ALTRUISM IN SUICIDE TERROR ORGANIZATIONS

by Hector N. Qirko

Abstract. In recent years, much has been learned about the strategic and organizational contexts of suicide attacks. However, motivations of the agents who commit them remain difficult to explain. In part this is because standard models of social learning as well as Durkheimian notions of sacrificial behavior are inadequate in the face of the actions of human bombers. In addition, the importance of organizational structures and practices in reinforcing commitment on the part of suicide recruits is an under-explored factor in many analyses. This essay examines the potential applicability of evolutionary models of altruism to the understanding of commitment to suicide on the part of terrorist organizational recruits. Three evolutionary models of sacrificial behavior in nonhuman species and many categories of human behavior are explored cross-organizationally: reciprocity, inclusive fitness theory, and induced altruism. Reciprocal altruism is unlikely to be a major motivator in suicide attacks because the costs exhibited by attackers are too high to be adequately compensated. However, the role of evolved self-deception in perceptions of personal death, and thus of rewards in the afterlife, is potentially illuminating. Inclusive fitness theory can help explain the motivations of attackers because rewards to kin often are offered by organizations to suicide recruits. However, suicide bombers also often act out of revenge for the loss of or injury to relatives, and inclusive fitness theory generally, as well as more specific theoretical models of retaliatory aggression, may not adequately account for the bombers' actions. Predictions from induced altruism theory appear to be well supported because suicide terror organizations tend to be tightly structured around practices intended to maintain and reinforce commitment though the manipulation of kinship-recognition cues.

Keywords: altruism: inclusive fitness; induced altruism; kinship recognition clues; reciprocal altruism; suicide terror

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In recent years a great deal has been learned about suicide terrorism—or suicide attack (following C. Reuter 2004) by human bombers (Strenski 2003, 5), both more politically neutral descriptions of the behavior and used as well throughout this essay. It occurs almost entirely in organizational contexts (Crenshaw 1990; Moghadam 2002; Pape 2003; 2005). As such, it is typically not an act of individual desperation but the calculated outcome of strategies designed to achieve specific goals (Atran 2006; Bloom 2005; Crenshaw 1990; Hafez 2006; 2007; Hoffman and McCormick 2004; Mannes 2004, xiii–xv; Pape 2003; 2005; C. Reuter 2004). It is not linked to any one political or religious ideology but can occur in various contexts of political domination (Pape 2005) and competition among rival groups (Atran 2006; Hoffman and McCormick 2004). Research strongly suggests that individuals who commit suicide terror are as unlikely to suffer from mental illness, psychological trauma, educational deprivation, familial instability, or poverty—or to come from countries that are poorer (Abadie 2004)—as those in the same population who do not (Atran 2003; 2004; Brym and Araj 2006; Hafez 2006; McCauley 2002; Merari 2005; Post 1987; 2007; Sageman 2004; Saleh 2004). In fact, if anything, human bombers are sometimes better educated and come from more privileged circumstances than the norm (Silke 2003). In general, however, they "span their population's normal distribution" (Atran 2003, 1537) and so resist attempts at psychological and demographic profiling.

What remains poorly understood is why such individuals would be willing to sacrifice themselves in such a way for any cause, under any conditions. Although there are many theories (for example, Interdisciplines 2006), there is no consensus around any of them. And, from a number of theoretical perspectives ranging from rational utility to Darwinian individual fitness maximization, the behavior appears to makes no sense.

Some possibilities can be dismissed out of hand. Although attackers may be lured into suicide by leaders who do not reveal that a mission will result in certain death (Merari 1990), this is a rare occurrence. Nor are human bombers a self-selecting population of individuals who desire to die and have found socially sanctioned opportunities to do so. Recruiters for terror organizations typically reject or carefully screen volunteers for suicide missions (Hafez 2006, 21; Kushner 1996, 330; Moghadam 2002), and a desire for suicide typically is not a selection criterion. As one Palestinian Islamic Jihad member put it, "If there were a one-in-a-thousand chance that a person was suicidal, we would not allow him to martyr himself" (Goldberg 2001, 37). Human bombers appear unlikely, on average, to be more suicidal than anyone else.

In anthropology and related disciplines, a longstanding view of the impetus for such sacrificial behavior is enculturation, or what John Tooby and Leda Cosmides (1992) have called the Standard Social Science Model. Generalized cultural norms, as well as more specific religious and political

ideologies and "the behavior and public representations of other members of the local group" (1992, 26), can shape member notions of what constitutes appropriate action, even in the case of suicide bombing.

On the face of it, this is a persuasive argument. Culture-specific views of life and death do influence attitudes regarding suicide terror, as in the case of the relationship of Japanese kamikaze to the deeply ingrained Bushido code (Forquer 1995; Shetfall 2006). Christopher Reuter's work in south Lebanon persuasively describes the "martyr cult" established by Hezbollah, where bombers' names and sacrifices are celebrated by the community, and "The very decision to volunteer for a bombing mission hinges on what relatives, friends, and local religious leaders have said about the actions of earlier volunteers" (C. Reuter 2004, 12). Similarly, in Palestinian contexts, "family and community" recognize suicide bombers as heroes and freedom fighters (Fields, Elbedour, and Abu Hein 2002, 215). Organized media attempts to shape attitudes toward violence and suicide are well documented, involving everything from graffiti and posters to videos of attacks, prerecorded martyr testaments, and children's television shows (Oliver and Steinberg 2005; C. Reuter 2004, 52–78). And, as both social learning (Bandura 1990; Victoroff 2005) and evolutionary (Boyd and Richerson 1985; Logan and Qirko 1996) theories suggest, observation and imitation of valued traits often lead to their adoption irrespective of their specific nature and even when they have maladaptive personal or social consequences.

However, social learning cannot fully explain individual motivation to engage in suicide terror. First, as Jeff Victoroff argues, the model "fails to explain why only a small minority among the hundreds of thousands of students educated for jihad in madrasas, the millions exposed to extremist publications, and the tens of millions exposed to public glorification of terrorists have become terrorists" (2005, 18). This point is even more relevant to suicide attack, given that many fewer of those who believe in the ideals or strategy of a cause commit to such drastic action (Schbley 2000). Second, different normative patterns can underlie suicide terrorism, to the point that none is predictive of individual motivation (Merari 1990). For example, adherence to specific religious ideologies will not explain human bombing because "half of the suicide missions in the three decades before 2003 were carried out by secular rather than religious organizations" (Argo 2006a, B15; 2006b). As Robert Pape (2003) points out, one of the most active suicide terrorist groups in recent history is the LTTE, the Tamil Tigers of Sri Lanka, whose Marxist/Leninist ideology is at odds with the religious extremism with which suicide terrorism is conventionally associated. Thus many different ideologies can encourage the same behavior (Ferrero 2006), and groups that share similar ideologies do not always adopt terrorism or its suicidal variant (Goodwin 2006, 320). Further, in some cases such as Chechnya, families and local communities are not supportive

of the actions of the terrorist groups that act in their name (Speckhard and Ahkmedova 2006), and in Iraq human bombers often are recruited from terrorist groups that are outside the local communities in which they operate (Hafez 2006, 12). Researchers go too far when they argue, as C. Reuter does (2004, 12), that "Suicide attackers will only be properly understood, insofar as any comprehensive understanding can be possible, by scrutinizing their spiritual-intellectual world, the ideologies that have molded them, and the myths they grew up in." Clearly, more specific dynamics than cultural or community norms and values must influence the motivation and behavior of human bombers.

Many researchers have explored the importance of small-group dynamics in influencing the motivation of suicide attackers (Atran and Stern 2005; Hudson 1999; Kruglanski and Golec 2004; Post 1987; 2007; Sageman 2004; Schbley and McCauley 2005). As Scott Atran puts it, these processes "can trump individual personality to produce horrific behavior in otherwise ordinary people" (2006, 141). Individual identity is submerged within the group to such an extent that life sacrifice is seen as a reasonable act. Charismatic leaders, group camaraderie, and deeply felt and exploited ties to family and friends all are potentially key factors in creating a "collective identity" (Post 2007, 8). However, there is little consensus in the literature as to which of these will be most relevant. The underlying processes associated with individual transference of commitment to the group still need to be better identified.

In sum, what motivates suicide attackers remains an open and important question. This essay explores the propositions that suicide attack is best understood as altruistic behavior in organizational contexts, and that organizations in which it takes place make use of practices that appeal to human altruistic dispositions in order to maintain and reinforce commitment to such sacrifice. Why any given individual commits to suicidal action is influenced by many factors, including adherence to group and community norms and ideologies as well as personal disposition and circumstances, and so can never be fully known or predicted. What can be better understood is the degree to which suicide terrorist organizations maintain and reinforce this commitment via institutional practices and the degree to which these practices exhibit cross-organizational regularities in spite of the temporal, geographic, and cultural variability that accompanies suicide in group contexts.

Key to this perspective is a more robust theory of altruistic behavior than is typically found in the literature on suicide attack, one that involves several models stemming from Darwinian evolutionary theory. These models have received strong support in many nonhuman species but remain controversial as applied to humans. Although some researchers have discussed the possible relevance of evolutionary models of altruism to suicide terror (Atran 2003; Tullberg 2004), in this essay I attempt to provide a

more focused and comprehensive analysis of their potential relationship to organizational structure and practice in terrorist groups as related to the reinforcement of their members' commitment to suicide.

Suicide Terrorism in Organizations

The notion of the lone bomber is appealing—yet, except in the final act itself, incorrect, because

> so far there has not been even a single case of a person who carried out a true terrorist suicide attack . . . on his or her own whim. In all cases, it was an organization that decided to use this tactic, chose the target and the time, prepared the explosive charge, and arranged the logistics necessary for getting the human bomb to the target. (Merari 2005, 446; see also Crenshaw 1988; 1990; Moghadam 2002; 2003; Pape 2003; 2005)

A definition of suicide terrorism as *institutionalized, violent use of suicide for the furthering of organizational goals* therefore appropriately shifts the focus from individual acts and actors on the one hand, and religious and cultural ideologies on the other, to organizational contexts and dynamics.[1]

This has several implications. Organizations are "special action structures" (Nash 1994) designed to effectively achieve specific goals. They are shaped both consciously by leaders and members at any given time and historically by inherited organizational information. Specific organizational practices, then, develop and are maintained because of their efficacy in meeting organizational needs around a variety of issues, including organizational survival, cohesion, and resource acquisition and distribution. It follows that cross-organizational analyses of the structure and practices of organizations that make use of suicide terror should be a productive means through which to explore questions of recruit motivation. Even if it is true that suicide attacks are "the most complete realization of a particular rhetoric and ideology" (Oliver and Steinberg 2005, xxii), the organizational characteristics that influence the decision of some members to commit suicide for others are important also.

One important observation from this perspective is that the "suicide terrorist organization" does not, in fact, exist. Instead, there are organizations that use suicide terrorism as one of several means through which to achieve their goals (Goodwin 2006; Pape 2005). Further, an important distinction within these groups is that between organizational leaders and trainers who employ suicide terrorism and the members who commit to carrying out the acts—or, following William Zartman (2003), between organizers and agents. There are fundamental differences between these two groups, and it is clear that they do not overlap. John Reuter (2005) says of them in Chechnya, "those who plan and implement suicide terrorism are analytically distinguishable from those women who actually carry out the attacks." Organizers make use of specific practices to motivate and train recruits to become the most reliable and effective weapons possible. Finding

individuals who are willing to commit suicide on command is ultimately an organizational goal like any other, and practices and protocols must be in place to assure that commitment is maintained and reinforced as far as possible. Suicide is therefore "a willful choice made by an organization for political or strategic reasons, rather than . . . the unintended outcome of psychological or social factors" (Crenshaw 1990, 7–8). Assaf Moghadam concludes, "Few efforts have been made thus far to devise an analytical framework for understanding the processes and factors that underlie the development of the suicide bomber and the execution of suicide bombing attacks" (2003, 67).

Altruism and Primary Groups

Notwithstanding the aggressive violence of suicide attack, its sacrificial component is obvious and ubiquitous, and altruism often has been cited as the motivation for suicide terrorists (Esposito 2002, 99–100; Hoffman 1998, 43). Where further discussed as a psychological process, it usually has been via Emile Durkheim's ([1897] 1997) model of altruistic suicide (Gould 2003; Pape 2003; 2005; Pedahzur, Perliger, and Weinberg 2003; Riemer 1998), which posits that individuals with "high levels of social integration and respect for community values" (Pape 2003, 3) commit suicide out of duty and see their own lives as "secondary to the interest of the collective" (Pedahzur, Perliger, and Weinberg 2003, 408). "Acute" altruistic suicide often includes a strong component of faith in an afterlife and the martyr's place in it (Pedahzur, Perliger, and Weinberg 2003).

This theory is problematic for several reasons. First, many persons exhibit high levels of social integration yet do not become human bombers. Additionally, in some contexts it is doubtful that suicide attackers are highly integrated into their communities. Further, the theory is definitionally vague. Ivan Strenski notes (2003, 6) that Durkheim "puzzled" over the relationship between suicide and life-sacrifice and the respectively negative and positive societal evaluations of intentional death. His solution, to classify suicide based on social attitudes, raises more questions than it answers, especially because various communities can have very different evaluations of the same actions by the same individuals (as in "one man's terrorist is another's freedom fighter," for example Ganor 2002).

Further, that positive social evaluation is sufficient to cause individuals to commit suicide is at least open to question, even if the rationale makes sense from the point of view of the community requiring and celebrating sacrifice. Strenski views the sacrifice of Palestinian bombers as a "gift," a "sacred duty" approved of by "societies of reference" (2003, 22–23). But are all members of something as large and amorphous as a community the referents? More likely it is a subset that can be defined and understood by its specific relationship to the individual. One possibility is the primary group, following Charles H. Cooley (in Clow 1919). Luther Lee Bernard

defines these as "face-to-face organizations of individual responses on the basis of very elementary or primitive impulses or sets of impulses, native or acquired, in human nature. These groups condition the individual's responses from his earliest days. . . . The most primary of all groups is perhaps the family" (Bernard 1926, 412).

Durkheim predicted that leaders of small, cohesive groups would tend to commit heroic suicide, but Jeffrey Riemer found that only 50 percent of Congressional Medal of Honor recipients who gave their lives for their comrades were in fact leaders. In suicide attacks, of course, very few are. Instead, Riemer argued that loyalty to primary groups helps explain heroic suicide. These combat units are based on "face-to-face interaction, cooperation, and strong emotional attachment" (Riemer 1998, 111) and clearly recall the cell or small-group structure of many suicide-attack training and operational contexts (Atran 2003; Sageman 2004). As noted by Clark McCauley (2000),

> Research with American soldiers in particular has shown that, in the stress of combat, most soldiers fight less for cause or country or hatred of the enemy than for their buddies. The half dozen or dozen men who share the loneliness of the battlefield are closer than brothers; they fight because to do less is to endanger the group on which they are totally dependent.

Thus, while Durkheimian views of altruism lack explanatory and predictive power, the concept of primary referent groups provides a bridge to another theoretical model through which to view sacrificial behavior. Although it is expected in the social sciences that individuals will behave altruistically for others (Schroeder et al. 1995), neo-Darwinian evolutionary theory predicts the opposite—that what appears to be altruism will in fact typically be beneficial in some way, as any genetic underpinnings for costly behavior without reward should be expected to have fallen away as a result of natural selection in evolutionary history (Okasha 2005). From this perspective, altruism, or "self-denying or self-destructive behavior performed for the benefit of others" (Wilson 1987, 10), has a stricter Darwinian definition: The sacrifice must involve fitness, or reproductive success (Williams 1981). Motivation, although linked to the context in which the behavior takes place, is not part of the definition, thereby forestalling the philosophical and other definitional debates about the genuineness of inclinations to act altruistically (Batson 2002, 90). Therefore, in evolutionary terms, altruism is simply an act that results in a loss of reproductive potential for one organism and a gain for another, measured with reference to either viability ("somatic effort") or reproduction itself (Alexander 1987, 114). As such, it provides the most robust theoretical framework for exploring suicidal behavior in terrorist contexts.

Edward O. Wilson called altruism the "central theoretical problem" (1975, 3) in an evolutionary view of social behavior more than thirty years ago, and so it remains, especially with respect to human behavior. Debates

continue regarding it within evolutionary biology (for example, Post et al. 2002), but evolutionary models nevertheless can adequately explain how tendencies to sacrifice for others may have arisen in humans (Qirko 2005). Further, they provide possible insights into how organizations can reinforce altruistic tendencies in the pursuit of their goals. This is because these models rely on the identification by potentially altruistic individuals of cues related to the likelihood of reciprocation on the part of others as well as likely kinship relationships among them. Proximate cues associated with adaptive behavior in the past may be disassociated in novel, more recent environments. For example, the use of contraceptives has in some circumstances disassociated sexual behavior from its certainly evolved reproductive contexts (Kanazawa 2003). In some cases, maladaptive behaviors may become commonplace, particularly in environments dramatically different from those typical throughout human evolution (Logan and Qirko 1996). Because they are by definition indirect, cues also can be subject to error and manipulation (Flohr 1987). Given that deceit and manipulation are important components of human behavioral strategies (Byrne and Whiten 1988; Cronk 1994; Ridley 1993, 329–44), proximate mechanisms can be manipulated in novel social contexts. One example is advertising, which can appeal to aspects of evolved cognition by enhancing cue-related attributes of products and messages (Grammer 1998; Saad 2007). Thus it is reasonable to expect that organizations will attempt to encourage and reinforce commitment to altruistic behavior that benefits them by manipulating cognitive cues associated with that behavior.

In what follows I review suicide terror organizational structure in terms of the major theories related to altruistic behavior—reciprocity (direct and indirect), inclusive fitness or kin selection, and induced altruism[2] (Trivers 1985)—and their potential applicability to the motivation of recruits for suicide campaigns. Illustrations are drawn primarily from the major modern-era suicide terror organizations (following Pape 2005): Liberation Tigers of Tamil Eelam, Hezbollah, Hamas/Islamic Jihad, and Chechen Separatists, as well as those Marc Sageman (2004; 2005) calls global Salafi jihadists, including al-Qaeda and affiliated or similar groups found in Iraq and around the world.

Evolutionary Models of Altruism and Suicide Terror Organizations

DIRECT RECIPROCAL ALTRUISM. Tendencies to behave altruistically can be selected for if they lead to behaviors that yield a return benefit greater than their cost. Reciprocal altruism, then, occurs where two individuals trade altruistic acts. As formulated by Robert Trivers (1971; 1985), it requires repeated reciprocal interactions among specific individuals exchanging benefits of equal fitness values so that the costs of being cheated

(providing the benefit without receiving it in return) in any given instance will not be too high. It appears to explain several categories of behavior among unrelated individuals within species (Wilkinson 1984), particularly primates (Brosnan and de Waal 2002; Schino 2007; Seyfarth and Cheney 1984) as well as some between-species interactions, such as the relationship of "cleaner fish" to their hosts (Trivers 1971). In humans, reciprocity is likely when there is "a big payoff, repeated interactions, and having somebody watch" (Betzig 1997, 10). However, evidence that humans behave in accordance with predictions based on reciprocal altruism theory as opposed to simply following cultural norms remains difficult to obtain, although there is some support from models (de Vos and Zeggelink 1997) and empirical research (Essock-Vitale and McGuire 1985; Gurven 2006; Schroeder et al. 1995).

On the face of it, reciprocal altruism does not appear to be relevant to the organizational contexts of suicide terror. As Trivers argued, "we must remain alive to receive the return effect. There is always some chance that we will not survive to enjoy the return benefit, and this chance of mortality will lead us always to devalue future effects when compared to present effects" (1985, 49). As an example of what might be called terminal altruism, suicide attack provides to its agents a loss instead of a payoff. No repeated benefits are exchanged, and ultimately the cost of the act cannot be compensated.

However, a variety of potential agent/organizational contracts have been suggested by suicide terror researchers, although not in evolutionary terms. Some models focus on currency pertaining to the lifespan of the individual sacrificer. Mark Harrison (2006) compares martyrdom to ordinary suicide in terms of the potential importance of identity in the social contract. That is, terrorist organizations offer young recruits an honored new identity that erases a problematic prior one. Ronald Wintrobe (2003) argues that social solidarity and its benefits, especially when multiplied by organizational attributes that reinforce individual sense of belonging, can be perceived as sufficiently valuable to result in a rational decision of life sacrifice. Bruce Hoffman and Gordon McCormick suggest that the roles associated with shared social identities place terrorist group recruits in "prepackaged contracts" (2004, 253). These contracts reward adherence and so reinforce the identity-related qualities for which organizations selected recruits in the first place and "ensure that their sense of identity and obligation are aligned with the groups' operational requirements" (2004, 252–53). This is accomplished in large part by replacing the concept of suicide with that of honored martyrdom and, more generally, by creating and promoting a "culture of individual self-sacrifice" (2004, 258). Ariel Merari (2005) argues for a similar yet negative adherence contract: Members of suicide cells commit to an "I will if you will" promise that, although not rewarded per se, is difficult to break. Lawrence Kuznar (2007) proposes an "inequity

aversion" theory, wherein the perception of being on the losing end of unequal societal payoffs, and the accompanying social humiliation, can influence a rational calculus and so lead to risk-prone behavior such as terrorism. Mohammed Hafez (2007, 142–45) also sees shame as a motivator, in his case a more generalized sense of the humiliation of Islam and its people at the hands of non-Muslim powers. Members of suicide terror groups who view their economic and social situations as unfair thus resent their position, and "Not only do individuals feel this resentment, but because their frame of reference is the group to which they belong, their humiliation strengthens bonds to their groups in an effort to redress the inequity" (Kuznar 2007, 324). To Kuznar, altruism need not be invoked to explain terrorist acts, only the calculus that a "threat to those one trusts may be seen as threat to one's self" (2007, 324).

However, these models fail to address the central problem for evolutionists in contract-related theories: Suicide is beyond cost/benefit and risk assessments in any conventional sense. Although the calculi discussed above may be relevant to organizers, the agents who sacrifice their lives receive no commensurate fitness benefit that could justify the act. Further, merely to argue that group identity in some sense replaces an individual one is insufficient, unless some presently or once adaptive psychological processes are coopted or manipulated in these contexts in order to produce such maladaptive effects. As Mario Ferrero has put it,

> However enormous the subjectively perceived benefits from joining a suicide group may be, if the probability of survival is exactly zero, the expected present value of membership falls to zero, and the conventional expected utility calculus breaks down. History is strewn with military, political, or religious actions that involved a very high risk of death, but high probability is qualitatively different from probability one—or so it seems. . . . (2006, 855–56)

Ferrero's solution to the problem is that benefits provided prior to sacrificial action that appeal to "normal, selfish preferences" (p. 858), along with severe sanctions and a probabilistic rather than certain death outcome, can explain why recruits would rationally join terrorist organizations. But it is unlikely that suicide attackers would perceive high status and intensely pleasurable days or weeks prior to action as "worth a whole life" (p. 858). Further, most human bombers expect certain death.

However, another kind of reciprocal contract often is made by suicide terrorist organizations with their prospective agents, one in which the currency offered in exchange involves material and spiritual rewards provided in the afterlife. Although the notion of "72 virgins" has been sensationalized and mischaracterized in the Western popular press (Silke 2003), clearly in many contexts of suicide terrorism the offer of rewards after death is common. These rewards often are considered credible by would-be human bombers. For example, Hafez notes that one of the three major motivations for suicide among Palestinian attackers, based on their statements,

is reward after death (2006, 45). Although it is possible that such statements reflect susceptibility to ritual or propaganda more than actually held beliefs, this is unlikely. Reuter provides both the public and private (to be viewed by family only) documents left behind by an Islamic bomber. Although they differ in some respects, the rhetoric is sufficiently similar to suggest sincerity of belief in the likelihood of eventual rewards:

> *Public:* "My brothers and my family: I shall be in Paradise, where everything will be mine."
> *Private:* "I know that it's hard and difficult for you to lose me, but don't forget that we'll see each other in Paradise. This is God's promise. What a wonderful and lovely promise if we all see each other again there." (C. Reuter 2004, 91–92)

Suicide bombers may simply be irrational, as Jan Tullberg (2004) proposes, because the reciprocity offered by organizations is so patently illusory. Or it could be argued that religious faith, including belief in an afterlife, is a sufficient motivator. However, we are still left with the fact that very few sacrifice their lives based on that faith, and yet there do not seem to be psychological or demographic variables that distinguish them from the rest of the communities of believers who do not.

An alternative view involves investigating some of the adaptive consequences of human cognitive processes related to death. The generally accepted model is Ernest Becker's denial theory, wherein our inability to face the end of our existence relates directly to creative and positive personal, religious, and cultural behavior. Heroism then is ultimately narcissistic. Knowledge of death is universally present but terrifying and therefore repressed; thus, even when "marching into point blank fire," the soldier "at heart doesn't feel that *he* will die, he only feels sorry for the man next to him" (Becker [1973] 1997, 2). He will occasionally sacrifice his life for others, of course, but must "feel and believe that what he is doing is truly heroic, timeless, and supremely meaningful" (p. 6). In the context of reciprocity, it seems that in Becker's view the suicide bomber's return benefit is living forever in the memory of others. As McCauley (2000) states, "The human answer to mortality is participation in a group that will not die when the individual dies." Hoffman and McCormick point out a problem with this logic: One would have to be simultaneously a believer and a pragmatist to be willing to die for belief yet also calculate the costs and benefits involved. Thus they doubt the likelihood of suicide bombers' "cutting a deal with God" (2004, 252).

A related possibility is that although we do understand death, there are cognitive biases against fully comprehending, at least in some contexts, that we will suffer it as individuals. Lee Kirkpatrick notes that "an explanation for religion as an adaptation for ameliorating fear of death begs the question as to why human minds would be built to fear death in the first place" (2001, 927). A clear understanding of personal death is inconsistent with an evolved psychology, as are other objective assessments of reality,

which research suggests are related to a lack of mental health rather than its opposite (Smith 2004, 27–28; Taylor and Brown 1988). Certainly work on self-deception by Trivers (2000) and others (Lockard and Paulhus 1988), although still in its infancy, suggests the possibility of self-denying adaptive mechanisms related to personal death. We deceive ourselves with respect to a variety of personal characteristics, and these biased self-assessments often are instant, unconscious, and persistent, suggesting their relationship to cognitive adaptations (Krebs and Denton 1997). If we in some sense also deceive ourselves regarding personal death, cues to reciprocal benefits in the afterlife may be interpreted as equivalent, to some degree, to benefits obtained during life. "Life is intrinsically future oriented and mental operations that keep a positive future orientation at the forefront result in better future outcomes" (Trivers 2000, 126). Cues to rewards in reciprocal relations certainly are relevant to both attempts to obtain a positive future outcome and their associated mental operations. Further, in novel environments such as modern warfare and organized terror, "a long evolutionary history of derogating others makes misassessments especially likely" with respect to risk and costs (Trivers 2000, 129). Also relevant may be findings that perceptions of death vary according to age (Bering and Bjorklund 2004; Bering, Hernandez Blasi, and Bjorklund 2005), because young recruits are preferred by virtually all suicide terror organizations (Atran 2003).

INDIRECT RECIPROCITY. More generally, reciprocity occurs at all levels of human interaction, and it is possible that human cognitive capacities for individual recognition and memory, as well as social organization wherein third-party rewards and punishment are common, allow for variants of Trivers's model to exist as evolutionary stable strategies (Nowak and Sigmund 1998). The best known example is Richard Alexander's (1986) notion of indirect reciprocity, where third parties observe reciprocal interactions and reward or punish participants on that basis. It appears to apply to nonhuman species as well as to between-species interactions (Bshary 2002). For humans, indirect reciprocity is defined as "a beneficial act whose return comes from someone other than the act's recipient" (Tullberg 2004, 1993) and is both "the foundation of moral, ethical, and legal systems" (Alexander 1986, 255) and central to the understanding of human cognition and psychology (see also Alexander 1987; Boyd and Richerson 1989). Some experimental (for example, Seinen and Schram 2006) and empirical (for example, Price 2003) evidence seems to follow.

Tullberg investigates the possible role of indirect reciprocity in suicide terrorism but concludes that forces such as novel environments, social manipulation, and fuzzy human thinking can sufficiently account for the presence of true altruism "more or less systematically in society" (2004, 1197). Atran (2003) explores the potential relevance of signaling theory,

given that costly signals of commitment can yield reciprocated, third-party benefits. Commitment in this context is "an act or signal that gives up options in order to influence someone's behavior by changing incentives or expectations" (Nesse 2001, 13). Dispositions to commitment "may have emerged under natural selection's influence to refine or override short-term rational calculations that would otherwise preclude achieving goals against long odds" (Atran 2003, 1537), and Atran suggests that terrorist organizations may manipulate these dispositions in recruitment and training to engender and reinforce commitments to sacrifice (see also Sosis and Alcorta 2003 with respect to religious groups). However, this model relies on the problematic assumption that the disposition to make commitments to life-sacrifice could have evolved through not only social selection but also natural selection (Qirko 2004a), given that its role is likely to be weak, complex, and perhaps irrelevant (Nesse 2001, 29). Atran (2003) suggests that rewards are engendered on average by a population if its members passionately commit to courses of action on which they are only rarely tested. How natural selection would operate in this case, however, is unclear without resorting to group-selection arguments that he dismisses.

Finally, Herbert Gintis and others have proposed the theory of strong reciprocity, which involves "a predisposition to cooperate with others and to punish those who violate the norms of cooperation, at personal cost, even when it is implausible to expect that these costs will be repaid either by others or at a later date" (Gintis et al. 2003, 154; see also Boyd et al. 2003; Rockenbach and Milinski 2006). Certainly sanctions against defection are present in many suicide terror organizational contexts (Ferrero 2006; Harrison 2006; Merari 2005). However, the theory of strong reciprocity is unlikely to be applicable, for several reasons. First, cooperative behavior does not require explanation because all parties involved receive benefits—it therefore "finds a peaceful home in evolutionary theory" (Trivers 1985, 57). Second, the altruism described by a strong-reciprocity model is on the part of the punishers, and here the distinction between agents and organizers in suicide terror organizations is once again important because the benefits obtained by organizers by punishing defecting agents are clear and require no explanation.

In sum, there remain issues in the applicability of both direct and indirect reciprocity and related concepts to suicide terrorism. These issues are a consequence of fitness currency because an act cannot benefit a participant in a reciprocal exchange, even in terms of third parties, if its cost is so high that no future rewards can be realized. Of course, as in all Darwinian "calculations," evolved proximate heuristics that have led to survival and reproduction in the past are more likely than cost/ratio assessments made possible by learning or culture (Ermer, Cosmides, and Tooby 2007). The question of interest is whether the proximate psychological mechanisms associated with entering reciprocal exchanges are subject to sufficient error

or manipulation that institutions can make use of them to reinforce commitment to suicide. The specific nature of human cognitive capacities associated with reciprocity is at this point unclear. Reciprocity rules certainly are learned and culturally variable (Schroeder et al. 1995, chap. 5). However, Cosmides and Tooby (1992) have argued that humans possess cognitive adaptations for "cheater detection" that relate directly to reciprocal social exchanges. Such specialized mechanisms would suggest not only cognitive universals and emotions associated with reciprocity (Moghaddam, Taylor, and Wright 1993) but also the possibility that linked cues can be manipulated.

INCLUSIVE FITNESS. Perhaps the most robust theoretical contribution of a Darwinian perspective to the understanding of social behavior is inclusive fitness theory. As first formally expressed by William Hamilton (1963; 1964; see also Dawkins 1979; Hughes 1988), it states simply that individuals share copies of their genes in differing degrees depending on the extent to which they are related. Therefore, any genetically driven trait that confers an advantage to more individuals sharing the trait than are lost due to its instructions can spread in a population. This notion has helped explain several of the apparent paradoxes of the natural world, including nonreproducing worker castes of social insects (Wilson 1975), and inclusive fitness predictions have received support in many species (Alcock 1998, 561–99; Emlen 1995; 1997; Jennions and Macdonald 1994). Humans often behave in ways consistent with these predictions as well (Essock-Vitale and McGuire 1985; Shavit, Fischer, and Koresh 1994; Smith, Kish, and Crawford 1987; Turke and Betzig 1985; Voland 1990; for a review, see Barrett, Dunbar, and Lycett 2002, chap. 3), including with respect to feelings of empathy that presumably underlie altruistic behavior (Cialdini et al. 1997; Kruger 2001). However, it is difficult in humans to evaluate the importance of learned norms for aiding social kin relative to potentially evolved psychology because much of the evidence remains circumstantial (Barrett, Dunbar, and Lycett 2002, 47; but see Madsen et al. 2007 for cross-cultural, experimental data).

Rewards/Benefits to Kin. Probably the most cited factor associated with the motivation of suicide terrorists is the material and intangible benefits their actions provide to kin. Many examples support the view that organizations use such means to reinforce, if not inspire, decisions to die. In Hezbollah and Hamas/Palestinian Islamic Jihad, families of suicide terrorists receive monetary sums for their kin's sacrifices, with estimates ranging from three hundred (Hoffman and McCormick 2004) to fifteen thousand dollars (Merari, as interviewed by Mark Juergensmeyer [2000]; see also Krueger and Maleckova 2003; Oliver and Steinberg 2005; Schbley 2000). Even present-day Iraq jihadists, although typically foreign, receive

money upon commitment to action, with larger sums going to their families upon their deaths (Jane's Intelligence Digest 2007).

In many of these cases, monetary rewards to kin are accompanied by elevated status provided by means of honorific titles and other markers of community approval, which can in turn lead to additional material benefits. Rewards also may be seen as extending beyond the life of family members. Farhad Khosrokhavar notes that the sacrifice of Palestinian suicide attackers

> ensures that family members will sit at the side of Allah. They will be treated with all the respect due to those whose sons die for the holy cause. In this world, they lead insignificant lives without dignity, but the situation will be reversed in the next world. It is not only the martyr who benefits, but all those who are linked to him by bonds of kinship. (2005, 136–37)

Kinship is further implicated in suicide terrorist organizations in other ways. Some groups are explicitly structured so that kinship bonds are important recruitment and commitment-maintaining tools. In Jemaah Islamiya (JI), a Southeast Asian terrorist group presumably linked to al-Qaeda (Sageman 2004, 114), brothers and other relatives are recruited and trained together and encouraged to marry sisters and daughters of fellow organization members (Ismail 2006). "Therefore," writes Noor Huda Ismail, "it becomes difficult for a member to defect from JI without seeming to betray his family in the process of disengagement" (2006, 6). Similarly, Hezbollah is organized in cells, with four to eight members "tightly knit by blood" (Schbley 2000, 175), and family ties are important for organizational security and logistics. Ayla Schbley suggests that before 1990 organization members displayed "the highest sense of idealism and devotion to their cause" (2000, 188). However, due in part to high payments to the families of suicide attackers, there has been a transformation of motivation from commitment to religious ideals to "blind addiction to money" (p. 189). Thus, over time, the organization has eroded, with cell members serving their own (primarily familial) interests instead of higher group ideals. This tension between individualism and communalism is repeatedly observed in developing religious groups (Andelson 1983; Bromley, Shupe, and Oliver 1982; Davis and Richardson 1993) that similarly demand material and reproductive commitment from their members (Qirko 2004b).

Concern about the resources and welfare of descendants may even explain why in some organizations participants in suicide attacks tend to be above average in wealth and education. Jean-Paul Azam suggests that increases in wealth also increase the lengths to which individuals will go to maintain it, and so "suicide bombing is just an extreme form of saving, such that the agent gives up any current consumption for the sake of enhancing the probability of his descendant to enjoy the benefit of the future public good" (2005, 196). Above-average education may yield more accurate assessments of future generations' needs and so may increase a willingness

to engage in ultimate sacrifice. David Goetze and Patrick James, however, explore the possibility that young, unmarried males with "diminished life prospects" may be encouraged to bring financial and other rewards to kin through their actions (2004, 184). This is consistent with Denys deCatanzaro's (1986; 1991) model of negative inclusive fitness, wherein reduced fitness potential of individuals, as well as their economic and psychological burdensomeness to kin, may be important variables influencing suicidal tendencies (for example, Brown et al. 1999).

Thus some researchers view benefits to kin, material or otherwise, as a powerful explanation for the motivation of suicide recruits (Blackwell 2006, for example). However, there are reasons to be cautious in this view. In more secular groups with weaker community support, such as Chechen rebels and Tamil Tigers, material and posthumous rewards for kin typically do not apply (Moghadam 2006, 35; J. Reuter 2004, 24). And even when benefits do accrue to kin, the organizations that provide them often are composed of affiliated nonkin members who are separated after recruitment from their families. Therefore, even if kin benefit from the commitment of suicide recruits, the maintenance of that commitment in nonkin settings may require additional reinforcement.

Revenge/Protection. In several suicide terrorist contexts, potential recruits have relatives who have died or suffered as a consequence of enemy action. In West Bank and Gaza strip refugee camps, for example, "potential bombers, who range in age from 12 to 17, almost invariably have a relative or close friend who was killed, wounded or jailed during Israeli occupation" (Kushner 1996, 332). Robert Brym and Bader Araj (2006, 1979) found that 82 percent of documented Palestinian suicide attacks during the second intifada were "reactive," that is, precipitated by specific Israeli actions such as the killing of a close relative. In Lebanon, Israel threatened locals with retaliation against imprisoned kin in Israel if they did not cooperate (C. Reuter 2004, 62). Similarly, "Most Chechen human bombers have lost loved ones in Russian 'counter-terrorist' operations or in fighting against Russian forces" (J. Reuter 2004, 3), so many that the press has called the female bombers, who predominate, "Black Widows" (see also Silke 2003, 97). And Hoffman and McCormick (2004, 259) describe how the Tamil Tigers first deliberately provoked the Sri Lankan government into retaliatory acts against the Tamil people, then recruited members from the victimized families (see also Post 2007, 97–98).

Organizations such as Hamas, Fatah, and PIJ in recent years have reacted to the pressure of Israeli campaigns against their leaders by operating in small, horizontally integrated groups (Pedahzur and Perliger 2006). While suicide missions have continued, recruitment, training, and leadership models have been transformed. Individuals working as "hubs" coordinate the necessary logistics and are driven by local competition as much as by

national-level strategic goals, and group members are neither formally recruited nor trained. Here kinship and other social ties appear instrumental, as recruits are obtained through friendship and family networks, and most hubs have "seen loved ones harmed or killed by Israeli security forces" (2006, 1993).

Thus revenge often is seen as a motivator for suicide attack (although some, including Hafez [2007], have focused instead on the psychological trauma associated with injury to kin). The extent to which relatives are seen as likely future targets of enemies also may serve as incentive for violent sacrifice. Theories of spite (Trivers 1985, 57–61) and retaliatory aggression, or "retaliatory infliction of fitness reduction" (Clutton-Brock and Parker 1995, 209), may be relevant, because revenge in this sense appears to be common among both humans and other social species. However, to the degree that retaliatory aggression is an example of negative reciprocity and so returns benefits to the aggressor, it suffers from the same problems as other reciprocity models because equivalent returned benefits are impossible in suicide. Its relationship to inclusive fitness is theoretically plausible because retaliation not simply to exact retribution but where relatives can be protected could be a powerful motivator in suicide terror contexts. Learning more about the categories of kin and injuries perceived by suicide recruits is a potentially illuminating way to test this possibility. For example, Basel Saleh (2004) examined the biographies of fifty Palestinian suicide attackers published in terrorist organization Web sites and found that almost half of the attackers' close consanguineal kin had suffered injury or death.

Where kinship ties apply to suicide recruit motivation, the desire for revenge or protection that these ties engender may be sufficient to motivate suicide campaigns and missions without a high degree of institutional reinforcement. If one has seen, or fears, loved ones being killed or hurt, charismatic leadership, recruitment rhetoric, intensive training, and institutional manipulation may be unnecessary to motivate action. This appears to apply in cases such as Chechnya, where revenge motivation seems to be accompanied by a relatively loose organizational structure (J. Reuter 2004), and perhaps in some Palestinian contexts as well (Oliver and Steinberg 2005). However, in nonkin settings typical of larger organizations, specific institutional practices are likely to be more important in maintaining and reinforcing commitment (and reducing the risk of defection or failure), in some cases including commitment to life sacrifice.

In sum, inclusive fitness theory can help explain the motivations of attackers, as organizations offer rewards to kin as incentives to suicide recruits. However, suicide bombers also often act out of revenge for the loss or injury to relatives, and inclusive fitness theory generally, as well as more specific theoretical models of retaliatory aggression, may not inform the bombers' actions in this context.

FICTIVE KINSHIP AND INDUCED ALTRUISM. The theory that suicide attackers suffer troubled familial circumstances and so are motivated by "replacement families" in organizations (Post 1984) does not seem to generally apply (but see Merari 1990, 203). However, the possible importance of fictive kinship ties in the social organization of these groups has been recognized by several researchers. Fictive kinship is "the extension of kinship obligations and relationships to individuals specifically not otherwise included in the kinship universe" (Wagner 1995), and Atran (2004; 2006) has commented on its likely role (see also Goetze and James 2004). Tullberg does so as well, although he calls it a form of specialized reciprocity:

> Parasitism is sometimes accomplished by pure force, but sometimes by manipulation of the host animal. The classical example is the adoptive parents of the cuckoo who act as if they were involved in providing for their kin. The cuckoo succeeds in manipulating the victims' understanding of the situation and to trigger a beneficial behavior. This parasitic behavior is based on a pseudo kin relationship. Men have used the feeling of affection between brothers and transformed it into the special bond of blood brothers. . . . In history there are brotherhoods of monasteries and of revolutionary activists. The ruler is normally described as the father of his subjects, from "the Holy Father" in Rome to "the Little Father" in Moscow. The point I want to make is that altruistic agitation is supported in its appeal by a pseudo kin vocabulary. . . . (Tullberg 2004, 1203–4)

Kin labels and roles certainly can encourage behavior toward nonkin that is appropriate to relatives. To some, this illustrates how culture, and not "blood," shapes kinship bonds in human societies (Sahlins 1976; Schneider 1984); to others, it is simply a metaphorical extension of the power of kinship as a socially organizing force in a variety of nonkin contexts, including businesses (Vlahos 1985) and prisons (Giallombardo 1966). More recently in anthropology, the traditional kinship distinction between actual and fictive kinship has been questioned, given the blurring between metaphor and reality that clearly takes place in many adoptive and other cross-cultural contexts (Carsten 2004). But few have offered answers to the questions "What are the mechanisms and slippages that allow kinship to take on these [metaphorical] guises? And what gives them their emotional power?" (Carsten 2004, 137) The model of induced altruism by kinship deceit, or the manipulation of kin cues, may help address these questions because it is another of the avenues through which fitness-reducing behavior can be explained from the perspective of Darwinian evolutionary theory (Trivers 1985).

Gary Johnson (1986; 1989; Johnson, Ratwick, and Sawyer 1987) has suggested that human altruism for the benefit of nonkin, particularly as related to military volunteerism, combat, and suicide, may be reinforced by the manipulation of the means through which individuals identify kin. The cues most likely to apply are association (where familiar individuals, especially during development, are kin); phenotypic matching (where a physical or behavioral "template" is innate or learned and those who match

it are kin); and kin terminology (Alexander 1990; Fletcher and Michener 1987; Hamilton 1964; Sherman and Holmes 1985). Johnson argued that institutions reinforce altruistic behavior by training recruits via practices that manipulate these cues to mimic kinship relations. Recruits typically are trained in close and intense proximity, in settings where uniforms and other apparel and insignias are used to enhance resemblances and relationships are characterized by the use of kin terms such as "mother country" and "brothers-in-arms."

Support for the contention that these cues inform human assessments of kinship is mixed but persuasive. The human brain seems particularly endowed to discriminate between human faces, supporting the importance of phenotypic similarity in kin recognition (Gauthier and Logothetis 2000; Wilson 1987; Zebrowitz 1997, 23–26), and humans cross-culturally use facial and other forms of physical resemblance as well as mannerisms, habit and speech patterns, and insignias and other forms of adornment to help identify relatives and cement kinship ties (Alexander 1990; Daly and Wilson 1982; DeBruine et al. 2008). Support for the importance of association is found in the apparent ubiquity among primates of the Westermarck effect, or the reduced sexual attraction among individuals reared together (Gray 1985). Children brought up together in Israeli kibbutzim (Shepher 1971; Talmon 1964) and in Taiwanese child marriages (Wolf 1995) often experience sexual disinterest and dissatisfaction, and there is evidence for other societies as well (Brown 1991, 118–29; Wolf 1995, 423–38). Finally, in all societies kin terms are "metaphorically extended . . . for evocative and propagandistic purposes" to apply to nonrelatives and even abstract entities (Daly, Salmon, and Wilson 1997, 287) and can elicit kin-appropriate behavior as a result (Johnson, McAndrew, and Harris 1991; Oates and Wilson 2002).

In research on institutionalized, lifelong vows of celibacy (Qirko 2002; 2004b) I developed a predictive model involving the three cues Johnson discussed and two associated factors. The two factors are (1) the age of recruits (essentially, the younger the better, based on the likelihood that kinship identification involves development-related sensitive periods) and (2) separation from kin (because research suggests that severed attachments can be relatively easily replaced, and so manipulated). I therefore predicted that institutions demanding celibacy of their members would

- encourage close association that replicates natural kin relationships (particularly parent/child and sibling roles);
- encourage the use of false phenotypic matches (such as uniforms, emblems, hair styles, speech patterns, and mannerisms);
- encourage the use of linguistic and other symbolic kin referents;
- prefer young recruits; and
- discourage association with actual kin.

Cross-cultural analyses of institutions that demand celibacy of their members, including the major religions and their offshoots, Aztec and Inca priestly classes, and the so-called Amazons of Dahomey, reveal strong support for these predictions. Because suicide terrorism is another example of dramatically self-sacrificial behavior exhibited in organizations, the model should apply to this behavior as well.

Several overviews of terrorist groups suggest that it does. Atran (2003; 2004) notes the importance of fictive kinship terminology and that recruits are almost always young and trained in intense association in camps (where the use of uniforms and other markers of phenotypic similarity is common) and cells. Merari similarly finds that suicide terrorist groups engage in "the relentless use of young boys for what is usually accepted as a man's duty" (1990, 199). And recruits typically are separated from kin and community. As Sageman (2004, 79–80) points out, "most terrorists are unmarried and those who are tend to sever family ties upon embarking on a terrorist career" (although the global jihadists he describes may be exceptions, as many members of al-Qaeda are married and have children).

More detailed data on specific groups also supports the predicted pattern. Tamil Tiger recruits typically are under the age of fifteen when they leave home, often facing opposition and criticism from family and community members, particularly if they are female. Their training is arduous and explicitly organized around kinship roles. Nanthini Sornarajah (2004) writes: "When cadres enter the LTTE, they develop simulated family relationships. Respectful forms of address customary within families are used such as older brother, older sister, or younger brother to denote relationships between cadres." Even young female members are called "mothers," while their leader, Velupillai Pirapaharan, is referred to as Annan, "Elder Brother." Each member pledges daily support not to the organization or the Tamil people but directly to Pirapaharan (Hoffman and McCormick 2004, 261). Members wear uniforms in training, parading, and missions. Those chosen for suicide cadres, the Black Tigers, undergo additional intensive training in small, isolated groups. They, too, have uniforms, although these are rarely worn during missions.

Another example is the Party of Allah in Iran under the leadership of Ayatollah Khomeini in the 1980s, which relied on a vast and complex system of recruiting and training martyrs for waging jihad. Preference was given to young recruits, because those over twenty were said to be corrupted by Western civilization. In one branch, the "Children of the Iman," children selected for martyrdom "no longer belong[ed] to their respective families" (Taheri 1987, 191). Once selected, they were sent off for training, which could last several weeks to months, in any one of three hundred or more camps. They wore distinctive red headbands identifying them as Volunteers for Martyrdom. They referred to each other as brothers and sisters and as the "children" of the Ayatollah (Taheri 1987; C. Reuter 2004).

Khosrokhavar (2005, 95) writes that to the young volunteers willing to sacrifice themselves for the Iranian revolution, "Khomeini was the 'superlative father' who usurped the role of *pater familias* in every domain where the defence of Islam was at stake." Recruits chose the organization as their new "family" and "married" it, describing themselves as "brothers" of their cohorts. They were cut off from their families (who often were compensated materially for their loss) and trained and lived in "unreal fraternisation behind closed doors" (2005, 88). They wore identical uniforms and enjoyed equal or greater status to adults in their communities.

This pattern is also consistently described for other groups, including al-Qaeda. Trainers in Afghan camps prohibit recruits from contact with others, and each receives "a uniform, boots, army belt, hat, handkerchief . . . jackets, gloves . . ." (Chivers and Rhode 2002a). Familial relationships play a "key role" (Gunaratna 2002, 96). Osama bin Laden is known as the "elder brother." Recruits are placed in "families" during training and deployment (Strenski 2003, 8), and each is treated "like a monk in a monastery in the Middle Ages" (C. P. Neimeyer, in Chivers and Rhode 2002b). Amri Taheri (1987) documents several examples of charismatic individuals forming terrorist organizations, sometimes including suicide terrorists, who use kin terms and other aspects of kin cue manipulation, especially as numbers grow and direct contact with charismatic leaders requires supplementary institutional practices. These organizations include the Muslim Brotherhood in Egypt, the Fedayeen of Iran, and the Lebanese Shi'ites. (For more discussion of the process of institutionalization in charismatic groups, see Qirko 2004b.)

Some suicide contexts, however, do not conform to the predicted pattern, and the recruitment and training of bombers seems much less formal than the model demands. This could be because, as Sageman (2004) argues, indoctrination is less important when group social ties and community reinforcement are stronger (see also Argo 2006b). As noted earlier, Chechen rebels appear to be so motivated by loss or injury to kin that relatively little recruitment and training is necessary. Also, the community can embrace martyrdom to such an extent that, again, little indoctrination is required. As Anne Marie Oliver and Paul Steinberg (2005) note concerning Hamas and the PIJ, after the end of the first intifada suicide bombings had become so institutionalized in the Palestinian communities that "lengthy indoctrination and training sessions for suicide bombers were no longer deemed necessary" (see also Post 2007, 229).

However, in more nonkin organizational contexts, the predicted pattern of kin-cue manipulation appears to apply, as it does in other military and religious institutions that demand costly sacrifice from their members (for example, Qirko 2004b), and for similar reasons:

> Every army aims to do what the terrorist group does: to link a larger group cause with the small-group dynamics that can deliver individuals to sacrifice. Every

> army cuts trainees off from their previous lives so that the combat unit can become their family; their fellow soldiers become their brothers and their fear of letting down their comrades becomes greater than their fear of dying . . . the psychology behind terrorist violence is normal psychology, abnormal only in the intensity of the group dynamics that link cause with comrades. (McCauley 2001).

What McCauley does not do, but kin deceit theory and related models may, is identify the specific means through which this familial identification is psychologically possible.

Discussion

Evolutionary models of altruism may offer some insights into the means through which organizations maintain and reinforce agent commitment to suicide. In the case of reciprocity, organizations often appear to enter into contracts with suicide terrorist recruits that involve immediate benefits and rewards in the afterlife. The relevance of reciprocity theory in this context, however, hinges on the possibility of an evolved psychology through which personal death awareness is denied or diminished. Otherwise it is difficult to see how material or other benefits offered a suicide agent for the duration of life or afterward could reinforce a commitment to suicide. The repeated exchanges and cue-based assessments of costs, benefits, and risks (that is, other party cheating) predicted by the theory are inconsistent with the terminal cost demanded of suicide agents.

In the case of inclusive fitness theory and sacrifice for genetic relatives, it is clear that suicide terror organizations often offer material and other rewards to the kin of suicide agents and that these agents are influenced in their commitment by these organizational practices. Unlike in reciprocity theory, inclusive fitness theory is theoretically consistent with suicide, depending on circumstances and factors that include perceptions of potential gains for kin relative to other options. Variability in the degree to which organizations provide kin rewards may relate in turn to the degree to which kin are either directly involved in the organizations or are victims of their enemies. In the first case, direct involvement of kin in organizations could be a powerful motivator for suicides if the agents' relatives were felt to be at risk, and of course terrorist organizations are by definition under constant threat. Suicide motivated by revenge for injury caused to kin who are not also in organizations is more difficult to understand in inclusive fitness terms. Its relevance likely will be related to agent perceptions that their suicides can prevent further injury and so depends on the nature and extent of such injuries and of the kin relationships involved.

In the case of kinship deceit via the exploitation of kin cues, the evolutionary model appears to apply to nonkin organizations and is to some extent empirically supported. Similar to inclusive fitness theory, kin deceit can help explain why individuals would be willing to sacrifice their lives.

Human cognition likely is designed to recognize kin via cues that appear to be manipulated by organizations in order to reinforce commitment to sacrifice. Tendencies to recruit young agents and separate them from kin are also consistent with the model. Here too, there is variability with respect to organizations using these practices, as for example in Chechnya. A prediction worth exploring in more detail is that loosely organized groups will be associated with actual kinship as a driver, while more structured organizations, including institutional practices related to kin-cue manipulation, will predominate in nonkin settings.

Several questions remain unaddressed, in part because of the lack of adequate data. Obviously, suicide terrorist organizations train and act in secrecy, rendering information on their practices sketchy, unreliable, and sometimes conflicting. Care must be taken to separate ideological and organizational principles at large from the specific contexts in which suicide bombers act and are trained. For example, although terrorist training camps typically are organized along "traditional" military lines that exhibit predicted institutional practices around kin-cue manipulation (for example, McCauley 2002), it is not known whether it is these or other aspects of military organizational structure that reinforce commitment on the part of suicide terrorist recruits. Additionally, differences clearly exist in the training of suicide cadres versus that of "ordinary" terrorist recruits in many organizations; how does the predicted pattern relate to these differences? The cases in which recruits from different organizations share training camps and protocols (for example, links between Hamas, PIJ, and Fatah) further complicate these issues.

Another issue relates to the difference between suicide agents and organizers. Juergensmeyer asks of suicide attacks, "Who would do such a thing, and why? The answers to such questions are best given by those directly involved in them" (2000, 70; see also Post 2007, 9). But successful human bombers obviously cannot be interviewed, and even when statements are left behind, or obtained from family members and failed or defecting suicide recruits (Bloom 2005; Ghosh 2005; Merari 2005; Post 2007), they may be shaped, if not scripted, by the organizations that sponsored the attacks. Further, agent perceptions may be suspect because we are all too often incapable of understanding and expressing the complexity of our own motivations. Knowing the mind of the suicide attackers may well be an "impossible task" (Oliver and Steinberg 2005, xxi).

Possible alternative explanations exist for the presence of organizational practices here associated with evolved cognitive models of commitment to suicide. For example, the youthful age of preferred recruits, consistent across most terror contexts, has been suggested to be significant. However, this preference is variously explained by terrorist groups themselves as related to ease of movement among the enemy or absence of familial responsibilities. Similarly, although several researchers (Atran [2003], for example) have

noted the potential significance of the small size of many terrorist units in fostering "family" ties, others have noted its importance in "cognitive damping" and bonding through ritual. And although, historically, combat and other high-risk units are small, "administrative requirements" may be the primary impetus for such a structure (Kellett 1990, 219). The use of uniforms and other identifying markers may also serve administrative or outgroup identification functions (although their use in secret training would still require explanation). And perhaps kinship terms are used to promote organizational solidarity because of their linguistic universality. Thus factors associated with biased cognition models may be accounted for in terms of other organizational functions. The strength of the models will rely on the rigor with which they are predicted by theory and tested through hypotheses. In the case of induced altruism through kin-cue manipulation, for example, the five predicted traits are interrelated elements from an independent theory supported by a substantial literature on kin-recognition mechanisms and evolutionary psychology and, to a lesser extent, studies of attachment theory and child development.

Diffusion is another potential explanation for the recurring presence of organizational practices here associated with evolutionary models of altruism. Traits may simply spread from one cultural setting to another, rendering their similarities weak in terms of support for predictive models. Suicide terror organizations have indeed influenced each other throughout their development, as in Chechnya, where the recent introduction of radical (Wahhabi) Islamic ideology, although only marginally embraced by the Chechen population as a whole, is implicated in the rhetoric and training of many suicide attackers (Reuter 2005; Speckhard and Ahkmedova 2006). However, cultural traits tend to diffuse not en masse but according to their perceived utility and congruence with existing cultural patterns (Barnett 1953; Rogers and Shoemaker 1971). Therefore the question of why the particular traits associated with organizational practices in suicide terror contexts are maintained in different cultural settings remains relevant.

Another factor to be considered is the role of coercion in suicide terror organizational contexts. Suicide attackers generally are willing participants in their own deaths, so force itself is rarely an issue. However, the line between free choice and coercion in organizational contexts is a blurry one. In some cases of recruitment and retaliation for reneging, coercion does seem to be present and could underlie seemingly willing cases of sacrifice (Ferrero 2006). For example, LTTE recruits wishing to leave the organization are required to perform two or three years of "punishment service" (Gunawardena 2004, 13). Merari (1990) points out that an understanding of the alternatives to suicide that recruits might face, including imprisonment and torture from external sources and negative sanctions from their organizations, is required to fully understand the role and nature of coercion in suicide attack.

Another issue is the role of friendship. Sageman (2004) and others (Schbley and McCauley 2005) find it to be of as much importance as kinship in suicide terror group dynamics. Sageman describes global Salafi terrorists as "a bunch of guys" whose strong bonds predate commitment to the jihad (2005). To the degree that kin-cue manipulation may be present as an organizing principle, this may not be an issue, because friendships, particularly longstanding ones, exhibit many of the same characteristics associated with kin relations (Schwimmer 1974). Here again, the nature and intensity of cues is likely to be important. Robert Cialdini and colleagues (1997), in testing Daniel Batson's (2002) finding that empathetic concern leads to genuinely altruistic behavior, note that the degree of identification of self in another, or "oneness," accounts for the significant differences between altruistic categories. They argue further that "kinship, friendship, similarity, and familiarity" all are cues expected to signal close genetic relationships and the variables that Batson finds related to genuine altruism (pp. 482–83). Another potentially relevant view is that of Tooby and Cosmides (1996), who describe an evolutionary "banker's paradox" for which friendship can be an adaptive solution. Just as people often need loans when they are in the worst position to repay them, in reciprocal and cooperative exchanges help may be most needed when it cannot be returned. Friendship, then, is an investment to mitigate that circumstance; "the deeper the friendship, the greater willingness there is to deliver benefits that are highly costly to the benefactor and/or not immediately (or conceivably ever) repayable by the recipient" (Schloss 2002, 226). Organizations therefore may exploit tendencies to engage in costly sacrifice for individuals sharing deep friendship bonds by attempting to recruit them as pairs or groups, as those Sageman describes, or by helping create and strengthen friendship ties among previously unfamiliar agents.

Conclusions

This essay has explored the possibility that suicide terrorism is a decision to terminally sacrifice fitness in the context of institutions structured so as to maintain and reinforce it via evolved predispositions to behave altruistically. To some, the idea that evolved human biases may relate to the reinforcement of suicide attackers' motivations to sacrifice may seem improbable, even absurd. But because suicide terror agents tend to be normal with respect to psychological and demographic variables, their commitment to kill themselves for a cause should be difficult to maintain. It could be that social norms make such commitment easier. However, social learning does not explain why relatively few members of communities that value martyrdom commit to suicidal action or why in communities that do not value it some individuals nevertheless are willing to do so.

It is in culture writ small, then, or the dynamics of the terrorist groups themselves, that the answer to commitment reinforcement must lie. But,

although group identification and bonding often are cited as key, the processes by which this occurs often are assumed or described without sufficient exploration of the psychology that may be involved. As Arie Kruglanski and Agnieszka Golec (2004) suggest, "However compelling the motivational reasons for suicide terrorism might be, the survival instinct and the fear of death remain a powerful psychological force," and there is no consensus around the means or reasons by which this powerful force can be overcome. The possibility that evolved biases relating to conditions under which sacrifice for others is adaptive may be involved is therefore reasonable. Further, present understanding of these biases suggests that humans can and will attempt to manipulate them in the context of organizations in order to achieve particular goals. Terrorism is not a single phenomenon, and terrorists, including suicide attackers, vary widely psychologically (Victoroff 2005). Whatever ultimately unknowable combination of heredity, development, history, ideology, culture, and circumstance lead some individuals to display a willingness to engage in suicidal sacrifice, how organizations may exploit evolved human psychology to maintain and reinforce commitment to do so is a relevant and important question.

There are several caveats, however. The models explored here do not assume or predict that humans will be blindly manipulated into behaviors that benefit others. They only suggest that cultural practices that tap into an evolved psychology can reinforce decisions to engage in particular behaviors, even those with significant costs. Further, the practices associated with these models are not presumed to be consciously selected by organizers as commitment reinforcers. Many practices are simply inherited, or borrowed from other groups and contexts, particularly military ones, when perceived as effective. If self-destructive valor in conflict is as old as organized conflict itself (Khasan 2003, 1049), it makes sense that the modern organizational reinforcement of commitment would look to traditional military training methods (McCauley 2002). Here, obedience, group cohesion under stress, and willingness to risk lives while engaging the enemy are much more important results of indoctrination than the acts of combat suicide that occasionally occur (Henderson 1985). Similarly, suicide terrorist cadres usually are a small subset of the forces being trained for more conventional purposes.

Nevertheless, although the most dramatic forms of sacrifice are the most puzzling, any type of sacrifice for unrelated others in institutional settings should be expected to benefit from reinforcement, in that competing individual and familial interests can jeopardize the meeting of institutional goals. Many categories of altruism therefore are reinforced through institutional practices, including financial contributions and participation in costly and time-consuming rituals and service. In the case of a minority of contexts and individuals, this set of commitment-reinforcing practices can reinforce more dramatic, even terminal, forms of altruistic behavior.

It should be no surprise, therefore, that many of the suicide terror organizations described here appear to make use of all three sets of practices potentially associated with evolutionary models of altruism, offering rewards to recruits and their kin and creating pseudo-kinship bonds among recruits. Other techniques frequently are involved as well, including involving recruits in smaller acts of terrorism and other high initiation costs that make defection more difficult, preparatory death rituals such as lying in a grave or wearing a death shroud (Kruglanski and Golec 2004), public (and thus hard to break) pledges, and the use of titles such as "living martyr" that render the suicidal act a foregone conclusion (Merari 2005). When the costs and stakes are as high as in these contexts, multiple motivational practices should be expected to complement the multiple motivations and personalities of entering recruits (Moghadam 2006).

Tracing the development of suicide terrorist organizations to see how and when commitment-reinforcing organizational practices are instituted should be illuminating. If the forces at work with respect to engendering commitment parallel those of religious institutions, it is when organizations grow from small groups in direct contact with charismatic leaders to larger ones where members are likely to be less related in terms of kinship and community that practices exploiting cognitive biases are developed.

If evolutionary theory is to continue to contribute to social scientific attempts to better understand human social behavior, it must directly address the most problematic aspects of that behavior. There are several such problems, such as the demographic transition, or the pattern of reduced fertility associated with increased wealth within and between modern societies, that Laura Betzig once called "a major challenge to a Darwinian view of human behavior" (1988, 6). But none may be as difficult to understand from a Darwinian perspective as altruism, especially in contexts such as suicide terror organizations. Some researchers have attempted to use evolutionary models to aid in its understanding, but the field still needs systematic, predictive studies based on reliable data. It is hoped that this essay contributes to the development of such studies.

Notes

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1. Not all individuals who sacrifice their lives in the context of suicide terror organizations do so as part of an attack. For example, Rex Hudson (1999) reports that Tamil Tigers have committed suicide simply in order to avoid being questioned by Sri Lankan authorities regarding acts of terrorism of which they have knowledge. The more important distinction, in terms of theories that may apply, is certain death through one's own actions as opposed to high-risk behaviors that may result in death. As Ariel Merari put it, "heroic behavior of soldiers in battle is fundamentally different from a suicide terrorist attack and cannot serve as a proper model for such attacks" (1990, 198).

2. A fourth model, group selection (for example, Sober and Wilson 1999), is not discussed because of the continuing debate around its validity as a force sufficiently strong and independent from kin selection to be relevant (Wilson and Sober 2002; Trivers 1998; Williams 1966).

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