Published in final edited form as:

Drug Alcohol Depend. 2008 June 1; 95(0 1): S1–S4. doi:10.1016/j.drugalcdep.2008.01.006.

Effects of A Universal Classroom Behavior Program in First and Second Grades on Young Adult Outcomes

Sheppard G. Kellam^{*},

American Institutes for Research, 921 E. Fort Avenue, Suite 225, Baltimore, MD 21230 USA

John Reid, and

Oregon Social Learning Center, 10 Shelton McMurphey Blvd, Eugene, OR 97401 USA

Robert L. Balster

Virginia Commonwealth University, Institute for Drug and Alcohol Studies, Richmond, VA 23298-0310 USA

1. INTRODUCTION

This special issue of *Drug and Alcohol Dependence* is focused on the impact into young adulthood of the Good Behavior Game (GBG), a universal preventive intervention implemented by teachers and directed at entire regular first- and second-grade classrooms. The GBG is directed at socializing children to the role of student and reducing aggressive, disruptive classroom behavior. Aggressive, disruptive behavior is a consistently reported early risk factor shared by a broad set of adolescent and adult problem outcomes, particularly those involving externalizing or acting out behaviors. A core set of this group of outcomes is reported in these papers. One of the main questions being addressed is whether directing an intervention at a shared single antecedent can reduce the risk of the whole profile of outcomes. The first two papers examine the relationships of: 1) the fall of first grade initial behavior responses of children to the classroom social task demands to long term outcomes by young adulthood, and 2) the potential impact of the GBG on these outcomes and on the use of services during this 13–14 year period. The second two papers go beyond the fall of first grade and examine the developmental trajectories from fall of first grade through seventh grade and the impact of the GBG on these trajectories. These papers include more detailed elaborations of these outcomes by young adulthood. The last paper is on the theory and methods for carrying out intent-to-treat preventive trials that are based on theory driven predictions of who should benefit and under what circumstances. Elaborated in each of these papers is the developmental epidemiological strategy for prevention research and life course/social field theory, an attempt to integrate individual and contextual influences on the course and malleability of development.

These developmental epidemiologically based randomized field trials were carried out in Baltimore in close partnership with the Baltimore City Public School System (BCPSS), a partnership that goes back to the early 1980s and has involved three generations of multi-level randomized field trials. An underlying theme in this issue is the fundamental importance of such partnerships between BCPSS or other school or human service institutions in doing studies (often involving randomization) of etiology and prevention in

^{*}Corresponding author : Phone: 410-347-8551 ; Fax: 410-347-8559 ; E-mail Address: skellam@air.org.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

defined populations. This special issue of *Drug and Alcohol Dependence* is focused on the first generation trial involving multiple levels of randomization and extending analyses of impact from first and second grades into early adulthood.

The partnership of the Baltimore City Public School System with this research group over the several decades of these studies has been the foundation for this work. Randomization of schools, teachers, classrooms, and children would have been impossible without designing the research within the vision and master planning of the School District. School leaders, parents and teachers, and children/youths would not have participated without trust and mutual self-interests being established from before any work on the research was started. This kind of partnership has become a vital part of the emerging field of prevention science.

The shared antecedent addressed by the GBG was aggressive, disruptive behavior. The set of young adult outcomes reported in these papers include: drug abuse/dependence disorders, alcohol abuse/dependence disorders, regular smoking of tobacco, antisocial personality disorder (ASPD), court records of juvenile delinquency and incarceration for violent and criminal behavior, school failure, suicide ideation and attempts, major depressive and generalized anxiety disorders, and frequency and kind of school services used for emotional, behavioral, drug and alcohol problems.

Why publish this broad set of papers together in *Drug and Alcohol Dependence*? From a theoretical perspective presenting the extent and limits of outcomes impacted by an intervention is important in the assessment of any etiological role of the targeted antecedent. Impact of the GBG on some of these outcomes and not others would suggest variation in the developmental and etiological paths, while similar results on the whole set of outcomes would suggest common developmental or etiological paths. From a practical stand-point, prevention services addressing one antecedent risk factor that would affect all outcomes would be very efficient as well as good news on many fronts. Prevention would be much more expensive and would need very different and expansive organization if each young adult outcome was in need of a separate early intervention.

The rationale for this special issue of *Drug and Alcohol Dependence* involves a set of questions, including the first described above concerning etiology. The experimental intervention (GBG) was directed at a shared antecedent of many of these outcomes, particularly those of a more acting-out or illegal nature. The trial was a way of testing the etiological role of early aggressive, disruptive behavior in one or more of the outcomes, with prior literature pointing to the externalizing outcomes more than the internalizing ones. The etiological question is: Is the specific antecedent of early aggressive, disruptive behavior part of the causal processes that lead to drug abuse/dependence disorders or is it just a preceding early correlate? The intervention experiment examines the role of this antecedent (if any) in the etiology of drug abuse/dependence disorders and also in the etiology of the other outcomes. If the GBG is directed at the early antecedent aggressive, disruptive behaviors, and this leads to later impact on these specific outcomes, it supports the etiological and developmental role of the antecedent. The authors can then examine whether the result is a reduction in one or more of the outcomes, revealing a shared or unique etiological role of the early antecedent in the development of the outcomes.

The second question is can more be learned about the variation in the developmental courses of these children by going beyond first grade and examining the clustering of kinds of developmental trajectories of aggressive, disruptive behavior from first grade through middle school. We can then assess how these classes of trajectories lead to different rates of outcomes and how the impact of the GBG may differ on one or more of the classes of

trajectories. Is it the fall of first grade that sets the outcomes or does the developmental stability and/or change also contribute to the outcomes and the impact of GBG?

The third question concerns variability in both the prediction from aggressive, disruptive behavior from first grade onward and the impact of GBG. Aggressive, disruptive behavior is far more predictive of poor outcomes among males than females. This variation in risk leads us to predict more impact where the risky behavior is at higher levels and more salient to the outcome. Also, the theory that drives these studies (life course/social field theory, elaborated in each of the papers in this issue) posits that early maladaptive responses to the classroom social task demands lead to later problem outcomes. Predictions of the course of early aggressive, disruptive behavior led to the hypothesis that impact would be stronger for those children who manifest higher levels of the targeted early maladaptive risk behavior and less so for those with less such behavior. Thus GBG impact is predicted to be greater among: 1) males more than females, and 2) more aggressive, disruptive children compared to better socially adapted first grade children. These hypotheses led methods of analysis that can examine not only main effects but variation in impact among genders and levels of baseline and early and emerging risk. Some readers may feel these are redundant analytic efforts, but they were done in the cause of satisfying the various viewpoints of researchers in public health and the other life sciences where these issues of variation versus main effects are still debated. Indeed, the last paper is a detailed discussion of theory and methods for intent-to-treat analyses and variation in impact and how epidemiologically defining the population aids in studying variation in randomized designs.

The issue of gender differences cross-cuts all of these papers both in the early risk and developmental courses and in the impact of GBG. The analyses reported here emphasize the role of early aggressive, disruptive behavior and the impact of GBG for males far more than females, with the important exception of suicidal ideation and attempts, where early aggressive, disruptive behavior plays much less of a role. These results underline the need for more developmental research among females to elaborate early antecedents and developmental paths that could lend themselves to experimental intervention trials for understanding female development and for developing effective programs of prevention.

Replication is clearly a vital part of prevention intervention science. While the main focus of these papers is on the effectiveness trial carried out in the first cohort of first grade children, a second cohort participated in the same GBG intervention but with little continuing mentoring or monitoring of the GBG teachers. The question posed is whether in a second cohort the same teachers in the same schools and children from the same catchment area would reveal the same level and kind of impact. Somewhat naively it was thought at the time that little continuing mentoring and monitoring would be needed for those same teachers. This turned out to be only partly the case, and emphasized the need for continuing precision in mentoring and monitoring fidelity of implementation in replication and in dissemination. Two of the outcomes, drug abuse disorders and ASPD with violent and criminal behavior, revealed significant replication, with the others generally not significant but in the predicted direction. The results are reported for the effectiveness trial extensively, and are reported for the replication trial more briefly, with certain papers reporting data from both cohorts while others report the Cohort 2 data as supplementary material with the online version of the journal. In addition to the replication reported here, more replication of the GBG is also needed in other school districts in other community populations.

2. SYNOPSES OF PAPERS

2.1 Effects of a Universal Classroom Behavior Management Program in First and Second Grades on Young Adult Behavioral, Psychiatric, and Social Outcomes (Kellam et al., 2008)

The first paper is an intent-to-treat report on the impact of the GBG implemented in first and second grades on the broad set of outcomes taking into account gender and the levels of aggressive, disruptive behavior at baseline—the fall of first grade—and outcomes by age 19–21. These intent-to-treat analyses are based on the entire population of first graders in 41 classrooms in 19 schools in Baltimore who were present at the start of the trial in the fall of first grade. A replication is also reported on the next consecutive cohort of first graders and the same implementing teachers but with much less mentoring and monitoring.

2.2 Impact of the Good Behavior Game, a Universal Classroom-Based Behavior Intervention, on Young Adult Service Use for Problems with Emotions, Behavior, or Drugs or Alcohol (Poduska et al., 2008)

This paper reports on the impact of the GBG on the use of services from first grade into young adulthood. These intent-to-treat analyses include the same population of first graders in Baltimore who were present at the start of the trial in the fall of first grade. The intervention was done in first and second grades. The baseline level of aggressive, disruptive behavior in fall of first grade of each child was part of the analytic modeling, as well as gender of the children. Just as in the first paper, the replication is reported on the next consecutive cohort of first graders with the same implementing teachers but with much less mentoring and monitoring.

2.3 Developmental 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 (Petras et al., 2008)

In this paper the authors utilize the same populations as the other papers but move beyond fall of first grade to study the growth trajectories of aggressive, disruptive behavior from fall of first grade through grade seven and the impact of GBG in first and second grade classrooms on the trajectories and the long term impact on ASPD and violent and criminal behavior as measured by juvenile court or incarceration records. Using general growth mixture models (GGMM) the analyses start with the classes of trajectories and then examine the risk of the young adult outcomes with and without GBG by age 19–21. The replication results in the second cohort are also reported in this paper.

2.4 The Impact of Two Universal Randomized First- and Second-Grade Classroom Interventions on Young Adult Suicidality (Wilcox et al., 2008)

This paper is somewhat different than the others, in that early aggressive, disruptive behavior is reported less often as a risk factor associated with later suicide ideation and attempts than with the other outcomes. Survival analyses reported in this paper allow examination in each gender of the developmental trajectories, using time-to-event methodology. Also the follow-up goes beyond age 19–21 to include age 23, taking advantage of data collected somewhat later than the data used in the other papers cited above. In this paper the GBG is compared to a second intervention check, Mastery Learning, a curriculum and instruction intervention aimed at reading achievement. The goal of this paper is to examine these outcomes as part of a continuing concern with gender differences found in all of the papers and outcomes in this special issue.

2.5 Methods for Testing Theory and Evaluating Impact in Randomized Field Trials: Intent-to-Treat Analyses for Integrating the Perspectives of Person, Place, and Time (Brown et al., 2008)

The last paper addresses a major issue in prevention science, as well as in public health more generally, namely the concepts and methodology for carrying out intent-to-treat analyses of the impact of interventions as hypothesized by theory. Traditionally in public health and in preventive and clinical trials, determining what works overall in the study populations has historically been a primary goal. In contrast, theory-driven interventions frequently focus on not only main effects but variation in impact when interventions are directed at specific hypothesized risk factors and there is variation in levels of baseline risk. In the case of life course/social field theory, it had previously been found that response to the GBG is greatest where there were higher levels of the targeted aggressive, disruptive behavior and less where the level of risk was lower at baseline. This is particularly the case in universal preventive interventions, such as the GBG, described in these papers where intervention is directed at classrooms and where risk varies from child to child, or teacher to teacher.

The GBG is directed at the total classroom to improve teacher's skills in classroom behavior management and socializing children to become successful students. Some teachers and children are doing well without further intervention, and life course/social field theory posits that the teachers who need better tools for classroom behavior management and the children who are aggressive, disruptive should respond to this intervention more than those who are already adapting well to the classroom. Thus for theoretical reasons, there should be an interaction between the levels of risk and the GBG impact. It was then predicted that GBG would improve the risk of long term outcomes more in the higher risk aggressive, disruptive children in classrooms where the general level of such behavior was higher. This core issue and the broader concepts in intent-to-treat trials and analyses is the focus of the last paper. We hope this will generate debate and analyses useful in the next stages of prevention science. The methods used throughout all of these papers have been a reflection of the close integration of research on new substantive questions and research on new methods to answer them.

3. DEVELOPMENT OF THIS ISSUE

One of the issue editors (Kellam) submitted a proposal for this supplemental issue of *Drug and Alcohol Dependence* to the journal editorial office and discussed the idea with the journal editor-in-chief (Balster). The final proposal was considered by the journal management and publisher and eventually approved. Because Kellam was Principal Investigator for the prevention trial on which the issue is based and a co-author on all of the papers, the other guest editors (Reid and Balster) handled the entire review process for this issue. Reid and Balster selected outside referees who were not part of the Baltimore trial and obtained blinded recommendations and comments for authors. Those papers that were ultimately accepted were extensively revised by the authors and in many cases returned for another round of reviews. The final versions of all papers were again evaluated by the journal editor-in-chief (Balster) before release to the publisher. The publication of this supplemental issue was sponsored by the National Institute on Drug Abuse.

References

- Brown CH, Wang W, Kellam SG, Muthén BO, Petras H, Toyinbo P, Poduska JM, Ialongo NS, Wyman PA, Chamberlain P, Sloboda Z, MacKinnon D, Windham A. the Prevention Science and Methodology Group. Methods for testing theory and evaluating impact in randomized field trials: intent-to-treat analyses for integrating the perspectives of person, place, and time. *Drug Alcohol Depend.* 2008; (this issue)

- Kellam SG, Brown CH, Poduska JM, Ialongo NS, Wang W, Toyinbo P, Petras H, Ford C, Windham A, Wilcox HC. Effects of a universal classroom behavior management program in first and second grades on young adult behavioral, psychiatric, and social outcomes. *Drug Alcohol Depend.* 2008; (this issue)
- Petras H, Kellam SG, Brown CH, Muthén BO, Ialongo NS, Poduska JM. 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 Depend.* 2008; (this issue)
- Poduska JM, Kellam SG, Wang W, Brown CH, Ialongo NS, Toyinbo P. Impact of the good behavior game, a universal classroom-based behavior intervention, on young adult service use for problems with emotions, behavior, or drugs or alcohol. *Drug Alcohol Depend.* 2008; (this issue)
- Wilcox HC, Kellam SG, Brown CH, Poduska JM, Ialongo NS, Wang W, Anthony JC. The impact of two universal randomized first- and second-grade classroom interventions on young adult suicidality. *Drug Alcohol Depend.* 2008; (this issue)