

AID TO EDUCATION AND TERRORISM: EXPLORING UNINTENDED CONSEQUENCES

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Abstract

Terrorism has proven itself to be one of the most tenacious threats of the modern world, in part because it is difficult to predict and because its root causes are poorly understood. In spite of the popular conception of the terrorist as an insane, impoverished radical, political scientists suggest that terrorists are typically established, educated, and well-off. Economists, operating from a macroeconomic perspective, suggest that terrorism occurs in countries where opportunities are few, incomes are extremely unequal, and political systems are closed - in short, when there are few educated, middle-class elites. This contradiction is problematic, especially for those who seek to undermine terrorism through nation-building and international development. If terrorism is perpetrated by educated elites, then do we risk creating more terrorists when we improve the educational systems of impoverished societies? Or does a broader middle class create socialization effects that de-radicalize potential terrorists? Answering these questions has important implications for development funding, counter-terrorism, and international stability and security. In this thesis, I investigate this relationship empirically using time- and country-fixed effects panel regressions. My results suggest a negative relationship between terrorism and educational aid, but are not methodologically strong enough to posit a causal relationship.

To friends, family, teachers, and mentors, without whom this paper would never have been written. You have preserved my sanity, if not my liver.

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Many thanks,
Kevin P. McGrath

TABLE OF CONTENTS

TABLE OF CONTENTS	V
INTRODUCTION	1
BACKGROUND AND LITERATURE REVIEW	3
DATA SOURCES AND SUMMARY OF DESCRIPTIVE STATISTICS	13
TABLE 1: SELECTED DESCRIPTIVE STATISTICS	16
METHODOLOGY AND QUANTITATIVE APPROACH	17
ANALYSIS OF QUANTITATIVE RESULTS	20
TABLE 2: PRIMARY REGRESSION RESULTS	21
TABLE 3: SECONDARY REGRESSION RESULTS	22
CONCLUSIONS	24
APPENDIX 1: DATA AGGREGATION PROGRAM (PYTHON)	26
BIBLIOGRAPHY AND SOURCES CITED	37

INTRODUCTION

Terrorism is one of the most important political phenomena of our time. It shapes policy in matters of defense, foreign relations, and development aid, and strategies designed to fight or prevent terrorism impact millions of lives across the globe. Despite this, the causes of terrorism are poorly understood, and research into the effectiveness of counterterrorism policies is ongoing. One of the most popular counter-terror strategies is the proactive application of foreign aid to countries where terrorism seems likely –both as a way to engender good will and as an attempt to restructure those societies to make them less welcoming to terrorist activity. Education in particular has been considered especially important in this endeavor but without causal evidence, it must be taken on faith that improving the educational systems of a country will reduce terrorism. This is in spite of the fact that research has shown that terrorists typically come from wealthy backgrounds and often sport advanced educational credentials. I hope to shine more light on this dynamic and investigate the impact that foreign aid for education has on terrorism rates. In the course of this research, I will also examine sociological dynamics that are either corrosive or supportive of terrorism, in hopes of better understanding how terrorism is generated in society. I hypothesize that there are negative returns to terrorism from foreign aid to education, but that the relationship is complex.

Modern theories surrounding the causes of terrorism are somewhat indeterminate, and in at least one sense, contradictory. Political scientists have used data to posit that terrorists are typically well-educated and well-off, which is counterintuitive to most modern preconceptions about terrorists. Economists, analyzing macroeconomic data, point out that better-educated states often have fewer terrorist attacks and produce fewer terrorists, further complicating the issue. I

investigate this particular juncture as thoroughly as possible, using panel data and time- and country-fixed effects regression analysis, in line with previous research in the field by Young and Findley, assessing the impact of net educational aid on the number of terrorist attacks in five-year periods from 1970 to 2010, applying controls for domestic social, political, and economic characteristics. If find limited support for the thesis that educational aid reduces terrorism, but the effect is not as strong as some internal social and political factors, nor is it robust enough to make causal claims.

BACKGROUND AND LITERATURE REVIEW

Since the 2001 terrorist attacks on New York City and Washington, D.C., the phenomenon and intricacies of terrorism and counter-terrorism have become mainstream fields for students of security policy. One of the largest policy priorities for governments that have developed national counter-terrorism strategies is the holistic prevention of terrorism by reducing the incentives or motivations for people to engage in terrorist activities. Defining those motivations has proven somewhat difficult, and different fields often arrive at separate - and often, contradictory - conclusions. Political economists studying the problem tend to reduce terrorism down to several powerful macroeconomic factors: the most important being closed political systems, a lack of economic opportunities, and highly unequal income distributions (Abadie, 2004). Political scientists, taking a different tact, pointed out that most terrorists are well-educated, middle class elites: people that usually make up the bread-and-butter of civil society (Pape, 2003).

One of the most successful preventative measures in counter terrorism strategy has been the application of foreign aid acts as a deterrent. By improving educational systems, countries create economic opportunity, an increasingly large middle class, and eventually more open political systems (Pourgerami, 1988). According to political economists, this solves the problem of terrorism, but it creates a contradiction in theory: if terrorists are typically well-educated, middle-class or wealthy elites why would educating more potential terrorists reduce terrorism?

The implications of these problems are far-reaching. The United States invests billions of dollars a year in foreign aid, and in recent years, development aid has become a big part of counter-terrorism efforts as the operations in Iraq and Afghanistan have turned into peacekeeping

and counterinsurgency campaigns – for fiscal year 2012, USAID and the State Department requested more than \$11 billion dollars for operations in Afghanistan, Iraq, and Pakistan (Office of Management and Budget, 2012). Various NGOs are also heavily involved: justifying one's programs as counter-terrorism investments is good for business. More clearly defining the relationship between development aid and terrorism will help policymakers plan better counter-terror programs.

Unsurprisingly, the renewed interest in terrorism as a political phenomenon since 2001 has reinvigorated the academic field. Political economists and political scientists have increasingly focused on defining the root causes of terrorism and identifying solutions that work - either palliative, or preventative. Developing counter-terror (and later, counterinsurgency) methods has been one of the primary academic studies of the field, but clarifying terrorism and its causes, as a secondary field, has also grown immensely in both quality and quantity (for a review, see (Shughart, 2006), and (Abadie, 2004)). Other fields have also taken an interest, and disciplines like sociology, anthropology, and computer science have created new avenues of research, most notably modifications of rational choice theory, radicalization and the psychology of small-group dynamics, and social network theory.

Defining terrorism has itself proven tricky. In the popular conception, terrorism means whatever people want it to mean: people who blow up buildings, insurgents fighting in Afghanistan, or failed shoe-bombers. Even in academia, the distinctions can be hazy: one man's terrorist is another's insurgent, and yet another's patriot. Insurgents in Afghanistan might clearly be classed as such, but what about foreign fighters working alongside them? The wide variety of terrorist tactics and strategies – from suicide bombing to hijackings, with targets ranging from military barracks to public markets or train stations – further muddies the waters. In mid-2000s

Iraq, for example, the distinction between terrorists and insurgents was often ignored – foreign fighters drawn to fight American forces in the country were often considered as equal to native resistance forces by soldiers, journalists, and strategists (Ricks, 2006). Academics and policymakers must constantly question who exactly is engaging in violence and why they do so when considering the label “terrorist.” These are important questions, and ones that are poorly addressed by society at large – and to great extent in philosophical digests. Despite their abstract nature, these details have a great deal of impact on how research is framed, and what questions get asked. Most researchers frame terrorism as violence committed against politically relevant targets in pursuit of a political ideology or goal (National Consortium for the Study of Terrorism and Responses to Terrorism (START), 2011). This is a necessarily broad definition, since based on the nature of a terrorist group’s motivations, targets can vary widely. Internal separatist groups might target government or military facilities, whereas anti-government groups might attack population centers in order to destabilize the standing regime. In short, the form of terrorism has to do with motivation: what drives an otherwise normal man or woman to commit violence?

Discerning motivations for terrorism has proven especially problematic. The most popular conventional answer, religion, quickly proves to be a red herring - where many terrorists are pious, this is largely because they live in relatively pious societies, and some scholar suggest that terrorists acquire their religious sheen *after* agreeing to terrorism, rather than as a motivation for doing so (Huson, 1999). For example, Sri Lankan rebels, the pioneers of suicide bombing and the “godfathers” of modern terrorist operational theory, were not overly religious, but motivated their followers on ethnic and political grounds. Support for terrorism was then thought to be associated with low levels of education or economic wealth, on the theory that those who are

uneducated are more easily swept up in ideological propaganda (Huson, 1999). This has proven less persuasive in recent years: a seminal work by Alan B. Krueger and Jitka Maleckova found that support for terrorist attacks on Israel among Gazans actually increased among higher-education sections of the population (Krueger & Maleckova, 2003). Robert Pape's *The Strategic Logic of Suicide Terrorism*, while largely a response to the theory of religious motivation for terrorism, points out that secular political goals drive nearly all suicide terrorist campaigns: withdrawal of American forces from particular countries, or allowing the secession of a particular territory, for example (Pape, 2003). By striking at vulnerable populations, terrorists hope to effect changes in policy. This, coupled with the demographic backgrounds of terrorists as middle-class, educated elites, suggests that terrorism is conducted by impassioned, politically aware individuals, not fanatical dupes.

This brings us to the problem of trying to prevent terrorism: the most commonly suggested preventative measure against terrorism is development aid, on the premise that productive, wealthy democracies can resolve the political problems that eventually motivate terrorism. Foreign aid programs, as the most direct method of effecting that change, have understandably come under scrutiny. The general consensus about foreign aid is that it does not stimulate economic development, but can help change key indicators and has positive effects in non-economic areas. Direct counter-terror aid, often in the form of grants or security assistance, has shown some effectiveness (Azam & Thelen, *Foreign Aid Versus Military Intervention in the War on Terror*, 2010), but there is evidence to suggest that recipient nations' use of repressive measures eventually lead to more terrorism (Mandler & Spagat, 2003-2010). Studies that measured the relative effectiveness of different kinds of aid found that targeted, rather than general, aid was more effective at reducing terrorism, especially aid to education (Azam &

Thelen, *The roles of foreign aid and education in the war on terror*, 2008). Joseph Young and Michael Findley's 2011 paper *Can Peace Be Bought? A Sectoral-level Analysis of Aid's Influence on International Terrorism* breaks down in great complexity the endogenous nature of aid, governance, and terrorism, but ultimately finds support for the thesis that sector-specific aid, specifically aid to education, has a negative effect on terrorism (Young & Findley, 2011).

There are a number of alternative theories that are worth examination when considering education's (and by extension, educational aid's) impact on terrorism. Education provides a great deal of specialized social and technical skills that can act as prerequisites for engaging in terrorism, and can also indirectly provide access and resources that make organizing terrorist groups easier for educated individuals. Education can also trigger political extremism in students, catalyzing opposition to existing social and ideological norms; for students leaving especially conservative or traditional societies to study in Western or cosmopolitan atmospheres, culture shock and resistance to assimilation could mature into xenophobia and reactionary opposition to globalization or perceived Westernization (Azam, *Why suicide-terrorists get educated, and what to do about it*, 2011). Education also tends to increase engagement in civic society, an inclination which could be rerouted to support terrorism in politically closed or repressive societies. Furthermore, it grants better access to the ever-expanding sum total of human knowledge, which naturally includes the political and organizational knowledge necessary to engage in terrorism, as well as exposure to perspectives and worldviews that endorse it as a tool for social change (Huson, 1999). On the other hand, education's socializing effects could normalize otherwise unacceptable political and cultural inclinations, promoting ideas of tolerance and cosmopolitanism in individuals who would otherwise be less tolerant of other viewpoints. Educated individuals also have more to lose from engaging in terrorism: education often leads to

more wealth, higher status, and more political access, all of which are endangered by participation in terrorism (Azam, Why suicide-terrorists get educated, and what to do about it, 2011). These competing theories all have significant drawbacks, and none of them perfectly explain the relationship between education and terrorism. As is often the case when studying political and social phenomena, the cause of terrorism is probably different in many different cases, with contributing explanations from a wide variety of circumstantial variables.

The simplest schema for the relationship between education and terrorism presupposes knowledge barriers to terror – ones that can be overcome by education. The technical expertise to build an explosive is not common knowledge among most of the planet's population, and the skill to do so safely, even less so. Civic engineering, chemistry, and military training are the three easiest routes to acquiring the skill to create and use explosives, which is taken as a simple example. Other skills – marksmanship and care for an AK-47, for example – do not even require literacy, in contrast. Within a terrorist organization, specialized skills will always be necessary: managerial talent, technical skills, whatever wily arts are necessary to acquire information and conceal training and operations until the right moment, and the financial acumen to covertly bankroll any such operation, without which a terrorist group would be unable to develop or execute its plans (Huson, 1999). For leaders, charisma and a persuasive ideology, wedded to an interpretation of history, are keys to attracting followers and motivating them to engage in terror – skills that are often found in educational institutions that prepare students to become civic, political, or business leaders. Developing sophisticated systems of incentives and punishments that necessarily exist outside of normal channels requires managerial talent, or an appreciation for law and civics (Dick, 1995). This theory suggests that education acts as a necessary condition for the formation of terrorist groups, at least for leaders and managers within such organizations.

Many of these skills are available in other venues, however, or could be taught outside of formal education, making their acquisition difficult to track – after all, even in normal society these skills are telegraphed between employers and potential employees by way of signaling devices, rather than direct demonstration or testing.

Another contributing explanation to education's relationship with terrorism is the role it plays in political ideology: terrorism needs a cause, and education has the potential to supply it. Exposure to new political schemes, causes to champion, and areas in which to develop expertise can provide the motivation, as well as the skills, to engage in terrorism. In the latter half of the twentieth Century, communism was a particularly common motivation for terrorism, and some of the longest-running terror campaigns – and some insurgencies – are built around the political goal of establishing a communist state. For the most part, many of those organizations cite their political education as a contributing factor for starting or joining terror movements (Huson, 1999). Islamist political theory was the driving ideological force of Al Qaeda and its affiliates, with the stated political goal of recreating a pan-Muslim caliphate and rejecting Western political and social structures. Exposure to new and sometimes captivating worldviews such as these can act as catalysts, either swaying non-believers into fanaticism, or making explicit and clear otherwise nebulous ideas about society, politics, and history (Agresto, 1990). Exposure to globalization – both personally through travel and more tangentially through learning about differences in standards of living and culture between societies – could also induce political activism, and in closed societies with no other outlet for those impulses, terrorism. As much as liberalism and democracy espouse open minds and curiosity, democratic political systems demand a degree of ideological moderation to function properly – extreme viewpoints rarely receive more than rhetorical victories – and autocratic regimes demand obedience: if education

introduces extreme viewpoints into a society that does not tolerate them, terrorism becomes a possible emergent outcome of education. This might be especially true of educational aid: the fact that it is tied intimately into international relations and global affairs encourages a worldview that is more globalist than parochial, and reactions to that globalist worldview can act as a ready-made political cause with which to motivate terrorism.

In a way, then, education can have perverse consequences for terrorism: education opens one's mind, offers the drive for change, and sometimes even the skills to engage in terrorism. In some societies, it allows for greater economic and political rights: access to better jobs, more political power or access, or higher social status. In other societies, education grants some or none of these rights: authoritarian societies limit political rights over most of the population and in many economically depressed communities, education does not necessarily provide greater economic opportunity – or the social status that comes with it. In those situations, an educated, capable individual with a desire to effect change lacks a legitimate method to effect that change: no outlet exists for activism. In some societies, such activism might actually be criminalized: protest or dissent can land people in jail, even in democracies. In such a situation otherwise-illegitimate routes to change become attractive, and perhaps even laudable or necessary. Terrorism, as a dramatic, highly visible tactic, becomes enormously attractive in the pursuit of political change: it always accrues media attention, it is relatively cheap in terms of materiel and personnel. In certain situations, it has proven highly effective at shifting the conversation to include more extreme viewpoints, as in the case of the Tamil Tigers, whose terror campaign not only popularized the tactic of suicide terrorism, but also brought attention to their political objectives and goals of ethnic Tamil autonomy.

Education also acts as a disincentive for terrorism in societies that do value it, however: when education provides status, wealth, or power, engaging in terrorism puts the terrorist at greater risk. In short, such individuals have more to lose: their jobs, position, or wealth could be compromised if their support of terrorism is made public. Educated individuals have higher human capital, wage potential, and in most societies, higher status – all of which are endangered by engaging in public acts of terror. It is important to note that these effects exist only in a state of sufficiently perfect information: if terrorism remains undiscovered, these costs are limited or nonexistent, beyond opportunity costs of time that might have been spent elsewhere (Frey & Luechinger, 2002). Nevertheless, terrorism's inherent publicity often makes anonymity difficult, and there are sometimes perverse incentives to make such involvement *ex post facto* – in pursuit of infamy and political power.

Another theory that comes into play here is basic socialization: education serves communities as an assimilative tool, creating a baseline of knowledge, civics, and language that – at least in modern states – are the bedrock of the state's cultural legitimacy (Nelson, 1982). If this is the case, schooling can act as a palliative against terrorism: adjusting attitudes towards the societal mean, or at least making that mean available to most of society. If this is the case, the socializing effect of education might moderate potential terrorists, reducing their desire or incentive to seek new or unusual political goals. Alternately, socialization could redirect those desires into more normal modes of political activism within society, and away from terrorism: civics education, in particular, expands students' knowledge of their government and society, and often focuses on the legitimate political channels for change.

Young and Findley's analysis is the jumping-off point for my own work, as it is the most rigorous empirical study of foreign aid's impact on terrorism to date. They find support for the

thesis that aid reduced terrorism, so long as the aid was targeted towards education, health, civil society, and conflict prevention. Their analysis covers a span similar to my own, using all the countries reported in the AidData set and all those present in the GTD and ITERATE databases, across the time span of coinciding data. Their basic approach uses a panel analysis and time effects using country fixed effects, but they also include statistical tests for endogeneity (Hausman tests) and a robustness check in the form of a GMM model. They adjust the aid received by weighing it by recipient countries' GDP, and control for political constraints on executive power, democratic participation, GDP, population size, histories of terrorism, and civil conflict along with regional- and time-fixed effects. Their initial results are not statistically different from zero, but after controlling for endogeneity, they found a significant negative effect to terrorism when aid was increased by one standard deviation. They performed analyses of three varieties of terrorism, but reported only results from their analysis of simple transnational terrorism, measured by number of attacks in a country. Their robustness checks using the Global Terrorism Database find especially strong relationships which indicate that foreign aid was especially useful in preventing domestic terrorist attacks. While I will not be making that distinction during my analysis, I consider it an interesting standalone finding.

Reconciling these findings with the demographics and theory of terrorism forms the bulk of my research. While both groups acknowledge the findings of the other, it is difficult to grok the mechanism at work. I intend to reproduce Young and Findley's results, and then apply additional internal controls to examine the effects of internal political, social and economic factors on the relationship between educational aid and terrorism.

DATA SOURCES AND SUMMARY OF DESCRIPTIVE STATISTICS

The data are drawn from the World Bank's World Development Indicators (WDI) Database, as accessed on November 8th, 2011. The data for terrorist incidents was taken from the University of Maryland's Global Terrorism Database (GTD), aggregated and grafted onto the WDI on November 8th. Data on educational aid was acquired from the AidData (AiDA) project, which is a joint project between Brigham Young University (BYU), the College of William and Mary (CWM), and the non-profit Development Gateway (DG). The data for the secondary analysis was acquired from the Quality of Governance Institute (QoG) at the University of Gothenburg; the data used were drawn from UNESCO research and the World Values Survey. Data on political institutions and structure were taken from the Polity IV project.

The WDI records data on several hundred metrics that measure a wide variety of health, education, financial, and private and public sector activity. Where data is unavailable, the World Bank generally uses missing values. The WDI records data from 1960 to 2010 and can be structured in a number of ways; for the purposes of this study, I structured the data in country-year format.

The GTD records the characteristics of individual terrorist attacks, covering every terrorist incident between 1970 and 2010. I aggregated the data into country-year format using customized Python code (Appendix 1). The GTD is in part a composite database: its first phase was collected by the Pinkerton Global Intelligence Service (PGIS), a private security agency. Its second phase, covering a stretch from 1998 to 2008, was collected by the Center for Terrorism and Intelligence Studies (CETIS), and all further data was collected by the Institute for the Study of Violent Groups at the University Of New Haven (ISVG). GTD researchers have worked to

supplement this information in pursuit of a complete data set. Incidents recorded by several other terrorism archives were also incorporated.

The Polity IV Project is a data project that examines the democratic and autocratic characteristics of political regimes, with data spanning all countries and covering a time period from 1800 CE to the present day. The Polity Score, their most commonly cited metric, ranges from -10 for hereditary monarchies to +10 for consolidated democracies. Presented in country-year format, the Polity Project provided me with the Polity Score, and their own “Democracy” score, which measures the overall democratic characteristics of countries. The Polity project acts a live data-collection service, making judgments on rapidly changing situations on a regular basis, and the annual Polity IV Country Report series disseminates this information to interested stakeholders and academics. I acquired this data from their website.

The Quality of Governance Institute was founded in 2004 by two professors at the University of Gothenburg in Gothenburg, Sweden. Their research combines the datasets of several prominent academic and institutional sources into a single database for exploring how states develop high-quality, responsive public institutions and governments. These subsidiary datasets use a wide variety of methodologies and analytic approaches, compiled in the QoG Standard Dataset, released most recently on April 6th of 2011. I used data from UNESCO sources and the World Values Survey. Data are organized in a country-year format, and covers a comparable breadth of countries over a similar time period.

Because of the controversial nature of the definition of terrorism, it’s important to be clear about the definition used to supply my data. The data collected by the GTD comes from several sources, and given changes in perspective regarding terrorism within its tenure, the definition has shifted somewhat since incidents began to be recorded. Since 1998, any terrorist

event that fulfills any one of three criteria is included in the database; if a violent act was either aimed at attaining a political, economic, religious or social goal, included evidence to coerce, intimidate, or convey a message to a large audience than the immediate victims, or was outside the precepts of International Humanitarian Law, they were recorded in the database. Events pre-1998 were sanitized and readmitted into the dataset to match these criteria. I decided to take the most inclusive definition of terrorism, and as a result I excluded no events from my data set, even when there was a degree of academic doubt as to nature of the event (for example, distinguishing a bombing from an insurgent strike). It should also be noted that the data collected from 1998 to 2007 was acquired in retrospect, while collection was taken in real time before and since. The GTD also has lost data from 1993 because of a pre-existing issue with PGIS, and efforts at recovery have so far been unsuccessful.

AidData is a joint project of two academic institutions and a non-profit. The project aims to increase the impact of development assistance and improve the quality of research on aid allocation and effectiveness through data transparency and access. It works with a wide range of development organizations to collect and leverage aid information, including the OECD and individual donor agencies. My research uses the so-called Research Release 2.0 of the AidData database, which is a static repository of aid-related data; while the release covers projects as far back as 1940, I only used projects beginning in 1970. The first educational aid project recorded in that time frame was in 1973, and the last was in 2008.

The statistical means, medians, and ranges of key variables are presented in Table 1. Of particular importance are the variables representing terrorist attacks, net aid to education, and the number of casualties as a result of terrorist attacks in a given country-year. It's important to note that both terrorist attacks and educational aid are relatively rare: a little more than 2,000 country-

years experienced terrorist events, and not even 300 received educational aid. It's important to note, however, that all countries that experienced educational aid also experienced terrorist events that year; this indicates that there is some relationship, though it obviously does not explain the entire phenomenon.

Table 1: Selected Descriptive Statistics

Variable	Obs	Mean	Standard Dev.	Min.	Max.
Terrorism	11231	.1844003	.3878276	0	1
Terrorist Attacks	11231	7.653904	46.6518	0	1176
Net Educ. Aid	297	53.00281	114.8888	.0111	1264.351
Pop Density	10615	295.0413	1402.829	.0986245	19416.29
Educ Expend / GDP	885	15.93407	6.92329	.96634	71.67613
Interest in Politics (wvse023)	215	2.631145	.3069332	1.800452	3.389667
WVS Police (e06906)	231	2.420624	.3755111	1.455357	3.15051
WVS Military (e06902)	231	2.307999	.3881093	1.209016	3.273613
Trust (wvsa165)	243	1.705293	.1516988	1.25835	1.971954
Health (wvs9)	207	2.223957	.3054732	1.525482	2.997544
Happiness (wvs8)	241	1.973104	.2783005	1.422354	2.735264

Source: GTD, AidData, and QoG databases. Author's calculations.

It is especially important to note how terrorism has changed since the GTD's coverage began in 1970: in that year, the leading country in the world for terrorist events was the United States, which was in the grip of mass student protests, riots, and domestic terrorist groups. Since the end of the Cold War, the fundamental nature of terrorism changed, and terrorist activity increased: where only 20 or so countries each year experienced terrorism in the early 1970s, the late 1970s showed more than 30, and the 1980s, more than 50 countries encountered terrorism. This was especially true in the 1990s, when terrorist operational tactics became more widely known amongst agitating groups. Terrorist attacks have been on the decline in sheer numbers since 1994, but they remain higher than they were in the 1970s and 80s. Terrorist casualties from these events have declined in aggregate despite the relatively large number of attacks each year, presumably as a result of more advanced medical techniques for treating trauma and battlefield wounds.

METHODOLOGY AND QUANTITATIVE APPROACH

Assessing the relationship between terrorism and foreign aid to education is somewhat tricky, and requires a number of statistical approaches. Because of the nature of the panel data provided by the World Bank and other data sources, a fixed-effects model is an ideal first effort, with allowances and modifications made to correct for missing data (Wooldridge, 2010). As a robustness check and alternative analysis, I have also examined several secondary figures for socioeconomic indicators without other controls to examine their effects on the relationship between terrorism and educational aid.

Resolving the problem of missing data has been the most challenging portion of my technical analysis. Because countries that experience terrorist events – and receive educational aid – are typically unstable and less economically and politically developed, they often do not report measures for infrastructure and spending as often or as reliably as other states. Thankfully, the GTD and AidData datasets are more complete, as is data acquired from sources other than the World Bank. However, the missing data in the World Bank database will be a problem, as it contains many of the socio-economic controls I had intended to include in my analysis. Adding data from the GoQ's repository of UNESCO and World Values Survey responses has acted as a secondary robustness check for these purposes.

To solve the problem of missing data and in order to eliminate yearly outliers and/or systemic cyclical effects, I have condensed the panel into 5-year windows of aggregated and averaged data, acting on the assumption that aggregating the data over time will give me better purchase when dealing with missing data. I will also conduct a cross-sectional analysis of the data based on averages and weighted averages as a secondary robustness check against the panel

data. This is liable to be the most complex regression presented, as it will have to include a wide variety of control variables to approach comparability with the panel regressions that will be the focus of my analysis.

The first order of business for my analysis was recreating a reasonable facsimile of the results from Young & Findley to act as a baseline for further analysis. I decided to avoid the dynamic fixed-effects model they used in favor a simpler and more methodologically austere approach. I use a simplified form of Young and Findley's approach, using country- and time-fixed effects to model the effect of aid on terrorism. From that model, new control variables for socioeconomic development, internal education spending, political characteristics, and the like can be added to examine the importance of the relationship more fully.

$$\widehat{T}_{it} = \alpha + \beta_x X_{it} + \beta_c C_{it} + \gamma_i + \tau_t + \varepsilon_{it}$$

The above equation offers an approximation of the model used in my analysis, where T_{it} indicates the number of terrorist events in a country-yearblock, α is the constant, β is the coefficient on the variables, where X represents net educational aid and C represents the various control variables applied – where i represents different countries, and t represents different time periods. For each control variable c applied, there is a different coefficient, βc . In this case, γ represents country-fixed effects and τ represents time-fixed effects. The error term is represented by ε_{it} .

As a secondary analysis, I will also consider models outside of the Young & Findley framework. The UNESCO and World Values Survey offer measures of social trust, school enrollment, and institutional trust that are well-suited to exploring unusual approaches to the problem of terrorism, and I consider it worthwhile to examine terrorism and educational aid

independently, even if these analyses will suffer the same methodological difficulties of my primary analysis.

There are many possible – and internally consistent – explanations for the unusual phenomenon presented by the literature on terrorism. The simplest explanation – that either political scientists or economists have missed the mark and that the other is correct – is quite probable. It is my hope, however, that a more complicated effect emerges. It is entirely possible for example, that education's effects on terrorism are path-dependent: countries that quickly develop a large, educated middle class with good access to economic opportunities, for example, might experience less terrorist activity than countries where the middle class does not experience economic liberalization (for a similar argument, see (Alesina & Rodrik, 1994)). Similar effects can be posited for political liberalization, and for the apparent size of an educated class: a broader and more diverse educated class might better socialize activists than a small one, preventing them from becoming terrorists. Alternately, a larger middle class might give potential terrorists more connections and exposure to terrorists, greatly increasing the breadth of society that terrorist leaders can draw upon for support. Examining these possibilities will form the bulk of my analysis, as I consider them much more interesting than a simple dichotomous effect.

ANALYSIS OF QUANTITATIVE RESULTS

Overall, my analysis found no conclusive evidence of a causal relationship between educational aid and terrorism, but suggests a clear and significant negative correlation between the two. Despite lacking the confidence to make a causal claim, we can identify important correlates of terrorism within the context of aid and terrorism: income inequality, in particular, seems to play a large role, as do certain social indicators taken in aggregate. Surprisingly, the effects of democratic political structures, overall political structures, and per capita wealth were found to have no statistically significant effects – and the effects of a history of terrorism are not robust. The largest culprit in the low significance of these factors in the primary relationship between educational aid and terrorism is overall poor data: unsurprisingly, countries that experience terrorism and violent extremism tend not to report socioeconomic data faithfully to the World Bank or UNESCO. I found no significantly different results from using different model specifications for terrorism; logarithmic models produced largely similar results. My inability to replicate previous studies using a similar baseline suggests that the methodology of any study of terrorism has powerful effects on the result of any analysis; the best solution, perhaps unsurprisingly, is better data.

The results for educational aid's negative correlations with terrorism were quite robust, and while the simplest regressions showed a positive correlation, the relationship inverted when controls for income inequality and social factors were added. The effect, once statistically significant, was always negative (Models 3-7). Because of the questionable causal strength of these regressions, it is unwise to make a causal claim about the data. Most models suffered from exceedingly low sample size, with the largest significant result drawn only 77 cases across 45

countries. Factoring in the controls used in panel regressions, it is possible that these models are actually close to being over-specified; even with healthy R-squared scores for a number of regressions, the inability to more perfectly control omitted variable bias means that a strong claim is inappropriate.

Table 2: Primary Regression Results

Variable	1	2	3	4	5	6	7
Net Educ. Aid	.113 (.494)	.104 (.513)	-.417** (.031)	-.517** (.013)	-.670*** (.000)	-.661*** (.000)	-.669*** (.000)
Path Dep		.513 (.240)	.031 (.478)	.375* (.091)	.666 (.197)	.665 (.199)	.653 (.333)
Gini			-8.206*** (.008)	-7.878** (.015)	-9.809** (.034)	-10.007** (.038)	-9.882* (.066)
Democ				-8.999 (.206)			
Educ Exp					-2.210 (.705)	-2.937 (.705)	-1.845 (.829)
Pop Dens						.056 (.725)	
GDP/Cap							-.001 (.944)
Const	48.805 (.000)	40.509 (.002)	421.9615 (.003)	429.6547 (.007)	503.7437 (.036)	515.6129 (.046)	503.8586 (.038)
N	159	154	77	69	46	46	46
Groups	69	69	45	43	32	32	32
R-within	.0178	.0454	.3858	.4321	.5207	.5276	.5272
R-between	.0215	.4809	.0145	.0008	.0829	.084	.0743
R-total	.0131	.2492	.0887	.0548	.2123	.1951	.2017
F-value	.4941	.4494	.0108	.0132	.0000	.0000	.0000

Note: Parentheses indicate p-values, and *s indicate levels of statistical significance: * $\alpha < .10$, ** $\alpha < .05$, and *** $\alpha = .01$

Nevertheless, we can draw some suggestive conclusions from the effects and polarity of the controls added to the models. My analysis surprisingly does not support previous findings that terrorism is path-dependent (Models 2-7) when controlled with internal socioeconomic factors, but upholds the finding that income inequality has an effect on terrorism (Models 3-7). Surprisingly, I did not discover statistically significant effects for democratic political characteristics – probably because of the inclusion of a number of unstable developing democracies in my sample that experienced a great deal of terrorism. While educational aid’s effect seems to be negative and significant, domestic spending on education proves to be largely

insignificant: it appears that in some cases, internal educational spending has less effect on terrorism than theory would suggest. Interestingly enough, enrollment appears to be positively correlated with terrorism, and educational spending, negatively – though neither control was sufficiently significant for closer analysis.

Table 3: Secondary Regression Results

	A	B	C	D	E
	UNESCO Enrollment total	UNESCO Enrollment Female	UNESCO Enrollment Male	WVS Happy	WVS Health
Net Educ Aid	2.028*** (.000)	1.511** (.020)	1.576** (.010)	0.077 (.649)	0.228 (.143)
Path Dep	0.349 (.528)	3.138 (.581)	0.289 (.594)	0.494* (.053)	0.586*** (.003)
Control	5.756** (.044)	0.939 (.65)	-2.317 (.513)	104.085 (.367)	-191.584 (.368)
Constant	-204.699 (.061)	-82.486 (.683)	249.706 (.499)	-144.142 (.505)	466.245 (.315)
N	57	60	60	31	31
Groups	41	40	40	21	21
R-within	0.8932	0.6618	0.6678	0.3701	0.4436
R-Between	0.0446	0.3585	0.3652	0.4497	0.2209
R-Total	0.1846	0.4997	0.5168	0.3734	0.1931
F	0.0000	0.0675	0.0402	0.0000	0.0000

Table 3: continued

	F	G	H	I
	WVS Trust	WVS-PolInterest	WVS Mil-trust	WVS Police-Trust
Net Educ Aid	0.407** (.044)	-0.016 (.0943)	0.029 (.913)	0.039 (.826)
Path Dependence	0.5408026** (.016)	0.4313669 (.126)	0.6044481* (.052)	0.4395856 (.146)
Control	490.093 (.276)	-174.378** (.024)	-90.293 (.565)	-220.736** (.030)
Constant	-823.201 (.303)	534.456 (.198)	248.682 (.461)	595.2903** (.024)
N	31	31	31	30
Groups	21	21	21	20
R-within	0.5053	0.4195	0.3753	0.6155
R-Between	0.0571	0.1871	0.0993	0.0739
R-Total	0.073	0.2017	0.1588	0.1662
F	0.0000	0.0005	0.0000	0.0000

Parentheses indicate p-values, and *s indicate levels of statistical significance: * $\alpha < .10$, ** $\alpha < .05$, and *** $\alpha = .01$

The primary cause of both low statistical significance and weak causal claims is the generally poor quality of internal socioeconomic factors. While 157 country-years exist with terrorism and educational aid data, these numbers quickly drop whenever socioeconomic controls are applied. This is not especially surprising – in some cases, the data simply might not exist, because it was never collected. Many governments have arcane or ad hoc budgeting systems that do not reliably account for educational spending, and collecting income distributions in countries that lack income taxes or reliable demographic institutions is a difficult proposition, especially for historical data. The World Values Survey has not been running for the entire stretch of time covered by my analysis, and retroactive surveys would likely prove to have little reliable use. As we acquire data on more modern events and attempt to collect more complete data streams on countries that experience terrorism, we can hope that future analyses will be able to overcome these limitations.

CONCLUSIONS

My results show that educational aid seems to have a negative relationship with terrorism, though my methodology does not suggest a relationship that I would consider causal. This has implications for using aid as a counter-terrorism tool, and seems to uphold economic assumptions about how and why terrorist groups form. Future analyses of the role of educational aid in combatting terrorism should make every effort to include internal socioeconomic data, and aid should attempt to target countries that are more economically equal to achieve the greatest effects. Indeed, given the strength of income inequality's effects on terrorism, educational aid policy should encourage governments to place a high importance on economic equality – and especially, inclusive economic growth – if they want to avoid terrorism. Overall, the common-sense suggestion is to consider carefully the social and economic conditions of a recipient country before doling out aid. Further studies should focus on understanding microeconomic effects to tease out exactly what it is about education that reduces terrorism, and attempt to study longitudinal effects – the legacy of education in a country, as much as the legacy of terrorism. Educational aid might be an effective counter-terror tool in some contexts, but more research is definitely necessary before we can be positive that its effects are wholly beneficial. Research into this field is growing at an astronomical pace, and in the course of my research, authoritative scholars have begun to pay a great deal of attention to what Jean-Paul Azam calls the “quality of terror” puzzle. So far, implications for counterterrorism suggest improving economic development and implementing repression are the most effective means of reducing terrorism, but that the social costs of these changes need to be considered as part and parcel of those actions (Azam, *Why suicide-terrorists get educated, and what to do about it*, 2011). Counterterror policy

should also remain sensitive to political and economic development – with inclinations towards encouraging states to develop inclusive economic institutions to prevent the spread of terrorism (Acemoglu & Robinson, 2012). Counterterrorism policymakers should also remain attentive to developments in social network theory, and to developments in small-group psychology and socialization if they seek to better understand noneconomic explanations for the origins of terrorism. Nevertheless my findings seems to support the idea that education without great social inclusion and persistence in income inequality can create fertile ground for political and societal instability, which in turn can breed terrorism and insurgency.

APPENDIX 1: DATA AGGREGATION PROGRAM (PYTHON)

```
def OpenCsvFile(name):
    infile=open(name)
    outfile=[]
    n=0
    for line in infile:
        current = line.split(";")
#     if n%1000==0:
#         print "Appending line "+str(n)
        n=n+1
        outfile.append(current)
    infile.close()
    return outfile
```

```
def OpenCommaSVFile(name):
    infile=open(name)
    outfile=[]
    n=0
    for line in infile:
        current=line.split(",")
        n=n+1
        outfile.append(current)
    infile.close()
    return outfile
```

```
def OpenCsvFileText(name):
    infile=open(name)
    outfile=[]
    for line in infile:
        outfile.append(line)
    infile.close()
    return outfile
```

```

def clean(astring):
    #print "Cleaning a: "+str(astring)
    if astring==" ":
        return int(0)
    elif astring[0]==" ":
        return int(0)
    else:
        return int(astring)

def same(disag,compiled):
    if disag[1]==compiled[0] and disag[2]==compiled[1]:
        return True
    else:
        return False

def more(infile,line,year,country):
    if infile[line][1]==year and infile[line][2]==country:
        return True
    else:
        return False

def amore(infile,line,year,country):
    if infile[line][1]==year and infile[line][2]==country:
        return True
    else:
        return False

def new(lister):
    if lister == []:
        return True
    else:
        return False

```

```

def Rename(country):
    #Renames countries to conform with World Databank Values
    if country=="Great Britain":
        return "United Kingdom"
    elif country=="West Germany (FRG)" or country=="Germany East":
        return "Germany"
    elif country=="East Germany (GDR)" or country=="Germany West":
        return "Germany"
    elif country=="North Yemen":
        return "Yemen, Rep"
    elif country=="Congo (Kinshasa)" or country=="Congo Kinshasa":
        return "Congo, Dem. Rep."
    elif country=="Congo (Brazzaville)" or country=="Congo Brazzaville":
        return "Congo, Rep."
    elif country=="West Bank and Gaza Strip":
        return "West Bank and Gaza"
    elif country=="Corsica":
        return "France"
    elif country=="Guadeloupe":
        return "France"
    # elif country=="Hong Kong":
    #     return "Hong Kong, SAR China"
    elif country=="Myanmar (Burma)":
        return "Burma"
    else:
        return country

```

```

def TerrorAggregate(infile):
    outfile=[]
    newline=True
    year=0
    country=""
    attacks=0
    kills=0
    current=[]
    print "Terror Data Aggregating"
    for line in range(0,len(infile)-1):
        #print "Aggregating Observation "+str(line)
        #print infile[line]
        current=infile[line]
        #print current
        if newline:
            newline=False
            year=current[1]
            country=current[2]
            #print year+", "+country
            attacks=1
            kills=clean(current[3])
        elif not newline and more(infile,line,year,country):
            attacks=attacks+1
            kills=kills+int(clean(current[3]))
        elif not newline and not more(infile,line,year,country):
            attacks=attacks+1
            #print type(clean(current[3]))
            kills=kills+int(clean(current[3]))
            outline=str(year)+";"+str(Rename(country))+";"+str(attacks)+";"+str(kills)+";\n"
            outfile.append(outline)
            #print "Appending Aggregated line '"+outline+"' to file . . ."
            newline=True
    print "Aggregation complete"
    return outfile

```

```

def AidAggregate(infile):
    outfile=[]
    newline=True
    year=0
    country=""
    commitments=0
    print "Aid Data Aggregating"
    for line in range(1,len(infile)-1):
        current=infile[line]
    ##     if int(line%(int(len(infile)-1)/100))==0:
    ##         print current
        if newline:
            newline=False
            year=current[0]
            country=current[1]
            commitments=int(float(current[2][:-1]))
    #         print commitments
        elif not newline and amore(infile,line,year,country):
            commitments=commitments+int(float(current[2]))
        elif not newline and not amore(infile,line,year,country):
            commitments=commitments+int(float(current[2]))
            outline=str(year)+";"+str(country)+";"+str(commitments)+";\n"
    #         print outline
            outfile.append(outline)
            commitments=0
            year=0
            country=""
            newline=True
    print "Aggregation complete"
    return outfile

def Finalize(infile,name):
    output= open(name,mode="w+")
    output.writelines("Year;country;attacks;deaths;\n")
    for line in infile:
        output.writelines(line)
    print "File Finished."
    output.close()

```

```

def searchgraft(country, year,graft):
    #Subroutine that finds appropriatedata for grafting, or returns null if no such exists
    for line in graft:
        current=line.split(";")
#    print country+", "+year
        if country==current[1] and year==current[0]:
#        print "Data Found: "+str(year)+", "+str(country)
            return ";1;" +str(current[2])+";" +str(current[3])+";\n"
#    print "No Data found for "+str(year)+", "+str(country)
    return ";0;\n"

```

```

def TerrorGraft(mainset, graft):
    #Grafts a smaller dataset onto a larger one
    #Check to make sure mainset is longer than the graft
    if len(graft)>len(mainset):
        return "Bad input: Graft is longer than Main Data Set"
    #Append headers in first line
#    print mainset[0]
    header = mainset[0][:-1]
    header = header+";terrorism;terrorist attacks;number killed by terrorism;\n"
    mainset[0]= header
    #print mainset[0]
    #For each line in the main file, check to see if there is a graftable line in the graft
        # if there is, graft that data on
        # otherwise, graft on "0,\n"
    for n in range(1,(len(mainset)-1)):
        if n% 1000==0:
            print "Checking for line "+str(n)
            line=mainset[n]
            workline=line.split(";")
#            print workline
            country=workline[1]
            year=workline[0]
#            print str(year)+", "+str(country)
            data=searchgraft(country,year,graft)
            mainset[n]=mainset[n][:-1]+data
    print "File Grafting Complete"
    return mainset

```

```

def searchaid(country,year,graft):
    #Subroutine that finds appropriatedata for grafting, or returns null if no such exists
    for line in graft:
        current=line.split(";")
#    print country+", "+year

```

```

        if country==current[1] and year==current[0]:
            print "Data Found: "+str(year)+", "+str(country)
            return ";" +str(current[2])+"\n"
#    print "No Data found for "+str(year)+", "+str(country)
    return ";0;\n"

def AidGraft(mainset, graft):
    #Grafts a smaller dataset onto a larger one
    #Check to make sure mainset is longer than the graft
    if len(graft)>len(mainset):
        return "Bad input: Graft is longer than Main Data Set"
    #Append headers in first line
#    print mainset[0]
    header = mainset[0][:-1]
    header = header+";netEducAidUSD;\n"
    mainset[0]= header
#    print mainset[0]
    for n in range(1,(len(mainset)-1)):
        if n% 1000==0:
            print "Checking for line "+str(n)
            line=mainset[n]
            workline=line.split(";")
#            print workline
            country=workline[1]
            year=workline[0]
#            print str(year)+", "+str(country)
            data=searchaid(country,year,graft)
            mainset[n]=mainset[n][:-1]+data
    print "File Grafting Complete"
    return mainset

```

```

def datacheck(inputs):
    if inputs=="":
        return False
    else:
        return True

def semicolons(alist):
    output=";"
    for item in alist:
        output=output+str(item)+";"
    return output

def fullsearch(country,year,terror,aid,polity):
#   print str(country)+" "+str(year)
    terror_data=""
    aid_data=""
    polity_data=""
    for tline in terror:
        current=tline.split(";")
        if country==Rename(current[1]) and year==current[0]:
#           print "Terror Data Found"
            terror_data=";1;" +str(current[2])+";" +str(current[3])+";"
    for aline in aid:
        current=aline.split(";")
#       print current
        if country==Rename(current[1]) and year==current[0]:
#           print "Aid Data found!"
#           print "Education Data: " +current[2]
            aid_data=str(current[2])+";"
    for aline in polity:
#       print aline
        current=aline
#       print current
        if country==Rename(current[1]) and year==current[0]:
#           print "Polity Data Found!"
#           print "Polity Data: " +str(current[2:])
            polity_data=semicolons(current[2:-1])
    if datacheck(terror_data) and datacheck(aid_data) and datacheck(polity_data):
        outdata= terror_data + aid_data+polity_data+"\n"
        #print "Full Data"
    elif datacheck(terror_data) and datacheck(polity_data) and not datacheck(aid_data):
        outdata=terror_data+";0;" +polity_data+"\n"
        #print "Terror and Polity Data"
    elif not datacheck(terror_data) and datacheck(aid_data) and datacheck(polity_data):
        outdata=";0;0;" +aid_data+polity_data+"\n"

```

```

    #print "Aid and Polity Data"
elif datacheck(terror_data) and datacheck(aid_data) and not datacheck(polity_data):
    outdata= terror_data + aid_data+"\n"
    #print "Terror and Aid Data"
elif datacheck(terror_data) and datacheck(polity_data) and not datacheck(aid_data):
    outdata=terror_data+"\n";\n"
    #print "Terror Data"
elif not datacheck(terror_data) and datacheck(aid_data) and datacheck(polity_data):
    outdata=";0;0;" +aid_data+"\n";\n"
    #print "Aid Data"
else:
    outdata=";0;0;\n";\n"
    #print "No Data Found: "+country+" "+year
return outdata

```

```

def FullGraft(terror,aid,mainset,polity=""):
    mainset=mainset
    if len(terror)>len(mainset) or len(aid)>len(mainset) or len(polity)>len(mainset):
        print "Bad input: grafts are longer than main set"
        print "Mainset: "+str(len(mainset))+", Terror: "+str(len(terror))+", Aid: "+str(len(aid))+",
Polity: "+str(len(polity))
        if len(mainset)<=1:
            print mainset
            quit
        header = mainset[0][:-1]
        header =
str(header)+";terrorism;terroristattacks;terrorcasualties;netEducAidUSD;democ;autoc;polity;poli
ty2;durable;xrreg;xrcomp;xropen;xconst;parreg;parcomp;exrec;exconst;polcomp\n"
        mainset[0]=header
#    print mainset[0]
        length = len(mainset)
        counter=0
        for n in range(1,(length-1)):
            if n%(length/20)==0:
#                print str(int((n/length)*100))+ "% Grafted"
                counter=counter+1
#                print workline
                print str(counter)+"/20 count completed."
                line=mainset[n]
                workline=line.split(";")
#                print workline
                country=Rename(workline[0])
                year=workline[2]
                #print str(year)+", "+str(country)
                data=fullsearch(country,year,terror,aid,polity)
                #print data
                mainset[n]=mainset[n][:-1]+data
#                print mainset[n]
        print "Terror and Aid Data Grafted"
        return mainset

```

```

def WriteFile(infile,name):
    output= open(name,mode="w+")
    for line in infile:
        output.writelines(line)
    print "File Finished."
    output.close()

def Semify(filename):
    for line in filename:
        line=line.split(";")
        for cell in line:
            if cell.find(",")==True:
                cell=cell.split(",")
                print cell
    return filename

def Main(filename,aidset,polityset,mainsetname=""):
    print "Opening File . . ."
    inputs=OpenCsvFile(filename)
    terror=TerrorAggregate(inputs)
    aidinput=OpenCsvFile(aidset)
    aid=AidAggregate(aidinput)
    polityinput=OpenCsvFile(polityset)
    if not mainsetname=="":
        mainset=OpenCsvFileText(mainsetname)
    #    print mainset
    output=FullGraft(terror,aid,mainset,polityinput)
    #    output=TerrorGraft(mainset, terror)
    #    output=AidGraft(output, aid)
    #    output=Semify(output)
    #    print output
    WriteFile(output,"C://Users/Kevin/Documents/Georgetown/Thesis/Data/Grafted.csv")
    # else:
    #    Finalize(graft,"C://Users/Kevin/Documents/Georgetown/Thesis/Data/PyOutput.csv")

Main("C://Users/Kevin/Documents/Georgetown/Thesis/Data/PythonInput.csv",
    "C://Users/Kevin/Documents/Georgetown/Thesis/Data/Aid-Input.csv",
    "C://Users/Kevin/Documents/Georgetown/Thesis/Data/Polity4Input.csv",
    "C://Users/Kevin/Documents/Georgetown/Thesis/Data/DatabankInput.csv")

```

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