THE NON-EFFECT OF PERSONAL RELATIONSHIPS WITH RADICALIZED INDIVIDUALS ON AN INDIVIDUAL'S PROPENSITY TOWARD VIOLENT EXTREMISM IN THE UNITED STATES

A Thesis
submitted to the Faculty of the
Graduate School of Arts and Sciences
of Georgetown University
in partial fulfillment of the requirements for the
degree of
Master of Public Policy
in Public Policy

By

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Washington, DC
April 9, 2021

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ABSTRACT

Terrorism in the United States is a continuing and evolving threat. Establishing methods to help identify and prevent domestic violent extremists, whether individuals and groups, from completing their objectives is necessary for the continued safety of American citizens. This study examines the personal relationships of individual extremists in the United States and their effect on those individual's propensity toward violent extremism. My hypothesis is that, in the United States, an individual with a family member, friend, or significant other already involved in radical activities will be more likely to commit a violent act of extremism, also known as a violent act of terror. Using data from *Profiles of Individual Radicalization in the United States (PIRUS, 2018)*, the effect is measured across three logistic regressions and three associated linear probability models that utilize unchanged *PIRUS* data, *PIRUS* data modified via total mean imputation, and *PIRUS* data altered with multiple imputation by chained equations (MICE), respectively. Across all three regressions, my hypothesis proves to be largely unsupported: a relationship with a radicalized family member, friend, or significant other does not predispose an individual to violent extremism (although there are mixed results for radical significant others).

ACKNOWLEDGEMENTS

I would like to thank my thesis advisor, Andrew Wise, without whom I could not have completed this thesis. His guidance and support during this process were invaluable.

Thank you also to Collin Meisel, who kindly allowed me to use his beautifully constructed tables as templates in my thesis. Special thanks to Eric Gardner for helping me collect and analyze my data and for providing great movie recommendations, and to Pooya Almasi for his assistance with MICE regression. Thank you to Emma Hurler and Austin May, who willingly proofread my entire thesis despite being equally busy second-year McCourt Master's students.

Above all, thank you to my wonderful family, who I can always count on to provide me with love and support for all of my endeavors.

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INTRODUCTION

In this paper, I study the personal relationships of individual terrorists in the United States. Specifically, I focus on their relationship with a family member, friend, or significant other who is involved in radical activities. My hypothesis is that, in the United States, an individual with a family member, friend, or significant other involved in radical activities will be more likely to commit a violent act of extremism, also known as a violent act of terror. To test my hypothesis, I use data from *Profiles of Individual Radicalization in the United States (PIRUS, 2018)*, an open-source dataset managed by the National Consortium for the Study of Terrorism and Responses to Terrorism (START). My methods include three logistic regressions and three associated linear probability models that utilize unchanged *PIRUS* data, *PIRUS* data modified via total mean imputation, and *PIRUS* data altered with multiple imputation by chained equations (MICE), respectively. Across all three regressions, I find that my hypothesis is largely unsupported: a relationship with a radicalized family member, friend, or significant other does not predispose an individual to violent extremism (although there are mixed results for radical significant others).

Terrorism in the United States is a continually evolving threat. There is "no single, universally accepted, definition of terrorism," although the Code of Federal Regulations defines it as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives."[1] The lack of a universal definition of terrorism, in this case, is not an indicator of insignificance. Following the attacks on September 11, 2001, terrorism came to dominate the

[1] U.S. Department of Justice - FBI, "Terrorism 2002/2005," Page, Federal Bureau of Investigation, accessed September 28, 2020, https://www.fbi.gov/stats-services/publications/terrorism-2002-2005.

minds of national security policy analysts and United States law enforcement and intelligence agencies.

Anyone can become radicalized and commit an act of terrorism domestically, unfortunately leaving civilians particularly susceptible to violent attacks. Despite the continued efforts of law enforcement and intelligence agencies, terrorism in the United States is difficult to track and prevent. Lone wolves are especially difficult to identify prior to committing an act of terrorism, as they are often radicalized online and have no connection to established terrorist groups.[2] Establishing methods to help identify and prevent terrorists, both individuals and groups, from completing their objectives is critical for the continued safety of United States citizens.

I propose that one possible counterterrorism method is to examine the personal relationships of individual terrorists in the United States. Are individuals more likely to commit an act of violent extremism if they have a close, personal relationship with someone already involved in radical activities? Does the type of relationship—family member, friend, or significant other—matter? While not enough to drive government response on its own, knowing more about perpetrators of violent acts of extremism and their relationships would contribute to the overall understanding and prevention of terrorism in the United States.

With the pursuit of that goal in mind, I proceed as follows: in the next section, I provide background and a review of relevant literature pertaining to the extremist radicalization process and the impact of personal relationships with people involved in radical activities on an individual level. In the third section, I describe the conceptual model I use to examine the drivers of violent extremism, focusing on the effects of personal relationships with individuals involved

[2] "Terrorism -- FBI," Folder, Federal Bureau of Investigation, accessed September 28, 2020, https://www.fbi.gov/investigate/terrorism.

in radical activities. The fourth section offers a description of the data I use to examine this issue, while the fifth section contains the associated empirical model and results. Finally, the sixth section discusses the results of the paper and concludes with related policy implications and recommendations.

BACKGROUND AND LITERATURE REVIEW

The September 11 attacks ensured that terrorism dominated and continues to dominate minds of national security policy analysts and United States law enforcement and intelligence agencies, as well as the public consciousness. With terrorism constantly evolving, it is necessary to establish methods to identify and prevent terrorists from completing their goals for the continued safety and security of United States citizens. In this section, I designate the definitions I will adhere to in this paper before discussing significant existing methods of measuring the individual radicalization process, motivators of extremism, and finally personal ties to people involved in radical activities and their effects on the individual radicalization process.

Defining Terrorism, Violent Extremism, and Radicalization

As previously mentioned, due to its complex nature, terrorism has "no single, universally accepted, definition," although the Code of Federal Regulations defines it as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives."[3] Relevant to this paper are the forms of terrorism committed in the United States. These acts of terror fall under two categories: domestic terrorism and international terrorism. Domestic terrorism consists of "violent, criminal acts committed by individuals and/or groups to further ideological goals stemming from domestic influences, such as those of a political, religious, social, racial, or environmental nature."[4] In contrast, international terrorism entails "violent, criminal acts committed by individuals and/or groups who are inspired by, or associated with, designated

[3] U.S. Department of Justice - FBI, "Terrorism 2002/2005."
[4] "Terrorism," Folder, Federal Bureau of Investigation, accessed November 8, 2020, https://www.fbi.gov/investigate/terrorism.

foreign terrorist organizations or nations (state-sponsored)."[5] The *PIRUS* data I study include domestic and international extremists, thus allowing for the examination of both domestic terrorists and international terrorists who committed acts of terror in the United States.

Not only are there inconsistent definitions of terrorism, but there are also associated moral biases connected to the word "terrorism." Laqueur, Lafree et. al., and others avoid these biases by replacing the word "terrorism" with the phrase "violent extremism."[6] Using the phase "violent extremism" implicitly signals there can also be "non-violent extremism," a distinction that is often forgotten when discussing terrorism (examples of violent and non-violent extremism are provided in the Empirical Model and Results section).[7] Although I will be examining individuals who committed violent extremist acts in the United States, it is crucial to remember that violent examples of extremism are the least likely outcomes of extremist actions, as opposed to non-violent outcomes.

So, the question becomes: how do individuals get to the point that they are ready and willing to commit a violent, or non-violent, extremist act? The process is called radicalization. Radicalization, as defined by Maskaliūnaitė is "a process by which a person adopts belief systems which justify the use of violence to effect social change and comes to actively support as well as employ violent means for political purposes."[8] Taşpınar argues that researchers and law enforcement should prioritize "radicalism," not terrorism.[9] This makes sense, as it is more

[5] "Terrorism."
[6] Walter Laqueur, *The New Terrorism: Fanatacism and the Arms of Mass Destruction* (New York: Oxford University Press, 2000).
[7] Collin Meisel, "The Non-Effect of Radicalization Duration on the Propensity for Violent Extremism in the United States," *Georgetown University-Graduate School of Arts & Sciences* (thesis, Georgetown University, 2018), https://repository.library.georgetown.edu/handle/10822/1050818.
[8] Asta Maskaliūnaitė, "Exploring the Theories of Radicalization," *International Studies. Interdisciplinary Political and Cultural Journal* 17, no. 1 (December 30, 2015): 9–26, https://doi.org/10.1515/ipcj-2015-0002.
[9] Ömer Taşpınar, "Fighting Radicalism, Not 'Terrorism': Root Causes of an International Actor Redefined," *SAIS Review of International Affairs* 29, no. 2 (2009): 75–86, https://doi.org/10.1353/sais.0.0059.

effective to prevent individuals from becoming violent extremists, as opposed to dealing with them once the process is already complete.

Some scholars believe that studying radicalization on its own is not enough. Schuurman and Taylor argue that the concept of radicalization suffers from an integral shortcoming, in that it relies heavily on the premise that involvement in terrorism stems from the adoption of radical beliefs. They claim that Taylor's concept of fanaticism, developed in the early 1990s provides a "conditional understanding of when radical beliefs can lead to violent behavior."[10] Ultimately, they argue that fanaticism is comprised of elements that "endow [it] with the specificity lacking in those interpretations of radicalization that conflate the adaptation of radical beliefs with involvement in radical behavior."[11] While Schuurman and Taylor make a fair point, current research continues to focus on individual radicalization. Below I will elaborate on some of the different methods used to measure the radicalization process.

Metaphorical Measurement Methods of Radicalization

Understanding the process of individual radicalization is vital when determining the best methods for preventing violent extremism. Having an understanding of how the process begins allows policy makers and law enforcement agencies to more easily prevent full radicalization from occurring. Researchers employ different methodologies when studying the process of radicalization. Below I will examine three methods used to measure radicalization: the narrowing staircase to terrorism, the four stages of radicalization, and the puzzle metaphor.

[10] Bart Schuurman and Max Taylor, "Reconsidering Radicalization: Fanaticism and the Link Between Ideas and Violence" 12, no. 1 (2018): 20.
[11] Schuurman and Taylor.

The Narrowing Staircase to Terrorism

Moghaddam's narrowing staircase to terrorism has a ground floor leading up to five other levels that represent a "behavior characterized by a particular psychological process.[12] As an individual ascends the staircase to terrorism, or violent extremism, their behavioral options start to decrease, going from a wide range of options on the ground floor to only one option on the highest floor – committing an act of terror.[13] The narrowing staircase method suggests that the more involved an individual is, or the higher they climb, the less able they are to abandon their path and the more constricted their choices become. This reasoning makes sense, as an extremist is not only propelled forward in their radicalization journey by outside influences, but is also constricted by peer pressure, groupthink, and other circumstances, both from within their personal psyche and from group or organizational relationships. It is questionable, though, if this method applies in the same way to lone wolf terrorists. Typically more isolated, lone wolves likely would not be affected behaviorally by the same influences.

The Four Stages of Radicalization

In Silber and Bhatt's four stages of radicalization, radicalization can be visualized as a funnel, in that the further a person progresses through the stages, the more likely they are to commit an act of violent extremism.[14] The four stages consist of Stage 1: Pre-Radicalization; Stage 2: Self-Identification; Stage 3: Indoctrination; and Stage 4: Jihadization; and remain consistent despite different circumstances and environments.[15]

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[12] Fathali M. Moghaddam, "The Staircase to Terrorism: A Psychological Exploration.," *American Psychologist* 60, no. 2 (2005): 161–69, https://doi.org/10.1037/0003-066X.60.2.161.
[13] van Stekelenburg, J. et al., "Radicalization," in *Identity and Participation in Culturally Diverse Societies. A Multidisciplinary Perspective* (Blackwell Wiley, 2010), 181–94, https://research.vu.nl/en/publications/84047cdd-3933-40b2-bd27-ba99fdcc5c91.
[14] Mitchell D Silber and Arvin Bhatt, "Radicalization in the West: The Homegrown Threat," *The New York City Police Department*, n.d., 90.
[15] Silber and Bhatt.

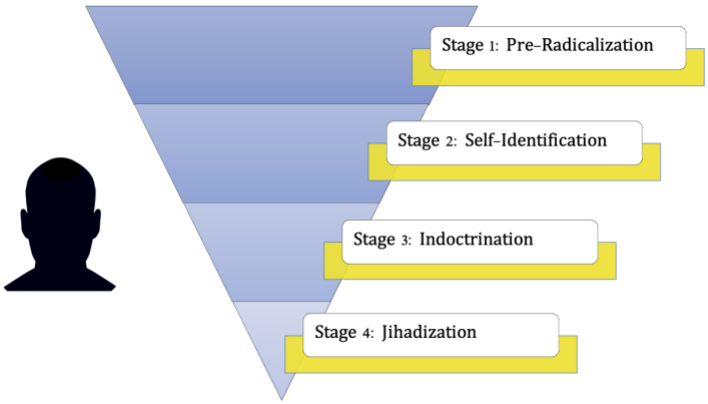

Figure 1: Author-Created Figure Based on Silber and Bhatt's Four Stages of Radicalization

The funnel visual shows how an individual can fall into the process, quickly sliding down the slope of radicalization. As a person progresses through the stages of radicalization, not only do their options narrow, but they also arguably start to lose control, as one would falling down a funnel. This is particularly relevant given that, although individuals typically start the radicalization process on their own, they eventually search for like-minded individuals as they progress through the stages of radicalization.[16] The more other people get involved, the less control the individual has of their own radicalization process, as they can be influenced by peers and groupthink. Given this theory, it behooves policy makers and law enforcement agencies to direct their efforts toward preventative measures that intercept individuals early in their radicalization process.

The Puzzle Metaphor

The previous two methods are both very linear in how they approach individual radicalization. In contrast, Hafez and Mullins' puzzle metaphor employs a more chaotic method of analyzing radicalization. They argue that grievances, networks, ideologies, and support studies

[16] Silber and Bhatt.

are present in most radicalization studies but can vary in how they fit together.[17] The method reflects the interdependent nature of radicalization variables, with each piece of the puzzle containing elements of the adjacent pieces.[18] While possibly making the radicalization process more difficult for law enforcement and researchers to predict, this method more adequately describes the radicalization process in a holistic fashion. Individual radicalization is a complicated process with many factors, both internal and external, influencing the individual.

So, what can be learned from these three methods of study? First, that there is no "one-size-fits-all" model of radicalization. Individuals are radicalized differently, come from different backgrounds, and are demographically unique.[19] One should not be discouraged by this, though, as studying the individual radicalization process can still be used to support preventative policies and solutions. Additionally, these methods show that radicalized individuals come from all walks of life—they are "unremarkable."[20] It is easy to forget that violent extremists were not always violent extremists and are not that different from their contemporaries. They have normal personalities and, by outward appearance, lack distinguishing characteristics to differentiate them from normal people.[21] Given that violent extremists are so difficult to distinguish from the rest of the populace, it follows that there is no single profile that can be used to pinpoint those who chose this path.

[17] Mohammed Hafez and Creighton Mullins, "The Radicalization Puzzle: A Theoretical Synthesis of Empirical Approaches to Homegrown Extremism," *Studies in Conflict & Terrorism* 38, no. 11 (November 2, 2015): 958–75, https://doi.org/10.1080/1057610X.2015.1051375.
[18] Hafez and Mullins.
[19] "Final Report: Empirical Assessment of Domestic Radicalization (EADR)" (National Consortium for the Study of Terrorism and Responses to Terrorism (START), December 2016).
[20] Silber and Bhatt, "Radicalization in the West: The Homegrown Threat."
[21] "FRD -- The Sociology and Psychology of Terrorism," accessed November 7, 2020, https://fas.org/irp/threat/frd.html.

Motivators of Extremism

While radicalization profiles may differ across extremist individuals, the motivations driving their behavior are often quite similar. What are their goals? Why are they acting this way? Kydd and Walter argue that "terrorist violence is a form of costly signaling." Specifically, there are five principle logics driving the costly signaling: 1) attrition; 2) intimidation; 3) provocation; 4) spoiling; and 5) outbidding. [22] Unable to express their discontent in a traditional, socially acceptable manner, extremists turn instead to acts of violence to persuade their audience to comply with their wishes. Those wishes are typically related to regime change, territorial change, policy change, social control, and status quo maintenance.[23]

On a more individual level, most acts of violence stem from political, religious, and socioeconomic factors. Additionally, group sociological and social psychology views and individual pathologies may affect the likelihood of a violent act.[24] Quest theory suggests that when people "perceive themselves as rejected, divested of control, or as victims of injustice, they feel belittled and disrespected." [25] Consequently, they attempt to fill that void with compensatory action, which in this case manifests in extremism.

One must keep in mind that most radicalized individuals do not reach the final stage of radicalization: committing a violent extremist act. Despite their motivations, something stops them from committing the final act of violence. Simi and Windisch conclude there are five types of barriers that hinder radicalization toward mass casualty violence: 1) it is counterproductive; 2) preference toward interpersonal violence; 3) changes in focus and availability; 4) internal

[22] Andrew H. Kydd and Barbara F. Walter, "The Strategies of Terrorism," *International Security* 31, no. 1 (2006): 49–80.
[23] Kydd and Walter.
[24] Amy Zalman, "Top Major Causes and Motivations of Terrorism," December 22, 2018.
[25] Katarzyna Jasko, Gary LaFree, and Arie Kruglanski, "Quest for Significance and Violent Extremism: The Case of Domestic Radicalization," *Political Psychology* 38, no. 5 (2017): 815–31, https://doi.org/10.1111/pops.12376.

organizational conflict; and 5) moral apprehension.[26] If policy makers and law enforcement agencies could integrate these barriers into preventative measures, they might be more successful in preventing violent extremism from occurring.

Personal Ties: Preventative or Precursors to Radical Extremism?

Why do some extremists go all the way and commit a violent act of terror while others do not? Many factors contribute to action, or inaction, such as Simi and Windisch's five types of barriers.[27] I will focus on personal ties to people involved in radical activities because they can both prevent or encourage individual violent radicalization.

The relationship between the radicalization of the social network and the inclination to use violence is more complex than it first appears. It is not always the case that personal ties draw potential extremists further down their radicalization path. Jasko, LaFree, and Kruglanski found that individuals with connections to non-violent extremist friends are less likely to commit acts of violence than those "with no connections or with connections to violent extremist friends."[28] Why would this be the case? Possibly because those with no connections feel isolated and insignificant and are therefore more likely to turn to violence. Additionally, non-violent friends could have a preventative effect on individuals tending toward radicalization, keeping them from committing an act or acts of violent extremism.[29]

Additionally, a change in romantic partners or relationships can help a person disengage from extremist activities. [30] Not surprisingly, non-extremist individuals can have a good

[26] Pete Simi and Steven Windisch, "Why Radicalization Fails: Barriers to Mass Casualty Terrorism," *Terrorism and Political Violence* 32, no. 4 (May 18, 2020): 831–50, https://doi.org/10.1080/09546553.2017.1409212.
[27] Simi and Windisch.
[28] Jasko, LaFree, and Kruglanski, "Quest for Significance and Violent Extremism."
[29] Jasko, LaFree, and Kruglanski.
[30] Michael Jensen, Patrick James, and Elizabeth Yates, "Contextualizing Disengagement: How Exit Barriers Shape the Pathways Out of Far-Right Extremism in the United States," *Studies in Conflict & Terrorism*, May 4, 2020, 1–29, https://doi.org/10.1080/1057610X.2020.1759182.

influence on extremist individuals. Especially in a romantic relationship, partners exert significant behavioral influence over one another. In encouraging each half of the relationship to actively seek to impress the other, cognitive focus focuses on productive, rewarding behaviors. If a non-extremist partner does not approve of their significant other's extremist actions, that individual might desist in order to please them. One can posit, though, that the opposite is true as well—that those who become romantically involved with an extremist individual are in turn more likely to become radicalized.

While there are instances, as evidenced above, where personal ties can pull extremist individuals out of the radicalization process, it is more common to see the influence exerted by personal ties pushing people the opposite way—toward violent extremism. For example, women are sometimes recruited into terrorist organizations by their lovers or accomplices. The Intifada in Palestine recruited many young girls in this manner.[31] The reasoning is the same as it is for romantic ties drawing individuals away from extremism – individuals become more radicalized to please their romantic partner.

Another facilitator of radicalization is "having connections with terrorists in one's offline network."[32] There is strong evidence that having friends or family members who "embrace terrorism" can be influential in an individual's choice to become or remain a terrorist.[33] Akers notes that those who interact with deviant peers more than conforming peers are more likely to be exposed to, and eventually "acquire, maintain, or increase deviant behavior."[34] Jasko, LaFree, and Kruglanski report that friends are even more influential than family members.[35] People do

[31] "FRD -- The Sociology and Psychology of Terrorism."
[32] Allison G Smith, "How Radicalization to Terrorism Occurs in the United States: What Research Sponsored by the National Institute of Justice Tells Us," n.d., 27.
[33] Smith.
[34] Ronald L. Akers, *Social Learning and Social Structure: A General Theory of Crime and Deviance* (New Brunswick, NJ: Transaction Publishers, 2009).
[35] Jasko, LaFree, and Kruglanski, "Quest for Significance and Violent Extremism."

not choose their family, but they do choose their friends. If the friends they choose to spend time with are already involved in extremist activities, they will slowly become radicalized themselves. Policy makers and law enforcement agencies should keep this in mind when creating preventative programs, targeting individuals who have yet to fully integrate with extremist groups.

Personal ties can also impede extremists from disengaging with their extremist community. Hafez found that familial ties to extremism commonly prevent individuals from disengaging from extremism, as they "intensify commonly cited intra-group mechanisms, such as peer-pressure, groupthink, and in-group/out-group dynamics."[36] Essentially, familial ties to extremism function as "exit barriers," preventing individuals from discontinuing their extremist activities.[37] The positive relationship evident between familial extremism and political violence is both a bane and a boon to law enforcement and researchers.[38] While it would be easier to fight extremist radicalization if personal ties were not so influential in the process, it is beneficial in elucidating precisely who might be more likely to engage in extremist actions. Those involved in preventing violent extremism must be intentional, though, in preventing negative biases from coloring their views of people who associate with violent extremists but may not be extremists themselves, especially within the law enforcement field.

Additionally, personal ties affect an individual's ability to gain access to extremist groups as well as their predisposition toward doing so. Social learning theory advances the concept that, when analyzing group membership in criminal or "deviant organizations," social reinforcement

[36] Jensen, James, and Yates, "Contextualizing Disengagement."
[37] Jensen, James, and Yates.
[38] Gary Lafree et al., "Correlates of Violent Political Extremism in the United States*," *Criminology* 56, no. 2 (2018): 233–68, https://doi.org/10.1111/1745-9125.12169.

of participants is done through the use of personal ties with family and friends.[39] Having family members, peers, or neighborhood acquaintances in extremist groups or movements will likely "lead to positive evaluations of membership in these organizations."[40] The personal connection gives the individual an "in" to the organization or group, similar to a CEO bringing in a personal acquaintance to work at their company when there is a job opening, bypassing the normal job application process.

If having personal ties to violent extremists is such a strong predictor of radicalization and violence, then why are there increasing numbers of lone wolf terror incidents? Mills et. al. explain that there is a correlation between lacking social bonds, like marriage and family bonds, or having those bonds weakened, and radicalization.[41] Someone with few or broken personal connections may be more likely to radicalize and engage in extremist activity. In contrast, Malthaner and Lindekilde argue that lone wolf, or lone actor, terrorists are not always that alone, and actually often interact or are "linked with other individuals, groups, and wider networks and movements in various ways."[42] Rather than being completely isolated, their radicalization pathways are shaped in part by embedded social relationships and interactions. Those pathways are just different from the "common pathways" to joining extremist groups.[43] In the case of lone wolf or single actor terrorism, personal ties still effect their radicalization process, just in different ways than with group terrorism.

[39] Colleen E. Mills et al., "Social Learning and Social Control in the Off- and Online Pathways to Hate Crime and Terrorist Violence," *Studies in Conflict & Terrorism*, March 29, 2019, 1–29, https://doi.org/10.1080/1057610X.2019.1585628.
[40] Mills et al.
[41] Mills et al.
[42] Michael Stohl, Richard Burchill, and Scott Howard Englund, eds., "12. Analyzing Pathways of Lone-Actor Radicalization: A Relational Approach," in *Constructions of Terrorism* (University of California Press, 2019), 163–80, https://doi.org/10.1525/9780520967397-014.
[43] Stohl, Burchill, and Englund.

Implications for this Study

My paper adds to this literature by examining in more depth the relationship between close personal relationships and individual radicalization culminating in an act of violent extremism. Using data provided by the *PIRUS* dataset, I will examine individuals with a family member, friend, and/or significant other involved in radical activities, both violent and non-violent. My goal is to determine if someone is more likely to commit an act of violent extremism if they have one or more influencer in their life. With this information, I hope to contribute to the literature being used by national security policy analysts and United States law enforcement and intelligence agencies in their quest to prevent violent extremism.

CONCEPTUAL MODEL

To examine the relationship between an individual's propensity to commit a violent act of extremism and their close relationship with a family member, friend, and/or significant other involved in radical activities, I developed the following conceptual model. While not all-encompassing, the model includes other relevant factors I deem most likely to influence an individual's propensity to commit an act of violent extremism, in addition to their personal relationships with others involved in radical activities.

$$Pr(\text{Extremist Violence}) = f(\text{family member/friend/significant other involved in radical activities, ideology, personal characteristics, socioeconomic status, random error}) \quad (1)$$

Thus, I assert that that the probability an individual will commit an act of extremist violence is a function of their relationship with a family member, friend, and/or significant other involved in radical activities, their ideology, personal characteristics such as age, marital status, and gender, and their socioeconomic status, specifically considering education and employment status.

As evidenced by literature discussed in the previous section, although there is no single profile of characteristics that is attributable to violent extremists, personal relationships can affect the likelihood of an individual committing a violent act of extremism. There are other factors affecting that likelihood as well. A person's closeness to society through their job and education, age and gender, marriage and relationship status, religion or political ideology—these all affect whether an individual is more susceptible to radicalization and, by extension, more

likely to commit a violent extremist act. Both Moghaddam's narrowing staircase to terrorism[44] and Silber and Bhatt's four stages of radicalization[45] indicate that there are stages in which an individual becomes radicalized to a violent level. Developing a better, more in depth understanding of an individual in the initial stages of radicalization would benefit policymakers, law enforcement personnel, and the intelligence community in their mission to end extremist violence in the United States. Even taking into account Hafez and Mullins' puzzle metaphor,[46] which argues for a less linear approach to the study of the radicalization process, it is certainly still beneficial to more clearly understand an extremist individual based on their personal characteristics and socioeconomic status.

To fully realize my conceptual model, I must use data to convert it to an empirical model. In the next section, I describe the data I will use to convert my conceptual model to my empirical model, allowing me to examine how close personal relationships with people involved in radical activities, controlling for personal characteristics, ideology, and socioeconomic status, can affect an individual's likelihood of committing a violent extremist act.

[44] Moghaddam, "The Staircase to Terrorism."
[45] Silber and Bhatt, "Radicalization in the West: The Homegrown Threat."
[46] Hafez and Mullins, "The Radicalization Puzzle."

DATA

The data come from the *Profiles of Individual Radicalization in the United States (PIRUS)* dataset.[47] This was compiled in 2018 by the National Consortium for the Study of Terrorism and Responses to Terrorism (START), a university-based research, education and training center and Department of Homeland Security Emeritus Center of Excellence led by the University of Maryland. *PIRUS* contains 2,226 observations, each a de-identified individual extremist who "radicalized to violent and non-violent extremism in the United States from 1948 through 2018," with associated information on that individual's background, attributes, and radicalization process.[48] To be included in the dataset, an individual needed to meet at least one of the following five criteria: 1) be arrested for committing an ideologically-motivated crime; 2) be indicted for an ideologically motivated crime; 3) be killed as a result of his or her ideological activities; 4) be a past or current member of a terrorist organization designated by the United States Department of State; 5) be associated, either in the past or present, with an extremist organization for which the leader(s) or founder(s) was or were indicted for an ideologically motivated violent offense.[49] Extremists are categorized ideologically as either Islamist, far-left, far-right, or single-issue, with additional sub-ideological categories that include, for example, white supremacist, anti-government, anti-immigrant, new left, and black nationalist/black separatist.[50]

[47] "Profiles of Individual Radicalization in the United States [Data File]" (National Consortium for the Study of Terrorism and Responses to Terrorism (START), 2018), http://www.start.umd.edu/pirus.
[48] National Consortium for the Study of Terrorism and Responses to Terrorism (START), "Profiles of Individual Radicalization in the United States (PIRUS)," START Research Brief (University of Maryland, May 2020).
[49] "PIRUS - Frequently Asked Questions," National Consortium for the Study of Terrorism and Responses to Terrorism (START), 2018 2010.
[50] National Consortium for the Study of Terrorism and Responses to Terrorism (START), "Profiles of Individual Radicalization in the United States (PIRUS)."

All information in the *PIRUS* dataset is collected from open-source material.[51] Open-source collection comes with both benefits and downsides. A strength of open-source data is they "can offer multiple, often alternative viewpoints beyond those of official reports or mainstream media."[52] The caveat is that the advantages those collective viewpoints provide must also be reliable and credible to be valuable to researchers. Ackerman and Pinson note that the use of open-source collection may lead to selection bias and description bias in the dataset.[53] Both biases must be accounted for when compiling information for a credible and valid open-source dataset. As noted in the "Empirical Assessment of Domestic Radicalization Final Report" when discussing the *PIRUS* dataset, although "every effort was made to ensure the representativeness of the data," news reporting trends over time are likely reflected in the sample due to the reliance on open-source data.[54] In this case, the increased focus of the news reporters on, for example, attacks fueled by one type of terrorist ideology means data on those attacks are more prolific. At the same time, there may be less coverage and therefore less data on other types of terrorist ideologies fueling attacks in that same time period.

For the purposes of this study, I utilized *PIRUS* data to create the indicator variables *single, married, past_relationship, male, nhs_graduate, hsg_sps, further_ed, employed, unemployed,* and *in_school,* from the categorical variables *Marital_Status, Gender, Education,* and *Employment_Status* (further explanations on the meaning of the indicator variables are included in the Empirical Model and Results section). Additionally, I recoded all "Unknown" and "Not Applicable" values in the *PIRUS* dataset as "missing" values. Finally, I excluded

[51] National Consortium for the Study of Terrorism and Responses to Terrorism (START).
[52] Gary A. Ackerman and Lauren E. Pinson, "Speaking Truth to Sources: Introducing a Method for the Quantitative Evaluation of Open Sources in Event Data," *Studies in Conflict & Terrorism* 39, no. 7–8 (July 2, 2016): 617–40, https://doi.org/10.1080/1057610X.2016.1141000.
[53] Ackerman and Pinson.
[54] "Final Report: Empirical Assessment of Domestic Radicalization (EADR)."

retirees from my analysis, dropping them from the *PIRUS* dataset to clarify the interpretation of the employment variables and due to their relatively low number of occurrences (N = 19).

Missing values in the *PIRUS* dataset pose a significant challenge to analysis (see Table 1 for descriptive statistics). To address this issue, in addition to my initial "complete-case" regression (N = 249), I employ simple imputation using total means (based on the work of Lafree et. al. and Tsikriktsis)[55] and regression-based multiple imputation by chained equations to generate larger sample sizes (N = 2,207) from the existing *PIRUS* data. In the next section, Empirical Model and Results, I discuss these methods in further detail, as well as provide further insight into my variables of interest.

[55] Lafree et al., "Correlates of Violent Political Extremism in the United States*"; Nikos Tsikriktsis, "A Review of Techniques for Treating Missing Data in OM Survey Research," *Journal of Operations Management*, 2005, 10.

Table 1: Descriptive Statistics. *(PIRUS 2018)*															
	Original Data					**Data After Total Mean Imputation**					**Data for Multiple Imputation by Chained Equations (MICE)** †				
Variable	*N*	*Mean*	*Stan. Dev.*	*Min.*	*Max.*	*N*	*Mean*	*Stan. Dev.*	*Min.*	*Max.*	*N*	*Mean*	*Stan. Dev.*	*Min.*	*Max.*
Violent	2,207	0.582	0.493	0	1	2,207	0.582	0.493	0	1	2,207	0.582	0.493	0	1
radical_family_member	765	0.363	0.481	0	1	2,207	0.126	0.332	0	1	765	0.363	0.481	0	1
radical_friend	1,250	0.861	0.346	0	1	2,207	0.921	0.270	0	1	1,250	0.861	0.346	0	1
radical_significant_other	941	0.274	0.0.446	0	1	2,207	0.117	0.321	0	1	941	0.274	0.0.446	0	1
Radicalization_Islamist	2,207	0.231	0.422	0	1	2,207	0.231	0.422	0	1	2,207	0.231	0.422	0	1
Radicalization_Far_Right	2,207	0.438	0.496	0	1	2,207	0.438	0.496	0	1	2,207	0.438	0.496	0	1
Radicalization_Far_Left	2,207	0.168	0.374	0	1	2,207	0.168	0.374	0	1	2,207	0.168	0.374	0	1
Radicalization_Single_Issue	2,207	0.164	0.370	0	1	2,207	0.164	0.370	0	1	2,207	0.164	0.370	0	1
Age	2,124	33.624	12.997	10	88	2,207	33.624	12.750	10	88	2,124	33.624	12.997	10	88
single	1,356	0.547	0.498	0	1	2,207	0.722	0.448	0	1	1,356	0.547	0.498	0	1
married	1,356	0.355	0.479	0	1	2,207	0.218	0.413	0	1	1,356	0.355	0.479	0	1
past_relationship	1,356	0.097	0.297	0	1	2,207	0.060	0.237	0	1	1,356	0.097	0.297	0	1
male	2,207	0.899	0.301	0	1	2,207	0.899	0.301	0	1	2,207	0.899	0.301	0	1
nhs_graduate	933	0.152	0.359	0	1	2,207	0.064	0.245	0	1	933	0.152	0.359	0	1
hsg_sps	933	0.512	0.500	0	1	2,207	0.794	0.405	0	1	933	0.512	0.500	0	1
further_ed	933	0.335	0.472	0	1	2,207	0.142	0.349	0	1	933	0.335	0.472	0	1
unemployed	1,051	0.194	0.396	0	1	2,207	0.092	0.290	0	1	1,051	0.194	0.396	0	1
employed	1,051	0.682	0.466	0	1	2,207	0.849	0.358	0	1	1,051	0.682	0.466	0	1
in_school	1,051	0.124	0.329	0	1	2,207	0.059	0.235	0	1	1,051	0.124	0.329	0	1
Student	1,257	0.262	0.440	0	1	2,207	0.149	0.356	0	1	1,257	0.262	0.440	0	1

† As, arguably, multiple imputation is not meant for descriptives, the MICE descriptive statistics are the same as those for the original data.[56] *However, it should be noted that, following MICE, the sample size (N) was 2,207 for all variables.*
Note: *Values are rounded to the nearest thousandth decimal place.*

[56] "Descriptive Statistics after Multiple Imputation - Statalist," accessed February 15, 2021, https://www.statalist.org/forums/forum/general-stata-discussion/general/1291521-descriptive-statistics-after-multiple-imputation.

EMPIRICAL MODEL AND RESULTS

Empirical Model

The empirical model I estimate can be summarized by the following equation:

$$\begin{aligned}\Pr(Violent = 1) = {} & \beta_0 + \beta_1(radical\_family\_member) + \beta_2(radical\_friend) + \\ & \beta_3(radical\_significant\_other) + \beta_4(Radicalization\_Islamist) + \\ & \beta_5(Radicalization\_Far\_Right) + \beta_6(Radicalization\_Far\_Left) + \\ & \beta_7(Radicalization\_Single\_Issue) + \beta_8(Age) + \beta_9(single) + \beta_{10}(married) + \\ & \beta_{11}(past\_relationship) + \beta_{12}(male) + \beta_{13}(nhs\_graduate) + \beta_{14}(hsg\_sps) + \\ & \beta_{15}(further\_ed) + \beta_{16}(employed) + \beta_{17}(unemployed) + \beta_{18}(in\_school) + \\ & \beta_{19}(Student) + \mu \end{aligned} \quad (2)$$

Where:

Violent, when equal to one, indicates that the individual actively participated in ideologically motivated operations/actions that resulted in casualties/injuries or was clearly intended to result in casualties/injuries (but failed), or was charged with conspiracy to kill or injure but was indicted in the plotting phase;

radical_family_member indicates if a family member of the individual is involved in radical activities;

radical_friend indicates if a close friend of the individual is involved in radical activities;

radical_significant_other indicates if the individual's significant other is involved in radical activities;

Radicalization_Islamist indicates if the individual became radicalized as a part of an Islamist or jihadist movement;

Radicalization_Far_Right indicates if the individual became radicalized as a part of a right-wing movement;

Radicalization_Far_Left indicates if the individual became radicalized as a part of a left-wing movement;

Radicalization_Single_Issue indicates if the individual became radicalized over a single issue;

Age indicates the age of the individual at the date of exposure (usually the time of the incident or arrest);

single indicates if the individual was single (never married) at the date of exposure;

married indicates if the individual was married (in a civil or religious marriage) at the date of exposure;

past_relationship indicates if the individual was either widowed or divorced or separated at the date of exposure;

male indicates if the individual's identified gender is male or female;

nhs_graduate indicates if the individual did not graduate from high school;

hsg_sps indicates the individual graduated from high school and has some post-secondary education (either College or Vocational School);

further_ed indicates if the individual has a post-secondary education (either College or Vocational School) degree and/or more, to include some or the completion of an advanced degree (either Master's or Doctoral/Professional);
employed indicates if the individual was employed or self-employed at the time of exposure;
unemployed indicates if the individual was unemployed and looking for work or unemployed and not looking for work at the time of exposure;
in_school indicates if the individual was a student at the time of exposure;
Student indicates if the individual was a student at the time of radicalization of beliefs or behaviors; and
μ is the random error.

Violent serves as the dependent variable in my model. Since I am studying violent extremism, I am interested in when *Violent* equals one, thus indicating the extremist activity perpetuated by the individual was violent in nature, as opposed to non-violent. Examples of violent acts of extremism include, but are not limited to, murder, assault, armed robbery, kidnapping, bombing, and arson, although not if they deliberately avoid human casualties. In contrast, non-violent acts of extremism include, but are not limited to, property destruction and vandalism, illegal protest, armed standoffs that were resolved without injury, receiving "terrorist training without acting on it, and "paper terrorism" (for example, tax fraud).[57] Although I argue that the following right-sided variables increase the probability of violent extremism in an individual, it is important to note that they are not the sole drivers of violent extremism.

Radical_family_member, *radical_friend*, and *radical_significant_other* are my independent variables of interest. Together, these indicator variables capture the effects on an individual of close personal relationships with a person involved in radical activities. As stated in my hypothesis, I posit that an individual with a family member, friend, or significant other involved in extremist activity, whether violent or non-violent, will have a higher likelihood of

[57] National Consortium for the Study of Terrorism and Responses to Terrorism (START), "Profiles of Individual Radicalization in the United States (PIRUS)."

committing an act of violent extremism. In other words, I predict that these three indicators will have a statistically significant, positive effect on an individual's predisposition toward violent extremism.

Radicalization_Islamist, *Radicalization_Far_Left*, *Radicalization_Far_Right*, and *Radicalization_Single_Issue* are all indicator variables that capture the ideology of the individual who, in this case, committed an act of extremist violence. Ideology can both push individuals toward violent extremist acts and also discourage such acts, depending on the group and the time period.[58] For instance, violent acts of extremism driven by far-left ideologies were more common in the late 1900's than in recent years, such as those perpetuated by the Weather Underground Organization in the late 1960s and 1970s. In contrast, in the past two to three decades, including the attacks on September 11, individuals driven by extremist Islamic ideology have committed significant numbers of violent extremist attacks. Finally, violent extremist acts driven by far-right extremism have risen dramatically in the past two to three years, as evidenced by Congress and the Department of Homeland Security naming white supremacists and other far-right extremists as the most significant domestic terrorism threat facing the United States in 2019.[59] Unfortunately, the *PIRUS* dataset only includes data up to 2018, meaning that the recent rise in violent and non-violent far-right extremism will not be adequately represented in the dataset. Even so, I believe that extremist far-right ideology will still have a positive effect on the likelihood of an individual committing an act of violent extremism, but the magnitude will be lower than one might expect. Additionally, I expect that individuals driven by far-left and Islamic ideologies will also be more likely to commit violent acts of extremism, though I

[58] Laqueur, *The New Terrorism: Fanatacism and the Arms of Mass Destruction*.
[59] Durbin, "S. 894 (Introduced-in-Senate)" (2019), https://www.congress.gov/116/bills/s894/BILLS-116s894is.xml; Geneva Sands, "White Supremacy Is 'most Lethal Threat' to the US, DHS Draft Assessment Says," CNN Politics, September 8, 2020, https://www.cnn.com/2020/09/08/politics/white-supremacy-dhs-draft-assessment/index.html.

attribute more significance and magnitude to those holding a radical Islamist ideology. Finally, I predict that an individual motivated by a single-issue will be more likely to commit an act of violent extremism. Presumably, focus on a single issue leads to a higher level of resolve or fanaticism, thus indicating a higher propensity for violence.

The next set of variables capture personal, or demographic, information for individuals in the dataset. The indicator variables *single, married,* and *past_relationship* indicate the marital status of an individual involved in extremist activities. While in some instances a significant other can also be involved in violent or non-violent extremism, I presume that in general, marriage would more likely provide a stabilizing effect to prevent an individual from committing an act of violent extremism (whether it be out of a sense of responsibility, happiness, or something else). As such, I predict marriage will have a negative impact on an individual's propensity for violent extremism. In contrast, I expect that individuals who are single or widowed, separated, or divorced will be more likely to commit violent acts of extremism. Single extremists may turn to their radicalized beliefs with more vigor, with those beliefs taking the place of a significant other. Extremists who are widowed, separated, or divorced may carry more bitterness and anger toward the world, causing them to turn to violence, or simply have less to lose.

Other variables capturing demographic data include *Age*, a continuous variable, and *male*, an indicator variable. Knowledge of both age and gender is necessary to better understand the other variables, as well as the overall radicalization process. Given that most violent extremists are male, I expect being male will have a statistically significant and positive effect on an individual's propensity to commit an act of violent extremism. The impact of age on whether or not an extremist individual turns violent is less definite, but I assume that young adults (ages 18

to 35 years) and middle-aged adults (ages 36 to 55 years) are more likely to commit violent acts of extremism than their younger or older counterparts. Those younger than 18 likely have not been radicalized to the level of violent extremism due to likely brief ideological exposure, while those older than 55 may be less physically able to commit violent acts of extremism.

The final set of variables capture socioemotional information on individuals in the dataset. Indicator variables *nhs_graduate*, *hsg_sps*, and *further_ed* show an individual's level of education, while the indicator variables *employed*, *unemployed*, and *in_school* indicate an individual's employment status. The indicator variable *Student* is also included in the model because it captures whether a student was employed or unemployed at the time of radicalization. Both education and employment, or unemployment, significantly drive human behavior over a vast span of topics, including violent extremism, and are therefore necessary to include in my model.

I expect that not graduating from high school or graduating with a high school degree but not a post-secondary degree will increase the likelihood that an individual will commit an act of violent extremism. In contrast, I predict that completing a post-secondary education or more will decrease the likelihood that an individual will commit an act of violent extremism. Similarly, I predict that being employed or in school/a student will have a negative effect on an individual's propensity to commit an act of violent extremism. I presume that employed individuals with higher levels of education will generally have fewer reasons to resort to violent extremism than their unemployed counterparts with lower education levels. As such, I expect unemployment will have a positive effect on an individual's propensity to commit an act of violent extremism.

My empirical research uses the statistical analysis software Stata and consists of three logistic regressions and three associated linear probability models. The first logistic regression is

a "complete-case"[60] analysis, in which observations from the *PIRUS* dataset with missing values contained in Equation 2 variables are dropped from the sample. The second logistic regression is on *PIRUS* data in which missing values were replaced using total mean imputation, which I will explain further below. Finally, the third regression is on *PIRUS* data in which I replace missing values using regression-based multiple imputation by chained equations, as explained below.

In the "complete-case" analysis, the data used in the logistic regression and associated linear probability model is in its original form and includes all missing values. As Stata automatically drops all variables that contain missing values, the sample size for the "complete-case" is relatively small. Despite the associated issues relating to having a smaller sample size, the "complete-case" approach is still useful. It acts as a control for the other two regressions using imputed data, as the unmanipulated data reflects real world observations, rather than projected values (as used to create imputed values).

For my second logistic regression and associated linear probability model, I use total mean imputation to replace missing values in the dataset. My approach was adapted from Lafree et al.'s and Tsikriktsis' work.[61] All but one of my variables of interest are binary variables, meaning the only values they contain are zero or one. As such, I had to construct a method for imputing the missing values based on the mean average value of each variable, as that value would not equal a zero or a one. My solution was to replace the missing values of a variable with a one if the associated mean average value was greater than 0.5 and a zero if the associated mean average value was less than 0.5. It should be noted that this approach is a less-sophisticated method of imputation and does have some potential concerns. The 0.5 cutoff is somewhat

[60] Meisel, "The Non-Effect of Radicalization Duration on the Propensity for Violent Extremism in the United States."
[61] Lafree et al., "Correlates of Violent Political Extremism in the United States*"; Tsikriktsis, "A Review of Techniques for Treating Missing Data in OM Survey Research."

arbitrary and does not account for if the associated mean average value of the variable equals exactly 0.5. The approach will also result in the modified data displaying downwardly biased variance.[62] Despite these concerns, the approach does increase the sample size of the dataset (*N* = 249 to *N* = 2,207) and bases the imputed values directly on observations drawn from the real world.

Finally, I use multiple imputation by chained equations (MICE) to modify my data for my third and final logistic regression and associated linear probability model. A more sophisticated method of imputation, this approach increases the sample size of the dataset (*N* = 249 to *N* = 2,207) and generates imputed values that reflect the distribution of the original data. Careful consideration must be made when using this approach to prevent the data from being missing not at random (MNAR), as such an occurrence invalidates the results. The invalidation occurs because multiple imputation assumes the data are missing at random (MAR).[63]

Both my second and third logistic regressions (and their associated linear probability models) use fully imputed data, to include my three independent variables of interest (*radical_family_member*, *radical_friend*, and *radical_significant_other*). While not best practice, I chose to impute these three variables, as well as my control variables, because of the drastic increase in sample sizes with the fully imputed data versus the partially imputed data (*N* = 2,207 versus *N* = 519). Such an increase in sample size is useful because larger sample sizes provide more reliable results and smaller margins of error. However, I ran both the second and third logistic regressions and their associated linear probability models using the partially imputed data as a check on my fully imputed data regression results (see Appendix for logistic regression

[62] Tsikriktsis, "A Review of Techniques for Treating Missing Data in OM Survey Research."
[63] Ian R. White and John B. Carlin, "Bias and Efficiency of Multiple Imputation Compared with Complete-Case Analysis for Missing Covariate Values," *Statistics in Medicine* 29, no. 28 (2010): 2920–31, https://doi.org/10.1002/sim.3944.

and linear probability model results). As an additional precaution, I will discuss all three regressions in my results section below.

Results

As the variables I use in my empirical model are largely indicator variables, I chose to analyze my data using logistic regressions and will interpret the results relating to my three independent variables of interest, *radical_family*, *radical_friend*, and *radical_signif_other*, using odds ratios. However, I use linear probability models, each done in conjunction with my three logistic regressions, to interpret my control variables. The results from the three logistic regressions and the three associated linear probability models are summarized below in Tables 2 and 3, respectively.

Table 2: Logistic Regression Results of Variables' Effects on the Odds an Extremist is Violent. *(PIRUS 2018)*

	Complete Case			Total Mean Imputation			Multiple Imputation by Chained Equations (MICE)			
Variable	*Odds-Ratio*	*Robust Std. Error*	*z-statistic*	*Odds-Ratio*	*Robust Std. Error*	*z-statistic*	*Odds-Ratio*	*Robust Std. Error*	*t-statistic*	*FMI*[†]
radical_family_member	0.638	0.252	-1.14	0.854	0.124	-1.09	0.618***	0.087	-3.43	65.34
radical_friend	0.842	0.294	-0.49	0.458***	0.098	-3.66	0.594**	0.133	-2.32	43.36
radical_significant_other	0.753	0.379	-0.56	1.281	0.208	1.53	1.248	0.220	1.26	57.36
Radicalization_Islamist	1.010	0.857	0.12	1.978***	0.304	4.44	1.752***	0.317	3.10	0.00
Radicalization_Far_Right	0.732	0.605	-0.38	1.402***	0.182	2.61	1.268	0.197	1.53	0.00
Radicalization_Far_Left	0.353	0.346	-1.06	0.425***	0.068	-5.32	0.392***	0.073	-5.04	0.00
Age	0.976	0.021	-1.10	0.982***	0.004	-4.46	0.986**	0.006	-2.32	3.76
single	0.754	0.488	-0.044	0.916	0.190	-0.42	1.155	0.227	0.73	38.56
married	0.374*	0.210	-1.75	0.720	0.158	-1.50	0.801	0.150	-1.19	38.56
male	2.247	1.456	1.25	1.917***	0.330	3.79	1.806***	0.336	3.18	0.00
nhs_graduate	2.990*	1.685	1.94	1.404	0.319	1.50	1.375	0.388	1.13	57.73
hsg_sps	2.585**	1.091	2.25	1.054	0.150	0.37	1.437	0.308	1.69	57.73
unemployed	1.287	0.857	0.38	1.489	0.416	1.42	1.545	0.502	1.34	52.38
employed	1.439	0.792	0.66	1.186	0.279	0.73	1.265	0.362	0.82	52.38
Student	0.515	0.230	-1.49	0.875	0.143	-0.82	0.825	0.143	-1.11	43.04
Constant	4.195	5.786	1.04	2.346*	1.091	0.067	1.510	0.839	0.74	
Sample Size (N)	249			2,207			2,207			
Wald Chi^2	28.43**			199.20***			8.72***[††]			
Pseudo-R^2	0.1361			0.0766						

$^{***}p \leq 0.01$, $^{**}p \leq 0.05$, $^{*}p \leq 0.1$

† Fraction of variance due to missing information prior to imputation. †† F-statistic rather than Wald Chi^2

Note: *Values are rounded to the nearest thousandth decimal place.*

Table 3: Linear Regression Results of Variables' Effects on the Probability an Extremist is Violent. *(PIRUS 2018)*

	Complete Case			Total Mean Imputation			Multiple Imputation by Chained Equations (MICE)			
Variable	*Coef.*	*Robust Std. Error*	*t-statistic*	*Coef.*	*Robust Std. Error*	*t-statistic*	*Coef.*	*Robust Std. Error*	*t-statistic*	*FMI†*
radical_family_member	-0.069	0.067	-1.02	-0.034	0.032	-1.08	-0.106***	0.030	-3.49	65.34
radical_friend	-0.029	0.051	-0.57	-0.140***	0.034	-4.13	-0.096**	0.040	-2.40	43.36
radical_significant_other	-0.063	0.094	-0.67	0.052	0.035	1.48	0.046	0.039	1.19	57.36
Radicalization_Islamist	0.027	0.114	0.25	0.152***	0.034	4.44	0.120***	0.039	3.09	0.00
Radicalization_Far_Right	-0.030	0.122	-0.25	0.081***	0.031	2.65	0.057	0.035	1.63	0.00
Radicalization_Far_Left	-0.176	0.176	-1.00	-0.200***	0.037	-5.41	-0.212***	0.040	-5.33	0.00
Age	-0.005	0.004	-1.23	-0.004***	0.001	-4.50	-0.003**	0.001	-2.40	3.76
single	-0.076	0.093	-0.81	-0.021	0.045	-0.45	0.027	0.042	0.65	38.56
married	-0.175*	0.089	-1.96	-0.072	0.048	-1.51	-0.050	0.042	-1.21	38.56
male	0.160	0.130	1.23	0.144***	0.037	3.88	0.125***	0.040	3.15	0.00
nhs_graduate	0.173**	0.086	2.02	0.065	0.046	1.43	0.070	0.059	1.18	57.73
hsg_sps	0.161**	0.074	2.19	0.011	0.031	0.34	0.081	0.046	1.76	57.73
unemployed	0.030	0.099	0.30	0.083	0.057	1.45	0.091	0.066	1.37	52.38
employed	0.045	0.085	0.53	0.035	0.049	0.71	0.050	0.059	0.84	52.38
Student	-0.105	0.072	-1.47	-0.030	0.034	-0.87	-0.041	0.036	-1.15	43.04
Constant	0.794***	0.237	3.35	0.669***	0.097	6.89	0.586	0.116	5.04	
Sample Size (N)	249			2,207			2,207			
F-Statistic	2.30***			19.82***			13.61***			
R^2	0.1511			0.0998						
Root MSE	0.40261			0.46963						

$^{***}p \leq 0.01$, $^{**}p \leq 0.05$, $^{*}p \leq 0.1$

† Fraction of variance due to missing information prior to imputation.

Note: *Values are rounded to the nearest thousandth decimal place.*

It is noteworthy that the results of both logistic regressions using imputed *PIRUS* data (regressions two and three) are statistically significant at the one percent level, while the results of the "complete-case" logistic regression are significant at the five percent level. All three associated linear probability models are significant at the one percent level.

In addition, in my "complete-case" logistic regression model, as well as both logistic regression models using imputed *PIRUS* data, the variables *Radical_Significant_Other*, *past_relationship*, *future_ed*, and *in_school* were omitted from the regression results because of collinearity. I still wanted to include these four variables in my results, as I believe that what they signify impacts an individual's propensity to commit a violent act of extremism. To that end, I ran a correlation test on the four collinear variables in relation to my dependent variable, *Violent*, for each logistic regression, the results of which can be found in the Appendix. Similar to the descriptive statistics, the correlation test results for the "complete-case" variables and the MICE variables are the same, as both use the original data that includes missing values. In both cases, all four variables are weakly, negatively correlated with *Violent*. In contrast, when running the correlation test on the total mean imputed data, only *Radicalization_Significant_Other* and *further_ed* were weakly, negatively correlated with *Violent*. Both *past_relationship* and *in_school* have a weak but positive correlation with *Violent*.

I will now discuss the results related to my independent variables of interest, interpreting my logistic regression models, as shown in Table 2. Having a family member involved in radical activities only has a statistically significant relationship with an extremist's propensity toward violent extremism in the third logistic regression, in which MICE is used. In this case, the sign on the relationship is between zero and one, meaning that having a family member involved in radical activities decreases the likelihood that the individual will commit an act of violent

extremism. Specifically, the magnitude of the variable *radical_family_member* in the third logistic regression shows that if an individual has a family member involved in radical activities, there is a decrease of 0.618 in the log of odds of that individual committing an act of violent extremism, ceteris paribus. In layman's terms, this means that an individual with a family member involved in radical activities is a little more than half as likely to be a violent extremist as an individual without a family member involved in radical activities, holding all other variables in the regression constant. The log-odds coefficient represents the log of odds of being in the violent extremist category when all other variables in the regression are held at a constant level (ceteris paribus). The odds come from the ratio of the probability of an individual committing a violent act of extremism to the probability of an individual committing a non-violent act of extremism. "The ordered logistical model transforms these odds to the natural log of the odds, and the log of the odds similarly increases as the odds (and the probability) increase…A smaller log of odds relates to lower odds and a less likely outcome. For the purposes of interpreting the coefficients in these models, a decrease in the log of odds indicates a less likely outcome."[64]

This result runs counter to my prediction that having a radical family member who is involved in radical extremist activities will make an individual more likely to commit a violent extremist act. In this case, it could be that individuals who have family members involved in violent extremism do not commit violent acts of extremism out of a sense of responsibility toward those involved family members. Possibly, committing a violent extremist act could have a negative effect on those involved family members.

[64] James Scott, "Taking the Bus to Work: The Relationship between Public Transit Commuting Time and Household Income in Washington, D.C. Suburbs," *Georgetown University-Graduate School of Arts & Sciences* (thesis, Georgetown University, 2014), https://repository.library.georgetown.edu/handle/10822/709850.

Unlike in the third regression, in the first and second regressions, the relationship between having a family member involved in radical activities and an individual's propensity toward violent extremism is not significant. However, it is notable that in both regressions, the coefficients are between zero and one, meaning that having a family member involved in radical activities is less likely to be associated with violent, rather than non-violent, extremism.

Statistical significance varies across the three regression models when examining the relationship between having a friend involved in radical activities and an individual's propensity toward violent extremism. In the first "complete-case" regression, the relationship is not statistically significant at any level. However, the coefficient is between zero and one, indicating that having a friend involved in radical activities leads to less likelihood of association with violent, rather than non-violent, extremism. The coefficient in the second regression, in which total mean imputation is used, is also between zero and one, and the relationship is statistically significant at the one percent level. The magnitude of the variable *radical_friend* in the second logistic regression shows that if an individual has a friend involved in radical activities, there is a decrease of 0.458 in the log of odds of that individual committing an act of violent extremism, ceteris paribus. Essentially, this means that an individual with a friend involved in radical activities is a little less than half as likely to be involved in violent extremism as an individual without a friend involved in radical activities, holding all other variables in the regression constant. This result runs counter to my prediction that having a radical friend involved in extremist activities makes it more likely that an individual will commit an act of violent extremism and is supported by my third regression, which uses MICE data and produced a similar result.

While only statistically significant at the five percent level, the coefficient on the variable *radical_friend* is still between zero and one, meaning that having a family member involved in radical activities decreases the likelihood that an individual will commit an act of violent, rather than non-violent, extremism. Specifically, the magnitude of the variable *radical_friend* in the third logistic regression shows that if an individual has a family member involved in radical activities, there is a decrease of 0.594 in the log of odds of that individual committing an act of violent extremism, ceteris paribus. In other words, an individual with a friend involved in radical activities is a little more than half less likely to be a violent extremist as an individual without a friend involved in radical activities, holding all other variables in the regression constant.

Radical_significant_other did not maintain statistical significance at any level across any of the three regressions. It did, however, have varied coefficients across the three regressions. The coefficient in the "complete case" regression was between zero and one, indicating that having a significant other involved in radical activities decreases the likelihood of an individual committing an act of violent extremism. In contrast, the second and third regressions, using total mean imputed data and MICE data, respectively, have coefficients greater than one, meaning an individual with a significant other involved in radical activities has an increased likelihood of committing an act of violent extremism. The lack of statistical significance and the contrasting coefficients could result from, among other things, missing data.

Now, I will use my linear probability models to discuss the results related to my control variables, as shown in Table 3. Statistical significance at the one percent level is maintained for all three variables related to ideology (*Radicalization_Islamist*, *Radicalization_Far_Left*, and *Radicalization_Far_Right*) in the second regression using total mean imputed data but is not present at all in the "complete-case" analysis. The variables *Radicalization_Islamist* and

Radicalization_Far_Left are also statistically significant at the one percent level in the third regression using MICE data. In contrast, the variable *Radicalization_Far_Right* holds no statistical significance. Regressions two and three show that a radicalized Islamist is 15.2 percent and 12 percent, respectively, more likely to commit a violent act of extremism than their radical far-right and radical far-left counterparts, ceteris paribus. In all three regressions, the relationship was positive, indicating that radical Islamists are more likely to commit violent acts of extremism. These results are not surprising, especially since following the September 11th attacks that initiated the era of the War on Terror, a significant number of terrorist attacks have been perpetrated by radical Islamists. However, as noted below, there may be a new preeminent radical ideological group on the rise in the United States.

A far-right extremist, as evidenced by the second regression using total mean imputed data, is 8.1 percent more likely to commit an act of violent extremism than a radical far-left or radical Islamist individual, ceteris paribus. While in both the second and third regressions the signs on the coefficients are positive, indicating that radical far-right individuals are more likely to commit violent acts of extremism, the "complete-case" analysis has a negative sign on the coefficient, indicating that radical far-right individuals are less likely to commit violent acts of extremism. In the coming years, this is likely to change. As mentioned earlier, in 2019, Congress and the Department of Homeland Security noted white supremacists and other far-right extremists are "the most significant domestic terrorism threat facing the U.S."[65] As evidenced by the insurrection that occurred at the Capitol on January 6, 2021, violent extremism in far-right individuals is likely to increase.

[65] Durbin, S. 894 (Introduced-in-Senate); Sands, "White Supremacy Is 'most Lethal Threat' to the US, DHS Draft Assessment Says."

Finally, regressions two and three show that a radical far-left individual is 20 percent and 21 percent, respectively, less likely to commit a violent act of extremism than their radical far-right and radical Islamist counterparts, ceteris paribus. In both cases, the variable is statistically significant at the one percent level. Across all three regressions, there is negative relationship, meaning that radical far-left extremists are less likely to commit violent acts of extremism. The lack of violence could be due to the nature of radical far-left attacks, which more often focus on objects or places, rather than people as targets.

Not surprisingly, whether or not an extremist is male is generally a significant predictor of extremist violence. Violent extremists are more commonly male than female. Both regression models using imputed data show the variable *male* to be statistically significant at the one percent level, although the "complete-case" regression does not show statistical significance at any level. This difference could be due to the limited number of observations (N = 249, as opposed to N = 2,207 in the two regression models using imputed data) used in that regression model. For the total mean imputation and multiple imputation by chained equations regressions, being male had a positive effect on an individual's propensity for violent extremism, with males being, respectively, 14 percent and 12 percent more likely to commit violent acts of extremism than females, ceteris paribus. Even in the "complete-case" regression, being male had a positive effect on an individual's propensity to commit a violent act of extremism. Note, however, that the *PIRUS* dataset only accounts for an individual's sex – either male or female. It does not account for an individual's gender identity—i.e., man, woman, non-binary, etc. Gender identities likely would affect an individual's propensity toward violent extremism but have not been studied in great depth yet.

Interestingly, *Age* obtained different levels of statistical significance across the three regression models. The ages of individuals in the *PIRUS* dataset spanned from 10 years to 88 years. In the "complete-case" regression, *Age* was not statistically significant at any level. However, it was statistically significant at the one percent level in the second regression using total mean imputed data. Although the associated coefficient is negative, it is not very large, indicating that for every year decrease in age, an individual is 0.4 percent more likely to commit a violent act of extremism, ceteris paribus. Violent extremists are generally younger or middle-aged, so this result does make sense on a certain level, but it is questionable toward the bottom of the range with such young ages as 10 years old. The result for the third regression using regression-based multiple imputation by chained equations is similar. *Age* is statistically significant at the five percent level and shows that as age decreases in year increments, the likelihood of an individual committing an act of extremist violence increases by 0.3 percent, ceteris paribus.

Marital status was, unexpectedly, a relatively insignificant predictor of violent extremism. The variable *single* did not attain statistical significance across all three regressions, and the variable *married* only attained statistical significance at the ten percent level in the "complete-case" regression. In that case, married individuals were 17 percent less likely to commit a violent act of extremism than their single or their divorced/separated/widowed counterparts, ceteris paribus. Across all three regressions, the variable *married* had a negative effect on an individual's propensity for violent extremism, while the variable *single* had a positive effect on an individual's likelihood to commit an act of violent extremism in the third regression using MICE data. Given my assumption that individuals are more likely to become violent extremists if they are widowed, divorced, or separated, I am not surprised that being

married has a negative effect on an individual's propensity for violent extremism. Unfortunately, as noted earlier, the variable for past relationships was dropped from the three regressions because of collinearity.

Neither of the two education-related variables maintained statistical significance across all three regression models. Only in the "complete-case" regression did either variable prove statistically significant, wherein both were at the five percent level. In this case, non-high school graduates were 17 percent more likely to commit an act of violent extremism than those who completed high school or a higher degree of education, ceteris paribus. Similarly, high school graduates who did not obtain a higher degree of education were 16 percent more likely to commit an act of violent extremism than those who did not graduate or those who went on to obtain higher degrees of education, ceteris paribus.

Surprisingly, employment was an insignificant predictor of violent extremism. Across all three regression models, *employed, unemployed,* and *Student* were not statistically significant at any level. Given that the *Student* variable also includes individuals noted to be employed or unemployed while also being students, the statistical insignificance may be due to the blending of these three variables. However, it is still worth noting that the coefficient for *Student* is negative, thus indicating the likelihood of an individual committing a violent act of extremism decreases when they are a student. This is also surprising, since friendship with a radical extremist is a relatively strong predictor of violent extremism in an individual and friendships are often made at school. It could be that individuals with one or more radical friends who were introduced to radical beliefs or behaviors as students regularly do not reach the level of violent extremism, but rather stay non-violent.

I now turn my conclusion and the policy implications of these results.

CONCLUSION AND POLICY RECOMMENDATIONS

Conclusion

In this study, I examined the possible relationship between an individual having a family member, friend, and/or significant other involved in radical activities and that individual committing an act of violent extremism, while controlling for factors relating to ideology, demographics, and socioeconomic status. Given the literature and my knowledge on violent extremism, I hypothesized that there is a positive correlation between the probability of an individual committing a violent extremist act and having a family member, friend, and/or significant other involved in radical activities. In other words, an individual who has a family member, friend, and/or significant other involved in radical activities will be more likely to commit an act of violent extremism.

To test my hypothesis, I used data (2018) from START's *Profiles of Individual Radicalization in the United States (PIRUS)*, an open-source dataset containing 2,226 de-identified individual extremists who "radicalized to violent and non-violent extremism in the United States from 1948 through 2018."[66] I utilized three logistic regressions and three associated linear probability models, using unchanged *PIRUS* data, *PIRUS* data modified via total mean imputation, and *PIRUS* data altered with multiple imputation by chained equations (MICE), respectively.

Unfortunately, my results generally support the conclusion that there is no easy way to identify a potential violent extremist based on a preset list of characteristics. Both *radical_family_member* and *radical_friend* exhibited mixed levels of statistical significance and supported the conclusion that having a radical family member or radical friend makes an

[66] "Profiles of Individual Radicalization in the United States [Data File]."

individual less likely to commit an act of violent extremism. *Radical_significant_other* showed no statistical significance at any level across all three regressions, although it did exhibit a general positive relationship with an individual's predisposition toward violent extremism. This does not mean, however, that actions cannot be taken to identify and prevent violent extremism.

Based on the results of my research discussed above, I recommend the following policy actions relating to the study and prevention of violent extremism.

Policy Recommendations

Collect more information on violent extremists as they are processed for unlawful behavior.

A significant issue with the *PIRUS* dataset is the amount of missing data it contains. Though it would be difficult to go back and retroactively collect information to fill in the missing data, policies can be changed moving forward to reflect the need for more in-depth data collection on violent extremists. This can be done effectively by law enforcement personnel and members of the intelligence community. Of course, one must keep in mind that in some cases, it is impossible to collect more information on a violent extremist, especially if that individual died carrying out their violent attack. However, even a small increase in data collected could prove critical to policymakers studying violent extremism.

Additionally, the continued and expanded collection of data allows policymakers to stay up to date with current violent extremist trends in the United States. As mentioned previously, the past two to three years have seen a rise in violent extremism driven by far-right ideology. This trend is not represented in the *PIRUS* dataset, which only contains data collected between 1948 and 2018, making it difficult to produce results that adequately represent the current situation in the United States.

Do not target all individuals simply because they have a close relationship with a person involved in radical activities.

Policymakers, law enforcement, and members of the intelligence community must be wary of targeting too many individuals who have close relationships with people involved in radical activities. Focusing on too many subjects would be infeasible. Law enforcement agencies do not have the resources to track so many potential subjects. Doing so could also take resources away from other necessary aspects of violent extremist prevention. Instead, the information collected about individual violent extremists should be used to create more targeted programs that assist law enforcement personnel in preventing violent extremist acts from occurring.

Create programs targeting at-risk individuals due to their age with the goal of preventing radicalization.

Despite the overall trend from my results that personal relationships do not have a substantial impact on an individual's probability of committing an act of violent extremism, programs should be created to foster healthy, non-radical friendships and relationships in those who are at risk of becoming radicalized. Given that my results show a correlation between age and violent extremism, programs could be provided locally, funded either directly by federal, state, or local government, or through private institutions with government support, that would target younger children and teenagers with the goal of introducing positive friendships with peers and other role models. Even those not at risk for radicalization would benefit from such programs, and such programs have proven effective elsewhere.

Directions for Future Research

Future studies on domestic violent extremism might repeat the contents of this study in the context of another country or countries. It is possible that other countries might have more

complete data on domestic violent extremists, and can further illuminate trends, or a lack thereof, in domestic violent extremism. Additionally, should the proposed programs in the previous section be enacted in any capacity, they should be closely monitored and evaluated to determine their effectiveness.

APPENDIX

Table 4: Logistic Regression Results of Variables' Effects on the Odds an Extremist is Violent. *(PIRUS 2018)*

	Complete Case			**Total Mean Imputation**			**Multiple Imputation by Chained Equations (MICE)**			
Variable	*Odds-Ratio*	*Robust Std. Error*	*z-statistic*	*Odds-Ratio*	*Robust Std. Error*	*z-statistic*	*Odds-Ratio*	*Robust Std. Error*	*t-statistic*	*FMI†*
radical_family_member	0.638	0.252	-1.14	0.575**	0.150	-2.12	0.562**	0.151	-2.15	65.34
radical_friend	0.842	0.294	-0.49	0.647*	0.166	-1.70	0.687	0.180	-1.43	43.36
radical_significant_other	0.753	0.379	-0.56	1.302	0.422	0.82	1.448	0.491	1.09	57.36
Radicalization_Islamist	1.010	0.857	0.12	1.672	0.744	1.16	1.868	0.878	1.33	0.00
Radicalization_Far_Right	0.732	0.605	-0.38	1.382	0.674	0.66	1.220	0.631	0.38	0.00
Radicalization_Far_Left	0.353	0.346	-1.06	0.654	0.374	-0.74	0.631	0.383	-0.76	0.00
Age	0.976	0.021	-1.10	0.968***	0.012	-2.64	0.983	0.013	-1.30	3.76
single	0.754	0.488	-0.044	1.024	0.416	0.06	1.367	0.614	0.70	38.56
married	0.374*	0.210	-1.75	0.596	0.227	-1.36	0.534	0.219	-1.53	38.56
male	2.247	1.456	1.25	2.794***	1.101	2.61	2.496**	1.058	2.16	0.00
nhs_graduate	2.990*	1.685	1.94	2.450**	1.071	2.05	3.016*	1.811	1.84	57.73
hsg_sps	2.585**	1.091	2.25	1.409	0.378	1.28	2.150**	0.769	2.14	57.73
unemployed	1.439	0.792	0.66	1.314	0.585	0.61	1.040	0.504	0.08	52.38
employed	1.287	0.857	0.38	1.582	0.864	0.84	1.165	0.568	0.31	52.38
Student	0.515	0.230	-1.49	0.881	0.291	-0.38	0.713	0.245	-0.98	43.04
Constant	4.195	5.786	1.04	2.231	2.076	0.86	1.342	1.340	0.29	
Sample Size (N)	249			519			519			
Wald Chi^2	28.43**			59.54***			3.44***††			
Pseudo-R^2	0.1361			0.1198						

***$p \leq 0.01$, **$p \leq 0.05$, *$p \leq 0.1$

† Fraction of variance due to missing information prior to imputation. †† F-statistic rather than Wald Chi^2

Note: *Values are rounded to the nearest thousandth decimal place.*

Table 5: Linear Regression Results of Variables' Effects on the Probability an Extremist is Violent. *(PIRUS 2018)*

	Complete Case			Total Mean Imputation			Multiple Imputation by Chained Equations (MICE)			
Variable	*Coef.*	*Robust Std. Error*	*t-statistic*	*Coef.*	*Robust Std. Error*	*t-statistic*	*Coef.*	*Robust Std. Error*	*t-statistic*	*FMI†*
radical_family_member	-0.069	0.067	-1.02	-0.105**	0.049	-2.13	-0.104**	0.049	-2.14	65.34
radical_friend	-0.029	0.051	-0.57	-0.069*	0.038	-1.83	-0.058	0.038	-1.54	43.36
radical_significant_other	-0.063	0.094	-0.67	0.039	0.062	0.63	0.056	0.062	0.89	57.36
Radicalization_Islamist	0.027	0.114	0.25	0.100	0.091	1.10	0.114	0.090	1.26	0.00
Radicalization_Far_Right	-0.030	0.122	-0.25	0.070	0.099	0.71	0.051	0.099	0.52	0.00
Radicalization_Far_Left	-0.176	0.176	-1.00	-0.085	0.122	-0.70	-0.083	0.121	-0.68	0.00
Age	-0.005	0.004	-1.23	-0.007***	0.002	-2.70	0.178**	0.084	2.10	3.76
single	-0.076	0.093	-0.81	-0.011	0.071	-0.15	-0.004	0.003	-1.48	38.56
married	-0.175*	0.089	-1.96	-0.104	0.071	-1.46	0.032	0.077	0.42	38.56
male	0.160	0.130	1.23	0.203**	0.082	2.47	-0.122	0.077	-1.59	0.00
nhs_graduate	0.173**	0.086	2.02	0.128**	0.064	2.01	0.180*	0.087	2.06	57.73
hsg_sps	0.161**	0.074	2.19	0.066	0.053	1.24	0.145	0.066	2.19	57.73
unemployed	0.045	0.085	0.53	0.036	0.071	0.51	0.021	0.074	0.29	52.38
employed	0.030	0.099	0.30	0.066	0.083	0.79	0.002	0.074	0.02	52.38
Student	-0.105	0.072	-1.47	-0.027	0.054	-0.49	-0.056	0.057	-0.99	43.04
Constant	0.794***	0.237	3.35	0.693***	0.179	3.87	0.591***	0.186	3.18	
Sample Size (N)	249			519			519			
F-Statistic	2.30***			5.15***			4.79***			
R^2	0.1511			0.1399						
Root MSE	0.40261			0.4162						

$^{***}p \leq 0.01$, $^{**}p \leq 0.05$, $^{*}p \leq 0.1$

† Fraction of variance due to missing information prior to imputation.

Note: *Values are rounded to the nearest thousandth decimal place.*

Table 6: Matrix of Pearson's Correlation Coefficient Illustrating the Relationship Between Violent Among Collinear Variables. *(PIRUS 2018)*

Complete Case

587 observations	**Violent**	**Radicalization _Single_Issue**	**past_ relationship**	**further_ ed**	**in_school**
Violent	1.0000				
Radicalization_ Single_Issue	-0.0429	1.0000			
past_ relationship	-0.0036	-0.0169	1.0000		
further_ed	-0.1732	0.1913	0.0271	1.0000	
in_school	-0.0154	-0.0846	-0.0749	-0.2011	1.0000

Total Mean Imputation

587 observations	**Violent**	**Radicalization _Single_Issue**	**past_ relationship**	**further_ ed**	**in_school**
Violent	1.0000				
Radicalization_ Single_Issue	-0.0477	1.0000			
past_ relationship	0.0122	-0.0340	1.0000		
further_ed	-0.0586	0.0485	0.0563	1.0000	
in_school	0.0051	-0.0534	-0.0144	0.0086	1.0000

Multiple Imputation by Chained Equations (MICE)

587 observations	**Violent**	**Radicalization _Single_Issue**	**past_ relationship**	**further_ ed**	**in_school**
Violent	1.0000				
Radicalization_ Single_Issue	-0.0429	1.0000			
past_ relationship	-0.0036	-0.0169	1.0000		
further_ed	-0.1732	0.1913	0.0.0271	1.0000	
in_school	-0.0154	-0.0846	-0.0749	-0.2011	1.0000

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