Dying for the group: Towards a general theory of extreme self-sacrifice

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Short Abstract: Whether upheld as heroic or reviled as terrorism, throughout history people have been willing to lay down their lives for the sake of their groups. Why? Previous theories of extreme self-sacrifice have highlighted a range of seemingly disparate factors such as collective identity, outgroup hostility, and kin psychology. This paper attempts to integrate many of these factors into a single overarching theory based on several decades of collaborative research with a range of special populations, from tribes in Papua New Guinea to Libyan insurgents, and from Muslim fundamentalists in Indonesia to Brazilian football hooligans.

Long abstract: Whether upheld as heroic or reviled as terrorism, throughout history people have been willing to lay down their lives for the sake of their groups. Why? Previous theories of extreme self-sacrifice have highlighted a range of seemingly disparate factors such as collective identity, outgroup hostility, and kin psychology. This paper attempts to integrate many of these factors into a single overarching theory based on several decades of collaborative research with a range of special populations, from tribes in Papua New Guinea to Libyan insurgents, and from Muslim fundamentalists in Indonesia to Brazilian football hooligans. These studies suggest that extreme self-sacrifice is motivated by 'identity fusion', a visceral sense of oneness with the group resulting from intense collective experiences (e.g. painful rituals or the horrors of frontline combat) or from perceptions of shared biology. In ancient foraging societies, fusion would have enabled warlike bands to stand united despite strong temptations to scatter and flee. The fusion mechanism has often been exploited in cultural rituals, not only by tribal societies but also in specialized cells embedded in armies, cults, and terrorist organizations. With the rise of social complexity and the spread of states and empires, fusion has also been extended to much larger groups, including doctrinal religions, ethnicities, and ideological movements. Explaining extreme self-sacrifice is not only a scientific priority but also a practical challenge as we seek a collective response to suicide terrorism and other extreme expressions of outgroup hostility that continue to bedevil humanity today.

Keywords: Identity fusion; memory; imagistic practices; rites of terror; self-sacrifice; suicide terrorism; warfare.

1. Introduction

Willingness to sacrifice one's life for the sake of a group has been documented all around the world and throughout human history, from the Christian martyrs of antiquity to the followers of Jim Jones in Guyana, from the Spartans at Thermopylae to the kamikaze pilots of Japan. In recent decades, a murderous form of self-sacrifice – 'suicide terrorism' – has become increasingly common, with an estimated 3,500 such attacks recorded in the past thirty years (McCauley 2014). The Victorian scholar Emile Durkheim (1897 [1951]) argued that 'altruistic suicide' in all its forms was a consequence of overintergration of the individual into the group, to an extent that abnegated even the most basic self-interest for the sake of the larger collective. In the ensuing century, social scientists tried to break down the idea of 'overintegration' into more precise and testable theories of group alignment and identity (e.g. Tajfel and Turner 1979; Swann et al. 2012), psychological kinship (e.g. McNamara & Henrich 2016), and parochial altruism (e.g. Bernhard et al. 2006). But the relationships between these constructs and their underlying causes have, until recently, been quite unclear. This paper sets out a more encompassing theoretical framework, drawing on an extensive programme of empirical research into the causes and consequences of 'identity fusion' – a visceral sense of oneness with the group (Swann et al. 2012) – that has been linked to extreme self-sacrifice in a wide range of special populations, ranging from Muslim fundamentalists in Indonesia to armed insurgents in Libya, and from football hooligans in Brazil to tribal warriors in Melanesia. For highly fused individuals, the boundary between personal and group identity is porous and an attack

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on the group is taken personally. Identity fusion is highly correlated with an expressed willingness to fight and die to defend the group against external threats (Swann et al. 2010, 2014; Whitehouse et al. 2014). It is argued here that enduring fusion with the group results from perceptions of shared essence, established via at least two distinct pathways (see Figure 1).

One pathway involves undergoing transformative experiences with other group members (e.g. life-changing ordeals) that shape the personal and group identities of participants (Whitehouse 2013). To the extent that such shared experiences are remembered as distinct episodes, prompting subsequent reflection, they form part of one's personal life history while also being group-defining (Jong et al. 2015). Some emotionally intense experiences take the form of collective rituals, orchestrated in culturally prescribed ways (Kavanagh et al. 2017). Highly arousing rituals, because they are causally opaque, can generate prolonged processes of reflection and meaning-making, contributing to the elaboration of both personal and group identities (Richert et al. 2005). Initiations, for example, are explicitly designed to transform novices permanently, often by putting them through shared traumatic ordeals that are never-to-be-forgotten and rich with symbolism and semantic connotations (Barth 1987; Whitehouse 1996).

A second pathway to fusion entails the perceived sharing of essentialized biological properties with the group in the form of inherited phenotypic characteristics (Park & Schaller 2005). Recent studies have shown that identical (monozygotic) twins report higher levels of fusion with each other than their non-identical (dizygotic) counterparts (Vázquez et al. 2017). Further, it has been shown that fusion with twin

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mediates the impact of zygosity on a range of measures of prosociality and that identical twins are more likely to prioritize each other even over their children on questions probing willingness to engage in self-sacrificial behaviour (Vázquez et al. 2017: 15). While phenotypic matching happens naturally among family members who share genetically transmitted physical or behavioural traits, it can also be triggered by norms and terminological practices emphasizing familial ties, e.g. referring to group members as 'brothers' or 'sisters' and emphasizing obligations of kinship and common ancestry (Swann et al. 2014).

Group bonding based on perceptions of shared essence among individuals who know each other personally may be described as 'local fusion' (Swann et al. 2012; Whitehouse 2013). This type of fusion is strongly associated with willingness to fight and die when the group comes under attack. In a study of revolutionary groups in Libya, many of whose members laid down their lives during the 2011 insurgency, local fusion emerged as a more powerful cohesive force than bonds with larger group categories, such as revolutionaries in general or supporters of the revolution (Whitehouse et al. 2014). When combined with perceptions of outgroup threat, high levels of local fusion are capable of motivating extreme self-sacrifice for the group. Gaddafi's forces in Libya presented a very obvious mortal threat to rebel groups in the region but outgroup threat can also play an important role in less deadly forms of intergroup conflict. For example, for highly fused supporters of football teams, rival supporters trigger perceptions of outgroup threat that motivate high-risk behaviours such as fan violence and hooliganism, as revealed by recent studies with diehard fans in several countries (Newson et al. In prep).
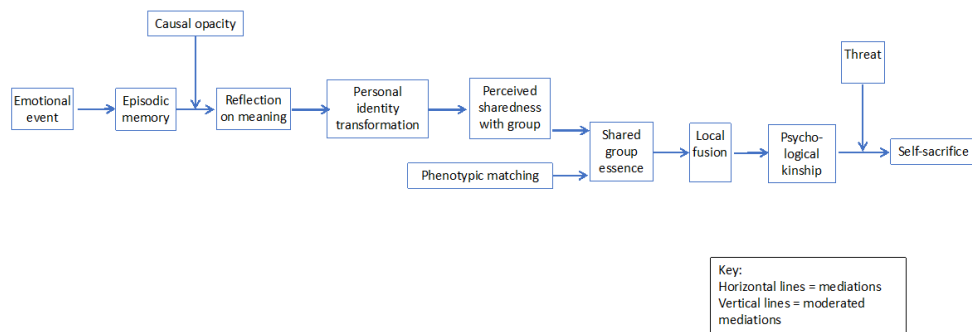
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Figure 1: Pathways to local fusion and self-sacrifice

The theory outlined in Figure 1 constitutes the first effort to synthesize findings from a global programme of inter-disciplinary research spanning several decades. Each of the boxes refers to a psychological event or process, forming part of two distinct causal chains. One of these chains begins with the perception of an emotional event that is subsequently stored in episodic memory; to the extent that these memories relate to causally opaque events (e.g. collective rituals), they prompt reflection, producing rich representations that form part of the core narrative self. When such representations are perceived to be shared with a group this produces feelings of shared essence, in turn giving rise to fusion. There is also a second pathway to fusion in which feelings of shared essence result from phenotypic matching – the perception of common biologically inherited characteristics. Stable perceptions of shared essence created by either of these pathways is predicted to give rise to fusion with a locally bounded group or relational network. Fusion produces a strong impression that members of the group are one's kin, eliciting willingness to pay high personal costs to

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support the group and, in the face of outgroup threat, to fight and die if necessary to protect members of the group.

The aim in what follows is to build an encompassing theory of extreme self-sacrifice, capable of explaining the willingness of some individuals to fight and die for their groups. Section 2 argues that suicide terrorism may be understood a form of homicidal self-sacrifice. Section 3 considers evidence that willingness to fight and die for a group, even when the odds of dying are extremely high, can be motivated by identity fusion, rooted in perceptions of shared sufferings and/or common ancestry. Section 4 explores potential evolutionary explanations for the patterns described above. Section 5 argues that ritual ordeals (such as the trials of initiation and hazing) may serve as culturally evolved gadgets for generating identity fusion in armed groups, ranging from warrior tribes to modern military units and terrorist cells. Section 6 considers whether large-scale group alignments, based on identification and extended fusion, can motivate self-sacrificial behavior. Finally, Section 7 provides an overall assessment of the theory presented here, emphasizing limitations as well as strengths, and identifying priorities for future research.

2. Suicide Terrorism as Extreme Self-Sacrifice

In his classic discussion of 'altruistic suicide', Durkheim detailed many examples of individuals taking their lives for the glorification of the group. Durkheim cited Charlevoix's colourful observations in Japan as exemplars of the category:

> "Nothing is commoner than to see ships along the seashore filled with these fanatics who throw themselves into the water weighted with stones, or sink their ships and let themselves

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be gradually submerged while singing their idol's praises. Many of the spectators follow them with their eyes, lauding their valor to the skies and asking their blessing before they disappear. The sectarians of Amida have themselves immured in caverns where there is barely space to be seated and where they can breathe only through an air shaft. There they quietly allow themselves to die of hunger. Others climb to the top of very high cliffs, upon which there are sulphur mines from which flames jet from time to time. They continuously call upon their gods, pray to them to accept the sacrifice of their lives and ask that some of these flames rise. As soon as one appears they regard it as a sign of the gods' consent and cast themselves head-foremost to the bottom of the abyss… The memory of these so-called martyrs is held in great reverence." (Charlevoix quoted in Durkheim 1897 [1951]).

In the passage where this quotation occurs, and in many others, Durkheim is at pains to emphasize that altruistic suicide is an expression of 'underindividuation' – the sublimation of the personal self to the greater and nobler will of the group. Durkheim associated underindividuation with what he called 'the lower societies' – that is, small-scale traditional societies where the division of labour was sufficiently simple that persons seemed eminently replaceable, one person substituting more or less easily for any other. Durkheim famously argued that the emotionally arousing rituals of simple societies served to heighten 'collective conscience' to a point of great fervour and excitement, eclipsing or even obliterating any sense of personal agency and individuality. He regarded the military as one of the last refuges of this primitive mentality in otherwise civilized societies and used this to explain the high incidence of altruistic suicide in various armies and navies, as well as self-sacrifice on the battlefield (Durkheim 1897 [1951]: 234-237).

In what follows, however, a somewhat different view is presented. Fusion resulting from the perception of shared essence does not sublimate individual identity but

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enables group alignments to tap into the motivational power of personal agency, strengthening and emboldening it. Fused individuals see themselves not merely as instruments of the group but as willing to do more for the group than other members. They see their personal self as encompassed, but not eclipsed, by the group. On this view, altruistic suicide is not caused by 'underindividuation' as Durkheim conceived of it, but by a visceral sense of oneness between self and group.

Suicide terrorism, the act of laying down one's own life in an effort to weaken or destroy an outgroup, may also be regarded as a form of altruistic suicide (Pape 2005: Chapter 9). As such, it forms part of a much larger class of extreme behaviors that involve sacrificing oneself for the group, ranging from non-homicidal forms of suicide (such as taking a bullet for a comrade or setting fire to oneself) through to so-called 'suicide missions' in conventional armies. Although suicide terrorism may be shaped by sophisticated strategic considerations (e.g. careful selection of targets to maximally advance terrorist objectives), altruistic motivation is a necessary condition for implementing these strategies, inasmuch as the individual is required to give up his or her own life for the sake of a group. Such actions may be described as *extreme* because they are (or are most likely to be) fatal. Efforts to explain the phenomenon have often emphasized its seemingly irrational nature, for example attributing such suicides to extreme religious beliefs or to individual pathology (Pape 2005: 16).

The notion that religious extremism (e.g. via indoctrination) motivates suicide terrorism may seem little more than common sense. Indeed, according to some public intellectuals (e.g. Harris 2004), religious doctrines extolling the righteousness of waging holy wars or of exterminating infidels, self-evidently explain extreme self-

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sacrifice such as suicide bombing. And it is easy to find examples throughout history of suicide terrorism being linked to religious beliefs of various kinds, from the Jewish Zealots and the Sicarii of antiquity to the many Islamist terror groups of today. Less convenient for those who favour this line of argument is the fact that most suicide attacks, at least until 2000 (see Atran 2006), have been carried out by secular organizations, and not by religious extremists (Post et al. 2009: 15; Gambetta 2005). Moreover, studies in the lab and in natural settings suggest that religious beliefs lead to prosocial action because they serve as markers of group alignment. That is, it would seem to be attachment to a collective, forged through shared rituals or other identity markers, and not beliefs *per se* that motivate pro-group action (Bloom 2012). For example, in a series of studies (Ginges et al. 2009) frequency of participation in collective rituals has been shown to predict support for suicide attacks whereas frequency of prayer (as a less groupish devotional act) does not. Ginges et al. found that for Palestinian Muslim adults, frequency of mosque attendance predicted stated willingness to die for one's religion as well as support for suicide attacks but, again, frequency of prayer did not.

It is possible that some extreme beliefs become so closely linked to the group that they take on an aura of sacredness (Atran, 2010), but if that is so then what connects those values to acts of self-sacrifice may well be fusion with the group rather than commitment to any kind explicit belief system or ideology *per se* (Whitehouse 2016). Efforts to disambiguate the effects of sacred values and group alignment are hard to interpret given that the measures of sacred values so far used in such studies are related to similar measures of willingness to sacrifice for sacred values (Gomez et al. 2017). The theoretical framework presented here suggests that willingness to fight

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and die is not motivated by doctrines and ideologies, religious or otherwise, but by a particularly intense love of the group. For highly fused individuals, the survival of the group constitutes a form of personal immortality in ways that may be more real psychologically than any religious dogma alone could convey.

Nevertheless, those who argue that suicide terrorism is a result of *pathology*, may not regard such behavior as an act of self-sacrifice at all. For example, Lankford (2014) has argued that jihadist martyrs may simply be suicidal individuals (see also Merari 2010) who choose this method of killing themselves because it is socially approved and even glorified by the groups they identify with, while also providing conveniently reliable methods (e.g. fatal explosive devices). On this view, the suicide bomber is not embracing death to achieve some greater goal but is actually engaging in a cowardly and selfish act: "For many suicide terrorists, blowing themselves up may feel like the least risky thing they could do – it could offer the greatest certainty that their overwhelming crisis will no longer plague them. For these individuals, the risky thing may be to face their uncertain future, tackle their problems one day at a time, or swallow their pride and ask for help" (Lankford 2014: 360). Lankford argues also that acts of suicide terrorism and genuine acts of self-sacrifice differ in the manner of their planning. Suicide attacks are generally planned long in advance whereas heroic self-sacrifice, such as leaping on a grenade or shielding a comrade in a hail of bullets, is more typically a split-second reaction to unforeseen events (2014: 360). Moreover, the suicide terrorist plans to die whereas genuine military heroes hope to survive, despite appalling risk to life and limb (2014: 359).

The distinction between laying down one's life for a group and merely risking one's

life may not be easy to draw, however. Expressed in terms of probabilities, it has been calculated that the chances of surviving an act for which a Victoria Cross medal has historically been awarded in the British and Commonwealth forces is just one in ten (Gambetta 2005: 272). Salim Jawha, a former colonel in Gaddafi's army who joined the insurgency in Misrata on the first day of the revolution, put it to me like this: "When the revolution began, there was no compulsion to join. We just called our friends and asked them: do you want to die or not? If you want to die, come with us. If not, go home and stay out of harm's way." (Jawha, quoted in Whitehouse 2016). Of course, there was no guarantee that one would die as a result of joining the revolutionary forces. But the chances of dying in action were dauntingly high and those choosing to fight were well aware of this. Nevertheless, thousands made the decision to go ahead anyway. They were not suicidal but they were surely prepared to lay down their lives.

Lankford's argument that suicide terrorists are suicidal has deservedly triggered much instructive debate but has also prompted criticisms, mainly highlighting limitations of the supporting data (Atran 2003, Beit-Hallahmi 2014, Egan 2014, Funder 2014, Qirko 2014, McCauley 2014, Merari 1993, Sela & Shackelford 2014, Tobeña & Vilarroya 2014, Weiss and Weiss 2014). Although these debates remain unresolved, according to Post et al. (2009), there is a well-established consensus among researchers that group, social, and organizational factors provide the key to understanding most suicide attacks. Factors frequently implicated in this form of terrorism are collective identity (Post 2005), kin psychology (Gray & Dickens 2014), and outgroup hostility (Ginges et al. 2009). New research into the causes of identity fusion suggests that these seemingly disparate theories of suicide terrorism may in fact be highlighting

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different aspects of a single process. As with some past approaches to suicide terrorism, the fusion theory emphasizes group alignment and psychological kinship, but it also focuses on the role of shared essence combined with perceptions of outgroup threat in motivating extreme self-sacrifice. This general theoretical framework is further elaborated and empirically substantiated below.

Studying the role of identity fusion in motivating suicide attackers is fraught with practical difficulties. Successful suicide attackers are by definition already dead and those who are foiled, even if they can be interviewed, may be unable or unwilling to provide accurate information on the psychological processes that drew them to violent extremism in the first place. The studies reported below have largely focused on measuring identity fusion and extreme self-sacrifice among currently serving members of armed groups, ranging from revolutionary insurgents to conventional military forces, especially those who, having witnessed the violent deaths of many of their fellow fighters, nevertheless voluntarily expose themselves to the same high risks. Much recent research also investigates the role of identity fusion among those who strongly endorse the use of violent self-sacrifice to accomplish group goals. Despite the difficulties of conducting research into these topics, there is growing evidence that fusion can motivate extreme pro-group action and that this process could plausibly explain at least some if not most instances of suicide terrorism as well as other forms of violent extremism.

3. Shared Essence, Fusion, and Willingness to Fight and Die for a Group

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Fusion – a visceral feeling of oneness with a group (Swann et al. 2009) – entails an identity configuration such that essential features of one's social identity are also considered to be essential features of one's personal self. Essentialized conceptions of the personal self or of a group presume the presence of nonobvious properties that are necessary for the entity to exist in its current form (Medin 1989). This is an all-or-nothing mode of categorization in that the person or group must have this nonobvious property or would no longer be the person or group in question (Diesendruck, & Gelman 1999: 339). But how do people come to attribute essences to persons and groups? One possibility is that the essential personal self derives from inherited biological attributes (Gil-White 2001), another that it is formed through life-defining experiences (Whitehouse 2013; Whitehouse and Lanman 2014). That is, we can imagine ourselves as being products of inherited traits as well as being moulded by unique personal histories (Whitehouse et al. 2017).

A series of recent studies sought to compare the effects on fusion of shared biology versus shared life experiences. In one study (Whitehouse et al. 2017), 198 participants were assigned to three priming conditions in which they wrote about either a self-shaping experience, a set of traits transmitted genetically, or the changing seasons (as control). They were then asked to imagine meeting somebody who had either shared their transformative life event, had turned out to be a long-lost sibling, or was a complete stranger (control). Those in the shared experience and shared biology conditions reported higher levels of fusion with the imaginary person although interestingly the effects were notably stronger for shared experience. In a further study, actual rather than imaginary shared genes and shared experience were experimentally manipulated (Whitehouse et al. 2017). 260 monozygotic and 246

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dizygotic twins were asked to describe transformative experiences shared with their twin and measures of fusion with twin were then taken. The results showed that both shared biology (as measured by zygosity) and shared experience predicted fusion levels independently.

Thus, sharing either biological or autobiographical essence with other group members, or both, produces identity fusion. Highly fused individuals report intense family-like connections to other group members, high levels of personal agency, and feelings of invulnerability in their group. Thus, when the group is felt to be threatened, it feels personal. This may help to explain why so many groups committed to violence describe themselves as victims acting to defend themselves against external aggressors (Furedi 2015). The desire to protect the group is experienced by fused individuals as an urgent and compelling act of self-defence. This process may resemble the way in which mortality salience stimulates ingroup defence and support in the population at large (Fritsche et al. 2008) but more acutely in the case of highly fused individuals, due to amplified feelings of personal agency (Swann et al 2010). Highly fused individuals exhibit an urge to make personal sacrifices for their group, ranging from donations of blood to help victims of terrorist attacks (Buhrmester et al. 2014) to fighting on the frontlines at grave personal risk (Whitehouse et al. 2014).

Efforts to investigate the shared experience pathway to fusion have focused on the role of self-defining episodic memories (Whitehouse 2013). Psychologists have long appreciated that memories for transformative experiences impact the development of personal identity (Conway 1995; Singer & Salovey 1993) and considerable empirical research has been conducted into the mechanisms linking memory for and reflection

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on life-changing experiences to autobiographical narratives and the construction of the personal self-concept (e.g. Conway 2005; C□ili & Stopa 2014). What fusion theory adds is the insight that some emotionally intense experiences are not only transformative in shaping the personal self but – insofar as these experiences are shared with relevant others – they also define the group (Whitehouse 2004), producing a visceral sense of 'oneness' or shared essence. Consequently, the personal self and the group self are uniquely conjoined in fused individuals – being forged through the same potent experiences that endure in memory (Whitehouse and Lanman 2014).

In order to investigate these processes, recent empirical research has focused on populations that have undergone emotionally distressing experiences together. Events involving psychological or physical suffering appear to have an especially enduring impact on memory and subsequent reflection (Pillemer et al. 1987; Conway 1995; Whitehouse 2006). In the literature on shared experience and identity fusion, such events are typically described as 'dysphoric' (Jong et al. 2015; Whitehouse et al. 2017) but they are often also accompanied by feelings of elation, for example upon surmounting the ordeal (Kavanagh et al. 2017). Indeed, it may be that an emotional 'high' is partly responsible for the long-term memory effects of such experiences. The theory elaborated here is primarily concerned with the impact of shared emotional events on the fusion process (via the mediating effects of memory, reflection, etc. as set out in Figure 1). Some of the research described below suggests that dysphoric events have a bigger effect on fusion than euphoric ones but it is not yet clear whether negative valence or merely overall emotional intensity is the key factor.

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A recent cluster of studies, focused on the effects of recalling terrorist attacks in New York, Madrid, and London, has shown that the simple act of remembering such experiences increases reported levels of fusion with and willingness to die for one's country (Buhrmester et al. in prep). Moreover, the extent to which dysphoric experiences are felt to be transformative or 'self-defining' predicts their effects on fusion. Similarly, the more nationalists and unionists in Northern Ireland have reflected on their sufferings during the history of sectarian conflict in that region, the more fused they are with their respective communities (Jong et al. 2015). Further, to demonstrate that such reflection actually causes elevated fusion, Bostonians affected by the 2013 Marathon bombings were primed with memories of the atrocity (versus controls who were invited to recall memories of running errands in Boston) and those who felt more intense negative emotions as a result of the prime were indeed more fused with their fellow Bostonians (Jong et al. 2015).

Similar patterns have been observed among spectators at football matches where fans who felt they had been most shaped personally by their memories of especially emotional club events also reported higher levels of fusion (Newson et al. 2016). For example, a recent survey of supporters of Premier League football supporters in the UK found that sharing the dysphoric experience of losing soccer matches made fans more willing to sacrifice themselves for each other, an effect that was mediated by identity fusion (Whitehouse et al. 2017). Losing seems to fuse fans more effectively than winning and, consequently, the less successful teams are likely to have the most loyal fan bases. Of course, this also means that the more embattled supporters would show greater eagerness to fight on the terraces but, while such fervent commitment to club does sometimes spill over into violence, intergroup rivalry is more typically

expressed in relatively harmless symbolic acts such as chanting and song.

Some aspects of the process by which shared dysphoric experiences lead to fusion have now been measured physiologically as well as using psychometric tests and self-report. For example, a recent longitudinal study of Brazilian, Spanish, and English fans during the 2014 FIFA World Cup revealed that increased heartrate and cortisol levels during live matches predicted higher levels of fusion over time (Newson et al. Revised). Efforts have also been made to explore the physiological processes by which outgroup threat motivates self-sacrifice in highly fused individuals. For example, recent studies using brain-scans to monitor activity in the medial prefrontal cortex (mPFC), a brain region associated with group membership processing, have explored the effects of fusion on the brain when deciding to pay a personal cost to harm a rival outgroup. In these studies, football supporters playing economics games with rival fans showed a marked tendency to punish fair and unfair offers alike, at cost to self. Activity across ventral and dorsal portions of mPFC, however, was affected by levels of fusion in these participants; the more highly fused players showed the strongest evidence for fairness by group membership interaction in the relevant brain regions (Apps et al, Revised).

In the above examples, sharing emotionally intense experiences has been shown to give rise to fusion and therefore willingness to fight and die for the group. Nevertheless, most of these studies rely mainly on self-report measures and hypothetical cooperation problems. Although behavioural measures, such as economic games and trolley problems, have been used in some of the studies reported above, these are not ideal proxies for extreme self-sacrifice, our main interest in the

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present context. To test this theory properly requires investigation of processes of fusion among people who *actually* lay down their lives for each other. The ethical and practical impediments to conducting psychological research with suicide bombers undergoing training are severe, however. And while it may be possible to interview thwarted terrorists serving prison sentences, this approach too is fraught difficulties including the need to build rapport and trust with interviewees as well as to overcome incentives for offenders to provide self-serving or misleading responses.

Recent efforts to investigate violent extremism operating outside the rule of law have focused on studies with frontline fighters in military groups such as members of revolutionary battalions in Libya during 2011, the year of the Arab Spring. The vast majority of Libyans who took up arms in 2011 were ordinary civilians, many of whom had never even held a gun prior to the uprising. All of them knew their chances of survival were poor. Many thousands were killed or suffered devastating injuries and all of them lost friends and family during the conflict.

Interviews were conducted with 179 insurgents in the city of Misrata (Whitehouse et al. 2014). Half the sample were frontline fighters and the others providers of logistical support to the fighters. All reported near ceiling levels of fusion with their families, with their closest friends in the battalions, and even with the members of other battalions, but not with pro-revolutionary Libyans who never joined a battalion and therefore did not fully share the intensely dysphoric experiences of participation in the 2011 uprising. In view of these high levels of fusion with multiple groups, a forced choice question was introduced: if you had to choose only one group as your primary fusion target, which would it be? And this produced a striking difference between

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those who faced the most traumatic ordeals of the war and those who suffered but not as intensely, by working behind the scenes. Frontline fighters were nearly twice as likely (compared with providers of logistical support) to choose fellow revolutionaries over their families.

A limitation of this study, however, is that there was no way of ascertaining whether shared dysphoric experience in battle led to high levels of fusion or fusion drove Libyan insurgents to the front line in the first place. To adjudicate on this question, studies have been undertaken with conventional troops that lacked control over their deployment on the front lines. For example, a survey of 380 Vietnam war veterans in the USA found that intensity of dysphoric combat experience predicted fusion with fellow fighters and that this fusion also mediated willingness to make personal sacrifices for other veterans (Whitehouse et al. 2017). Although there are many practical impediments to conducting research with groups whose members have sacrificed their lives in appreciable numbers, and the evidence drawn upon here is limited, efforts to access more participants in other troubled regions of the world are ongoing. Data collection using much the same methods as those employed in Libya in the research described above has been undertaken among fundamentalist Islamist groups and convicted terrorists in prison (e.g. Kavanagh et al. In prep).

4. The Evolution of Fusion and Extreme Self-Sacrifice

From a gene's eye point of view the vehicle for its transmission (the individual organism) should usually preserve its own life and maximize its reproductive advantage at all costs but kin selection famously presents an exception. Kin selection

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causes genes to increase in frequency when the degree of genetic relatedness of individuals benefiting from an altruistic act, multiplied by the benefit thereby procured, is greater than the reproductive cost to the altruist. Self-sacrifice to save fellow group members might make evolutionary sense if all members of the ingroup are genetically very similar, as in the case of some eusocial insects. In the case of humans, taking a fatal spear to protect one's kinsmen might be similarly adaptive if, under evolutionarily stable conditions, self-sacrificing individuals stood a better chance of passing on their genes via surviving relatives than by mating successfully themselves.

Fusion may have arisen as a psychological adaptation to facilitate cooperation among kin in the face of extreme adversity, such as lethal outgroup threat (Whitehouse and Lanman 2014) but it may simply be a byproduct of the way autobiographical memory evolved in humans. Still further evolutionary explanations for fusion are considered below. Nevertheless, even if fusion was a psychological adaptation that arose through kin selection, social institutions could hijack the fusion mechanism in novel ways. For example, male initiations involving extreme privations and sufferings could mimic the trials and tribulations of kin groups struggling to survive in tough environments, producing similar psychological effects and behavioural outcomes. An important difference is that the ordeals of initiation deliberately maximize emotional and sensory impact, so as to create a stable impression of shared essence in an imaginary 'brotherhood' (Whitehouse 1996; 2004). In everyday life, by contrast, the shared sufferings and setbacks of kin groups occur more unpredictably, and their emotional intensity, causal opacity, and consequentiality for group members is more variable, taking many years to assemble and thus to produce fusion and psychological kinship

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(Whitehouse 2013). In short, some social institutions may have arisen through cultural evolution that exploit our biologically evolved systems for supporting and defending kin in the face of adversity.

It is also conceivable that culturally evolved discursive practices exploit intuitions of shared biology to some extent, for example by referring to priests as 'fathers' or group territory as the 'motherland'. In a recent survey covering 11 countries from six continents, 86.1% of the 2,438 respondents expressed willingness to die for their families before any other group (Swann et al. 2014) but the same survey also showed that priming feelings of shared biology among people already fused with their countries made them more willing to make extreme sacrifices for their fellow countrymen. Mediation analyses showed also that fusion impacted willingness to fight and die for country via feelings of kinship. These findings are supported by studies of groups actually (as opposed to hypothetically) experiencing an external threat. For example, in the wake of the 2013 Boston Marathon bombings, the willingness of locals fused with America to give blood or money to help the victims was mediated by feelings of psychological kinship with fellow countrymen, expressed by endorsing statements like "members of my country are like family to me" (Buhrmester et al. 2014).

The kin selection account for the evolution of fusion suggests that shared life-shaping experiences, just like biologically inherited traits, may have served as reliable phenotypic markers in ancestral groups composed mainly of closely related individuals (Lieberman et al. 2007; Whitehouse & Lanman 2014) and this seems consistent also with the finding that sharing core values or attitudes signal genetic

relatedness (Park & Schaller 2005; Swann et al. 2014). A common cause of shared life-shaping experiences, prompting fusion and extreme self-sacrifice, may have been chronic intergroup raiding and warfare. There is some debate about the prevalence of warfare in the Pleistocene but some scholars estimate that up to 40% of all male deaths in human prehistory can be attributed to intergroup conflict (Keeley 1996). Even if this seriously exaggerates war-related mortality rates (Ferguson 2013), there is little doubt that intra-species violence is a widespread and persistent feature of human behaviour (Gómez et al. 2016) and ancient foragers probably always faced threats of predation that were best parried by standing together, despite strong temptations to defect or run away.

Previous research has likewise emphasized family-like bonds as a powerful motivator of suicide terrorism (Atran 2003; Mandel & Litt 2013) and of self-sacrifice for comrades in conventional military groups (e.g. Stouffer et al. 1949; Vaughan & Schum 2001). Gray and Dickens (2014) link this urge to protect one's 'brothers-in-arms' to perceptions of shared biology based on phenotypic matching. In an interesting application of kin selection theory to the phenomenon of suicide in general, it has been suggested that individuals with little chance of reproducing may constitute a drain on the resources of their kinsmen, such that committing suicide might actually increase their inclusive fitness by improving their chances of passing on genes via their surviving relatives (deCatanzaro 1980; but see also Syme et al. 2015). One might object that the act of suicide could itself cause serious collateral damage impairing the prospects of bereaved kinsmen, not least due to social stigma. And Joiner (2015) has argued that suicide in general results from a pathological underestimation of one's own evolutionary worth and overestimation of the burden

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one is inflicting on others. But Joiner's argument could be turned on its head in the case of suicide bombers, in that martyrdom may indeed serve to improve the circumstances of their families. For example, Blackwell (2008) has argued that Palestinian suicide attackers increased their inclusive fitness outcomes by contributing, through the celebrity of their deaths, to the wellbeing and reproductive prospects of their close kin.

Following a closely argued discussion of these issues, Orbell and Moriwaka (2011) consider whether Blackwell's argument can shed light on the motivations of kamikaze pilots in WW2. Based, however, on extensive analysis of letters, poems, wills, and memoirs left behind by 661 Japanese pilots who perished in suicide attacks, the authors conclude that the act of self-sacrifice was not undertaken in order to increase the welfare of close kin. Rather, the writings of kamikaze pilots placed much greater emphasis on the desire to die for the nation or for the emperor. One possibility, considered by Orbell and Moriwaka, is that an evolved algorithm to sacrifice self for kin had somehow been hijacked by nationalistic ideology, such that the country or its ruler had taken on the status of family. Nevertheless, as these authors also observe, evolution should act strongly against mistaking fellow countrymen for kin, especially where the stakes are so high. Rather, they suggest that when warfare becomes genocidal, a distinct psychological mechanism comes into play that enables kin groups to form coalitions:

> "To be successful (thus to survive in the event of genocide), coalitions of kinship groups would have to include significant numbers of individuals who were prepared to fight and perhaps die for individuals who were *not* close kin—whatever primary loyalties might be owed *to* close kin. A coalition of kinship groups whose members fought only for their own

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group would be a notably ineffective coalition, likely to be defeated by a coalition of kinship groups *whose members mobilized kinship-based emotions on behalf of the entire coalition, kin and nonkin…* In the context of coalitional warfare, therefore, natural selection could favor genes that led an individual to respond to all members of a coalition as if they were close kin—and not just to those members of the coalition who were *in fact* close kin." (Orbell & Moriwaka 2011: 20-12).

Intriguing as this argument undoubtedly is, it is by no means clear that genocidal outgroup threat, as envisaged by Orbell and Moriwaka, was sufficiently acute and widespread in human prehistory for such a mechanism to evolve under natural selection. At any rate, it would be wise to consider a range of alternatives to kin selection to explain how extreme self-sacrifice may have evolved under natural selection.

One recent study presents a mathematical model predicting that any group suffering negative experiences, not only kin groups or coalitions of kin groups, should be more cooperative in the future (Whitehouse et al. 2017). The model, based on a multi-level selection approach, considered an imaginary population divided into numerous groups whose survival depended on overcoming two kinds of collective problems: 'us vs. nature' contests (e.g. hunting game, defending against predators) and 'us vs. them' contests (e.g. conflict with other groups over access to resources). In the real world, failure of any given group in an 'us vs. nature' contest might have little impact beyond the group itself; by contrast, doing well or badly in 'us vs. them' contests would likely have a significant impact on surrounding groups participating in conflict. In the model, 'doing well' equated to a euphoric experience with a corresponding positive impact on the fitness of group members, as measured by their capacity to

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leave offspring. By contrast, 'doing badly' equated to dysphoric experience and had the opposite effect. Groups that did so badly they died out were replaced by the offspring of more successful groups.

The setup consisted of two rounds. In the first round, euphoric (fitness increasing) or dysphoric (fitness reducing) experiences were randomly assigned. If that was all there were to it, then groups undergoing euphoric, fitness-enhancing experiences would obviously do better than those that had dysphoric experiences. But the model also contained a second round in which the consequences of each group's efforts overall to solve collective action problems were measured. Every individual was allocated a pair of genes, one of which was capable of triggering cooperative behaviour only after a euphoric experience and one of which was capable of doing so only after a dysphoric experience. But only one of these genes could be expressed in any given individual and all individuals of the same group shared this capacity. Thus, the model was designed to study the evolution of genetic endowments controlling behaviour. Although these genetic endowments made cooperation possible, they certainly didn't make it inevitable. In fact, the model was set up so as to make the chances of cooperation close to zero. However, we ran not one but many simulations allowing for mutation, recombination and migration. Each group lineage went through both euphoric and dysphoric experiences at equal frequencies. The question was whether cooperative behaviour would evolve over repeated simulations. The finding was that the gene effects on cooperation resulting from dysphoric experiences evolved to be larger than gene effects on cooperation resulting from euphoric experience. This pattern was even more pronounced for groups engaged in 'us vs. them' contests than

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for those engaged in 'us vs. nature' contests, the former involving more intense

intergroup competition.

5. Ritual and Local Fusion

Throughout most of prehistory, our ancestors lived in hunter-gatherer bands

confronted with both 'us versus nature' and 'us versus them' contests. If the fusion

mechanism originally evolved in small, relational groups of this kind then it should

come as no surprise that terrorists are also usually tied to highly cohesive cells

comprising around ten core individuals on average (Richardson 2006). We refer to

this as *local fusion* (Swann et al. 2012; Whitehouse 2013), as distinct from 'extended

fusion' discussed in the next section. While fusion in ancestral foraging bands may

have come about through exogenously caused dysphoric events, such as enemy

ambush or natural disaster, some prehistoric groups probably also engaged in rare,

emotionally intense rituals serving as cultural gadgets to increase levels of fusion

among warriors and hunters.

Many scholars have observed that collective rituals are a potent source of cohesion in

social groups and that the more physically or psychologically arduous the rituals in

question the more powerfully they bond participants (Durkheim 1912; Irons 2001;

Henrich 2009; Konvalinka et al. 2011; Olivola & Shafir 2013; Xygalatas et al. 2013).

Early examples come from evidence for initiation rituals in Upper Paleolithic deep

cave sites involving altered states of consciousness and manipulation of the visual and

auditory affordances of underground labyrinths (Rossano 2010). In the early stages of

the Neolithic too, rare and emotionally intense rituals probably occurred, for example

in the form of hunting-ancestor cults at sites like Cataloyuk where pictorial art suggests the sporadic performance of dramatic feasting events involving the baiting of large and dangerous animals (Whitehouse & Hodder 2010; Whitehouse et al. 2014). Emotionally intense rituals, fusing participants into small relational groups, may also have been necessary for ancient foragers coping with natural hazards (Rossano 2010: 91). The association between rare, emotionally intense ritual ordeals, on the one hand, and social cohesion and self-sacrifice for the group is even more readily apparent in the much richer datasets relating to contemporary small-scale societies. For example, based on an analysis of ethnographic data stored in the standard cross-cultural sample, it has been argued that the severity of traumatic initiation rites is positively correlated with warfare intensity (Sosis et al. 2007).

The pain and fear evinced by some collective rituals documented by anthropologists are so extreme that they have been described as 'rites of terror' (Whitehouse 1996). Procedures entailed in such rituals bear comparison with techniques of torture, entailing beatings, whippings, mutilation, burning, and evulsion of the fingernails (Barth 1987; Strehlow 1947). Pain is often inflicted on especially sensitive regions of the body, such as the genitals (Barth 1975). In addition to direct assault, such rituals commonly inflict suffering by depriving participants of rest, sleep, food, warmth, light, social contact, and other basic needs, often for extended periods (Allen 1967). One of the effects of agonizing ritual ordeals is that they bond participants together so tightly that they will stop at nothing to defend each other and their fellow tribesman from external threats. Often these extreme rituals are associated with warrior cults and may be accompanied by oaths to defend the group and commitments of unwavering loyalty (Weisfeld 1979).

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Rites of terror have been documented all around the world and evidence of their existence is present throughout human history and prehistory, and so the need for a general explanation has long been recognized. Inspired by Festinger's (1957) theory of cognitive dissonance, Aronson and Mills (1959) proposed that the endurance of painful initiations into the group is inconsistent with disliking the group and consequently initiates convince themselves that the group is worthy of their loyalty and affection. Others have suggested that participation in painful rituals serves as a costly signal of commitment to the group, thereby promoting trust and prosociality among group members (e.g. Bulbulia 2004; Sosis 2003). A drawback with both dissonance and costly signalling explanations of rites of terror, however, is they assume that participation is voluntary. Although that may be true in some cases, very often it is not. Failure to submit to the ritual tortures typically carries heavy penalties – ranging from social exclusion to execution (Cimino 2011). Moreover, these theories often assume that the ritual ordeals are used to mark entry into groups and often this is not the case; they may be performed by already-established groups for a wide range of stated purposes that have little or nothing to do with initiation or the conferment of membership (Whitehouse 1996; Atkinson & Whitehouse 2011).

An alternative perspective is provided by the theory of 'imagistic practices' (Whitehouse 2000) that is consistent with the 'shared experience' pathway to fusion discussed above (and which it largely inspired). Unlike cognitive dissonance and costly signalling approaches, the theory of imagistic practices applies to a wider range of intensely emotional rituals and not only voluntary initiations (Whitehouse 2004). An early account of imagistic bonding focused on a single case study: a cargo cult in

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the rainforest of New Britain, Papua New Guinea known as the Pomio Kivung (Whitehouse 1995). Observations and interviews in the field suggested that emotionally intense rituals, particularly those involving negative valence (such as pain, fear, and disgust), produced vivid and enduring memories (Whitehouse 1992). In view of the causally opaque, seemingly arbitrary nature of ritualized behaviour, episodic memories for cult rituals prompted efforts to interpret the meaning and significance of what had occurred, a process that has been dubbed 'spontaneous exegetical reflection' (Whitehouse 2001; 2004). The sharing of traumatic ordeals and subsequent process of reflection on their significance and value seemed to contribute to group bonding among splinter-group members (Whitehouse 1995).

Based on all the real-world research conducted so far, both quantitative and qualitative, it appears that imagistic rituals produce social cohesion through the sharing of exceptionally thought-provoking and life-shaping experiences, encoded in episodic memory (Whitehouse 1992; 1995). Because these kinds of memories specify who else was present at the time, the groups they generate have rigid boundaries – members cannot be added if they are not part of the recalled episode nor can anyone who participated be excised from memory. As such, imagistic practices are associated with relatively fixed, small, face-to-face groups an observation based on both ethnographic data (e.g. Whitehouse & Laidlaw 2004) and historical materials (e.g. Whitehouse & Martin 2005; Whitehouse & Hodder 2010). Fine-grained qualitative case studies have provided useful insights into the nexus of relations between ritual, emotion, memory, reflection, group cohesion, and prosocial commitment, including willingness to fight and die for the group in conditions of intergroup conflict and warfare (Whitehouse and McQuinn 2012). This qualitative information has been

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gradually augmented by quantitative correlational studies of large datasets (Atkinson and Whitehouse, 2011; Whitehouse et al. 2013; Gantley, Whitehouse, & Bogaard, In Press). Research on these topics has also led to the creation of by far the most ambitious longitudinal dataset on ritual and social complexity ever constructed known as *Seshat: Global Historical Databank.* This vast storehouse of historical data is now making it possible to explore the relationship between shared emotion, ritual frequency, group size and structure, warfare, and agricultural intensity over thousands of years and on a global scale (Turchin et al. 2012; Currie et al. 2015; Turchin et al. 2015; Whitehouse et al. 2015).

Central to the theory of imagistic practices is the idea that rare or unique emotionally intense experiences give rise to vivid, long-lasting memories for episodic details (such as what happened, how it felt, who else was present, etc.). These memories in turn become a locus for subsequent reflection, infusing the episodes recalled with meaning and salience (Barth 1975, 1987; Whitehouse 1992, 2003). If experiences of suffering and trauma are especially memorable and thought-provoking, this should be all the more so in the case of strongly valenced rituals which, like all rituals, are by definition 'causally opaque' – that is, actions for which nobody would expect there to be a rational physical-causal explanation (Whitehouse 2011). Ritual procedures are the way they are because that is the done or conventional way of performing them and this in turn makes them interpretable in a wide range of different ways (Humphrey & Laidlaw 1993; Whitehouse 2004). Emotionally charged rituals, since they are both causally opaque and remembered long afterwards, prompt a protracted search for meaning, a feature frequently observed in mystery cults and other esoteric religious traditions (Chinnery & Haddon 1917; Williams 1928; Whitehouse 1992, 2001, 2002;

Martin & Pachis 2009). Undergoing especially salient, symbolically charged rituals, as well as the process of revelatory meaning-making ensuing from them, is at once a very personal experience but also one that is shared with the group. For participants, these rituals are not only self-shaping they are also group-defining. In part, this is because the memories for such experiences are unique and unrepeatable, specifying who else was present. Groups formed in this way have somewhat rigid boundaries – those who were not present cannot be inserted into one's memories after the fact, nor can anybody who has been through the ordeals be excluded subsequently (Whitehouse 2004).

Early efforts to investigate these processes in carefully controlled experiments, used artificial rituals with sufficient emotional intensity to prompt both episodic recall and subsequent reflection on their meaning. In one such study, participants were invited to participate in what they were told was a reconstruction of an ancient Amazonian fertility rite (Richert, Whitehouse & Stewart 2005). According to the cover story, anthropologists were seeking to puzzle together the long-forgotten meanings of the ritual acts and artefacts and were eager to learn from the impressions and interpretations of participants in the reconstruction. As part of the ritual sequence participants were invited to place their hands in a hole in the ground while a drum played in the background. In this between-subjects design, the actions were varied such that participants in a high-arousal condition wore blindfolds when reaching into the hole. This made the experience considerably more frightening, as evidenced by self-reports of emotional intensity gathered immediately afterwards. All participants were asked to describe their ideas about the meaning of the ritual a week later, allowing time for reflection in the intervening period. Those experiencing the ritual as

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more frightening scored significantly higher on the meaning-making measures, suggesting that dysphoric intensity is linked to spontaneous reflection on the symbolism of ritual actions. These findings have been further supported by experiments using more objective measures of physiological arousal (Richert, Whitehouse, & Stewart 2005), and other methods of inducing dysphoria such as the trauma film paradigm (Russell, Gobet, & Whitehouse 2014). In addition to experiments using made-up rituals, studies of real world rituals suggest that the more frightening or painful the ritual experience the more exegetical reflection it provokes (e.g. Xygalatas 2007). Moreover, recent studies of hazing rituals have shown that elevated exegetical reflection on the meanings of collective rituals mediates the relationship between dysphoric intensity, identity fusion, and willingness to sacrifice oneself for the group (Whitehouse et al. 2017).

Although modern day hazing rituals are usually illegal and therefore difficult to study directly, especially in high-security environments such as the military, it is possible to conduct research on the phenomenon in certain contact sports such as Brazilian Jiu-Jitsu. BJJ is a martial art based on principles derived from Judo. BJJ practitioners must progress through a system of grades associated with distinctive belts. In some BJJ schools, promotion to a higher grade entails a form of hazing via agonizing belt whippings, producing severe welts and bruises to the back and shoulders. A recent study of 564 BJJ practitioners showed that those who had suffered the most intense whippings reported higher levels of fusion to their school and also expressed greater stated willingness to risk their lives fighting for the club (Kavanagh 2017; Whitehouse et al. 2017). In a related study, 146 members of American college fraternities and sororities were asked about their experience of hazing or other

initiatory ordeals. The more central such ritual experiences were to the participants' personal identities the higher their reported levels of identity fusion with their fraternity or sorority, and the more willing they were to sacrifice themselves for the sake of the group (Whitehouse et al. 2017).

In view of the above, it should come as no surprise that a recent exhaustive survey of modern suicide terrorism identified bonding via intense initiation rituals one of the features common to most suicide groups (Pape 2005: 8). But while imagistic practices in the small-scale societies of prehistory would have supported efforts to fend off other groups of similar size, wielding more or less equivalent levels of lethal force, such practices took on a whole new significance with the emergence and spread of states and empires. Jewish Zealots who set out to assassinate Herod during the Roman occupation of Judea, or the Ismaili Assassins undertaking suicide missions in eleventh and twelfth century Persia, Syria, and Lebanon, willingly gave their lives for the sake of a group but they did so in a highly asymmetric theatre of operations, where the outgroup was more or less certain to overpower them as individual actors (Gambetta 2005). Through their martyrdom they intended to instil fear in the powerholders and motivate others to rise up in support of their cause. The same logic, albeit without the element of murderous intent, motivated the hunger strikes of Mahatma Gandhi in 1940s India and the self-immolations of Buddhist monks and nuns in 1960s South Vietnam, both of which resulted in massive movements of popular support. In the same way, suicide terrorists of recent decades have harnessed the motivating power of fusion, whether generated through naturally occurring shared experiences of oppression or artificially induced ritual ordeals (or more likely both), to mobilize would-be martyrs to strategic effect (Pape 2005).

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Not only in the specific case of terrorist cells but in other kinds of interest groups, embedded in religions, professional guilds, and even schools and universities, imagistic practices have posed a threat to centralized states, empires, and priesthoods and have historically played a prominent role in many civil wars and revolutions as well as religious splinterings and reformations (Whitehouse 2004; Whitehouse and Martin 2004). Efforts throughout history to suppress, contain, or wipe out imagistic organizations have met with varying success (Whitehouse and Martin 2005). And the same may be said of America's global 'war on terror', which in many cases amounts to an effort to eliminate unauthorized imagistic cells, especially those with a revolutionary vision to establish alternative states or empires. But ruling elites have also opportunistically harnessed the imagistic mode, by endorsing rituals that foster local fusion among elite groups and crucially also in the military. And this continues today, for example in the form of secretive hazing practices in the institutions through which ruling classes are recruited, in the fraternities of elite universities and masonic lodges, and in the armed forces. These practices give rise to fusion in much the same way as imagistic rituals have done for many millennia in small-scale societies and, nowadays, in a wide range of non-state armed groups (Whitehouse and McQuinn 2012).

6. Extended Fusion, Identification, and Self-sacrifice

So far, we have been focusing on fusion within a local group. The members of such groups fuse as a result of undergoing transformative, self-defining experiences together or sharing biological traits that are through interpersonal contact. As such,

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the bonds of fusion are based on relational ties among particular individuals: family members, fellow fighters in a military unit, co-participants in a ritual, and so on. But there is also evidence that people can fuse with much larger group categories, such as country, ethnic group or world religion. This has been described as 'extended fusion' (Swann et al. 2012; Whitehouse 2013).

The notion of extended fusion raises a number of conceptual challenges. One of these is the thorny question how it relates to the more extensively studied phenomenon of 'identification', which is essentially a measure of the strength of one's commitment to a social category (Tajfel & Turner 1979). Another is how extended fusion might fit with the theory of 'tribal social instincts' (Richerson & Henrich 2012), which includes an evolutionarily grounded account of how ethnic markers arise and spread (Boyd and Richerson 1987). Identification is a depersonalizing form of group alignment in which group members perceive themselves to be interchangeable (Swann et al. 2009) because they are merely the bearers of prototypical traits that have been socially acquired from others (Whitehouse and Lanman 2014). By contrast, fused individuals regard their group identities as grounded in personal experience (Whitehouse 2013) producing a "strong autonomous self" that is "merged with the group" and therefore capable of motivating extreme pro-group action in nonprototypical ways (Swann et al. 2009; Whitehouse, McQuinn et al. 2014; Swann et al. 2014). In contrast, identification with a group only motivates self-sacrificial behaviour to the extent that it is endorsed by the group *and* that one's personal self does not become salient and trigger self-preservation motives that conflict with group values or interests (Whitehouse 2013). The first empirical demonstration of the fundamental differences between identification and fusion was a study in which

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participants were first asked about their willingness to defend themselves personally when threatened (priming personal identity) and then their willingness defend their group when threatened (priming group identity). Compared to a control condition that did not prime personal identity, the personal identity prime increased willingness to defend the group at cost to self in strongly fused individuals. But the personal identity prime had no effect on willingness to defend the group among those who were highly identified but not highly fused with the group (Swann et al. 2009). Subsequent studies further support the view that identification and fusion are fundamentally distinct forms of group alignment (e.g. Gomez et al. 2011; Swann et al. 2012).

Nevertheless, *extended fusion*, like identification, entails alignment with group categories rather than with a network of local, relational ties. Some of these group categories specify enormous populations – far too large for their members to know each other personally. Such groups may be described as 'imagined communities' (Andersen 1983), in the sense that one cannot actually perceive one's fellow members directly; instead one can only imagine the coexistence of others in the group who share the same identity markers. It has been argued that semantic memory for shared beliefs and procedural memory for shared practices both play a crucial role in the formation of imagined communities (Whitehouse 2004). Such memories take the form of schemas and scripts in which the slots for actions, actors, patients, and instruments, are not populated by particular individuals and artefacts but generic representations of prototypical ones (Whitehouse 2005). Semantic memory provides us with most of the knowledge required to be a competent member of a large social group, such as a nation or a world religion, but it is a very impersonal kind of knowledge, in which the relevant agents are faceless bearers of social roles. Such

memories are not anchored in personal experience – in fact they are acquired through social learning from others in ways that are rapidly detached from any single episode in time or space (Whitehouse and Lanman 2014).

Unlike fusion, which taps directly into personal experience, identification is 'deindividuating' (Diener et al. 1980). Activation of social identities makes personal experience (and thus the personal self) less salient – it is as if one 'loses oneself in the crowd'. Since identification does not tap into personal agency in the same way as fusion, we should expect identification to be a comparatively weaker basis for group cohesion (Whitehouse 2013; Whitehouse and Lanman 2014). True, identification motivates many forms of cooperation in society, including submission to higher authority, following and enforcing norms, participating in democratic institutions, dutifully paying tax or tribute, and so on. It may even lead to heartfelt sympathy for those who lay down their lives for the group. But sympathy for the sacrifices of other group members, including the actions of suicide bombers, is not the same as being willing to undertake such actions oneself. Since identification is not a sufficiently powerful social glue to overcome selfish drives and impulses penal systems are often required to sanction selfishness. This is particularly noticeable where conflicts of interest between individual and group are most extreme and the temptations to defect are high. A case in point would be participation in the military during wartime. But while shooting deserters, or punishing criminality in general, may have a deterrent effect, it is not the most effective way of inspiring commitment to the group. Military leaders have long appreciated that combatants motivated by fear of punishment are far less effective in battle than those motivated by love of the group, of the kind that only fusion can produce. This may be one reason why terrorist and guerrilla forces, even

when greatly outnumbered, can present such a stubbornly persistent threat to states with only conventional armies at their disposal.

Although identification with large group categories may be a relatively weak motivator, at least when it conflicts with personal self-interest, it is reasonable to ask whether extended fusion fares any better. Extended fusion is thought to entail the extension of bonds of kinship to larger groups (Whitehouse 2013), such that the metaphor of brotherhood triggers similar emotional responses, via norm internalization, as genetic relatedness (Richerson and Henrich 2012: 62-3). This might be conceptualized as a process of 'projection' (Swann et al. 2012) whereby bonds forged in small groups, such as the family, come to permeate our feelings about larger groups, such as church or nation. Consistent with this view is the pervasive use of metaphors of kinship when talking about country (e.g. as motherland, fatherland), fellowship (e.g. as brotherhood), and ethnicity (e.g. emphasizing common genealogical roots). Nevertheless, the bonds forged in small relational groups, such as families, are often rooted in quite different kinds of memories from those uniting larger social categories. This is very apparent in the way different kinds of rituals bond participants.

As we have seen, imagistic rituals rely heavily on shared *episodic* memories deriving from rare, emotionally intense, and personally consequential events such as initiation or frontline combat (see above). Relying as it does on self-defining episodic memory, fusion taps into the agentic personal self at the same moment as it activates social identities (Swann et al. 2012). To the extent that these kinds of episodic memories may be associated with much larger group categories, we can fuse with 'imagined

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communities'. But note that this process of fusion, if correctly conceptualized, must be grounded in concrete personal experience and, consequently, it must be 'local' before it can be 'extended'.

While fusion with country has been shown to correlate highly with stated willingness to fight and die to protect one's fellow countrymen (Swann et al. 2010), it remains doubtful whether anyone would prefer to die for an extended fusion target over a local one. The fact that the beliefs and practices defining large groups are acquired from others, rather than arising from internal processes of reflection and individual learning, may be one reason why identification fails to tap into personal agency, as noted above. Consequently, even if collective beliefs and practices can be 'personalized' via the projection of local fusion onto an extended group, such a process may dilute the authenticity and uniqueness of the episodic memories upon which the fusion of personal and group identities depends. For example, the Christian evangelist might have experienced uniquely episodic and personal revelations even though her conversion narrative is at the same time heavily shaped by socially learned and often quite highly standardized cultural schemas. To the extent that the experience of being 'born again', for example, can be shared with others in one's group, it might really be just the socially learned semantic schemas that are common to conversion rather than the self-defining experiences of converts.

There is also the question of whether sharing life-shaping experiences first hand produces stronger fusion and associated behavioral consequences than would be the case if the evidence for sharedness is indirect. Tribal initiates or frontline fighters, for example, can actually recall who else was there during the most salient rituals or

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battles, suffering by one's side. It is possible that this kind of memory fosters the strongest fusion and motivates the most extreme prosocial actions in defending other members of the group. At the other end of the spectrum might be bonds based only on indirect evidence of shared experience, such as wearing the same medals or other insignia. Viewed in this light, war wounds or scars of initiation might serve as evidence of intermediate reliability, a compelling testimony to common suffering but without the episodic 'time travel' quality of remembering particular group members actually being present during shared ordeals. In the study of Libyan revolutionaries reported above, participants expressed ceiling levels of fusion both with members of their own battalions (local fusion) and with those they hadn't met from other battalions who fought bravely (extended fusion) – but on a forced choice question they overwhelmingly chose their relational network over any extended group (Whitehouse et al. 2014). Although it is not yet known whether differences in the strength of local and extended fusion are due to the directness of evidence for shared experience or some other factor, it is quite possible that only local fusion is capable of motivating extreme self-sacrifice. All these topics should be explored more systematically in future research.

6. Conclusions and next steps

Why die for a group? This paper integrates core insights from the literature on suicide terrorism into a novel theory in which identity fusion, combined with perceptions of outgroup threat, motivates extreme self-sacrifice. It is argued here that fusion is caused by perceptions of shared essence, whether that is due to shared biology, shared experience, or both (although there may be additional, as yet unknown, factors that

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give rise to fusion). This theoretical framework results from a synthesis of several decades of research on religious groups together with a wide range of more recent studies measuring willingness to fight and die for the group in special populations including football fans, martial arts clubs, Islamic fundamentalists, and members of other highly cohesive organizations, as well as data from groups whose members actually laid down their lives for each other on the battlefield, including non-state armed groups in Libya and conventional forces serving Iraq and Afghanistan.

Several theories of the evolutionary origins of the fusion mechanism are considered here. One proposes that fusion is the outcome of kin selection, motivating high levels of cooperation and mutual support among close genetic relatives (Whitehouse and Lanman 2014). Another proposes that conditioning cooperation on past experience is sufficient to fuse groups of distantly related individuals in the face of adversity (Whitehouse et al. 2017). These theories are not mutually exclusive and could both help to explain the biological evolution of the fusion mechanism under natural selection. In much of human prehistory, fused groups probably comprised small warring bands bound together in adversity but in contemporary complex societies fused groups are often embedded in much larger organizations, such as armies, religious sects, and terrorist organizations. In many cases, fusion results not only from ordeals triggered by external factors, such as enemy attacks or natural disasters, but also through culturally evolved cohesion gadgets such as traumatic initiations. So-called 'imagistic practices' of this kind are found not only in small-scale societies traditionally at war but also in modern military units and terrorist cells, including those using suicide attacks as a strategic weapon.

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The theory of extreme self-sacrifice proposed in this paper is falsifiable, hinging as it does on the following testable hypotheses regarding the psychological causes and behavioural consequences of identity fusion (see Figure 1): perceptions of shared essence lead to local fusion; perceptions of shared essence are outcomes of at least two distinct processes (experiencing emotionally intense events with others and/or believing that one shares inherited biological traits); local fusion motivates psychological kinship and self-sacrifice for the group. A number of similarly testable subsidiary hypotheses have also been presented regarding the causal pathways linking shared emotional events to fusion and self-sacrifice. For example, it is proposed that episodic memories for shared events are 'group-defining' to the extent that they also prompt reflection on the meanings of those experienced events. Causally opaque events are hypothesized to generate more reflection than causally transparent ones. It is also proposed that fusion and psychological kinship only motivate violent self-sacrifice when a plausible outgroup threat of sufficient magnitude is present. Evidence has been presented in support of each of these hypotheses but there remains a need for wider independent replications to validate existing findings.

The pathways to fusion and self-sacrifice proposed here could turn out to be mistaken in some of their details, without being completely wrong. What would be fatal for the theory is if it turned out that convictions of shared essence failed to predict high fusion scores or if fusion (plus outgroup threat) were shown to be a poor predictor of actual (as opposed to declared) willingness to fight and die for the group. These two claims are so central to the conceptual framework that, if shown to be false, the entire edifice would collapse. Somewhat less disastrous for the theory, but still a setback, would be a significant reduction in its explanatory provenance. For example, the

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theory may eventually prove to be applicable only to some armed groups but not all – and perhaps most crucially not to suicide terrorists. Although there would seem to be many similarities between the self-sacrificial acts of armed militia (whose fusion levels with numerous target groups have been measured) and those of suicide bombers (whose fusion levels are unknown), these similarities may turn out to be more apparent than real. If, as some have argued (see section 2 above), most suicide terrorists are motivated by pathology (e.g. suicidal depression) rather than the desire to act in the interests of a group, that would be a serious problem for the theory as articulated in this paper. Decisive evidence on this question may require more extensive research among would-be suicide terrorists and those who have attempted unsuccessfully to carry out such attacks (the previously acknowledged difficulties of conducting such studies notwithstanding).

The theory presented here also raises many new empirically tractable questions, for example concerning the relationship between local and extended fusion. Future research should investigate whether perceptions of shared essence are stronger if they are based on direct observation rather than on the testimony of others. Would remembering who else was there alongside you in a decisive battle or a traumatic rite of passage, or perceiving shared phenotypic traits in a sibling, provide more compelling evidence of shared experience or shared biology than merely displaying the same kind of medals or reciting myths of shared ancestry? Relational ties to a local group often incorporate episodic memories for self-defining events, which other group members indelibly inhabit. By contrast, categorical ties to an extended group are based largely on 'knowing that' certain identity markers serve as indirect testimony to shared experience. Indirect evidence of shared experience may not be

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capable of motivating acts of self-sacrifice to the same extent as bonds forged through episodic memories of shared ordeals within a band of brothers.

Research into the causes of extreme progroup action is not merely of scientific interest – there is potential also to use the findings in practical ways. For example, de-radicalizing Islamist militants might be re-framed as a process of *de-fusing* extremists. Given that we now have a well-substantiated account of the causal pathways to fusion, together with evidence that priming the mediating variables in this pathway increases fusion (e.g. Whitehouse et al. 2017), it may be possible to reduce the effects of mediating variables so as to obstruct or reverse the fusion process. This has yet to be demonstrated in practice but the general approach is well motivated theoretically. Such an approach should not be confused with the notion of 'de-programming' because the goal would not be to alter people's beliefs or goals against their will. Indeed, the aim would not be to challenge the validity of ideologies or doctrines at all but only to facilitate a process of reflection on past experiences and their relevance to group alignments. The process would need to engage the wider participation not only of extremists but also members of their social networks and surrounding communities (such as parents, school teachers, religious leaders, and others), although the ethics of any interventions would require careful scrutiny and monitoring.

Yet another potential application of this new framework would be neither to create nor to obstruct group alignments but to harness existing ones. There are a number of potentially desirable ways in which this could be done, not least in rebuilding societies devastated by conflicts or natural disasters. For example, during the uprising of 2011, many Libyans fought passionately and at huge cost to clear the way for a

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prosperous future under a more consensual system of governance. The social cohesion needed to build that vision was available in abundance at the end of the revolution but there was a failure to harness it for the public good both on the part of the international community and Libyan leaders vying for power at the time. The same pattern repeats itself endlessly in other conflicts around the world. Only by understanding better the underlying causes of pro-group commitment, can we benefit from its potential for building trust and cooperation while limiting its capacity to stoke intergroup conflict.

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