up (http://cfc.uoregon.edu/intervention.htm) | • Assure that children affected by such a situation are placed in classrooms with very high levels of implementation of PAX GBG, and with low rates of spleems per 15 minutes per child. The child will do better and acquire more protective factors as a consequence.<br><br>• Please feel free to contact PAXIS Institute about ongoing research and resources to assist with these risk factors. | ○ See above |

| Family domain risk factors | | Suggested Application of PAX GBG & Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Poor family management | Parents' use of inconsistent and/or unusually harsh or severe punishment with their children places them at higher risk for substance use and other problem behaviors. Also, Parents' failure to provide clear expectations and to monitor their children's behavior makes it more likely that they will engage in drug abuse whether or not there are family drug problems. | A reminder: PAX GBG is a universal, environmental classroom strategy that that has documented positive impact on family management [25, 44], but is not parenting program per se. The commercial version has added evidence-based kernels explicitly designed to increase positive behavior of the child at home and to assist parents in having more positive relationships with their children [42, 49].<br><br>These include sending Tootle Notes and No Carbon Required PAX It notes home [49], and having students teach families how to write Tootle Notes at events or parent-teacher conferences.<br><br>This includes the PAX Home Self-Modeling Reproducible book that comes with each teacher's kit, as well as 1-sheet reproducibles on specific kernels easily copied at home. Self-modeling stories wherein the child and family members are heroes of the change implementing evidence-based kernels have their own scientific studies and results [51-55], and one of these stories is included, which can be reproduced for parents. | • If possible, assure that children affected by such a situation are in classrooms with very high levels of PAX GBG implementation and with low rates of spleems per 15 minutes per child. The child will do better and acquire more protective factors as a consequence<br>• Absolutely assure that such families and other families are getting their child's Tootles from others and No Carbon Required copies of the PAX-IT notes from adults in the building<br>• Mentor teachers to reasonable levels of the implementation rubric, 34 or higher<br>• Introduce and promote the PAX GBG book for home<br>• Promote relevant evidence-based kernels for home, per letters in the teachers' reproducibles<br>• Introduce evidence-based kernels at all family nights and events, via children's plays, songs, and demonstrations that increase family attendance.<br><br>Consult with PAXIS about related strategies expected to be added as options for communities to use with families, such as PAX@HOME. | ○ If families are filling out the SDQ's at enrollment at the beginning of each year, note changes the mean and range of scores on the five factors.<br>○ As you have child performing events about PAX, measure the following:<br>○ Increases in family participation.<br>○ Parental ratings about the utility or benefits of PAX GBG kernels at home.<br>○ Parental engagement in other important aspects of the child's life.<br>○ Improvements in the children's behavior at school<br>○ Child attendance<br>○ Child illnesses at school<br>○ Accommodations requested by family for children, under 504 or IEP plans<br>○ Child protection events reported from the school |

| **Family domain protective factors** | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Family attachment | Young people who feel that they are a valued part of their family are less likely to engage in substance use and other problem behaviors. | For simplicity, these have been grouped because of overlap from the impact and generality of PAX GBG and its kernels, which can be applied in homes. Again, the reminder that PAX GBG is a universal, environmental strategy for schools and group settings (after school, etc.) for children. PAX GBG generalizes from school and group setting to families if well implemented, and its evidence-based kernels can be promoted at home and improve family protective factors. Specifically these include:<br>• Tootle Notes and PAX-IT notes share with home, and promoted in the broader community.<br>• Promoting the use of kernels like Beat the Timer, Fickle Finger of Fate, Granny's Wacky Prizes, PAX Vision, PAX Stixs, Tootles, PAX Jobs at school and home etc. all have demonstrable impact on these three domains of family protective factors.<br>• These kernels can be promoted in youth serving or family serving organizations and businesses or media to facilitate and cause imitation or generalization by children and families. For example, most of the strategies can be used by Boys and Girls Clubs, YMCA, Scouts, 4-H, community recreation programs, church programs, etc. They can be promoted in local media and even restaurants or grocery stories, since these kernels have experimental and case-study evidence of benefit in those settings [28, 42, 56]. | • Mentor teachers/staff for solid implementation of PAX GBG using the "Purrfect PAX rubric" as well as providing feedback on Spleem charts and PAX Minutes.<br>• Create broader constituency of organizations invested in PAX (CADCA, DFC or SS/HS type models), and have them visit successful schools/classrooms. Such visits actually increase fidelity of implementation, as people want to show out.<br>• Promote standard data to the media and stakeholders on the change (e.g. reduced Spleems and increased PAX Minutes)—and why important.<br>• Make presentations with teachers and students to local service groups and clubs, which will cultivate local media.<br>• Develop trainings on embedded PAX GBG evidence-based kernels that can be spread to families and youth serving organizations. (Note there are videos and slides for such purposes available from PAXIS Institute.) | ○ Donations, contributions and commitments from organizations and individuals to support and expand PAX GBG in community.<br>○ Community participation in PAX related events.<br>○ Requests by families for child to be in classroom with PAX.<br>○ More "family and kid" friendly activities and events in community.<br>○ Requests by families for PAX tools at home. |
| Opportunities for prosocial involvement | Young people who are exposed to more opportunities to participate meaningfully in the responsibilities and activities of the family are less likely to engage in drug use and other problem behaviors. | | | |
| Rewards for prosocial involvement | When parents, siblings, and other family members praise, encourage, and attend to things done well by their child, children are less likely to engage in substance use and problem behaviors. | | | |

| School domain risk factors | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Academic failure | Beginning in the late elementary grades (grades 4-6),** academic failure increases the risk of both drug abuse and delinquency. It appears that the experience of failure itself, for whatever reasons, increases the risk of problem behaviors.<br><br>**This is now proven to be as early as first grade, though such failure in fourth grade and beyond rapidly accelerates the risk. | PAX GBG increases first grade reading scores [25] and reduces the need for special services. Further it increases high-school graduation and university entry [57]. Recently, an in-press paper shows that reductions in Spleems in fourth-grade classrooms predict better short-cycle test scores associated with standardized achievement [58].<br><br>In addition several of the evidence-based kernels (random calling sticks, pinch slates, student jobs, beat the timer, etc.) have their own independent evidence of impact on academic success [42].<br><br>PAX Minutes (the mathematical and practical equivalent of engaged learning) are powerful predictors of academic success.<br><br>NOTE: Other specific evidence-based kernels can be added to PAX GBG once students are capable of sustained attention that greatly improves academic success. These include rapid responding, peer-assisted learning, self-monitoring, the learning game, and meta-cognitive strategies such as paragraph shrinking. Contact PAXIS for info. | • Mentor and promote teachers to post cumulative PAX minutes to challenge students to do more PAX<br>• Mentor and promote principals and instructional leaders to challenge students to create more PAX Minutes<br>• Prompt teachers to use Beat the timer, PAX stix, ABCD pinch slates, and go-getter jobs to improve academics<br>• Prompt and explain to teachers that playing PAX Games for preparation for standardized tests improves student scores<br>• Use the Purrfect PAX rubric to give mentoring feedback on these kernels in PAX | ○ Correlate PAX Minutes or reduced spleems with test scores for training and coaching.<br>○ Measure changes in referrals for special services, IEPs and other supports over time for classes with solid implementation of PAX |
| Low commitment to school | Surveys of high school seniors have shown that the use of hallucinogens, cocaine, heroin, stimulants, and sedatives or non-medically prescribed tranquilizers is significantly lower among students who expect to attend college than among those who do not. Factors such as liking school, spending time on homework, and perceiving the coursework as relevant are also negatively related to drug use. | Overall high-quality implementation of PAX GBG for 1-to-2 years has large impact on reducing the trajectory of use of alcohol, tobacco, and drugs by students. Children typically do not have first initiation of these until grades 4 to 6. PAX GBG significantly delays first initiation and dramatically reduces actual use and abuse of ATOD [19, 20, 25, 59]. | • The key predictor for these outcomes:<br>○ Is high-quality implementation of PAX GBG using the rubric, and providing reinforcement and feedback to staff on the Purrfect PAX Rubric<br>○ Multiple observations that show the class is capable of having low levels of "Spleems" consistently, when playing and not playing the Game over time<br>○ Ability of students to demonstrate significant gain in PAX Minutes | ○ Improved attendance of students<br>○ Solid improvements in benchmark or short cycle test scores<br>○ High levels of engaged learning measured by PAX Minutes<br>○ Lower levels of health problems for both students and staff<br>○ Higher standardized test scores<br>○ Greater high-school completion<br>○ Greater college entry |

| School domain protective factors | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Opportunities for prosocial involvement | When young people have more opportunities to participate meaningfully in important school activities, they are less likely to engage in drug use and other problem behaviors. | This protective factor emerges from the research by Sir Michael Rutter [6, 37] at macro-level and from the work of behavioral analysts with notions of differential reinforcement of incompatible behavior [38]. With PAX GBG, the protective factor operates at several levels: a) every child has a meaningful role on rotating teams (opportunity), b) every child gets additional opportunity roles (Chapter 18) for the classroom, and c) older students have opportunities to spread and implement PAX in whole school or community efforts —when school- or district-wide adoptions occur.<br><br>For school-wide implementations, PAXIS provides a supplement for 300 meaningful roles in a school building, which have links to STEM and reduces bullying in schools, plus improves academic success. | • Assure teams for the game are rotated, and that ad-hoc teams are used to increase cooperation among diverse students<br>• Mentor teachers to have students filling all PAX roles for teams within 8 to 10 weeks of the start of school, for grades 2 through 6. See chapter 18.<br>• Consider adding more roles for student, as students demonstrate social competencies | ○ Peer friendship networks increase<br>○ Socially competent students bid to include students who are less socially skilled<br>○ Tattling declines<br>○ Visible inclusion and helping of children with disabilities |
| Rewards for prosocial involvement | When young people are recognized and rewarded for their contributions at school, they are less likely to be involved in substance use and other problem behaviors | Three or more times a day, students on PAX teams can earn potent, brief activity rewards (Granny's Wacky Prizes based on the Premack Principle and evidence-based kernels). Staff encourages students to write Tootle Notes for prosocial behaviors, often modeled on the PA system daily. And, adults write and give Tootles to each other and students as models. Tootles and special versions to families are sent home for adults to praise and reinforce prosocial behavior: scientific research supports the effectiveness of these positive notes. | • Granny's Wacky Prizes and ideas rotated often across grades and teachers<br>• Tootle notes counted and shared with families each week<br>• Classrooms or schools teach new behaviors or competencies to be tootled each week<br>• Socially competent children trained to be "secret tootlers" for shy, withdrawn, or aggressive children<br>• Teachers use mystery PAX player (PAX Surprise) strategy<br>• Sample Tootles read aloud on PAX each day to evoke imitation<br>• No Carbon Required PAX-IT notes used to send home social recognition from adults about students<br>• Diffuse Tootles to local media about students' successes<br>• Granny's Wacky Prizes diffused to families | ○ Children show increasing ability to delay rewards, as shown by playing longer games<br>○ Children show resiliency in ability to work harder for their rewards if their team doesn't win<br>○ Children show ability to calm down after exciting Granny's Wacky Prize<br>○ Children suggest "banking prizes" to work for a bigger group reward |

| Peer-individual risk factors | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Attitudes favorable toward antisocial behavior and drug use | Initiation of use of any substance is preceded by values favorable to its use. During the elementary school years, most children express anti-drug, anti-crime, and pro-social attitudes and have difficulty imagining why people use drugs. However, in middle school, as more youth are exposed to others who use drugs, their attitudes often shift toward greater acceptance of these behaviors—increasing peer use. | PAX GBG clearly belief and support for peaceful, productive, healthy and happy behaviors by predicting what PAX and Spleems are, self-monitoring both, coaching each other for fewer Spleems and more PAX.<br><br>The ongoing prediction and visioning of PAX and Spleems helps build lifetime prosocial behaviors. PAX GBG does not lecture or have lessons about drugs, etc. Rather, it creates an environment in which students are not caught in accidental reinforcement of deviant behaviors to gain peer approval, and that students both individually and collectively work for peace, productivity, health and happiness. This reduces lifetime antisocial, deviant behaviors in longitudinal studies. | • Students and staff construct PAX visions for classrooms, activities, other settings such as buses, playground, gym, home, field trips, etc. to facilitate generalization of PAX and Spleems<br>• Students lead their families in PAX Visions for homes<br>• Teachers and staff ask students to predict PAX and Spleems for new activities<br>• Teachers and staff ask student teams to debrief PAX and Spleems after playing PAX games. | ○ Students spontaneously use the language of PAX and Spleems, and request the PAX Game<br>○ Students spontaneously reinforce each other for PAX<br>○ Longitudinal data show fewer students with predictors of ATOD use |
| Early initiation of problem behavior | Early onset of drug use predicts misuse of drugs. The earlier the onset of any drug use, the greater the involvement in other drug use and the greater frequency of use. Onset of drug use prior to the age of 15 is a predictor of drug abuse, and a later age of onset of drug use has been shown to predict lower drug involvement and a greater probability of discontinuation of use. | PAX GBG does not teach anything about drugs per se. Rather, PAX GBG create a social environment that is now scientifically proven to be the first, universal classroom strategy, that causes protective expression of Brain Derived Neurotropic Factor (BNDF) genes, which in turn reduce problematic behaviors and brain chemistry that pose a risk for mental, emotional and behavioral disorders [41]. The result is that multiple studies show a significant reduction of the trajectory of problematic behaviors [59]. | • Mentor teachers so that students have solid exposure to well implemented PAX for 1-2 years in school<br>• Provide feedback to administrators and policy makers about the durable and cost-effective protection of children's futures from PAX GBG [59], and student behavior change indicators | ○ Reduction in need for special education and/or 504 accommodations<br>○ Reduction in behavioral referrals (School Wide Information System) data<br>○ Reductions in juvenile crime<br>○ Reduction in early initiation of tobacco and alcohol<br>○ Delayed first vaginal sex<br>○ Fewer suicide attempts<br>○ Less delinquency |

| Peer-individual risk factors | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Friends' use of drugs | Young people who associate with peers who engage in alcohol or substance abuse are much more likely to engage in the same behavior.<br><br>Even when young people come from well-managed families and do not experience other risk factors, spending time with friends who use drugs greatly increases the risk of that problem developing. | Young people tend to move through school as peer cohorts, even with mobility across schools and communities.<br><br>PAX GBG causes students to refrain from social reinforcement of deviant behavior among their peer cohort, and increases peer reinforcement for prosocial, positive behaviors. This in turn protects against deviant behavior based on many longitudinal studies of drug use and deviant behavior. If students continue to be reinforced by peers for PAX like behaviors that in turns magnifies the protective effects of 1-2 years of exposure of PAX GBG. | • Reduction in observed Spleems within the school year from baseline through solid implementation of 70 to 85%<br>• Measured reduction in Spleems during baseline at the beginning of a new school year and grade, by students who have previously had PAX GBG for a year more before entering the new grade, compared to students/ classrooms with no prior experience of PAX GBG | ○ As young people enter middle school, instruments such as the Pride Survey or the Communities That Care Survey show later age of first initiation and lower percentages of children with any 30-day use. |
| Interaction with antisocial peers | Young people who associate with peers who engage in problem behaviors are at higher risk for engaging in antisocial behavior themselves. | PAX GBG powerful addresses this issue from an earliest age. First, the evidence-based kernels reduce anti-social behaviors by peers dramatically. This is a modeling effect and context effect.<br><br>Next, the Good Behavior Game dramatically reduces the actual rates of children in the classroom with anti-social behaviors. | • Reduction in observed Spleems within the school year from baseline through solid implementation of 70 to 85%<br>• Fewer reports of children experiencing being bullied in the same school year<br>• Lower rates of injury from violent or unintentional injuries on campus<br>• Fewer referrals for fights | ○ Fewer students in middle school suspended or expelled for violent actions<br>○ Fewer students in middle school who have been charged with juvenile crimes<br>○ Fewer students in middle school requiring placement in alternative schools<br>○ Fewer students in middle school on probation in school, and fewer high school students on parole<br>○ Fewer adolescent girls who are pregnant or have been treated for STDs |
| Perceived risk of drug use | Young people who do not perceive drug use to be risky are far more likely to engage in drug use. | PAX GBG has dramatic effects on reducing the age of initiation of any ATOD and the development of any ATOD addiction. | • NOTE: Virtually all elementary school children endorse perceived risk of ATOD<br>• This is not measured by PAX GBG, because of the above | ○ Lower levels of first use reported in sixth grade of any substance for children who have had PAX GBG 1-2 years, when well implemented |

| Peer-individual risk factors | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Rewards for antisocial behavior | Young people who receive rewards for their antisocial behavior are at higher risk for engaging further in antisocial behavior and substance use. | PAX GBG directly reduces rewards for antisocial behavior through the use of evidence-based kernels in PAX and the Good Behavior Game.<br><br>The Purrfect PAX Rubric basics need to be promoted, inclusive of the children being exposed to playing the Game two to three times per day. | • Encourage rotation of Granny's Wacky Prizes, including ones suggested by students<br>• Increasing PAX Minutes for each classroom<br>• Increase use of student-initiated student Tootles, and adult NCR tootles or PAX It Notes home<br>• Use of a Team of One for children who deliberately Spleem for attention | ○ Reduced referrals for fighting, bullying, and other forms of aggression—including vandalism<br>○ In middle school and beyond, less involvement with the criminal justice system and police |
| Rebelliousness | Young people who do not feel part of society, are not bound by rules, don't believe in trying to be successful or responsible, or who take an active rebellious stance toward society, are at higher risk of abusing drugs. In addition, high tolerance for deviance, and strong needs for independence and normlessness have been linked with drug use. | Rebelliousness and rewards for antisocial behavior overlap highly. Thus, assuring high-quality implementation of PAX GBG is key in reducing this trait. PAX GBG includes strategies in "PAX to the MAX" – multilevel tier of behavioral supports to address this issue among children who are extreme on the scale. Long-term studies of PAX GBG show this trait is reduced. | • Use of a Team of One for children who deliberately Spleem for attention<br>• Use mystery player to assist children in reducing such rebelliousness<br>• Assure such children have meaningful roles for helping implement PAX GBG<br>• Provide "Secret Tootles" from a "secret PAX friend" who looks for prosocial behavior and gives the anonymous Tootle to the teacher to deliver | ○ See above |
| Sensation seeking | Young people who seek out opportunities for dangerous, risky behavior in general are at higher risk for participating in drug use and other problem behaviors. | This trait is actually useful in some contexts for human survival. Thus, PAX GBG uses some very exciting and thrilling Granny's Wacky Prizes as rewards, and teaches children at the same time to self-calm quickly under conditions of excitement. Because PAX GBG provides a vehicle for the trait's positive expression in the context of self-regulation, there are putatively fewer issues. | • Include some exciting Granny's Wacky Prizes and make them brief so that self-regulation of the trait is nurtured<br>• Ask students to suggest such exciting rewards, to earn by banking prizes | ○ Fewer unintentional injuries at school, home and the community<br>○ Delayed initiation of substance use |
| Gang Involvement | Youth who belong to gangs are more at risk for antisocial behavior and drug use. | Frequent use of the Game changes the propensity for clustering of antisocial youth, through frequent team rotations and positions of roles in implementing the Game. | • Never assign most of the antisocial children to one team<br>• Rotate children frequently on teams<br>• Play the game often<br>• Provide roles for children | ○ Reduce gang affiliation or perceived affiliation by intermediate grades<br>○ Fewer convictions involving gangs in middle school and beyond |

| Peer-individual protective factors | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Religiosity | Young people who regularly attend religious services are less likely to engage in problem behaviors. | PAX GBG is highly acceptable to religiously affiliated schools, and is adaptable for use in Sunday School or other religious activities. There are internet postings and publications about this.<br><br>The construct of PAX GBG is based on universal principles found in almost all faiths (see Preface of manual). The set-up of PAX GBG is a child friendly embodiment of the "Golden Rule." | • Invite members of the local religious faiths to make public comments about PAX GBG, and see it in action<br>• Offer training in implementation of PAX or kernels for afterschool settings and youth-serving organizations, including faith-based entities. The PAX Tool Box can be used in many settings. | ○ Surveys of students will endorse more prosocial behaviors and secular versions of the Golden Rule<br>○ Local faith organizations express support for PAX in schools |
| Social skills | Young people who are socially competent and engage in positive interpersonal relations with their peers are less likely to use drugs or engage in other problem behaviors. | PAX GBG expressly evokes high levels of prosocial behaviors of both children and adults, in its underlying component and full-scale implementation research.<br><br>Indeed, the "PAX" portion of PAX GBG emerges from the PeaceBuilders study [21], which has some of the most robust prosocial outcomes in school-based prevention [23]. Some individual components or evidence-based kernels are particularly powerful in increasing prosocial behavior such as Tootles [60], as well as positive notes home from adults to parents about their child [45-49]. | • Coach high levels of peer to peer Tootle notes<br>• Coach high levels of use (2 per adult per week) for NCR PAX-IT notes<br>• Engage local media to provide air-time or print time for Tootles or PAX-IT notes<br>• Promote student "job roles" for implementing the game | ○ Teachers and parents will rate children and teens better on the Strengths and Difficulties Questionnaire or similar instruments that have scales for social skills<br>○ Fewer children will be sick at school or miss school<br>○ Fewer injuries on the playground or bus<br>○ Less mental illness and suicide |

| Peer-individual protective factors | | Suggested application of PAX GBG and Kernels | Suggested implementation rubric indicator(s) | Suggested distal monitoring and outcome indicator(s) |
|---|---|---|---|---|
| Belief in the moral order | Young people who have a belief in what is "right" or "wrong" are less likely to use drugs. | The motto for students about PAX is, "I better my world and I better myself." This is a child-friendly version of the Golden Rule, and it gets enacted EVERY day in well-implemented PAX classrooms through a variety of evidence-based kernels and procedures in PAX.<br><br>This perception of moral order is also about the student perceiving that they have self-efficacy in creating a predictable, safe and future oriented situation for themselves and others. | • Mentor teachers and staff to have students use the See, Hear, Do, and Feel charts for many different situations<br>• Mentor teachers to invite children to predict PAX and Spleems before new PAX Games<br>• Mentor teachers to ask students to debrief what PAX and Spleems the teacher might have noticed during Games<br>• Mentor teachers to ask students how they might "paxify" situations (e.g., using rock/paper/scissors to decide who goes first)<br>• Coach use of positive debrief of children solved a problem | ○ Students report fewer mental, emotional and behavioral disorders in themselves<br>○ Students are more likely to graduate from high-school and to seek higher education<br>○ Students are less likely to engage in violent crimes or to harm self |

References Cited


1. Hawkins JD, Catalano RF, Miller JY: **Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention**. *Psychological Bulletin* 1992, **112**(1):64-105.
2. Ekholm M: **Readiness to help others and tolerance: Attitude development during the school years and a ten-year comparison**. *Scandinavian Journal of Educational Research* 1984, **28**(2):71.
3. Graham P, Rutter M, George S: **Temperamental characteristics as predictors of behavior disorders in children**. *American Journal of Orthopsychiatry* 1973, **. 43**(3):328.
4. Lockyer L, Rutter M: **A five- to fifteen-year follow-up study of infantile psychosis: III. Psychological aspects**. *British Journal of Psychiatry* 1969, **115**(525):865.
5. Yule W, Rutter M: **EDUCATIONAL ASPECTS OF CHILDHOOD MALADJUSTMENT: SOME EPIDEMIOLOGICAL FINDINGS**. *British Journal of Educational Psychology* 1968, **38**(1):7.
6. Rutter M: **School influences on children's behavior and development: The 1979 Kenneth Blackfan lecture, Children's Hospital Medical Center, Boston**. *Annual Progress in Child Psychiatry & Child Development* 1981:170.
7. Kellam SG, Brown CH, Fleming JP: **Relationship of first-grade social adaptation to teenage drinking, drug-use, and smoking**. *Digest of Alcoholism Theory & Application* 1983, **2**(2):20-24.
8. Dolan LJ, Kellam SG, Brown CH, Werthamer-Larsson L, et al.: **The short-term impact of two classroom-based preventive interventions on aggressive and shy behaviors and poor achievement**. *Journal of Applied Developmental Psychology* 1993, **14**:317-345.
9. Kellam SG, Rebok GW, Ialongo N, Mayer LS: **The course and malleability of aggressive behavior from early first grade into middle school: Results of a developmental epidemiology-based preventive trial**. *Journal of Child Psychology and Psychiatry* 1994, **35**:259-281.
10. Cleveland MJ, Feinberg ME, Jones DE: **Predicting alcohol use across adolescence: Relative strength of individual, family, peer, and contextual risk and protective factors**. *Psychology of Addictive Behaviors* 2012, **26**(4):703-713.
11. Monahan KC, VanDerhei S, Bechtold J, Cauffman E: **From the school yard to the squad car: school discipline, truancy, and arrest**. *J Youth Adolesc* 2014, **43**(7):1110-1122.
12. Prinz RJ, Sanders MR, Shapiro CJ, Whitaker DJ, Lutzker JR: **Population-based prevention of child maltreatment: The U.S. Triple P System Population Trial**. *Prevention Science* 2009, **10**(March):1-13.
13. Kellam S, Ialongo N, Brown H, Laudolff J, Mirsky A, Anthony B, Ahearn M, Anthony J, Edelsohn G, Dolan L: **Attention problems in first grade and shy and aggressive behaviors as antecedents to later heavy or inhibited substance use**. *NIDA Res Monogr* 1989, **95**:368-369.
14. Flower A, McKenna J, Muething CS, Bryant DP, Bryant BR: **Effects of the good behavior game on classwide off-task behavior in a high school basic algebra resource classroom**. *Behavior Modification* 2014, **38**(1):45-68.
15. Tingstrom DH, Sterling-Turner HE, Wilczynski SM: **The Good Behavior Game: 1969-2002**. *Behavior Modification* 2006, **30**:225-253.
16. Embry DD: **The Good Behavior Game: a best practice candidate as a universal behavioral vaccine**. *Clinical Child & Family Psychology Review* 2002, **5**(4):273-297.
17. Mayer GR, Butterworth T, Nafpaktitis M, Sulzer-Azaroff B: **Preventing school vandalism and improving discipline: a three-year study**. *Journal of Applied Behavior Analysis* 1983, **16**(4):355-369.
18. Mayer GR, Butterworth TW: **A Preventive Approach to School Violence and Vandalism: An Experimental Study**. *The Personnel and Guidance Journal* 1979, **57**(9):436-441.
19. Storr CL, Ialongo NS, Kellam SG, Anthony JC: **A randomized controlled trial of two primary intervention strategies to prevent early onset tobacco smoking**. *Drug & Alcohol Dependence* 2002, **66**(1):51.
20. Furr-Holden CD, Ialongo NS, Anthony JC, Petras H, Kellam SG: **Developmentally inspired drug prevention: middle school outcomes in a school-based randomized prevention trial**. *Drug & Alcohol Dependence* 2004, **73**(2):149-158.
21. Embry DD, Flannery DJ, Vazsonyi AT, Powell KE, Atha H: **PeaceBuilders: A theoretically driven, school-based model for early violence prevention**. *American Journal of Preventive Medicine* 1996, **12**(5,

Suppl):91.
22. Krug EG, Brener ND, Dahlberg LL, Ryan GW, Powell KE: **The impact of an elementary school-based violence prevention program on visits to the school nurse**. *American Journal of Preventive Medicine* 1997, **13**(6):459-463.
23. Flannery DJ, Vazsonyi AT, Liau AK, Guo S, Powell KE, Atha H, Vesterdal W, Embry DD: **Initial behavior outcomes for the PeaceBuilders universal school-based violence prevention program.** *Developmental Psychology* 2003, **39**(2):292-308.
24. Vazsonyi AT, Belliston LM, Flannery DJ: **Evaluation of a School-Based, Universal Violence Prevention Program: Low-, Medium-, and High-Risk Children**. *Youth Violence and Juvenile Justice* 2004, **2**(2):185-206.
25. Ialongo N, Werthamer L, Kellam SG, Brown CH, Wang S, Lin Y: **Proximal impact of two first-grade preventive interventions on the early risk behaviors for later substance abuse, depression, and antisocial behavior**. *American Journal of Community Psychology* 1999, **27**(5):599-641.
26. Becker KD, Darney D, Domitrovich C, Keperling JP, Ialongo NS: **Supporting universal prevention programs: A two-phased coaching model.** *Clinical Child and Family Psychology Review* 2013, **16**(2):213-228.
27. Becker KD, Bradshaw CP, Domitrovich C, Ialongo NS: **Coaching teachers to improve implementation of the good behavior game**. *Administration and Policy in Mental Health and Mental Health Services Research* 2013:No Pagination Specified.
28. Miller S, Sheff-Cahan V: **Give Peace a Chance: Psychologist Dennis Embry helps to transporm schoolyard bullies into angels**. In: *People.* New York, NY: Time, Inc; 1999.
29. Treynor R: **The Power of PAX**. In: *Madison Press.* London, OH: Madison Press; 2014.
30. County OFiL: **PAX-iT-Notes**. In.; 2012.
31. Embry DD: **Ohio Counties Pass Levy That Protects Children Against Lifetime Risk of Mental Illness**. In: *Children's Mental Health Netowrk, News.* Edited by Comstock SB, vol. 2014. http://www.cmhnetwork.org; 2014.
32. Embry DD, Biglan A: **Reward and Reminder**. In. Edited by Administration SAaMHS. Washington, DC: National Registry of Evidence Based Programs and Practices; 2009.
33. Wilson DS, Hayes SC, Biglan A, Embry DD: **Evolving the Future: Toward a Science of Intentional Change**. *Brain and Behavioral Sciences* 2014, **in press**.
34. Petras H, Masyn K, Ialongo N: **The developmental impact of two first grade preventive interventions on aggressive/disruptive behavior in childhood and adolescence: an application of latent transition growth mixture modeling**. *Prev Sci* 2011, **12**(3):300-313.
35. Petras H, Kellam S, Brown CH, Muthen B, Ialongo N, Poduska J: **Developmental epidemiological courses leading to antisocial personality disorder and violent and criminal behavior: Effects by young adulthood of a universal preventive intervention in first- and second-grade classrooms**. *Drug & Alcohol Dependence* 2008(Special Issue):15.
36. Practices NRoE-BPa: **Prize Incentives Contingency Management for Substance Abuse**. In., August, 2007 edn. National Registry of Evidence-Based Programs and Practices: Substance Abuse and Mental Health Services Administration; 2013.
37. Rutter M, Maughan B, Mortimore P: **Fifteen Thousand Hours: Secondary Schools and Their Effects on Children**: Harvard University Press; 1982.
38. Mayer GR, Sulzer-Azarooff B, Wallace M: **Behavior Analysis for Lasting Change**, 2nd edn. Cornwall-on-Hudson, NYR: Sloan Publishing; 2012.
39. Ellis BJ, Del Giudice M, Dishion TJ, Figueredo AJ, Gray P, Griskevicius V, Hawley PH, Jacobs WJ, James J, Volk AA *et al*: **The evolutionary basis of risky adolescent behavior: Implications for science, policy, and practice**. *Developmental Psychology* 2012, **48**(3):598-623.
40. Kellam SG, Wang W, Mackenzie ACL, Brown CH, Ompad DC, Or F, Ialongo NS, Poduska JM, Windham A: **The impact of the good behavior game, a universal classroom-based preventive intervention in first and second grades, on high-risk sexual behaviors and drug abuse and dependence disorders into young adulthood**. *Prevention Science* 2014, **15**(Suppl 1):S6-S18.

41. Musci RJ, Bradshaw CP, Maher B, Uhl GR, Kellam SG, Ialongo NS: **Reducing aggression and impulsivity through school-based prevention programs: A gene by intervention interaction**. *Prevention Science* 2013:No Pagination Specified.
42. Embry DD, Biglan A: **Evidence-Based Kernels: Fundamental Units of Behavioral Influence**. *Clinical Child & Family Psychology Review* 2008, **11**(3):75-113.
43. Embry DD, Lopez D, Minugh PA: **Stop the Methamphetamine Epidemic**. *Arizona Medical Association Journal* 2005, **16**(4):30-34.
44. Ialongo N, Poduska J, Werthamer L, Kellam S: **The distal impact of two first-grade preventive interventions on conduct problems and disorder in early adolescence.** *Journal of Emotional & Behavioral Disorders* 2001, **9**(3):146-160.
45. Kelley ML, Carper LB, Witt JC, Elliott SN, Gresham FM: **Home-based reinforcement procedures**. In: *Handbook of behavior therapy in education.* edn.: Plenum Press: New York; 1988: 419-438.
46. Kelley ML, Jurbergs N: **Daily report cards: Home-based consequences for classroom behavior**. In: *Behavioral interventions in schools: Evidence-based positive strategies.* edn. Edited by Akin-Little A, Little SG, Bray MA, Kehle TJ. Washington, DC, US: American Psychological Association; 2009: 221-230.
47. Kelley ML, McCain AP: **Promoting academic performance in inattentive children: The relative efficacy of school-home notes with and without response cost**. *Behavior Modification* 1995, **19**(3):357-375.
48. Kelley ML, Palcic JL: **Daily behavior report cards: Home-school contingency management procedures**. In: *Cognitive behavior therapy: Applying empirically supported techniques in your practice (2nd ed).* edn. Edited by Fisher WTODJE. Hoboken, NJ, US: John Wiley & Sons Inc; 2008: 123-131.
49. Kelley ML, Palcic JL: **Daily behavior report cards: Home-school contingency management procedures**. In: *General principles and empirically supported techniques of cognitive behavior therapy.* edn. Edited by Fisher WTODJE. Hoboken, NJ, US: John Wiley & Sons Inc; 2009: 221-229.
50. Jurbergs AN, B.: **Relative efficacy of school-home notes and teacher feedback in minority elementary students with attention-deficit/hyperactivity disorder**. ProQuest Information & Learning: US; 2006.
51. Embry DD: **Designing Instructional Materials for Young Children**. In: *New Directions in Special Education.* edn. Edited by Gallagher J. San Francisco, California: Jossey-Bass, Inc.; 1980: 440.
52. Embry DD: **The safe-playing program: A case study of putting research into practice.** In: *Human Services That Work: From Innovation to Standard Practice.* edn. Edited by Paine S, Bellamy B. Baltimore, MD: Brookes Co.; 1984: 624.
53. Embry DD, Rawls JM, Hemingway W: **My Safe Playing Book: An Experimental Evaluation of a Bibliotherapuetic Approach to Reduce the Risk of Pedestrian Accidents to 4-Year Old Children**. In. Wellington, New Zealand: Ministry of Transport, Road Safety Division; 1985: 38.
54. Possell LE, Kehle TJ, McLoughlin CS, Bray MA: **Self-modeling as an intervention to reduce disruptive classroom behavior**. *Cognitive and Behavioral Practice* 1999, **6**(2):99-105.
55. Dowrick PW: **A review of self modeling and related interventions**. *Applied & Preventive Psychology* 1999, **8**(1):23-39.
56. Embry DD, Peters L: **A three-city evaluation of the diffusion of a pedestrian-safety injury control intervention**. In. Edited by Division RS: New Zealand Ministry of Transport, Wellington, NZ; 1985.
57. Bradshaw CP, Zmuda JH, Kellam S, Ialongo N: **Longitudinal Impact of Two Universal Preventive Interventions in First Grade on Educational Outcomes in High School**. *Journal of Educational Psychology* 2009, **101**(4):926-937.
58. Fruth J: **Impact of a universal prevention strategy on reading and behavioral outcomes**. *Reading Improvement* in press.
59. Kellam SG, Wang W, Mackenzie AC, Brown CH, Ompad DC, Or F, Ialongo NS, Poduska JM, Windham A: **The Impact of the Good Behavior Game, a Universal Classroom-Based Preventive Intervention in First and Second Grades, on High-Risk Sexual Behaviors and Drug Abuse and Dependence Disorders into Young Adulthood**. *Prev Sci* 2012.
60. Skinner CH, Cashwell TH, Skinner AL: **Increasing tootling: The effects of a peer-monitored group contingency program on students' reports of peers' prosocial behaviors**. *Psychology in the Schools* 2000, **37**(3):263-270.

Appendix A: PAX GBG Spleem Observations

# Validity and Reliability of Observations of Classroom Problematic Behaviors, "Spleems"

A long-history of direct observation of classroom behaviors exists in education, child development and applied behavioral efforts. One of the first citations for in PsychInfo appears in 1935 [1], and significant increases in observations of student behaviors in classrooms began in the late 1960s. One such study nicely summarizes the potential value of such observations [2]:

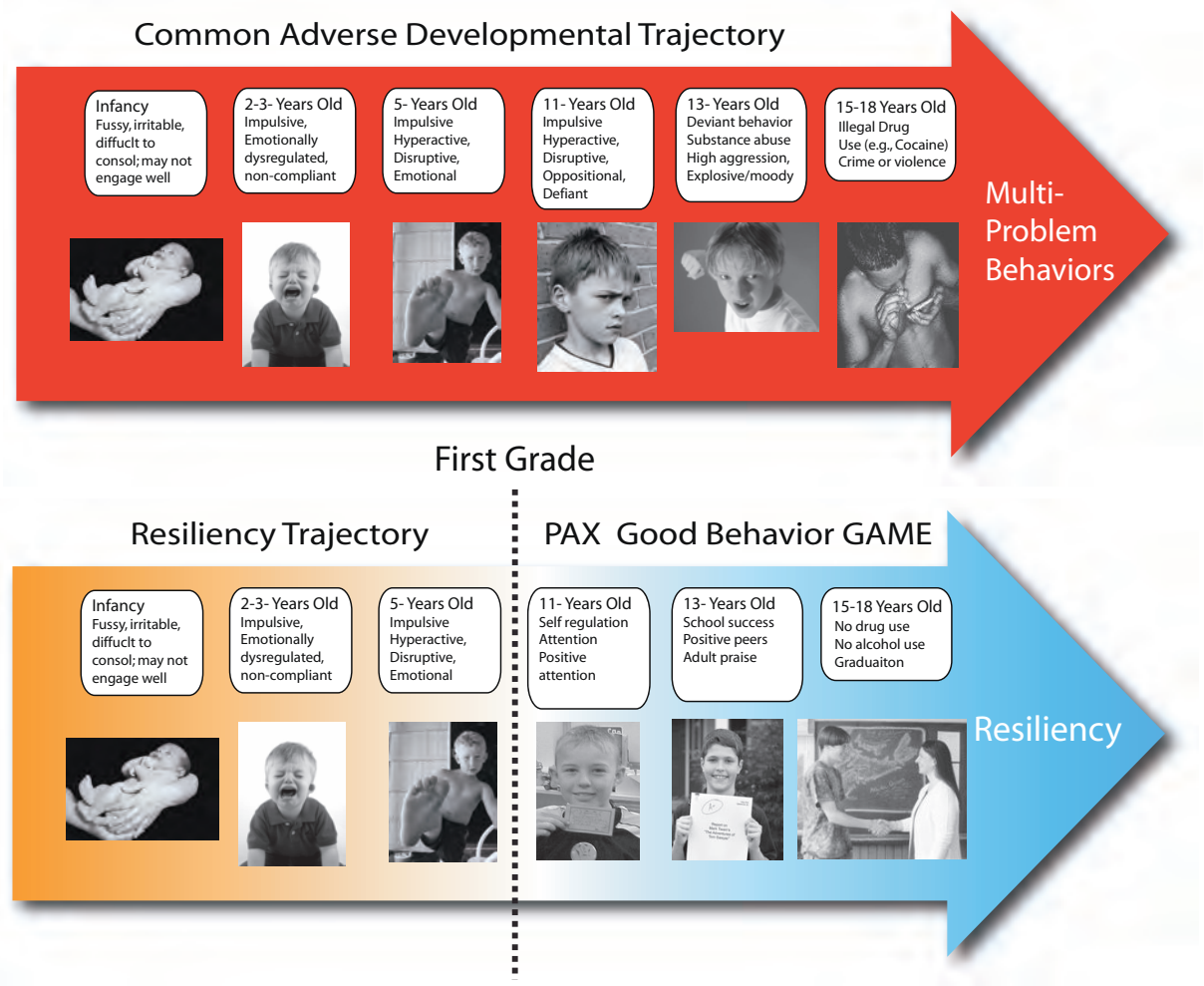
> *Evidence suggests that a method of direct behavioral observation in the classroom is reliable, can discriminate between normal and emotionally disturbed children, yields meaningful information on the nature of a child's maladjustment to school when it is of the conduct problem type, offers data on the efficacy of a special class program, serves as a sensitive dependent variable measure of various acute therapeutic manipulations...*

That same study made this concluding observation: *"The relevance of this measure to children with problems other than the conduct problem type has not been established."* It took longitudinal studies that spanned a decade or more to discern the importance of early problematic behaviors in classrooms predictors lifetime risk of mental, emotional, behavioral and even physical disorders. Today, we can summarize those longitudinal (some simply descriptive developmental efforts and some longitudinal randomized trials) visually in **Figure 1** from research in both Canada and the U.S. [3-13]

Early single-subject design behavioral experiments in classrooms such as the Good Behavior Game [14-17] and related applications to whole schools of behavioral procedures [18] had a significant impact on reducing indicators of peer aggression based on direct observations. Kellam and colleagues had clearly established the linkages between early observable classroom behaviors and distal outcomes in some prospective developmental studies in the 1980s [19, 20]. The first randomized longitudinal trial to show reductions in observable peer-to-peer aggression in classrooms was the Good Behavior Game studies by Kellam [21] and then Iaongo [22]. The first randomized longitudinal trial of whole school strategies to impact observable aggressive behaviors and then more distal outcomes including actually reduction medically coded violent injuries was the PeaceBuilders project [23-26].

So what are the directly observable behaviors among students in classrooms that predict either a life-course history of increasing adverse developmental outcomes or resiliency given prior early childhood predictors: high-levels of observable aggressive, of-task, defiant, distracted, impulsive, bullying or destructive behaviors versus high levels of posocial and academically engaged behaviors amongst peers.

**Figure 1: Developmental Trajectories Problem and Protective Behaviors**




## Contextual Nature of the Predictive Behaviors

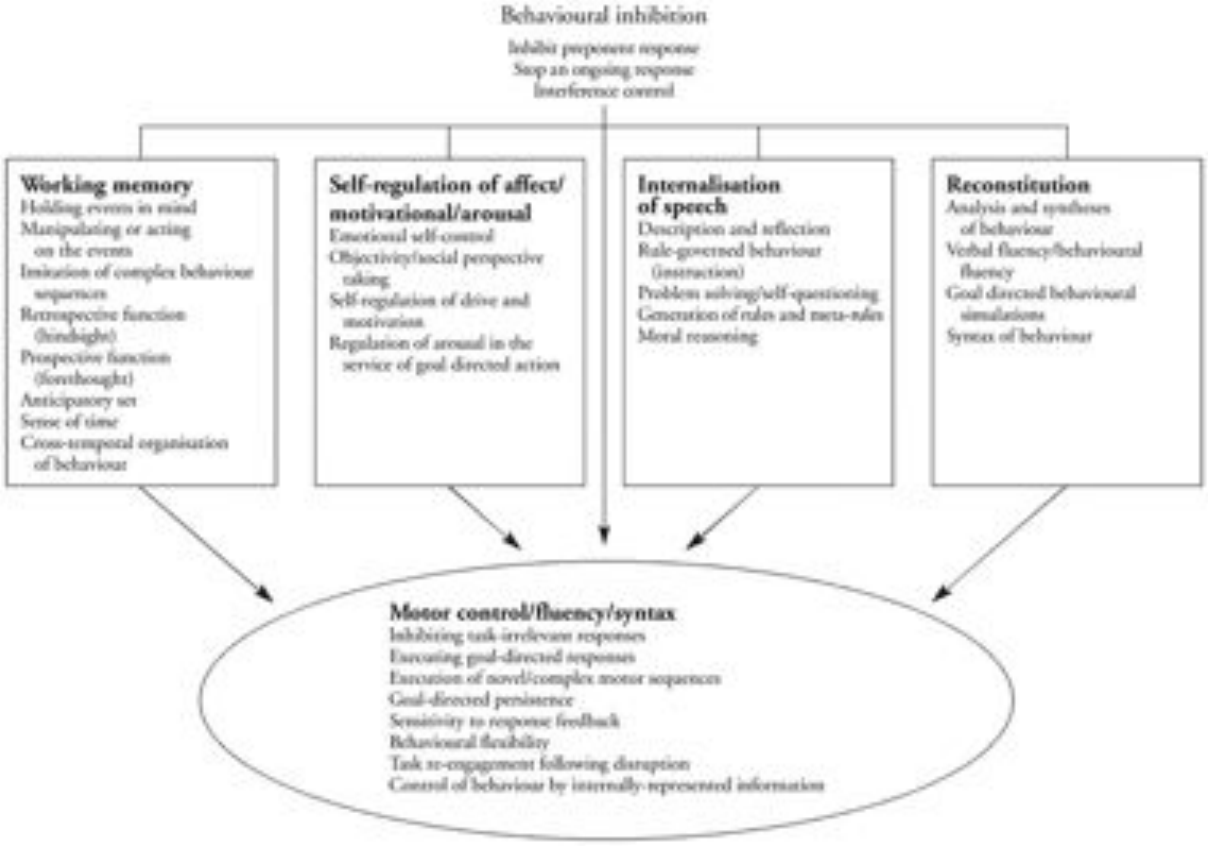
Human behavior is inherently contextual. So for example, we would tend to say that offering food to a guest in our home is polite. Offering a ham sandwich to a devote Jew or Muslim visiting our home would not be polite; it would be grossly inconsiderate. One might say that human behavior is contextually driven by social emotional intelligence, which evolves in the context of language, custom, culture, persons present, and activities or antecedents. For example, kicking is not normally allowed at school, but kicking a soccer ball in physical education or at recess would be entirely "appropriate"—even though the topography of the behavior was nearly the same as kicking something in the classroom as kicking a ball. Shoving or bumping into others in the hallway would be judged inappropriate in most schools, but perhaps not when playing certain sports on the field or pitch. Perceived social context determines the appropriateness of the topography of behavior.

This can be further complicated by the fact that topography of a human behavior could well be appropriate, but its function is not appropriate at all. For example, a child might comply to the topography of a compliance request by an adult yet be highly inappropriate or even aggressive in tone or subtle action. For example, a child might pick up in the classroom or home as instructed but be rough with the objects being picked up or mumbling threats under his or her breath.

## Measuring the Presence of and the Absence of Behavior in Child Development

The human brain, along with all vertebrates, has two key behavioral circuits: the Behavioral Activation System (BAS) and the Behavioral Inhibition System (BIS). Both normal development as well as developmental psychopathology can map to imbalances in the BAS and BIS. Too much behavioral inhibition (BIS) in humans is linked to such difficulties as depression, anxiety, phobias, and obvious difficulties in relationships and work. Too much behavioral activation (BAS) is linked ADHD, intentional/unintentional injuries, addictions, and obvious problems in relationships and work. Too much BIS or BAS has adverse effects on educational attainments.

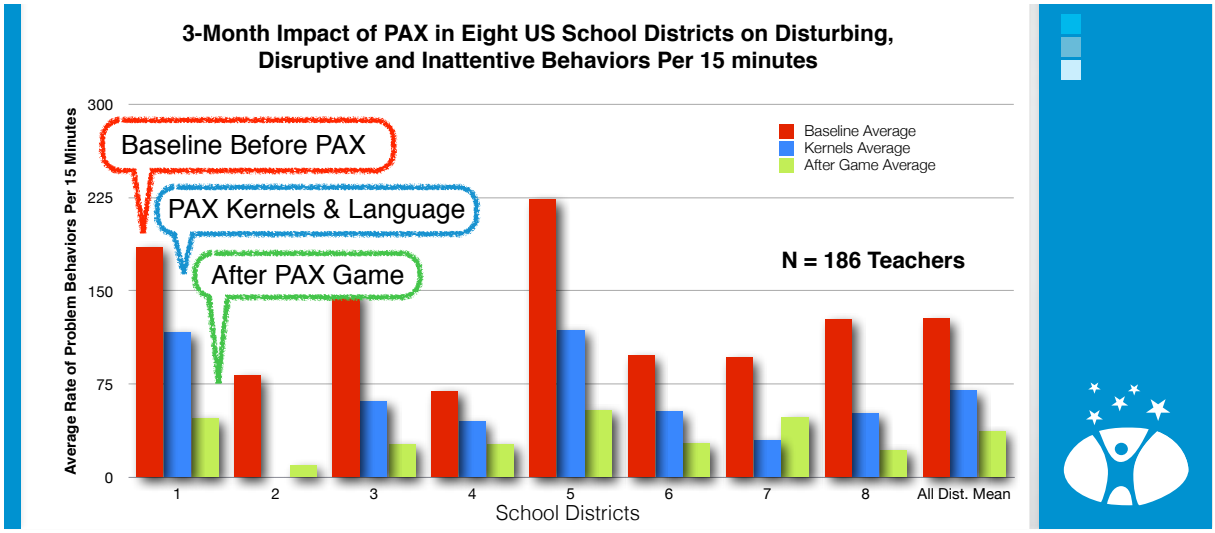
Here is a simplified model from Barkley's work on inhibition, which is helpful understanding the observation of PAX GBG in the classroom.




Clinical measures used by psychologists and psychiatrists are wonderful for measuring both BIS and BAS, but such measures are not suitable for a public-health universal

model of prevention. From a practical perspective of implementing PAX GBG, sampling the classroom behaviors provides a reasonable estimate of the proximal impact on ALL the children growing their skills related to behavioral inhibition. If changes are not easily visible, then it's likely that something is off-track in implementation or some children may need extra supports or both.

Typically speaking, reasonable implementation of PAX GBG results in rather dramatic drops of problematic or unwanted behaviors of 70% or more using direct observations of "spleems." Note here, that not all school districts were able to collect observational data during the "kernels and language" phase of early implementation. So what does these numbers translate into per child in classrooms, as a rate per hour.




So assume that the average across all 186 classrooms here is 128 disturbing, disruptive, destructive, inattentive, and/or otherwise unwanted behaviors at baseline during a 15-minute period, or an average of 512 problematic behaviors in an hour. If there are 20 students in the classroom, that is 25 problematic behaviors on average per hour per student.

Most adults, as a matter of social validity, would say that the children were more than a bit wild, and lacking in self-regulation. The teachers were probably rather stressed. After about a month of playing the PAX Game and implementing the evidence-based kernels and language of PAX GBG, the rate per hour in the 186 classrooms was 148 problematic behaviors per hour or about 7.4 problematic or unwanted behaviors per child per hour. Social-validity measures (i.e., just asking the adults if the children were engaged and learning was happening, many people would say yes). The social validity question can be clarified by asking if the children were being threatened, punished or inappropriately being "bribed"; as well as if the visitors thought the children were happily engaged in active learning.

In the context of the direct observation of "Spleems", newer iterations of the protocols also will include some social validity questions on the part of the observers — to enhance the meaning of the obtained observations.

## What About Validity of This Type of Classroom Observations?

Validity in this case is mostly tied to the issue of developmental outcomes, both negative and positive. Here is a summary of validity information:

- High observed levels of the problematic, off-task, disturbing, disruptive, etc. behaviors in classrooms developmental psychology in the near, medium and long-term. Specifically, children are more likely to require special education services, be exposed to bullying and peer aggression, be referred for treatment services, have higher levels of illness and injuries, develop one or more addictions, dropout of school, commit crimes, etc. This holds true for individual students with these unwanted behaviors [9, 19, 20, 27, 28], and this holds true for children randomly assigned to classrooms with different histories of problematic behavior [28].
- Experimentally reduced levels of these problematic, off-task, disturbing, disruptive, etc. behaviors in whole classrooms, when directly observed predicts much lower prevalence rates of both internalizing and externalizing disorders measured longitudinally even among children with very high levels of risk randomly assigned to those classrooms [22, 29, 30].
- Null or Week Effects on reducing such behaviors in experimental studies tends to show null effects on more clinical assessments as well as distal outcomes, even with other implementations of the Good Behavior Game than PAX GBG [31].

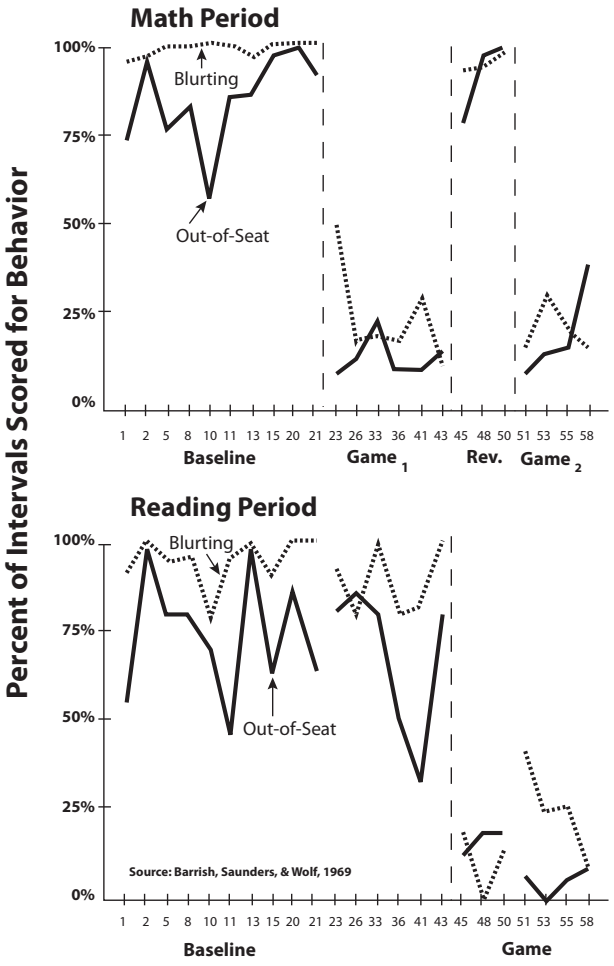
## Reliability of Observing Problematic Classroom Behaviors

The developer of PAX GBG, Dr. Dennis Embry, was extremely well trained in observational methodology, at the University of Kansas where Applied Behavior Analysis flowered and where the first GBG study was done [14]. The earliest studies he was involved with, for example, were direct observations of newborn's behavioral responses to stimuli, using 2-second interval coding with high-reliability. In the case of the infants' operant responses, it was necessary to have such brief intervals to capture their exertion of control over auditory and visual stimuli. Subsequent work on direct observation coding involved 10-second interval coding of parent-child interactions in both clinical settings and homes, teacher-preschooler interactions, outdoor-play interactions with peers at home, and linguistic coding of undergraduate students in college courses. One of his studies was the first to establish that spanking and related scolding caused dangerous, risky behaviors in young children, which was the result of reliable 10-second coding of outdoor play around children's homes [32-35].

The hallmark of Applied Behavior Analysis is direct observation, and all of the single-subject studies that led up to the randomized trials of PAX Good Behavior Game and other variations involved direct observation of child behaviors [15-17, 30, 36], and more cited in four review papers on the Good Behavior Game [37-40]. These single-subject

studies were vital for understanding variations in the Good Behavior Game, and understanding its core robustness and flexibility compared to other classroom strategies [39]. Single subject designs are vital for the development of programs and practices, especially to identify sources of variance in programmatic effects.

The kind of interval-by-interval observations used in the single-subject studies that resulted in such a powerful practical program, however, are nearly impossible to carry out when testing scaled up, population-level approaches. This can be illustrated with the very first study of the Good Behavior Game in 19967 {Barrish, 1969 #29}. The graph of results (recreated for visual clarity) is depicted in Figure to the right.




For the sake of simplicity, there were 60 observations in Math and 60 observations in reading. For convenience, say observations happened in Math and Reading on the same day, and 50% of the time there was a second observer. Observations happened for 30 minutes in each subject, with rotating pool of three observers. Interval-by-interval coding happened every 1-minute, the same as presently conducted for PAX GBG.

Inter-observer occurrence agreement for the behaviors was computed interval-by-interval, a common standard in behavior analysis. Occurrence agreement for out-of-seat behavior ranged from 74% to 98% and averaged 91%. Agreement for talking-out behavior ranged from 75% to 98% and averaged 86%. Non-occurrence reliability was not computed is this study, as that was not consensus at the time in ABA studies.

This study is a citation classic that changed the word of prevention science, and core observations have been replicated more than 40 times in peer reviewed studies using variations in similar observations.

### Using Direct Observation in Real-World Implementations

The methodology of observational data collection in the original GBG study and subsequent efficacy replications are not possible for real-world, effectiveness trials. Consider the scale of the Alberta Collaborative Study of 30 schools, each with 2-3 classrooms from K-5. Theoretically, this could range from 360 to 540 classrooms. If

there were 50 observations per classroom, this would range from 18,000 to 27,000 with an average of two observers each.

The implementation and coaching of PAX GBG, however, does benefit by direct observations, partly as "reliability check" for sites' reports of implementation and feedback loop for the sites and implementing partners. It is important to note that PAX GBG is the only *universal* classroom prevention strategy that includes direct observation of student behavior as a standard part of program delivery as well as direct observation of staff implementation behavior.

A significant question exists about whether 75% inter-observer reliability in the case of population level effort like the 8-school district (186 classrooms) or the 30-school implementation in Alberta would be sensitive to practical change? One can use the eight-district SAMSHA effort to estimate that issue. So assume that 75% inter-observer agreements were applied to the 8-district data, to compute low and high range of impacts, compared to reported.

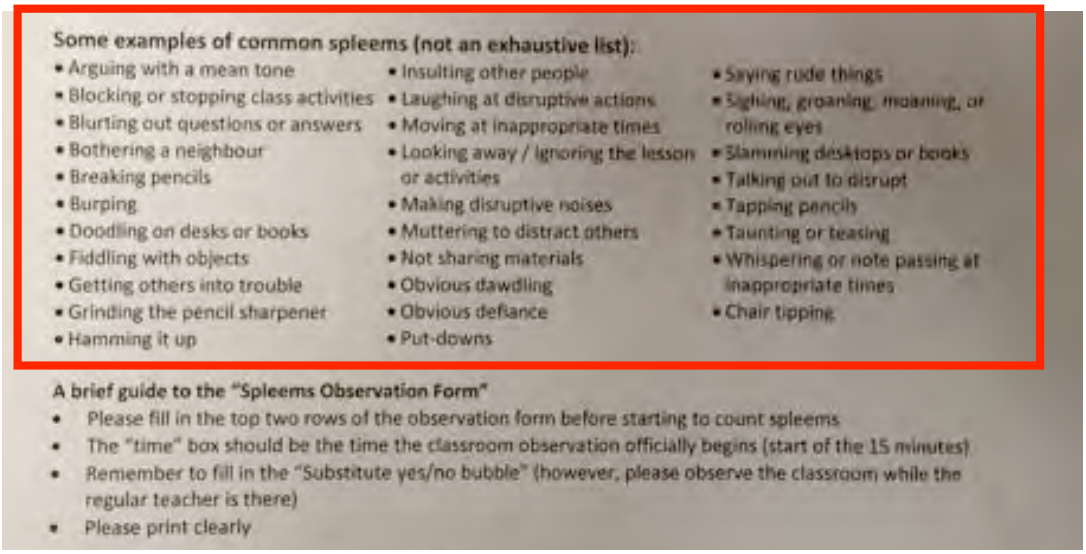
**Table 1: What if 75% inter-observer reliability was applied to 8-Districts observed spleems?**

| | Baseline Spleems | Kernels Spleems | After PAXGBG Spleems |
|---|---|---|---|
| Low rate estimate | 96 | 52 | 28 |
| Actual Reported | 128 | 70 | 37 |
| High rate estimate | 159 | 87 | 46 |

What above table suggests is that even with a relatively lower rate of inter-observer agreement, that the direct observations of "spleems" will be sensitive to the impact of an implementation of PAX GBG that resembles the implementation proposed in Alberta and similar efforts, based on the real-world rollout in eight diverse school districts in the U.S. with 186 classrooms. In no case is there overlap between conditions, which is an important conclusion.

All eight of the diverse school districts in the U.S. received a "standardized" list of Spleems below, along with standard form (both hardcopy and scanable).

**Figure 2: List of Standardize Spleems**



**Some examples of common spleems (not an exhaustive list):**

- Arguing with a mean tone
- Blocking or stopping class activities
- Blurting out questions or answers
- Bothering a neighbour
- Breaking pencils
- Burping
- Doodling on desks or books
- Fiddling with objects
- Getting others into trouble
- Grinding the pencil sharpener
- Hamming it up
- Insulting other people
- Laughing at disruptive actions
- Moving at inappropriate times
- Looking away / ignoring the lesson or activities
- Making disruptive noises
- Muttering to distract others
- Not sharing materials
- Obvious dawdling
- Obvious defiance
- Put-downs
- Saying rude things
- Sighing, groaning, moaning, or rolling eyes
- Slamming desktops or books
- Talking out to disrupt
- Tapping pencils
- Taunting or teasing
- Whispering or note passing at inappropriate times
- Chair tipping

**A brief guide to the "Spleems Observation Form"**

- Please fill in the top two rows of the observation form before starting to count spleems
- The "time" box should be the time the classroom observation officially begins (start of the 15 minutes)
- Remember to fill in the "Substitute yes/no bubble" (however, please observe the classroom while the regular teacher is there)
- Please print clearly

**Figure 3: Example Spleem Recording Form**