School, drugs, mentoring, and peers: Evidence from a randomized trial in the US

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ABSTRACT

This paper finds that the expensive, comprehensive, and controversial mentoring program, Quantum Opportunity Program (QOP), was successful among youths with ex-ante high-predicted risk of drug-use as it increased their likelihood of graduating from high-school by 15%, attending post-secondary education by 21%, and completing 2 years of post-secondary education by 32%. It also finds some evidence that, for this group, QOP improved employment and wages. Many of these impacts persisted 10 years after random assignment. The lack of QOP effects on curbing these youths' risky behaviors while they were in their late teens hides beneficial results for those with ex-ante bad peers, and detrimental effects for those with ex-ante good peers as other treated youths during QOP group activities may have been a bad influence.

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1. Introduction

Poor academic performance and engagement in risky behaviors are two of the most serious problems facing youth in the United States today. Despite recent improvements, the US ranks 12th among 34 OECD countries in the percentage of 25- to 34-year-olds who had completed high school in 2014 (US rate is 90 percent). Results are similar for the percentage of 25- to 34-year-olds attaining higher levels of education, with the US ranking 11th (US rate is 46 percent).[1] Perhaps more concerning, US ranks 25th among 33 advanced countries in the percent of 15- to 19-year-olds not in education, employment or training (US rate is close to 9 percent in 2009, the latest available common year), and in the percentage of 15- to 19-year-olds in education (US rate is over 80 percent in 2013).[2] At the same time, the US also underperforms in terms of 13- to 15-year-old engagement in risky behaviors, ranking 15th among 30 OECD countries in 2009.[3] Estimates from the 2015 National Survey on Drug Use and Health reveal that as many as 25 percent and 28 percent of 12- to 17-year-olds reported illicit drug and alcohol use in their lifetime (18 and 23 percent in the past year). Consequently, a large part of the US government resources is devoted to improving the social and educational outcomes of youths. For instance, in 2011, the US total expenditures on educational public institutions represented 14 percent of total public expenditures (OECD, 2014). Most recently, the US Federal government alone allocated $15.4 billion to the *Title I program,* the largest program under *No Child Left Behind,*

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and $90 million to *The Safe and Drug Free Schools Program* in the 2016 fiscal year (U.S. Department of Education, 2016).[4] In addition, many policy makers, practitioners and researchers have sought to develop programs whose main objectives are to improve school performance and curb adolescents' problem behaviors (Rodríguez-Planas, 2012a,b).

Among these programs, the *Quantum Opportunity Program* (QOP thereafter) is a particularly interesting randomly designed program to analyze due to its intensity (5 years), and comprehensiveness. QOP's goals were twofold: to help youths graduate from high school and enroll in post-secondary education or training, and to reduce risky behaviors.[5] To achieve these goals, QOP offered low-performing students from low-performing US high schools intensive mentoring to help them overcome a broad range of barriers, including substance abuse, during the four years of high-school (plus one additional year in case students fell behind one grade).[6] This one-on-one time between the mentor and the enrollee was complemented with three different types of group activities. Developmental activities were designed to reduce risky behaviors; educational services were designed to improve academic achievement, high-school completion, and post-secondary education enrollment; and community service were designed to help youths develop a sense of responsibility for the quality of life of others in the neighborhood.

Rodríguez-Planas (*AEJ: Applied Economics 2012*) estimates the average effects of QOP and finds modest results (at most) on educational outcomes and controversial results on risky behaviors.[7] QOP's positive effects on high-school graduation when youths were in their late teens faded away within two years, and QOP's impact on post-secondary education was modest with no effects on employment outcomes. While QOP had no effects on youths' engagement in risky behaviors when they were in their late teens and early twenties, it increased their engagement when they were in their mid-twenties. As this was an expensive program (it cost a total of $14.5 million, or $25,000 per enrollee for the whole intervention), many researchers and policymakers have questioned whether the results warrant its intensity and comprehensiveness.[8]

One possibility is that Rodríguez-Planas' (2012) average effects may be hiding interesting heterogeneity results. QOP mentors were social workers trained to identify at-risk enrollees and deal on a one-on-one basis with the many structural barriers these youths may have faced. According to the psychologist literature, mentoring works best among those most at need in terms of personal and structural barriers (Rhodes, 1994; Hall, 2003). Hence, heterogeneity analysis based on the ex-ante risk of problem behavior may shed new light on the earlier findings. This is the first objective of the paper.

At the same time, QOP offered many educational, cultural and recreational *group* activities to treated youths, helping them build strong relationships with their mentors and other treated youths. While QOP may have been more effective for those with a higher presence of negative peers during high school (if mentors succeeded in identifying and helping those most at-risk youths–not only in terms of individual barriers, but also in terms of social environment), building strong cohesion within a group might also have backfired. Evidence from psychologists and economists reveals that peer effects play an important role in youths becoming involved in risky activities.[9] This occurs because peers reinforce deviant conduct by responding with approval and attention (Dishion et al., 1999; Dishion et al., 1996; Patterson et al., 2000). Whether QOP was more effective on youths based on their level of ex-ante "bad" high-school peers, defined as those with high *predicted*-drug use within gender/race/school/treatment cells, is an empirical question. This is the second objective of the paper.

Using the control group's self-reported drug use at the age 19 to estimate the predicted probabilities of problem behavior, we subsequently evaluate whether the program was effective for two distinct groups, defined by whether their predicted probabilities of drug use at age 19 were above or below the control group median. To address the possibility of bias arising from estimating the probability of drug use for the *full* sample of controls (also known as endogenous stratification bias),[10] this paper generates consistent estimators using the leave-one-out sample procedure, which estimates control-group individual's predicted probability of drug use by excluding that particular individual in the probability model.

Because we estimate the effect of QOP on 24 different outcomes and for two different subgroups, we are simultaneously testing several hypotheses, raising the possibility that some of the true null hypotheses will be rejected if we do not take into account the multiplicity of the tests. This concern is known as multiple hypothesis testing. To address it, we follow Kling et al. (2007) and construct four summary index variables that groups several variables within a domain together, reducing the multiplicity problem from 22 to 4. In addition, we also estimate p-values corrected for Romanov and Wolf (2005a, 2005b) when presenting individual outcomes.

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[4] These two programs aim at improving primary and secondary education of disadvantaged students and preventing violence and illegal use of tobacco, alcohol, and drugs by students, respectively.

[5] QOP's objective was *not* to help youth transition from high school into employment, but instead to enter post-secondary education. Hence, it is unlikely that mentors help youths find jobs.

[6] Enrollees who graduated from high-school on time received some mentoring and assistance in enrolling in post-secondary education or training between graduation and the end of the fifth year of the experiment.

[7] The design, implementation analysis, and evaluation of the Quantum Opportunity Program was conducted by Mathematica Policy Research and reported in Maxfield et al., 2003a, 2003b; Schirm et al., 2003, 2006; Schirm and Rodr&guez-Planas (2004).

[8] By comparison, the operating costs of the likewise-expensive Job Corps program were approximately $16,500 per participant in 1998 (Schochet et al., 2008).

[9] See survey on peer effects on consumption of drug, alcohol and cigarettes by Soetevent (2006).

[10] As Abadie et al. (2014) show, in a finite sample, control-group observations with large negative values tend to be over-fitted, which pushes these observations towards the lower interval of predicted outcomes, creating a negative bias in the average outcome among control observations that fall into the lower interval of the predicted distribution and, therefore, a positive bias in the average treatment effect estimated for that group. Similarly, average treatment effect estimators for the upper intervals of predicted outcomes are biased downward.