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Article — Published Version

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Public Choice

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Springer Nature

Suggested Citation: Sabri, Amir; Schulze, Günther G. (2020) : Are suicide terrorists different from 'regular militants?', Public Choice, ISSN 1573-7101, Springer US, New York, NY, Vol. 188, Iss. 1-2, pp. 155-181,
<https://doi.org/10.1007/s11127-020-00817-2>

This Version is available at:

<https://hdl.handle.net/10419/288913>

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Are suicide terrorists different from ‘regular militants’?

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Received: 1 November 2019 / Accepted: 25 April 2020 / Published online: 13 May 2020
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Abstract

We analyze the differences in the socioeconomic profiles between suicide terrorists and ‘regular’ militants using a dataset of 1596 militants (including 209 suicide terrorists) from Hamas and Palestinian Islamic Jihad (PIJ). We find that suicide terrorists are better educated, younger, less likely to be married or have children, and less likely to live in the Gaza strip than their non-suicide counterparts. Moreover, although the profiles of Hamas and PIJ militants are distinctively different, the suicide terrorists are very similar to one another.

Keywords Suicide terrorism · Terrorism · Hamas · Palestinian Islamic Jihad

JEL Classification D74 · J49 · Z12

1 Introduction

Suicide missions are deadlier and make more news than ‘regular’ terror attacks; they allow attacking hard and more valuable targets as no escape route has to be planned (Berman and Latin 2005, 2008)—in short, they spread terror more effectively than any other form of terror. Yet, suicide missions demand the ultimate sacrifice from the attacker. What kinds of people engage in suicide missions?

No consensus has emerged in the literature on the determinants of suicide missions.¹ Four explanations can be identified. The first approach investigates suicide terrorists’ potential personality disorders or social marginalization, the second focuses on the societal

¹ Economics in general and public choice in particular has a well-rooted and expanding literature on terrorism, notably on the determinants of terrorism, both at the individual level (e.g., Krueger and Malečková 2003; Berrebi 2007; Bemelech et al. 2012) as well as on the country level (e.g., Kurrild-Klitgaard et al. 2006; Basuchoudhary and Shugart 2010; Kis-Katos et al. 2011, 2014; Brockhoff et al. 2015; Gleditsch and Polo 2016). For surveys, see Krieger and Meierriks (2011) and, more recently, Gaibilloev and Sandler (2019).

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conditions that are conducive to suicide terror, such as oppression and humiliation by an external force, coupled with strong within-group solidarity. The third explanation posits that suicide terrorists are rational actors and models the conditions under which suicide may be an individually rational strategy, while the fourth explanation seeks to identify situations in which terrorist groups adopt suicide missions as a strategy for achieving their goals (more in Sect. 2 below). Except for the first line of investigation, the literature does not ask whether suicide terrorists are different from other radical militants; the first strand of (mostly psychological) literature has not arrived at consensus.² In particular, it remains moot whether or not suicide bombers are marginalized socially.

The question we thus ask in the context of the Palestinian-Israeli conflict is: are suicide terrorists different from other, non-suicide militants in any observable way? The relevant reference group in our context is not the Palestinian population at large, which may feel grievances, anger and opposition to Israel's statehood, but does not engage in terrorism; rather it is the set of individuals who likewise have been radicalized and who have joined an Islamist organization, thus fulfilling all of the criteria the literature identifies for suicide terrorists, *but did not engage in suicide attacks*. What makes suicide terrorists different from those who choose to be militants facing high risks of being killed, but still prefer to live?

We rely on a dataset comprising 1596 deceased militants affiliated with Hamas and the Palestinian Islamic Jihad (PIJ), 209 of whom are suicide terrorists, and investigate the extent to which observable characteristics differ between the subgroups of suicide and non-suicide militants. We compare a range of socioeconomic variables, such as education, age, economic status, marital status, and area of residence, finding significant differences. In particular, suicide terrorists are better educated and younger than non-suicide militants, and they are much less often married or have children; they are less likely to be unemployed and they are not more often poor than 'regular' militants. Moreover, while distinct differences emerge between Hamas and PIJ militants, the socioeconomic profiles of suicide terrorists are very similar for the two groups.

Our paper speaks to the small literature on the socioeconomic characteristics of terrorists. Krueger and Malečková (2003) analyze a sample of 129 deceased Hezbollah fighters and find that they are less likely to be poor and more likely to have been enrolled in secondary school than the pool from which they were drawn. Berrebi (2007) uses a sample of deceased Hamas and PIJ fighters, as we do; however, his sample size is 335, of whom 66 are suicide terrorists. Like Krueger and Malečková, Berrebi reports that all terrorists as well as suicide terrorists are better educated and better off than the population at large (also in the respective age cohorts). Benmelech and Berrebi (2007) assemble a dataset of 148 Palestinian suicide terrorists and show that they too are better educated than the population at large. They also show that better educated and older suicide terrorists are assigned to attack harder targets and are more successful in killing people than others. None of those articles, however, explore the differences between suicide terrorists and other militants.

Our contribution also is related to the political-economic literature on suicide terror, which focuses mainly on the strategic use of suicide attacks in the Palestinian-Israeli conflict (Pape 2003, 2005; Bloom 2004, 2005; Piazza 2008, 2018). Berman and Latin (2005, 2008) find that suicide terrorists attack hard targets and they argue that the club-goods' model predicts that terror organizations providing social services and other club goods are

² The bulk of the psychological evidence on *non-suicide* militants seems to suggest no obvious deviant character traits (Hogan 2014).

particularly well-suited for organizing suicide attacks because they can prevent defection more effectively.³ Basuchoudhary and Razzolini (2018) demonstrate how culture matters for keeping terror groups together. Piazza (2018) shows that suicide attacks are staged more often against hard targets, are more successful than other strategies and that foreign occupation as such is not the driver of suicide attacks. Filote et al. (2016) investigate whether religious cleavages give rise to more suicide attacks and find no evidence for that hypothesis. Lastly, Bemelech et al. (2012) find that suicide attacks in bad economic times are carried out by better educated, more mature, and more experienced terrorists, which may indicate that economic opportunity costs may matter even when considering the decision whether or not to participate in a suicide mission.

To the extent that the literature has analyzed the characteristics of suicide terrorists, it has compared suicide terrorists exclusively to the population at large, in some specifications also corrected for different age and gender profiles. Such a comparison implicitly assumes that the relevant decision is between engaging in suicide missions and not engaging in terrorists' causes at all. We argue that that choice is not the only and possibly not the most relevant alternative. Militants contemplating suicide missions already have been radicalized, are devout believers and are willing to fight—the obvious alternative would be to join the organization as 'regular', non-suicide militants. (Some suicide terrorists—mostly from Gaza—join suicide missions only after they have become 'regular' militants. For them, the obvious alternative would be to continue as a 'regular' militant). Which members of that group embark on suicide missions? That is the concern of the present paper and the novelty of our analysis.

The remainder of the paper is organized as follows. In the next section we survey the relevant literature on suicide terrorism; next we present our dataset on deceased PIJ and Hamas militants, Sect. 4 presents the empirical model and the main results. Section 5 reports several robustness checks and some extensions. Section 6 concludes.

2 Literature on suicide terror

No consensus has emerged in the literature as to what drives people to engage in suicide missions. Four explanations have been put forward. The first one focuses on the psychological traits of suicide bombers, trying to identify potential reasons for being willing to 'die for the cause'. Personality disorders rooted in childhood experiences or authoritarian educations making individuals susceptible to charismatic leaders have been said to be conducive to becoming a suicide terrorist (Lackhar 2002; De Mause 2002; Lester et al. 2004). Israeli (1997, p. 106) depicts suicide terrorists as marginalized, unsuccessful people striving for personal significance: "Unsuccessful, perhaps self-despising, they find solace in becoming martyrs, thus almost instantly and mythically transforming frustration into glory, failure into victory and self-depreciation into public adoration." Lankford (2010) maintains that suicide terrorists present clinically observable suicidal tendencies. That diagnosis disregards the circumstantial factors that have led individuals to embark on suicide missions, focusing only on deviant personality traits, and therefore cannot explain the surge in suicide missions in the second Intifada (Pedahzur 2005).

³ Cf. Buchanan (1965) for the seminal contribution to the theory of clubs.

Moreover, it seems implausible that terror organizations use mentally unstable individuals because they would endanger group survival (Hassan 2011). Merari et al. (2010) analyzed 15 Palestinian suicide terrorists who failed to complete their missions and compared them to ‘regular’ terrorists and the organizers of suicide attacks. None of the suicide terrorists was found to have clinical mental disorders (including psychotic characteristics), even though they had low self-esteem, tended to have dependent and avoidant personality styles, making them susceptible to authority figures, and were more likely to have subclinical symptoms of depression than the control groups.

Despite those differences, personality factors alone seem to be unable to explain willingness to engage in suicide attacks (Hassan 2011; Pedahzur 2005).⁴ Most researchers reject the notion that suicide terrorists are pathological (Atran 2003; Moghadam 2003). On the contrary, many researchers regard suicide terrorists as rational⁵ (see, inter alia, Azam 2005; Ferrero 2006; Wintrobe 2006; Berman 2009; Kacou 2013).⁶ Caplan (2006) defines three different concepts of rationality, i.e., responsiveness to incentives, narrowly defined self-interest and rational expectations. He argues that although terrorists largely can be described as ‘close’ to being rational actors in all three dimensions, suicide terrorists do not fit the latter two definitions of rationality.⁷

The second explanation emphasizes the societal conditions under which suicide terrorists emerge. In situations of intense oppression and humiliation, individuals decide to participate in suicide missions to fight against an overpowering enemy. That explanation presupposes an environment of strong social solidarity among terrorist group members and a culture that values suicide missions as acts of altruistic martyrdom (Hassan 2011, pp. 42–49). The goals pursued by suicide missions are political in nature, such as ending oppression or occupation of the community (Araj 2008; Pape 2005; Ahmed 2005), but terror groups may adopt religious references to mobilize recruits and supporters (Hassan 2011; Pape 2005).⁸ The circumstances conducive to suicide terrorism thus are characterized by despair, humiliation and anger, a strong feeling of solidarity within the group subjected to what they feel as subjugation and oppression. That explanation centers on the notion of altruistic suicide according to Durkheim’s (1951) classification of suicide types; it does not focus on suicide terrorists’ individual traits, but rather on their collective experiences of humiliation and trauma, which leads some militants to sacrifice their lives in order to inflict death and terror on the group they regard as oppressors. Such an argument explains why people become radicalized, but it does not explain *who* becomes radicalized

⁴ Merari et al. (2010, p. 97) note that, “Essentially, suicide attacks are a group phenomenon, and practically all of them have been planned and organized by groups.” Of course, the authors rely on a small and selected sample of non-successful suicide terrorists, but Merari et al. is one of the rare studies that examine suicide terrorists with the help of clinical tests rather than inferring pathologies from circumstantial evidence or reconstructed biographies.

⁵ Rationality here is meant in the economic sense of systematically and purposefully maximizing one’s utility; other disciplines (medicine, for instance) may entertain different conceptions of rationality.

⁶ Pedahzur (2005) provides anecdotal evidence for personal and financial crises that may have contributed to the decision to carry out a suicide attack. Caplan (2006, p. 96) argues that biographies of successful as well as interviews with unsuccessful suicide terrorists suggest that their prime motivation is not escaping from a desperate personal situation, but rather to fight for a cause (also see Gambetta 2005, p. xii).

⁷ “On balance, the common sense view that suicide attacks are self-destructive, not self-interested, is probably correct” (Caplan 2006, p. 96).

⁸ As a consequence, harsh counterterrorism activities may exacerbate the feeling of despair and thereby promote suicide terrorism (Pedahzur and Perlinger 2006). Cf. Horne (1977/2006) illustrates the potential backlash against counterterror policies for the Algerian case.

and who out of the group of radicalized people becomes a suicide terrorist (rather than a ‘regular’ militant).

The third line of explanations regards suicide terrorists as rational actors who sacrifice their lives in striving to maximize utility. Bernholz (2004, 2006) argues that radical ‘supreme values’ may give rise to terror: Those supreme values, understood as first values in a lexicographic preference ordering, would require the allocation of all resources necessary to achieve the supreme goals, as formulated by a religious beliefs or a secular ideologies regarded as absolute truths, including sacrificing one’s own life. If ideology or religion commands seizing secular power, especially to convert or annihilate ‘infidels’ and to erect a divine order in a divine state, or its secular equivalent, violence would not only be justified, but necessary. In situations of asymmetric power balances, terror would be the option of choice for the “true believers” in the fight against what they regard as evil.⁹ Suicide terrorists would be the embodiment of a devout believer in radical supreme value ideologies, religions, or both, as they are prepared for the ultimate sacrifice.

Wintrobe (2006, ch. 5) likewise models suicide terrorism as a result of a rational choice. Individuals seeking to obtain more solidarity from a (terror) group trade their original beliefs against a stronger feeling of belongingness; in that process, they base their decisions increasingly on the groups’ beliefs, which may lead to suicide. Azam (2005) models suicide terror as rational, intergenerational investments on the part of altruistic individuals. Ferrero (2006) argues that suicide terrorists enter rationally into martyrdom contracts that provide earthly benefits prior to the mission, a probability of death below one, or both, that are enforced by social sanctions and stigma. All three authors underline the importance of the group for the individual’s decision to carry out suicide attacks, but again neither they nor Bernholz explain *who* carries them out.

While the first three lines of explanation focus on the supply side of suicide terrorists, the fourth explanation emphasizes the demand side, asking under what circumstances terrorist organizations use suicide attacks. Such a perspective assumes no shortage of people offering themselves for suicide missions; some evidence to support that assumption is available (Hassan 2001).¹⁰ The advantages of suicide attacks are apparent—they are more deadly, more shocking, leave behind no one to be interrogated, and may be easier to plan and execute because exit routes are not required. Those circumstances make suicide attacks particularly useful against hard targets (Berman and Latin 2008). Nevertheless, such attacks are mounted infrequently—so when are they, under what conditions are suicide attacks especially productive for the terrorist organization? Two explanations have been put forward. Bloom (2004, 2005) posits that suicide bombings give the organization an edge over their rival terror groups because they demonstrate resolve, determination and mobilize public support.¹¹ Pape (2003, 2005) argues that suicide attacks are mounted predominantly in situations of foreign occupation to coerce the occupier into withdrawing from the occupied territory; it thus is an important element in the struggle for national

⁹ For the seminal work on “true believers” see Hoffer (1951).

¹⁰ Hassan (2001) writes, “‘Our biggest problem is the hordes of young men who beat on our doors, clamoring to be sent,’ a Hamas leader told me. ‘It is difficult to select only a few. Those whom we turn away return again and again, pestering us, pleading to be accepted.’” <https://www.newyorker.com/magazine/2001/11/19/an-arsenal-of-believers> (3. May 2019).

¹¹ Brym and Araj (2008) argue that during the second Intifada (2000–2004), acceptance of suicide bombing increased among the Palestinian population; support for Hamas, which had used suicide attacks intensively, was rising at the expense of Fatah’s support.

liberation. Some evidence supports Pape's view,¹² yet it has been criticized because it disregards 'lone-wolf' suicide attacks that are not part of campaigns of national liberation (Crenshaw 2007). Moreover, Berman (2009, pp. 178ff) points towards a potential attribution problem—he argues that foreign troops who are targeted by suicide terrorists largely represent hard targets, and it is hard targets against which suicide attacks are mounted, not just occupying troops per se. In any case, Pape's approach leaves unexplained the salient characteristics of those embarking on suicide missions.¹³

Thus, no consensus exists as to the prime motivations for suicide terror. Scholars like Pape, Bloom and others regard suicide missions as driven predominantly by political considerations; others point to the use of suicide missions by secular groups, such as Fatah or the Sri Lanka's LTTE, which do not appeal to religion as prime motivators (e.g., Pedazhur 2006). In contrast, Bernholz views faith as the supreme driver of suicide attacks by religious terror groups. Berman and Laitin (2005, 2008) regard the provision of club goods and religiously motivated sacrifices as enabling factors for suicide missions, not predominantly religious motivation as such, however. Regardless of the relative weights assigned to religious motivations, altruism towards the collectively traumatized group or political considerations are for explaining suicide attacks, and no matter how different the motivations of terror group leaders and those carrying out the suicide attack may be, four elements need to be present in a suicide mission mounted by an Islamist terrorist: (at least some) religious motivations, strong grievances, a tightly knit, altruistic social network, and a terror organization that plans and supports the attack logistically.¹⁴ All of those elements, however, also characterize non-suicidal militants.

3 Data

We compare the characteristics of 209 suicide terrorists with the characteristics of 1387 'regular militants', belonging to the same organizations and dying in the same period as the suicide terrorists. We explain our data-generating process in the next subsection before we describe our data in the following subsection.

3.1 Data generation

We collected data from deceased Palestinian militants as published by their organizations; the only organizations that consistently report information on "martyrs" are Hamas and the Palestinian Islamic Jihad (PIJ). Specifically, we collected biographies from the websites

¹² Piazza (2008) finds that foreign occupation does predict suicide attacks, among other factors; he does not find evidence supporting the hypothesis that democratic states more frequently are the targets of suicide attacks, as Pape (2003) maintains. Piazza (2018) reports no evidence supporting the conjecture that foreign occupation is the primary driver of suicide attacks.

¹³ Pape (2003) bases his conclusions on the universe of all suicide attacks from 1980 to 2001, 188 attacks in total, but he does not compare them to 'regular' terrorist attacks, which makes it difficult if not impossible to draw conclusions on the different nature of suicide missions (compared to other terror attacks)—Pape is sampling on the dependent variable (Ashworth et al. 2008). In contrast, we compare 209 suicide terrorists to 1387 'regular militants' from the same organizations who died in the same period.

¹⁴ We disregard lone actor terrorism as it is somewhat irrelevant in the Israeli-Palestinian conflict. (From 2015 onward, lone actor terrorism becomes more active in the Israeli-Palestinian conflict, but such observations are not relevant for the questions we ask herein).

www.qassam.ps, operated by Hamas, and www.saraya.ps, maintained by PIJ. The data-collection effort resulted in a sample of 1596 individuals, which is the largest dataset of Palestinian militants available to date (outside of the intelligence community).¹⁵

We coded the biographies to assemble data on the individuals and their families, such as age at time of death, sex, family size and composition, marital status, number of children, place of residence, their organizational affiliations (Hamas/PIJ), the durations of their memberships in the organizations' military wings, and whether the individual was killed during a suicide mission. The coding process is explained in "Appendix 2", in which we provide an example obituary for a Hamas suicide bomber and explain how information is extracted and categorized. Of 1596 militants, 209 individuals are suicide terrorists, representing 13% of the full sample. The first person died on November 7, 1988; the last death in our sample occurred on July 31, 2010. (Data were collected from January 9, 2010, through October 22, 2010.)

Generating data on deceased terrorists raises issues of data accuracy or biasedness because the information is self-reported. We do not think that self-reporting is a major problem in our context because no obvious incentive exists to misstate personal information, such as gender, age, family size, marital status, or place of residence. Moreover, as many people know the deceased, factual errors would undermine the credibility of the information. The groups may seek to portray their members in a more favorable light, such as characterizing them as being more devout than they actually were, but since we extract factual information, our data are not subject to such a bias. What is more important, even if a reporting bias were present because, for instance, the groups overstated educational achievements of their deceased members, such misstatements hardly would invalidate our results because we are comparing suicide terrorists with 'regular' militants: the bias would apply equally to both groups. At any rate, data on deceased Hamas or PIJ fighters as provided by websites acknowledging their 'martyrs' are the only publicly available sources of information containing individual data on militants.¹⁶

One concern may be that the terror organizations may report a selected group of "martyrs" rather than all of them. Although we cannot rule out that possibility, we do not think that it is a major concern. First, Hamas and PIJ are in mutual competition and compete with other Palestinian organizations such as Fatah (Bloom 2004); the two groups studied here thus have an incentive to report all deceased militants in their ranks to demonstrate their resolve and determination a broad audience. Second, in a small geographical area with highly developed communication technology and social media such as the West Bank and the Gaza Strip, deceased militants are known widely, including much information about their personal details; therefore, excluding selected individuals from the list of deceased militants clearly would undercut the organizations' credibilities.¹⁷

¹⁵ Berrebi (2007) relies on a sample of 335 Palestinian terrorists, 66 of whom were suicide terrorists, including 48 with sufficient observations on their socioeconomic characteristics. Krueger and Malečková (2003) analyze 129 members of Hezbollah's military wing, of whom three were suicide bombers. Benmelech and Berrebi's (2007) sample contains 148 suicide bombers. The Hamas website changed its domain name to <https://www.alqassam.net> in the meantime.

¹⁶ Benmelech and Berrebi (2007) compared information from the Hamas and PIJ websites on suicide bombers with information from the Israeli Security Agency and found no disparities (Benmelech and Berrebi 2007, p. 227, fn. 3).

¹⁷ The groups even publish data on deceased civilians (not included in our data). Reports may differ in length depending on the rank or importance of the militant or the attack, but since we collect only factual information on gender, age, education, and economic status, this difference is inconsequential.

We carried out a number of plausibility checks. For instance, the Israeli Ministry of Foreign Affairs publishes lists of “Suicide and Other Bombing Attacks in Israel Since the Declaration of Principles (Sept 1993)”.¹⁸ While the lists also include non-suicide attacks and exclude attacks outside Israel, it closely matches our list of suicide terrorists’ dates of death. The Israeli Security Agency (Shabak) publishes reports on terror attacks on its website <https://www.shabak.gov.il>. For instance, the 2008 report lists the number of suicide attacks over the years from 2001 to 2007. The numbers match closely with ours.¹⁹

We now detail the protocol followed for coding the variables collected from the biographies that were provided by Hamas and PIJ.

SUICIDE is a dummy variable that is set equal to one if the individual died in a suicide mission (and zero otherwise). It is our dependent variable. It includes suicide missions carried out with car bombs, suicide vests, guns, and machine guns. Since suicide missions carried out with guns may not necessarily end fatally, in contrast to bombs strapped to the body or placed in cars that the individual is driving, we distinguish in a robustness check between the subcategories (Sect. 5).

AGE is the age of the individual at the time of death in years. MARRIED is a dummy variable that is set equal to one if the individual is married, and zero if he or she is single or widowed. The dummy variable HAS_CHILDREN indicates whether the individual had any children at all.²⁰ FIRSTBORN captures whether the individual is the oldest son or daughter. Those variables may capture specific obligations to spouses, children, or parents, which may make it more challenging to choose to embark on a suicide mission.

The dummy variable POOR denotes an individual of low income. The status of being poor was assigned if the militant or suicide terrorist explicitly was characterized as such in the obituary. It also was assigned if the biographical information implied that the individual was poor or came from a low-income family, such as saying that the father was unemployed, the family was living in a refugee camp, the person had to quit school in order to work, or was too poor to get married. Typically, our assessment is based on a combination of such biographical information. The fact that a person lived in a refugee camp is not enough to classify a militant or suicide terrorist as poor because a number of people in refugee camps may be reasonably well off, even if the people living in camps are on average poorer than the average Palestinian. For example, in one obituary, it is mentioned that the deceased militant’s father was unemployed and unable to work because of illness. As a result, the deceased militant quit school to take a job. The family lived in poor housing conditions and the person was not able to marry. We classify that individual as poor; the other categories are middle-income status and rich.²¹

¹⁸ <https://mfa.gov.il/MFA/ForeignPolicy/Terrorism/Palestinian/Pages/Suicide%20and%20Other%20Bombing%20Attacks%20in%20Israel%20Since.aspx> (accessed 5. March 2020).

¹⁹ General Security Agency (December 2008), Summary of 2008—Figures and Trends in Palestinian Terrorism, at <https://www.shabak.gov.il> (accessed 20.2.2020), p. 8. For instance, the Israeli report for 2001 counts 35 suicide attacks, while our dataset contains 43 attackers. In three instances, three suicide terrorists died on the same day; in four instances, two died the same day. If all of the suicide terrorists who died on the same day were involved in the same attack, we would have 33 attacks. If two out of the seven same day death of suicide terrorists were classified as involved in separate attacks by the Israeli security agency, we would have an exact match. (On May 25 and September 9 two attacks happened on the same day, but in different places.)

²⁰ Alternatively, we entered the actual number of children, which did not turn out significant. The significant difference is between having children at all or not having any children.

²¹ In the following, we report only results on the variable POOR, as including RICH did not yield any significant results.

Education is determined by the institution in which the individual was enrolled or had graduated from. We created a dummy variable `EDU_TERTIARY` that is set equal one if the individual is in, or has graduated from, a bachelor's or a master's degree program, and zero otherwise. Employment status was captured by the dummy variable `UNEMPLOYED`.²² `GAZA` is a dummy variable identifying individuals residing in the Gaza Strip, `RURAL` identifies non-urban residences and `REFUGEE_CAMP` identifies individuals living in such camps at their times of death.²³

Affiliations are captured by the dummy variable `HAMAS`, which is set equal to one if the individual is a member of that group and zero if he or she is a member of the PIJ. We also entered a continuous variable `MEMBERSHIP_MIL`, which indicates the length of time (in years) the individual has been a member of the military wing of his/her organization.

Finally, we controlled for gender. It turned out that only nine of the 1596 deceased militants in our sample were female; six of them were suicide terrorists, three were 'regular militants'. We could have entered a variable `FEMALE`, which would have been positive and significant in a regression explaining `SUICIDE`. Since we did not want to base a point estimate on just nine observations, we included the nine women into our sample without a gender identifier. Excluding them would not change our results since no discernible differences are observed between women and men other than sex, apart from the fact that women are more likely to be members of Hamas.

3.2 Descriptive statistics

Descriptive statistics for all variables are reported in Table 8 in the "Appendix 1". Table 1 displays the means of the variables for the two groups of suicide terrorists and militants.

Significant differences are apparent. Suicide terrorists tend to be younger by about three years; on average, they die at the age of 22. In principle, that difference simply could be explained by their shorter life expectancies (at any given age): suicide terrorists' deaths are (almost) certain at the time they engage in a suicide mission. However, for a subset of individuals—69% of non-suicide militants and 26% of suicide militants—we have information on when they joined the political or the military wing of the organization (whichever came first). Suicide terrorists joined, on average, at the age of 18.3 years, which is younger than non-suicide militants, who joined at the age of 19.8 years. If we assume that missing values imply that individuals joined the organizational ranks just prior to the attack that led to their deaths (see below)—say half a year before—the average age when joining would be 21.3 years for non-suicide militants and 20.7 years for suicide terrorists. (If they joined just weeks prior to the suicide attack the age difference would be larger). Thus, the age difference is not merely an artifact of suicide terrorists having lower life expectancies when they join a terror group.

Suicide terrorists are unemployed less often (by almost 7 percentage points), and they are significantly more educated, as measured by the share of individuals with tertiary schooling. Almost 56% of suicide terrorists have tertiary educations, but while the share remains high (at 44%) for the militants, it is a stark 12 percentage points lower. Fewer than 9% of the suicide terrorists are married, while a third of all militants in our sample are

²² Members of the military wing may receive compensation/income. We did not consider it as employment.

²³ `REFUGEE_CAMP` turned out insignificant in all regressions (not reported).

married. No more than 7% of suicide terrorists have children, whereas the corresponding figure is 25% for militants.

While more than 90% of militants in our sample belong to Hamas, which reflects the mass organization type of that group, Hamas accounts only for 64% of all suicide terrorists in our sample. Of the 186 PIJ members observed in our sample, 76 are suicide bombers, demonstrating the difference in tactics used by the two groups. Suicide terrorists are significantly more likely to reside in rural areas—while more than a quarter of all suicide terrorists are from rural areas, only 11% of the ‘regular’ militants live in the countryside. About 31% of all suicide and non-suicide militants live in refugee camps. The geographical concentration of terrorists is most obvious when comparing the Gaza Strip to the West Bank. Eighty-six percent of non-suicide militants stem from the Gaza Strip, but only 42% of the suicide terrorists do. That difference reflects the dominance of Hamas in the Gaza Strip and may indicate different recruitment strategies for suicide and non-suicide missions.

In the reduced sample for which we have data on the duration of memberships in the military wings of the two organizations, we find that suicide terrorists have been affiliated with terror groups for half the time (1.9 years) that militants have been (3.7 years). That difference may reflect suicide terrorists’ comparative youth, but also different recruitment and training processes. Data on membership duration is available only for 20% of the suicide terrorists. Yet, we think that most of the missing values effectively are zero for the following reasons.

First, the values are coded as missing if no information on time served in the military wing was provided. If suicide terrorists had not been members previously, such information naturally would be missing. If they had been members, that information would be valuable and the organization would be proud of its “martyrs” and thus have a strong incentive to report it. Second, military training is costly and thus should be targeted at people with longer terms of service in the organization’s military wing. Third, more than two-thirds of the suicide terrorists were equipped with explosive vests or car bombs for which military training is not necessary (psychological/ideological preparation is more important). Fourth, the pattern of missing values—very large for the West Bank and high, but significantly less for Gaza—is plausible if we think that the observations represent zeros, given that Hamas and PIJ have no training facilities in the West Bank: 121 suicide bombers from the West Bank are observed and 88 from the Gaza Strip. For 91% of the West Bank’s suicide terrorists, information on the duration of previous military membership is missing; for the Gaza strip, the corresponding figure is 64%. Of the 43 individuals (34 from Gaza) for whom we do have information, 9 individuals (Gaza 7) had not previously been affiliated with a military organization. Because Hamas and PIJ have no training facilities in the West Bank, very few militarily trained suicide terrorists resided there, while the share is larger in Gaza. Lastly, the percentage of missing values is much smaller for ‘regular’ militants, at less than 38%, while the corresponding percentage is 79% for suicide terrorists. Again, the number of missing values is much higher for non-suicide militants in the West Bank than in Gaza.²⁴

²⁴ Treating missing values as zero, the average time of service in the military organization would be 8 months for suicide terrorists from Gaza and two months for those from the West Bank. For non-suicide militants, the average length of time in the military organization is 0.68 years in the West Bank (compared to 0.17 years for suicide terrorists), but for Gaza, the average time is 2.6 years; it is 0.68 years for suicide terrorists).

Table 1 Descriptive statistics on suicide terrorists and militants

Variables	Suicide = 0		Suicide = 1		Mean diff ^a
	Obs	Mean	Obs	Mean	
Female	1387	0.00200	209	0.0290	−0.027***
Age	1352	25.18	191	22.14	3.041***
Poor	1387	0.148	209	0.172	−0.0240
Unemployed	1387	0.200	209	0.134	0.066**
Edu tertiary	1387	0.442	209	0.555	−0.113***
Married	1387	0.325	209	0.0860	0.239***
Has children	1387	0.251	209	0.067	0.184***
Hamas	1387	0.921	209	0.636	0.284***
PIJ	1387	0.0790	209	0.364	−0.284***
Gaza	1387	0.859	209	0.421	−0.438***
Firstborn	1387	0.0820	209	0.0570	0.0250
Rural	1387	0.106	209	0.263	−0.157***
Refugee Camp	1387	0.317	209	0.306	0.0100
Membership_Mil	866	3.722	43	1.860	1.861***

^aSignificance levels based on *t* test for continuous variables, Chi² test statistics for categorical variables

****p* < 0.01, ***p* < 0.05, **p* < 0.1

Taken together, these comparisons indicate clearly that suicide terrorists are distinctively different from other militants. The descriptive statistics motivate our econometric analysis below.

4 Empirical approach and results

Our dependent variable is the status of being a suicide terrorist (SUICIDE), conditional on being a member of one of the two organizations. We specify a logit model that reflects the binary character of our dependent variable and estimate the following equation:

$$\pi_i = \frac{e^{X_i\beta}}{1 + e^{X_i\beta}} + \varepsilon_i,$$

where π_i denotes the probability of being a suicide terrorist, X_i is a vector of control variables, β the vector of estimated parameters, and ε_i is a well-behaved error term. The results are presented in Table 2.

First, the results show consistently that being older is associated with a smaller probability of being a suicide terrorist, which reflects the comparatively young ages of suicide terrorists (on average 22 years); each additional year reduces the probability by more than 1 percentage point. Being poor is not significantly associated with a greater likelihood of being a suicide terrorist; it is barely significant in models 1 and 2 but loses significance in more comprehensive models. Having tertiary education is associated with a higher probability of being a suicide terrorist (by about 4–6 percentage points, depending on the model). Being unemployed is associated with a lower likelihood of being a suicide terrorist. Being married is associated with a lesser probability of being a suicide terrorist in

model 2, but once we control for residence in the Gaza Strip and membership in Hamas (rather than PIJ), the effect loses significance (models 3–6). That finding reflects the larger percentages of married Hamas fighters and Gaza Strip origins.²⁵ Thus, the organizational affiliation variable may capture some of the effects of being married. The effect of having children in addition to being married, is not a significant determinant of the likelihood of being a suicide terrorist. All suicide terrorists/militants who have children are married. The large percentage of single suicide terrorists may be explained by fewer family responsibilities, financial or otherwise. The effect could operate on the demand side, such that terrorist groups want to avoid supporting the families of suicide terrorists left behind, or because married individuals are less willing to offer themselves for suicide mission as they have to leave their wife, and possibly children, behind (supply side).

Hamas militants are less likely to be suicide terrorists, which reflects the smaller share of suicide terrorists in that group relative to the PIJ and points towards a different mode of operation. The same is true for residence in the Gaza Strip. That is where most Hamas and PIJ militants live (Hamas is in firm control of the Gaza Strip), yet only 42% of all suicide terrorists resided there (see Table 1). Being the firstborn son or living in a rural area has no impact on the probability of being a suicide terrorist.

We also estimated a regression that included the lengths of time individuals had been members of the military wings of the two organizations, inquiring whether being prepared for a suicide mission required longer training and indoctrination periods or was instead the high point of a lengthier military career. The opposite seems to be the case. An additional year of being affiliated with the military branches of Hamas or PIJ is associated with a 1.6 percentage point smaller likelihood of being a suicide terrorist. Of course, such a variable is determined jointly; the results of model 6 thus are illustrative rather than causal.

We also checked whether having been arrested in the past by Israeli security forces increased the likelihood of becoming a suicide terrorist. We found no evidence for such an effect (results not reported).

Overall, our empirical findings reveal little evidence that marginalized poor people who have been radicalized are more likely to give up their lives in suicide missions. Our results thus contradict the notion put forward by Israeli (1997) that suicide terrorists exhibit low statuses prior to their deeds.²⁶ On the contrary, suicide terrorists are, on average, better educated and less likely to be unemployed than their militant comrades, and they are married less frequently.

We check the robustness of our results below.

5 Robustness and extensions

5.1 Mode of suicide attack

A first concern may be that suicide *bombers* are determined to die—their attack modes imply success only if the terrorists sacrifice their lives, while terrorists attacking with guns,

²⁵ People in Gaza tend to marry earlier. If we enter an interaction between *MARRIED* and *GAZA*, the baseline effect of being married remains significantly negative.

²⁶ We cannot exclude the possibility that they feel deprived relative to their peers, who may be even better off, or perhaps even more plausibly, relative to their Israeli counterparts with whom they may compare themselves.

Table 2 Baseline results

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Suicide	Suicide	Suicide	Suicide	Suicide	Suicide
Age	−0.0154*** (0.00228)	−0.0115*** (0.00261)	−0.0123*** (0.00233)	−0.0125*** (0.00233)	−0.0122*** (0.00228)	−0.00453** (0.00228)
Poor	0.0500* (0.0274)	0.0455* (0.0268)	0.0183 (0.0217)	0.0175 (0.0216)	0.0123 (0.0210)	0.0374 (0.0234)
Edu_tertiary	0.0588*** (0.0177)	0.0551*** (0.0176)	0.0479*** (0.0153)	0.0484*** (0.0153)	0.0428*** (0.0152)	0.0290* (0.0155)
Married		−0.0934*** (0.0341)	−0.0418 (0.0367)	−0.0367 (0.0376)	−0.0462 (0.0359)	−0.0194 (0.0333)
Has_children		0.0501 (0.0751)	0.0163 (0.0517)	0.0131 (0.0507)	0.0174 (0.0515)	0.0376 (0.0683)
Hamas			−0.197*** (0.0314)	−0.200*** (0.0316)	−0.203*** (0.0317)	−0.119** (0.0468)
Gaza			−0.283*** (0.0274)	−0.296*** (0.0318)	−0.279*** (0.0271)	−0.217*** (0.0619)
Firstborn				−0.0286 (0.0238)		
Rural				−0.0170 (0.0183)		
Unemployed					−0.0507*** (0.0157)	−0.000733 (0.0170)
Membership_Mil						−0.0164*** (0.00455)
Observations	1543	1543	1543	1543	1543	908

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

knives or cars may have (small) chances of getting away from the scene (which they may overestimate). They may intend to escape. If so, their determination to give up their lives may be lower and, in consequence, those modes of attack *may* draw different people than suicide bombings do.²⁷

To investigate such a possibility, we divide suicide terrorists into suicide bombers (using suicide vests or car bombs) and other suicide terrorists, who in our dataset only use guns. We test for differences in means of the relevant variables. The results are reported in Table 3.

Only small differences in the socioeconomic characteristics are observed: suicide bombers are, on average, 1.5 years older than suicide gunners. The share of Hamas members is significantly larger for suicide gunners (at 77%) than for suicide bombers (at 58%); suicide bombers are much less likely to reside in the Gaza Strip than suicide gunners.

To test whether those small differences influence our results in any way, we estimated our baseline regressions excluding the suicide gunners, i.e., the dependent variable is

²⁷ A very high risk of dying may be qualitatively different from dying with certainty (Ferrero 2006, pp. 855f).

Table 3 Suicide terrorists by attack mode

Variables	Suicide bombers		Suicide gunners		MeanDiff
	Obs	Mean1	Obs.	Mean2	
Female	145	0.0340	64	0.0160	0.0190
Age	128	22.63	63	21.14	1.482**
Poor	145	0.152	64	0.219	−0.0670
Unemployed	145	0.131	64	0.141	−0.0100
Edu tertiary	145	0.572	64	0.516	0.0570
Married	145	0.0760	64	0.109	−0.0340
Has children	145	0.0690	64	0.0630	0.00600
Family size	61	10.61	33	11.15	−0.545
Hamas	145	0.579	64	0.766	−0.186***
Gaza	145	0.310	64	0.672	−0.362***

See notes for Table 1

SUICIDEBOMBER, which is set equal to one if the individual is a suicide bomber and zero otherwise. The sample includes all suicide bombers and all other militants; suicide gunners are excluded. Table 4 presents the results. Columns 1–2 display again the baseline regression results; column 3–4 repeat the regressions excluding the 64 suicide gunners.

Overall, the results change very little and are remain qualitatively similar. The estimated coefficients are reduced somewhat in absolute magnitudes but retain previous signs and significances. Only MARRIED now reaches customary significance: being married is associated with a statistically significant 8 percentage point lower probability of being a suicide bomber.

5.2 Leaders versus foot soldiers

A second concern may be that the comparison group of militants is heterogeneous because it is composed of leaders and “foot soldiers”. Comparing suicide terrorists to a group that includes leaders could be inappropriate; suicide terrorists never had chances to become leaders. Leaders are 8 years older, not unemployed, 19 percentage points more likely to have tertiary educations, 45 percentage points more likely to be married and to have children than rank-and-file group members. They are less likely to reside in the Gaza Strip, possibly a consequence of being better protected there because Hamas is in firm control. Deceased leaders from the West Bank may be overrepresented in our full sample.

To address such a concern, we identified members with leadership status and omitted them from the sample. Obituaries for leaders typically contain information on their positions, functions and responsibilities.

The results are presented in columns 5–6 of Table 4. They reveal no material differences with the baseline regression.

5.3 Hamas versus PIJ

Our sample contains militants from two different organizations that may function very differently and that may attract and recruit different kinds of people. Hamas is said to have

Table 4 Robustness checks I

Variables	Baseline		Only suicide bombers		No leaders	
	Suicide	Suicide	Suicidebomber	Suicidebomber	Suicide	Suicide
	(1)	(2)	(3)	(4)	(5)	(6)
Age	−0.0122*** (0.00228)	−0.0123*** (0.00229)	−0.00571*** (0.00177)	−0.00573*** (0.00177)	−0.0108*** (0.00235)	−0.0109*** (0.00235)
Poor	0.0123 (0.0210)	0.0117 (0.0210)	−0.00404 (0.0169)	−0.00601 (0.0168)	0.0137 (0.0220)	0.0134 (0.0219)
Edu_tertiary	0.0428*** (0.0152)	0.0434*** (0.0152)	0.0258** (0.0127)	0.0264** (0.0127)	0.0480*** (0.0158)	0.0485*** (0.0158)
Married	−0.0462 (0.0359)	−0.0411 (0.0368)	−0.0778* (0.0398)	−0.0756* (0.0399)	−0.0427 (0.0375)	−0.0379 (0.0383)
Has_children	0.0174 (0.0515)	0.0134 (0.0504)	0.0690 (0.0847)	0.0651 (0.0822)	0.0226 (0.0535)	0.0182 (0.0524)
Hamas	−0.203*** (0.0317)	−0.206*** (0.0319)	−0.183*** (0.0297)	−0.188*** (0.0300)	−0.219*** (0.0342)	−0.221*** (0.0344)
Gaza	−0.279*** (0.0271)	−0.294*** (0.0315)	−0.255*** (0.0262)	−0.277*** (0.0308)	−0.311*** (0.0294)	−0.323*** (0.0340)
Unemployed	−0.0507*** (0.0157)	−0.0505*** (0.0157)	−0.0395*** (0.0129)	−0.0398*** (0.0129)	−0.0579*** (0.0159)	−0.0576*** (0.0159)
Firstborn		−0.0268 (0.0235)		−0.0114 (0.0205)		−0.0262 (0.0245)
Rural		−0.0181 (0.0181)		−0.0213 (0.0137)		−0.0151 (0.0193)
Observations	1543	1543	1480	1480	1467	1467

Standard errors in parentheses; average marginal effects

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

more resources and is larger than PIJ; what is most important, it controls the Gaza Strip. PIJ is smaller, more radical, and enjoys more support from Iran and Hezbollah.²⁸ We compared the characteristics of suicide terrorists and militants affiliated with the two organizations. The results are reported in Table 5.

Hamas's non-suicide militants are significantly less likely to be poor (by 16 percentage points), 9 percentage points less likely to be unemployed, and 9 percentage points more likely to have tertiary educations than their PIJ counterparts. They are less likely to have children. Overall, Hamas militants' economic statuses seem to be better than that of PIJ's. In contrast, hardly any difference is evident between the suicide terrorists of the two organizations.²⁹ That is interesting in itself—even though the two organizations have very different profiles for their 'regular' operatives, they recruit very similar suicide terrorists.

²⁸ On the different ideological backgrounds and techniques of the two organizations, see Milton-Edwards (1992). For the use of suicide missions by the two organizations see Gupta and Mundra (2005).

²⁹ PIJ suicide terrorists are even less likely to be married than Hamas suicide terrorists (4% versus 11%).

Table 5 Differences between Hamas and PIJ militants

Variables	PIJ		Hamas		MeanDiff
	Obs	Mean1	Obs	Mean2	
<i>Non-suicide militants</i>					
Age	108	25.58	1244	25.14	0.442
Poor	110	0.291	1277	0.135	0.155***
Unemployed	110	0.282	1277	0.193	0.089**
Edu tertiary	110	0.364	1277	0.449	−0.085*
Married	110	0.373	1277	0.321	0.0520
Has children	110	0.318	1277	0.245	0.073*
Family	83	10.78	369	11.15	−0.363
Gaza	110	0.873	1277	0.858	0.0140
<i>Suicide terrorists</i>					
Age	66	21.77	125	22.33	−0.555
Poor	76	0.171	133	0.173	−0.00200
Unemployed	76	0.118	133	0.143	−0.0240
Edu tertiary	76	0.553	133	0.556	−0.00400
Married	76	0.0390	133	0.113	−0.073*
Has children	76	0.0390	133	0.0830	−0.0430
Family	38	10.74	56	10.84	−0.102
Gaza	76	0.408	133	0.429	−0.0210

See notes for Table 1

Our observation is consistent with the demand determination of suicide terrorists. Suicide terrorists are selected by the group, typically shortly prior to a planned attack. The group rationally chooses individuals with the highest expected success rates, namely, the most educated, religious, not known to Israeli security forces, and young and unmarried in order to limit obligations to surviving dependents. The dominant consideration is the quality, not the quantity of suicide terrorists. Both groups operate by the same calculus; we thus find no material differences between Hamas and PIJ in the profiles of suicide terrorists.³⁰ The ‘regular’ militants, in contrast, are more numerous and their characteristics are not exclusively demand-determined. Being a militant offers distinct rewards, such as money, food, equipment, transportation and status, not available in a failed state. Hamas, being richer and in control of Gaza, can offer better packages and, thus, attracts a different pool of people.

To address differences in the organizational structures of Hamas and PIJ, we estimated regressions for each militant group separately. The results are reported in Table 6. Columns 1–2 reproduce the baseline regressions, columns 3–4 the regressions for the Hamas militants and columns 5–6 those for the Palestinian Islamic Jihad.

Differences between suicide terrorists and non-suicide militants qualitatively are the same across both groups, yet the sizes of the coefficient estimates differ considerably. Owing to the smaller number of observations on PIJ, the significance levels of those regressions are lower. PIJ’s suicide terrorists are 3.8 years younger than PIJ’s non-suicide

³⁰ Hassan (2001) reports that no shortage of volunteers for suicide missions exists; thus, terror groups may not be supply-constrained.

Table 6 Robustness checks II: Hamas vs. PIJ

Variables	Baseline		Hamas		PIJ	
	Suicide	Suicide	Suicide	Suicide	Suicide	Suicide
	(1)	(2)	(3)	(4)	(5)	(6)
Age	−0.0122*** (0.00228)	−0.0123*** (0.00229)	−0.0120*** (0.00237)	−0.0121*** (0.00238)	−0.0143* (0.00810)	−0.0127 (0.00838)
Poor	0.0123 (0.0210)	0.0117 (0.0210)	0.0266 (0.0199)	0.0268 (0.0198)	−0.0755 (0.0771)	−0.0977 (0.0802)
Edu_tertiary	0.0428*** (0.0152)	0.0434*** (0.0152)	0.0446*** (0.0149)	0.0449*** (0.0149)	0.0228 (0.0622)	0.0253 (0.0615)
Married	−0.0462 (0.0359)	−0.0411 (0.0368)	−0.0161 (0.0376)	−0.0111 (0.0378)	−2.262 (130.7)	−2.426 (263.3)
Has_children	0.0174 (0.0515)	0.0134 (0.0504)	0.00372 (0.0427)	−0.000745 (0.0428)	2.074 (130.7)	2.238 (263.3)
Hamas	−0.203*** (0.0317)	−0.206*** (0.0319)				
Gaza	−0.279*** (0.0271)	−0.294*** (0.0315)	−0.164*** (0.0140)	−0.168*** (0.0154)	−0.334*** (0.0443)	−0.411*** (0.0795)
Unemployed	−0.0507*** (0.0157)	−0.0505*** (0.0157)	−0.0344* (0.0197)	−0.0353* (0.0196)	−0.189*** (0.0685)	−0.182*** (0.0692)
Firstborn		−0.0268 (0.0235)		−0.0232 (0.0277)		−0.0399 (0.109)
Rural		−0.0181 (0.0181)		−0.0124 (0.0191)		−0.129 (0.109)
Observations	1543	1543	1369	1369	174	174

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

militants, which is significant at the 1% level, yet in model 5, the age effect is significant only at the 10 % level and insignificant in model 6. The same finding applies to tertiary education: 55% of PIJ suicide terrorists have tertiary educations compared to 36% of its non-suicide militants, which difference again is significant at 1%. In regression models 5 and 6, however, the effect does not reach usual significance levels. PIJ suicide terrorists are less concentrated in Gaza than their Hamas counterparts; the difference in employment status between suicide and non-suicide militants is much stronger for PIJ than for Hamas militants.

Despite some marked differences overall, pooling of Hamas and PIJ militants in the baseline models does not mask fundamentally different cleavages between suicide and non-suicide militants across the two organizations.

5.4 The 2008 Gaza War

A third concern may be that the reference group of non-suicide militants may be influenced by massive military operations. If, during such circumstances, a different set of people is killed than in more peaceful times, the period under study may become decisive for any

comparison. That could be the case if, in “normal” times, predominantly active militants are killed during their attacks on Israeli targets (or in response to such attacks), while massive military operations may target militant groups and their infrastructures more generally, including training facilities, warehouses, weapon stashes or tunnels, and support assets, including operating staffs.

To address that concern, we investigated the 2008 Gaza War, known as Operation Cast Lead or Battle of al-Furqan, which took place from 27 December 2008 to 18 January 2009. During that war, more than 1000 Palestinians and 13 Israelis were killed. In response to frequent rocket attacks on Israeli soil from within the Gaza Strip, Israeli Defense Forces (IDF) launched an offensive on 27 December 2008, beginning with massive airstrikes and subsequent naval operations. The ground offensive started on January 3; on January 8, Israeli troops reached Gaza City. On January 17, Israel declared a unilateral ceasefire, which took effect on January 18, at 00:00 h GMT. The goal of the offensive was to weaken the Palestinians’ ability to launch rocket attacks on Israeli assets and to destroy tunnels and military installations in the Gaza Strip.

In our dataset, 314 of 1596 militants were killed during those three weeks, accounting for nearly 20% of all observations.³¹ The causes of death differ from non-war times: airstrikes killed 89% of the deceased compared to 34% in non-Gaza War times. Only 10% were killed in clashes or other fire fights, while during “normal” times, the figure is 54%. Almost nobody was killed by equipment failures or other technical problems, while in non-war times, the share is 9%. The profiles of the killed militants differed along some dimensions: A much smaller share of unemployed people were killed (13% instead of 22%), and 7 percentage points more married militants died. The share of Hamas member deaths is larger by 5 percentage points and, obviously, all of those killed resided in the Gaza Strip, which is 18 percentage points higher than in non-war times.

To investigate whether that event has affected our conclusions, we ran the baseline regressions, excluding Gaza War fatalities. The results are reported in Table 7. Columns 1–2 repeat the baseline regressions; columns 3–4 exclude the 314 militants killed during the Gaza War. The empirical findings plainly are not affected by excluding the Gaza War fatalities.

Overall our results are very robust.

6 Conclusion

We have shown that suicide terrorists do not fit the profile of other militants. They are even better educated than their non-suicide counterparts (which in turn have been shown to be better educated than the population at large; see Berrebi 2007). Fifty-six percent of all suicide terrorists have engaged in tertiary education compared to 44% of non-suicide militants. They are younger and are far less often married or have children. They are not more likely to be poor and are less likely to be unemployed. Our results have been shown to be robust in several dimensions.

This evidence presented herein contradicts the notion that economically marginalized, unsuccessful people are more inclined to engage in suicide terrorism, as Israeli (1997) has

³¹ On the first day of the war, around 200 people were killed by airstrikes, which targeted police stations operated by Hamas’s de facto government, among other targets (<https://www.haaretz.com/1.5101984>, May 27, 2019). Hamas members staffing police stations might be different from ‘regular’ militants.

Table 7 Robustness checks III: excluding the Gaza War fatalities

Variables	(1)	(2)	(3)	(4)
	Baseline		Without Gaza War	
	Suicide	Suicide	Suicide	Suicide
Age	−0.0122*** (0.00228)	−0.0123*** (0.00229)	−0.0145*** (0.00276)	−0.0148*** (0.00277)
Poor	0.0123 (0.0210)	0.0117 (0.0210)	0.0197 (0.0263)	0.0190 (0.0263)
Edu_tertiary	0.0428*** (0.0152)	0.0434*** (0.0152)	0.0459** (0.0187)	0.0463** (0.0186)
Married	−0.0462 (0.0359)	−0.0411 (0.0368)	−0.0492 (0.0463)	−0.0419 (0.0475)
Has_children	0.0174 (0.0515)	0.0134 (0.0504)	0.0114 (0.0617)	0.00685 (0.0604)
Hamas	−0.203*** (0.0317)	−0.206*** (0.0319)	−0.223*** (0.0349)	−0.226*** (0.0350)
Gaza	−0.279*** (0.0271)	−0.294*** (0.0315)	−0.269*** (0.0278)	−0.284*** (0.0317)
Unemployed	−0.0507*** (0.0157)	−0.0505*** (0.0157)	−0.0672*** (0.0193)	−0.0670*** (0.0192)
Firstborn		−0.0268 (0.0235)		−0.0332 (0.0293)
Rural		−0.0181 (0.0181)		−0.0235 (0.0220)
Observations	1543	1543	1238	1238

Standard errors in parentheses, average marginal effects

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

argued. On the contrary, it is the well-off, well-educated individuals that engage in suicide missions. We also found no evidence that suicide terrorists are mentally unstable, which, however, is no definite proof that they are not because terror organizations may be reluctant to report mental disorders. Our setup does not allow us to test for contextual factors conducive to suicide terror because context is persistent relatively, given that we are analyzing the Israeli-Palestinian context only.

Interestingly, the profiles of Hamas and PIJ non-suicide militants are distinct; their suicide terrorists nevertheless are remarkably similar in their observable characteristics. That finding suggests that highly educated young men, mostly single, may be either particularly attracted to suicide missions or particularly attractive to Islamist organizations that choose them for such terrorist tactics. Like all other analyses of individual terrorists, we observe only the militants—in our case both suicide terrorists and ‘regular’ militants. Nevertheless, we cannot distinguish between the supply of or the demand for suicide terrorists and cannot assess the extent to which our results are demand- or supply-side determined. However, the patterns observed are consistent with the notion that suicide terrorists’ profiles are explained by the demands of terror groups for people who will carry out their missions successfully.

Obviously, our results have been based on the suicide terrorists serving Hamas and the Palestinian Islamic Jihad; it is not clear that our results can be extended to other terror groups in other time and places. It would be interesting to study the differences between suicide and non-suicide militants in other contexts, especially for terror organizations that are not predominantly religiously motivated and are motivated by different grievances (Kis-Katos et al. 2014). Such groups may attract different kinds of people to their ranks. However, not many organizations mobilize numbers of suicide terrorists large enough for such analyses.

Acknowledgements Open Access funding provided by Projekt DEAL. We are very grateful to the editor of this journal and three anonymous referees for helpful comments. The usual disclaimer applies.

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Appendix 1. Descriptive statistics

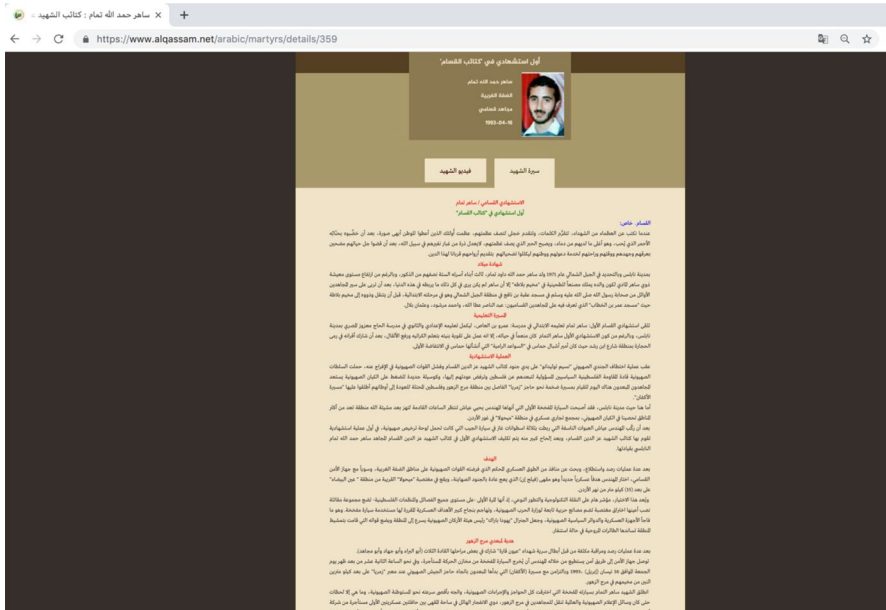
See Table 8.

Table 8 Descriptive statistics

Variable	Definition	Obs	Mean	Std.Dev.	Min	Max
Female	Dmy var = 1 if individual is female	1596	0.00564	0.0749	0	1
Age	in years	1543	24.80	5.834	16	57
Poor	Dmy var = 1 if individual is poor	1596	0.151	0.358	0	1
Unemployed	Dmy var = 1 if indiv is unemployed	1596	0.191	0.393	0	1
edu tertiary	Dmy var = 1 if individual has bachelor or higher education	1596	0.457	0.498	0	1
Married	Dmy var = 1 if individual is married	1596	0.294	0.456	0	1
has children	Dmy var = 1 if individual has children	1596	0.298	0.457	0	1
Deathyear	Year of death	1596	2005	3.804	1988	2010
Hamas	Dmy var = 1 if indiv. belongs to Hamas	1596	0.883	0.321	0	1
PIJ	Dmy var = 1 if indiv. belongs to PIJ	1596	0.117	0.321	0	1
Gaza	Dmy var = 1 if indiv. residence is in the Gaza strip	1596	0.802	0.399	0	1
Firstborn	Dmy var = 1 if indiv. is the first child	1596	0.0789	0.270	0	1
Rural	Dmy var = 1 if indiv. lives in rural area	1596	0.127	0.333	0	1
Refugee camp	Dmy var = 1 if indiv. lives in ref.camp	1596	0.315	0.465	0	1
Membership_Mil	Years of membership in military wing	909	3.634	2.877	0	19

Appendix 2. Classification of terrorist data from the website “hailing the martyrs”

We use the example of Hamas’s Saher Tammam, found at <https://www.alqassam.net/arabic/martyrs/details/359>.



We provide a literal translation of the Hamas website below. The italicized and underlined parts are the terms that led to the classification of our variables (not italicized or underlined in the original). We added numbers in brackets to the paragraphs for reference.

"Qassam martyr/Saher Tammam (Link)

The first martyr in the “Qassam Brigades”

Qassam special report

[1] When one writes about the great martyrs, the words become small and humbly step forward to describe the greatness, the greatness of those who gave the homeland the most fabulous image after adorning the land with the red henna that the land loves and which is most precious to them, their blood. Yet, the ink used to write of their greatness does not equal a grain of dust blown up by those rushing to war for God’s sake³² after they have spent most of their lives sacrificing their sweat, effort, time and comfort in the service of their “Religious call” and homeland only to undermine these sacrifices by presenting their souls as an offering to their Faith.

³² Holy War (ed.).

Birth certificate

[2] In the city of *Nablus*, specifically in the *Northern Mountain area, in 1971, Saher* Hamdallah Dawood *Tammam* was born, *the third of six children, half of them being males*. Even though his family had a *high standard of living because his father owned a ‘tahini factory’* in the Balata camp, Saher did not see in this what connects him to this life. He was brought up, in his early stages, following the conduct of the first “Mujahideen of the Companions of Allah’s Messenger”,³³ peace be upon him, in the Uqba ibn Nafi Mosque in the Northern Mountain area. He then moved with his family to Balata camp where, in the Omar bin al-Khattab Mosque, he got to know the Mujahideen militants Abdel Nasser Attallah, Ahmed Marshoud, and Othman Bilal.

The educational process

[3] The first Qassam martyr, Saher Tammam, received his *primary education* at Amr Ibn Al-Aas School and *completed his preparatory and secondary education* at Al-Hajj Maazouz Al-Masri School in Nablus. Despite *being well-heeled in his life*, the first martyr Saher Tammam strived to strengthen his body by *learning karate and weightlifting*, after having joined his peers in throwing stones on Ibn Rushd Street, where he was the Prince of Hamas’ cubs,³⁴ who joined the striking forces of “Alsawaeid Al Rramia”,³⁵) which was established by Hamas in the first Intifada.

The martyrdom operation

[4] After the kidnapping of the Zionist soldier “Naseem Toledano” at the hands of the soldiers of the martyr Izz ad-Din al-Qassam Brigades and the failure of the Zionist forces to free him, the Zionist authorities held the Palestinian political resistance leaders responsible in order to deport them from Palestine while refusing their return to it. As a new way to pressure the Zionist entity, the deported Mujahideen are preparing themselves today to carry out a massive march towards the “Zamriya” checkpoint, which separates the Marj al-Zuhur region and occupied Palestine to push for their return to their homeland. They called it “The Shrouds March”.

[5] Here, near the city of Nablus, the first *car bomb*, finished by engineer Yahya Ayash, had been waiting for the next hours to detonate, after the will of God, one of the most fortified areas in the Zionist entity, a military complex in “Mehola” in the Jordan Valley.

[6] Engineer Ayash installed the explosive devices attaching them to three gas cylinders in a Jeep that carried an Israeli license plate in order to prepare the first martyrdom operation carried out by martyr Izz ad-Din al-Qassam Brigades. After great urgency, Mujahid

³³ Allah’s Messenger: Prophet Muhammad (ed.).

³⁴ A cub is a junior member of Hamas’s Scout Association, for boys aged about 8–11. <https://dictionary.cambridge.org/dictionary/english/cub> (ed.).

³⁵ “Alsawaeid Al Ramia” are military groups formed to support the first Palestinian Intifada in 1988. They were part of Palestinian groups’ military wings and given the name because they were throwing stones and Molotov cocktails on the areas occupied by the Israelis and on the settlers.

[https://ar.wikipedia.org/wiki/%D8%A7%D9%84%D9%82%D9%88%D8%A7%D8%AA_%D8%A7%D9%84%D8%B6%D8%A7%D8%B1%D8%A8%D8%A9_\(%D8%A7%D9%84%D8%A7%D9%86%D8%AA%D9%81%D8%A7%D8%B6%D8%A9_%D8%A7%D9%84%D8%A7%D9%88%D9%84%D9%89](https://ar.wikipedia.org/wiki/%D8%A7%D9%84%D9%82%D9%88%D8%A7%D8%AA_%D8%A7%D9%84%D8%B6%D8%A7%D8%B1%D8%A8%D8%A9_(%D8%A7%D9%84%D8%A7%D9%86%D8%AA%D9%81%D8%A7%D8%B6%D8%A9_%D8%A7%D9%84%D8%A7%D9%88%D9%84%D9%89)

Saher Hamdallah Tammam Al Nablisi, the first Izz ad-Din al-Qassam martyr, was assigned to drive the car.

The target

[7] After several monitoring and exploration operations and a search for safe ways out of the tight military cordon imposed by the Zionist forces on the West Bank, and together with the Qassam security apparatus, the “Engineer” chose a new military target, a café (the Village Inn), which was usually packed with Zionist soldiers, located in the “Mehola” settlement³⁶ near the “Ain Al-Bayda” area, about 15 km from the Jordan River.

[8] This choice is an important indication of a technological shift and a qualitative development as it is the first time that, at the level of all Palestinian factions and organizations, a combat group set foot in and penetrated a settlement area that includes military factories affiliated with the Zionist War Ministry and successfully attacked military targets using a *car bomb*. This surprised the Zionist military and political circles and caused General “Ehud Barak”, chief of the Zionist Staff, to rush to the region and deploy his forces, which combed the area with the support of helicopters, in a state of alert.

A gift for the deportees of Marj Al Zuhur

[9] After several intensive monitoring and control operations by the secret heroes of the “Ayoun Qara” martyrs, where the three leaders (Abu Barra, Abu Jihad and Abu Mujahid) took part in some of them. The security apparatus found a safe way for the “Engineer” to take the car bomb out from Hamas rented storage hall at approximately 12 pm on *Friday, the 16th of April 1993*, precisely in conjunction with the (Shrouds) March that the deportees started towards the Zionist army’s checkpoint at the “Zamriya” crossing, two kilometers away from their camp Marj al Zuhur.

[10] Martyr Saher al-Tammam departed with his *car bomb*, broke through all Zionist barriers and checkpoints, and drove as fast as possible towards the Zionist settlement. It took only a few moments until the Zionist and international media broadcasted the news, broadcasting to the Mujahideen in Marj AL Zuhur, about the massive explosion in the café square between two military buses.

[11] The first bus was rented from the Egged Company (line 96) to take Zionist soldiers from Tiberias to Jerusalem, while the second one transported soldiers from Jordan Valley to the center of occupied Palestine, before Tammam changed their routes to a trip to Hell. The massive explosion resulted in dozens of killed and wounded as well as the complete burn down of the two buses while causing a significant damage to the restaurant. This caused General “Ehud Barak”, chief of the Zionist Staff, to rush to the region and deploy his forces, which combed the area with the support of helicopters, in a state of alert.

³⁶ The precise expression is not “settlement” but “raped areas” because Hamas considers them to have been taken forcefully from the Palestinians. The expression “raped” is used several times the same way throughout the text; we will not translate the respective passages literally but mark them with a³⁶.

Proof of excellence

[12] Mujahid Saher Tammam's desire for jihadist activity in the Qassam Brigades, which had laid their first foundations in the Nablus area, was very strong. He therefore did not get tired of notifying Mujahid Ahmed Marshoud, one of the most prominent leaders of the Qassam Brigades in the Nablus area, about his willingness to join their ranks. He became later a member of the group of the imprisoned commander Zahir Jabareen. As for Tammam, whose love for Jihad had overtaken his heart and mind, he wanted to bring, in his own way, a "certificate of proof" confirming his worthiness to join the ranks of the Qassam chasers.

[13] On Monday morning (15/3/1993) Mujahid, Saher Tammam drove *his Mercedes (608)* from Nablus city, *carrying a load of Tahini and Halawa from his father's factory* in Balata camp to merchants in the city of Ramallah. On his way back from the same road, at about 10 am, he spotted Sergeant "Ofer Cohen" (27 years), and Sergeant Yitzhak Barkha (24 years), waiting at the bus station near the "Shilo" junction on their way to the Zionist army camp near Nablus City to perform the reserve forces' annual military service.

[14] Mujahid Saher Tammam began flooring the gas pedal to increase the car's speed dramatically. Once the car approached the two soldiers, he pulled around the steering wheel and drove the car onto the sidewalk to run them over. Before leaving the scene, he made sure he saw them in his car's mirror steeped in blood.

[15] After a settler*³⁷ witness the run over attempted, he tried to interfere by firing several shots at the car, after the settler* failed to hit the car, he called the Zionist medical teams, which were unable to save the lives of the soldiers, who died minutes later. Large forces, reinforced by the police and border guards, arrived at the scene as well as "Moshe Ya'alon", commander of the Zionist forces in the West Bank and the new commander of the Zionist central region "Nehemiah Tamari". After the Zionist forces failed to find Mujahid Saher Tammam, the Zionist settlers* wreaked havoc and destruction upon the cars, houses, and properties of the Palestinian citizens of that area, while Zionist forces were expanding their search for Qassam Mujahid Tammam in the surrounding areas with the support of Zionist helicopters. Meanwhile, Mujahid Tammam had reached "Yatma" village in Nablus district, near "Zaatara" village, where he left behind the bus with which he had driven there, when a tractor driver had stopped to help him in order to pass through the mountains and reach the Qassam commanders on foot.

The first martyr

[16] There he found Mujahid Abdel Nasser Attallah in the Mosque of the Al-Najah National University to inform him about what happened to him and to be transferred later on to one of the hideouts of the Al Qassam brigades as he became one of their Mujahedein. He later joined them in many jihadist missions and armed clashes before being nominated by the Qassam leadership in the northern West Bank to be their first martyr, after the first *car bomb* that their "Engineer" Yahya Ayyash prepared needed a martyr to drive it to the Zionist camp in the occupied Jordan Valley. Saher Tammam drove it to opened up the way for dozens of Qassam martyrs in various places of Palestine and from different factions."

³⁷ The exact expression used is "rapist witness", associating the Israeli with invading and raping the Palestinians' territories and freedoms. We will not translate the respective passages literally but marking them with a *.

Classification protocol

Paragraph [2] provides the individual's first and last name, his gender, his birth town, year of birth, family size, and composition of brothers and sisters. It also characterizes the wealth status of the family as wealthy ($RICH=1$). [3] described his education as having completed secondary education. "He was well-heeled in his life" describes in Arab that he did not miss anything materially, the fact that he could go to a sports club is another indicator of wealth. [4] to [11] describe the suicide operation, which leads to the classification as a suicide bomber ($SUICIDE=1$ and $SUICIDEBOMBER=1$). It gives the time and location of the attack, which allows calculating the AGE of the suicide bomber at the time of death. [5] [8] and [16] describe the weapon used in the suicide operation (i.e., $SUICIDEBOMBER=1$). [13] confirms the wealth status of the attacker and his family as rich. The wealth status is thus ascribed based on multiple pieces of information.

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