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**Near the Knuckle: How Evolutionary Logic Helps Explain Irish Traveller Bare**

**Knuckle Contests**

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## Introduction

“If you can’t take pain you can’t be a real fighter”

(Bartley Gorman. Bare-Knuckle Fighter. Once known as “The King of the Gypsies”<sup>i</sup>)

The ability to give and take pain is intrinsic to hierarchical male-male aggression across taxa. This insight more or less defines pain tolerance, in this context, as being commitment to investment in said hierarchical conflict. It is only recently that this has ceased to be a major reproductive factor in human hierarchies, but we are left with its legacies. These include physical legacies, such as the sexual dimorphism in muscularity that reflects this phylogeny (Puts, 2010) and psychological legacies such as the enjoyment of, and impulses to excel in, combat sports. Hierarchical conflict is importantly distinct from the sorts of violent activity required in predator-prey interactions (such as pursuit, ambush, flight, and killing) where nothing short of death or escape constitute success.

When Napoleon Chagnon made first contact with the Yanomamo in the 1960s, he was presented with a bewildering display of what initially seemed like chaotic violence. Careful analysis, as laid out in his seminal work *The Ax Fight*, revealed a complex interplay of surprisingly coordinated and controlled social interactions with a gradually escalating violence, that could be shown to serve highly social functions (Ash & Chagnon, 1975; Chagnon, 1968). Inspired by this approach, we decided to apply the same logic to a local manifestation of male-male violence, specially, Traveller bare-knuckle contests in the Republic of Ireland. Our goal was to provide a proof of concept for the methods and materials to study these behaviors in more detail.

The basic logic of non-lethal violence was first laid out by Maynard-Smith and Price in their seminal (1973) paper. However, this insight has yet to find universal scholarly acceptance in behavioral science applied to humans. For instance, it is a cliché of social psychology textbooks (e.g. Hogg & Vaughan, 2011) to lump *all* human violence together in the category of so-called anti-social behavior. While it remains true that, in common with most behavioral scientists, we seek the reduction of violence in human society, we feel that to frame it all as being anti-social is to mischaracterize it, to over-simplify it as uni-dimensional, and thus, make its reduction less likely. The key to Maynard-Smith and Price's (1973) insight is as follows: Genes that give rise to suites of dispositions that underlie the following interactive behavioral logic will be likely selected: If I can convince my opponent (in a non zero-sum game) that a protracted fight would eventually result in my almost inevitable victory (and thus my hierarchical promotion) then there is no need to kill them (thereby risking injury to myself in the process) to prove it. We can both live to fight and mate another day. Across taxa we see multiple examples of sub-lethal aggressive behaviors, sometimes accompanied by a specialized morphology (such as antlers) that are not typically used to produce deadly force. Viewed through this lens, much aggression and attendant violence is therefore highly *social*, in that it helps to create and maintain social structure. Such a judgement is, of course, utterly distinct from morally valuing, or defending such behavior.

### **Context: The Irish Traveller Community**

The Irish Traveller Community (the Irish term *an lucht siúil* means “The Walking People”) is a traditionally itinerant ethnic group with members spanning Ireland, Great Britain, and even as far as the United States and Australia. In Ireland, they are considered a distinct ethnic group, separate from the majority of Irish society, and with their own shared history, culture, linguistic features, and set of traditions including a nomadic and clannish lifestyle (Centre, 2013; Dillon, 2013). The 2011 Irish census recorded nearly 30000 self-

identified members. Traveller traditions also include strong hierarchies, and intense traditions of sexually dimorphic behavior. This can manifest itself in ways that bring them into conflict with wider society.

For Travellers, bare-knuckle boxing constitutes a significant time-honored tradition, that continues into the modern era. It is described by Dillon (2013) as being Traveller men's method of settling disputes, and has an essential formality, and a rule-based structure. Yet, notwithstanding the historical and cultural significance of the sport for this community, it is associated with the criminal violence and brutishness which often seems to characterize Travellers in the media. Furthermore, bare-knuckle boxing is illegal—if rarely prosecuted—in Ireland (Murphy, 2012).

We hope that an increased understanding of the sport of bare-knuckle boxing may serve to strengthen overall understanding of the Travelling community itself—contributing to a reduction of prejudice—as well as allowing insight into an ongoing practice of highly sexually-dimorphic, ritualized male-male combat with directly observable fitness-related consequences, that is otherwise hard to study. The present study aimed to provide a proof of concept test bed for piloting the methods to test competing hypotheses regarding such violence in order to establish which of the main psychological explanations for violence, best captured it; in terms of functions, significance, and meaning for Travellers.

### **Theories of Violence: The Irish Travelling Community and In-group Violence**

In-group violence has a number of key characteristics. It is typically hierarchical, rule-following, male-male, and sub-lethal. There are many species with horns, antlers, and other specialized combat structures. In these species, such combat tools and associated behaviours are not typically the ones used for subduing prey or defending against predators, but can be considered specialised for in-group violence. In-group violence differs from the out-group

kind. For example, venomous snakes compete, not through biting, but through winding competitions (Shine, 1979). Giraffes (Simmons & Scheepers, 1996) and stags (Reby et al., 2005) can kick predators with lethal force but use their armoured heads in butting contests with one another.

By contrast, out-group violence more closely fits the mode of predatory assault and its attendant defence. No appeasement of a predator is possible, and all combat is aimed at either lethality or, in the case of prey, escape at all costs. The mode of attack is the most directly lethal possible--preferably from ambush (Romero, Pham, & Goetz, 2014). Mercy and rules are irrelevant to predator/prey interactions. Human out-group violence is typified by many other elements that attend out-group cognitions- such as dehumanising of the enemy, and an emphasis on swift and lethal destruction. These features alone disbar it from being the phenomenon we are discussing here.

### **Psychological explanations for in-group violence**

A number of psychological theories have attempted to explain the nature of violence in humans, and recently these proximate explanations have been supplemented with the added value of ultimate ones (Scott-Phillips & Dickens, 2011).

The frustration-aggression hypothesis (Dollard, Doob, Miller, Mowrer, & Sears, 1939) proposed that aggression is always caused by some kind of frustrating event or situation; frustration invariably leads to aggression. This reductive one-to-one mapping was later modified to a supervenience relation: That all aggression resulted from frustration, but that frustration could be redirected (e.g. a necessary but not sufficient condition). This excitation transfer theory (Zillman, 1971) states that the expression of aggression is a function of learned behaviour, some excitation from another source, and the person's interpretation of the arousal state. Zillman (1971; 1979) suggested that residual arousal can

transfer from one situation to another in a way that promotes the likelihood of an aggressive response. One theory is a development of the other and hold to a hydraulic model of aggression—that it is viewable as a force seeking release. Both views assumed an anti-social view of aggression and violence, in that they do not suggest that aggression has any evolutionary function. They are also restricted to describing proximate mechanisms alone. The model is inherently an hydraulic one: Violence is conceptualized as a semi-autonomous pressure seeking an outlet. This sort of violence is not assumed to serve a function, except in the broadest sense of what constitute goals.

Darwin (1861) regarded the greater proneness to physical aggression by men than women as explainable by one aspect of sexual selection, in that men are required to compete for resources (like mates) in order to secure a chance at reproduction. While a simplistic “males compete females choose” model is stating things too starkly (Stewart-Williams & Thomas, 2013), it is still the case that, among humans, ritual violence—often codified into sport—is more common in men than women. By displaying impressive fighting ability, a male may have histotircally signalled to a female that he is more sexually appealing as a potential father—or, at least--protector.

As an example of inter-sexual display, consider the traditions of the Surma people--an ethnic group residing in South Sudan, and Southwestern Ethiopia. The tradition of stick-fighting or *Donga* is a central part of the Surma culture. It is male-male competition which takes place between using sticks with rule-keeping monitored by a referee (Beckwith & Fisher, 1991). Winners gain more brides (Beckwith & Fisher, 1991). As a model for bare-knuckle fighting it has some interesting shared features.

As well as inter-sexual display there is also intra-sexual competition. Mates may be directly competed for, but often males compete for hierarchical positions that generate indirect access to mates via status. Lombardo (2012) proposed that although sports (like

boxing) can provide an appealing display for female onlookers, men are statistically more likely to participate in, enjoy, and avidly observe such sports than are women. If such displays are for the benefit of women, then how do we explain the intense interest men have in watching sport? He proposes that sport evolved to provide men with arenas for intra-sexual competition and a way to evaluate potential allies and rivals. Romero et al., (2014) supports this view with the observation that intra-sexual contests between human males typically occur between roughly symmetrical opponents, where males are well matched in status and ability, and are more likely to happen in the presence of an audience. This audience often encourages, discourages, or intervenes in the fight. In addition they note that these contests typically begin with a challenge, usually to one's manhood (Romero et al., 2014). In relation to Irish Traveller boxing, these competitions are known to occur exclusively amongst men and not women (Dillon, 2013), thus suggesting the possibility of an intra-sexual contest explanation.

A third, ultimate, explanation for the type of aggressive conflict which occurs within groups is that of Boehm (2000) who proposes that in-group conflict, such as male-male contest, should be the natural focus for exploring the development of human moral communities. This theory suggests that groups of humans develop moral systems based on removing self-aggrandizing bullies. If an individual deviates from this morality by exhibiting undesirable behaviour which may lead to the victimization of others, or to conflict within the group, then the group as a whole will unite in order to punish this deviant, for example by 'administering beatings' (Boehm, 2000). There thus must be a common agreement within the group as to what constitutes deviance. Boehm (2000) suggests that alpha-male type behaviour is one example of such deviance via the generation of political, social, and economic problems for the group, therefore this behaviour must be extinguished. Males attempting to become dominant are punished by the group as a whole, that is, their behaviour is reined in.



This is a type of levelling mechanism, a practice used to ensure social equality (Haviland, Prins, McBride, & Walrath, 2013).

If this applies to the Travelling Community, it suggests that bare-knuckle boxing matches may occur in order to rein in the actions of alpha males in the group, whereby the group as a whole monitors the behaviors of its members and convenes to take punitive action on those who deviate from acceptable conduct. Given that this levelling mechanism is intended to benefit the group as a whole, this putative ultimate explanation for aggression is considerably pro-social in nature. It should be noted however, that Boehm (2000) proposes that mobile bands (which Travellers are) are ethologically egalitarian, compared to tribes that live in chiefdoms which are conversely hierarchical. It should be noted that Travelers are both nomadic, and traditionally have authoritative members like a Traveller King (Dillon, 2013).

A final, (proximate) proposal for understanding in-group aggression explores the behavior's cultural relevance, such as that seen in cultures of honor (Cohen, Bowdle, & Schwarz, 1996). The concept of a culture of honour pertains to societies in which affronts are met with violent retribution (Cohen et al., 1996). Studies have shown that in these cultures, acts of physical aggression constitute one means by which men prove their masculine status because such behaviors convey to others that a man is strong, fearless, and willing to act despite risks to personal safety (Barnes, Brown, & Tamborski, 2012; Bosson, Vandello, Burnaford, Weaver, & Wasti, 2009). One of the most important attributes that the male members of such a culture can adopt, is a reputation for physical aggression and toughness in response to any affront to his status or honor (Latham, 1997). This includes affronts which may come from members of the group itself. This explanation of the outbreaks of violence is not in competition with ultimate ones—honor may well constitute a mediating proximate mechanisms by which ultimate mechanisms are cashed out in reality. However, it would

stand in contradiction to a standard social science model of frustration/ aggression. That is because the latter implies displacement activity. However, one does not gain honor by dueling those of lower status. Dueling implies a controlled release of aggression to specified targets, not random lashing out.

In the United States of America, the Southern States are hypothesized to constitute such a culture (Nisbett & Cohen, 1996), as is the Latino community (IJzerman & Cohen, 2011) and parts of the country of Turkey (Bagli & Sev'er, 2003; Kardam, 2005). These cultures tend to originate in environments where a weak (or non-existent) state is unable to enforce contracts, protect individuals from predation, or punish the guilty (Leung & Cohen, 2011). In addition, IJzerman & Cohen (2011) state that these cultures tend to embrace values of religiosity, female chastity, familial loyalty, high social esteem, and defence of reputation through violence. While the Irish Traveller Community has not been previously defined as a culture of honour, it is undoubtedly characterised by these other attendant factors. The Travellers are deeply religious, highly sexually dimorphic (for example having strict customs of chastity for women) and are very family oriented (Allen, 2012; Dillon, 2013; Griffin, 2002; McGaughey, 2011). An example of how the Travellers are referred to implicitly as a culture of honor in a report by The Traveller Interagency Programme (2011), who describe how in the Travelling Community, 'backing down is seen as weakness.'

### **Exploring in-group, male-male competition**

It is the theme of countless martial arts coming of age tales. The young student is schooled in how to compete according to fair rules, while the baddies are told "No mercy" is the only rule. This encapsulates the difference between in and out-group male-male aggression.

In a Traveller bare-knuckle fight there is much posturing and threat leading up to the violence (Gallant, 2000). There are rules of combat, enforced by cultural norms- “a fair fight” or a “square do”. For example, there are multiple opportunities for one side to withdraw. Referees can intervene, towels can be thrown in, and fighters are expected to pull back when told to do so. Low blows, kicks, and the like are forbidden. Fighters are separated from clinches. A formal or semi-formal insult is central to in-group competition. This ordinarily constitutes an insult to the honour of a potential competitor (Gallant, 2000).

In structured male-male competition, certain techniques that might be deployed in a fight will be forbidden and even appear disgusting if employed. This is not always clear to those naïve of social differences in fighting, which do not boil down merely to differences in style. Consider the shocking ear-biting behaviour by Mike Tyson in his match against Evander Holyfield in 1997. This was widely abhorred by boxers and fans of the sport alike. However, some opponents of boxing world spoke at the time as if this was the sort of violence that logically follows from boxing (for instance, Willis, 2013 explores contemporary reports). The tactic violated an implicit rule of combat (Romero et al., 2014), an essential element of culturally acceptable in-group violence.

A very specific act is invariably prohibited in male-male in-group competition across cultures. This is the direct attacking of the genitalia of the opponent, again something which is in direct defiance of the implicit rules of combat as described by Romero et al., (2014). Such a technique would be undoubtedly effective. However when viewed in a biological context of hierarchies where status correlates closely with access to females (Buss, 1989), the prohibition becomes clear. Note that such a prohibition is probably unconscious in humans (in males at least), and certainly so in other animals. Put in blunt biological terms, loss of genitals could be worse than loss of life- to males, if that life loss had come as a prize for reproductive success. For instance, in some species males die as part of mating and this

increases their inclusive fitness (Roeder, 1935). Attacks to male genitalia could constitute mutually assured genetic destruction. For such a vulnerable target to be on limits would make the “live to mate another day” goal hard to achieve. When such attacks do occur in other animals they are part of a much more lethal strategy than hierarchical acquisition; there is no coming back from here (De Waal, 2007). Such conduct should cause outrage in contestants and onlookers.

Appeasement or submission rituals are also associated with male-male competition (De Waal, 2007). Appeasement involves an individual ‘displaying apologetic, submissive, and affiliative behaviour, which prevents or reduces others’ aggression, increases social approach, and re-establishes the individual’s relation to others’ (Keltner, Young, & Buswell, 1997). Appeasement is not to promote some group benefit, but for the simple economic reason that reducing damage when a winner has been established beyond doubt is mutually beneficial to both combatants. Even a loser may do serious damage to a winner. In human competition, typical appeasement rituals include a hand-shake, or a clear admission of defeat.

Despite its name, bare-knuckle fighting is rarely totally bare-knuckle. Contrary to popular and scholarly belief, human fists are not well-adapted to punching, and those who fail to protect the delicate bones and connecting ligaments with hand wraps are in danger of losing a hand (King, 2013). Thus, bare-knuckle fighting requires considerable ritual and preparation before it is performed.

Ritualised male-male combat that fits these patterns has been documented across various societies other than the Irish Traveller Community. Some prominent examples include the western tradition of duelling (Williams, 1920), Nuba wrestling (Riefenstahl, 1995) and club-fighting among the Xhosa (Kaschula, 1996). Defending one’s honor in these communities is paramount and it comes with an established set of rules and structures.

## **The present study**

Competing evolutionary and anthropological explanations, both ultimate and proximate, were assessed in terms of implied predictions for observation in Traveller fights. Not all predictions are mutually exclusive, but some are. The theoretical explanations for the occurrence and nature of such fights are:

1. Anti-social behaviour (Dollard et al., 1939; Zillman, 1971): This is the standard social science model explanation of violence- that such behaviour has no social benefit and is unstructured, indiscriminate, and unpredictable. For the purposes of this study, elements of the frustration-aggression hypothesis and the excitation transfer model are being subsumed under an anti-social behaviour explanation for aggression. This is a proximate explanation for this behaviour.
2. Inter-sexual display (Darwin, 1861): Male--male violence displays reproductively salient features to watching females. There will be female onlookers present and men will be competing in order to impress them and secure their chances at finding a mate. This is an ultimate explanation for this behaviour.
3. Group-selection (Boehm, 2000): Male-male violence has a group benefit—the reigning in of deviant behaviours of members of the group such as alpha male bullies, who are then punished by the group as a whole. This is an ultimate explanation for this behaviour.
4. Intra-sexual selection (Darwin, 1861; Lombardo, 2012; Romero et al., 2014): Male-male violence constitutes a specialized form of hierarchical combat. Males are protecting their status from threat. This overlaps with inter-sexual display, and culture

of honor explanations, but is distinct in certain respects. This is an ultimate explanation for this behaviour.

5. Culture of Honor (Nisbett & Cohen, 1996): Members of certain cultural groups defend their personal and family honor using violent retribution against any affront. Again this is related to the status contests of intra-sexual selection contest, but has other distinctive qualities. This is a proximate explanation for this behaviour.

These theories each make a number of predictions about the behavioral and contextual factors of in-group male-male competition. The combination of these predictions constitutes a set of mutually exclusive hypotheses about what we will see when we observe Traveller contests. Some rationale for each observational hypothesis is offered below:

1. *The fight will occur between apparent equals*: This is predicted by theories 2, 4 and 5.

The literature indicates that if a contest is an inter-sexual or intra-sexual display, then it should occur between individuals of similar age and size. Additionally, if a contest is taking place for reasons of honour and status, then opponents should be relatively well-matched in terms of age, size, ability and strength.

2. *The fight will be made a public affair*: This is predicted by theories 2, 3, 4 and 5. If a fight occurs due to members of a culture of honor defending their status and reputation, then this should be a public display which ensures other members of the group are aware of these fighters' willingness to defend their honor. Intra-sexual display theory, whereby males are competing for status in the eyes of other men, predicts that male bystanders will be present, evaluating potential rivals. The group-selection theory predicts that members of the group will have convened to ensure a morally deviant member is being punished. This hypothesis is not predicted by theory 1, as anti-social behaviour should not call for onlookers.

3. *There will be a challenge or insult issued in the beginning:* This is strongly predicted by theory 5, which states that any affront to a member of a culture of honor must be swiftly met with violent retribution. It is also predicted by theories 2 and 4. An inter-sexual display aimed at impressing on-looking females should constitute males challenging one another. An intra-sexual display whereby males are attempting to gain status among other men should also involve the issue of an initial challenge.
4. *There will be women present:* This is predicted by theory 2. If *direct* inter-sexual display is the reason behind the fighting (rather than having indirect effects via established hierarchy), then females should be present to evaluate these potential mates. In addition, theory 3 predicts that the group as a whole should be present to punish deviant alpha males, thus this should involve females in the group. It is not predicted by theories 4 and 5. Intra-sexual display purely among men does not require the presence of women.
5. *The fight will appear unstructured and random:* This is strongly predicted by theory 1. Anti-social behaviour should not constitute structured or rule-bound violence. The violence should essentially erupt without warning. This hypothesis is strongly not predicted by theories 2, 3, 4 and 5, all of which encompass elements of structure, ritual, and organisation.
6. *Rules will be enforced:* This is strongly predicted by theories 4 and 5. Competitions dealing with status among men have been shown to have both explicit and implicit rules of combat which must be obeyed. These rules may be enforced by official referees or a crowd of onlookers. These rules will limit the degree of damage, while allowing appeasement rituals to occur. Any breach of rules should be looked upon with disapproval. This hypothesis is not predicted by theory 1.

7. *There will be indicators of the fighters' families investment in the fight:* This is predicted by theory 5. Fighting from a culture of honor perspective entails defending the status and reputation of family name and prestige. Members of fighters' families might be present or (perhaps more likely) fighters could make it known that they are defending/ representing their family.
8. *Certain ritualistic elements of combat should occur:* The types of contests in question are known to include factors which add to the ritualistic nature of competition. This should include formal hand shaking at the beginning, appeasement rituals such as hand shaking at the end of the fight, the use of uniform or protective wear, and in the case of the group selection theory, the notable punishment of a moral deviant in front of the group. This hypothesis is predicted by theories 4 and 5, and not predicted by 1.
9. *There should be a resolution or attempt at one:* Theories 2,3,4 and 5 say that these fights occur with a pro-social purpose, and a resolution of conflict should be the final aspect of such competition. Particularly in relation to inter-sexual and intra-sexual display theories, a winner should emerge victorious and the loser should admit defeat, and differences should be dispelled. Additionally, a member of culture of honour defending the honour of himself or his family should be satisfied that the competition has solved the dispute and a resolution should be reached.



## **Methodology**

### **Methods**

We carried out an observational study on recordings of actual bare-knuckle contests. While observing bare knuckle boxing matches live might have seemed optimal, this was neither logistically nor ethically possible to implement. Not only are these activities illegal, the presence of outsiders at these matches can compromise the ecological validity of the activity and the safety of the raters. These events are technically criminal, potentially placing raters in the invidious position of legally having to report people they had befriended. Video observation allowed for more controlled, and repeated, observation.

### **Ethics**

Ethical approval was obtained from the supervising university authority. Special attention was paid to the fact that the Irish Travelling Community is a minority group, thus it was ensured that the materials and videos were treated with dignity and respect throughout the study. Furthermore, it was considered extremely important that this study emphasized the better understanding of both the Travelling Community and in-group competition in general, rather than having the potential of exploiting the community and its boxers in any way. In terms of confidentiality and anonymity, no names or identifying details from the boxing matches will be mentioned in this study.

### **Raters**

We used three expert raters. Although, according to strict conventions of content analysis these are considered “participants”, we will use the term “rates” throughout to forestall confusion with the fighters. Expert raters must have the ability to “distinguish one behaviour from another, to sustain attention, to be attentive to fine detail, to react quickly and

to summarize behavioral samples verbally” (Sattler, 1988). One of the designers (not used as a rater) was a former lightweight Mixed Martial Arts fighter (UK Pancrase 2001 Champion), and recruited other experts through snowball sampling. Inclusion criteria for raters required that they have an expert or semi-expert knowledge of combative competition involving exchange of punches. In order to ensure this, potential raters were required to fit at least two of the following three criteria: At least 5 years training in combat sport; coaching experience; self-professed knowledge of competitive combat. Furthermore, they were required to have conducted some research at University level. Raters consisted of two males, one female and ranged from ages 21-34 ( $M = 27$ ,  $SD = 6.5$ ). Further details available on request.

## **Materials**

### **Videos.**

Ten videos of Traveller bare-knuckle boxing matches were compiled for rating from the extensive Youtube.com collections. The search terms *bare-knuckle boxing* and *Irish Traveller bare-knuckle boxing* were used. Exclusion criteria were: presence of Roma or other ethnicities (judged by a local researcher according to accent and additional information in the video) videos of less than three minutes, and inaudible or poor video quality.

The videos were edited down to three minutes in length each using *Windows Live Movie Maker*<sup>TM</sup> software. The majority of fighting behaviors apparent in the original videos, such as displaying strength, issuing challenges, rule breaking etc., were considered short in duration. The selection of target behaviors (Sattler 1988) was based on theoretical priors from the five types of theories being explored. Therefore, we used the first minute of the fight, the last minute of the fight, and a random minute from throughout the video would be most representative of bare-knuckle boxing matches whilst also ensuring target behaviour would be compatible with the time samples chosen. If challenges at the start of the fight and

resolutions at the end were apparent in the original videos, they were included. The selection of a random minute from the video would also serve to decrease the researcher's bias.

Random selection of this minute was achieved using an online random number generator (Ltd, 2015). Two videos had some running background commentary, which was edited out to further prevent biasing of raters.

Videos were labelled from 1 to 10 (videos available on request). Prior to conducting the video study, a random number generator was used to decide in which order the videos would be presented to the raters (Ltd, 2015), to even out order effects.

### **Rating Scale**

A four-point rating scale was designed for the specific purposes of this study. Each item represents target behaviour or contextual factors for observation. After discussion as to possible redundancy of categories, 23 items in total were selected. Items were allocated to each hypothesis depending on which hypothesis they represented (see table 1).

*[table 1 inserted here]*

### **Additional Questions**

Four additional (open-ended) questions were asked after each rating period to give raters (no longer in a 'rater' capacity) the opportunity to express anything further they wished to say. These questions were 1) What surprised you about the fight? 2) What did not surprise you about this fight? 3) What did you notice which we have not mentioned, that you think is important? 4) Any further comments?

### **Information and consent**

An information sheet was prepared in order to outline the nature of the study to the raters prior to beginning the observation. Raters were not informed of the nature of the study in its entirety in order to reduce bias. It was deemed ethically necessary to warn raters of the potentially violent and disturbing nature of the videos.

### **Instructions**

Prior to conducting observational rating, raters were provided with a set of instructions which outlined how the procedure would take place and what exactly would be required of them.

### **Procedure**

The same procedure was followed for every observation rating which took place in a quiet room with raters separated: After a minute of playing the video, it was paused and raters were instructed to rate as many of the items that had been relevant so far as possible. They were given a minute to do so. The video was then continued for a further minute and paused again. Raters were given a further minute to rate relevant items. The video was then played until the end for the final minute. Raters were given a minute to finish rating all items. They were then instructed to take as much time as they wished to complete the open questions.

### **Data Analysis**

#### **Analysis of Open Questions**

The answers the open-ended questions added meaning and value to the study in addition to the behavioral ratings and were subjected to content analysis. This began with the researcher reading all data repeatedly to achieve immersion and gain a sense of the data as a whole (Hsieh & Shannon, 2005). Data were then read word by word to derive codes. Codes were derived from key words or phrases in each line which seemed to capture the key

opinions of the raters, and were written in the adjoining margin. Eighty-eight codes were initially extracted. The various codes were compared based on differences and similarities and sorted into clusters. Care was taken to keep the number of clusters between 10 and 15, as advised by Hsieh & Shannon (2005). These clusters were labelled based on their underlying idea.

These tentative clusters were revised and further examined through a process of reflection. Depending on the relationships between clusters, some were combined to make overall categories. Labels were amended in some cases to further indicate meaning.

## Results

### Inter-rater agreement

The level of agreement (measured by Fleiss'  $k$ ,) among raters ranged from .43 (moderate) to .9 (very good) across videos, SE .08--.12, (Altman, 1991). For details see *table 2*.

*[table 2 Fleiss' kappa of inter-rater agreement goes here]*

It was therefore deemed acceptable to treat the degree of inter-rater reliability as high enough to proceed with aggregated data. Percentage profiles of ratings per item were then devised based on whether raters agreed that an item (behaviour/context) occurred, did not occur, or was unknown to have occurred or not. Items on the scale which were rated as *Strongly Agree* or *Agree* were considered as 'occurring', items endorsed as *Strongly Disagree* or *Disagree* were considered as 'not occurring'. *I Don't Know* rated items were considered 'not known'. This analysis provides a descriptive representation of what was occurring throughout these videos.

*[table 3 observed occurrence of events witnessed by observers in the fight]*

### Support for predictions

*[table 4 matching observations to theory-driven predictions]*

Of the nine hypotheses detailed above, six were observationally supported at (somewhat arbitrary) levels of fifty percent or more. They are detailed in *table 3*.

## Qualitative Results

### Content Analysis

Analysis of open-ended questions yielded 88 codes (full details available on request) which were divided among 13 preliminary clusters, including a miscellaneous cluster for codes which did not appear to add value/meaning to the analysis. Additionally, a preliminary cluster entitled ‘Ambiguous’ emerged for coded items which were unclear or difficult to interpret.

After a process of revision and reflection, some of these initial clusters were combined based on their relationships and the closeness of meaning between them. For example, ‘Losing’ and ‘Cheating’ were subsumed as subcategories under the main category- ‘Losing & Cheating’ given that they were closely related in meaning. Similarly, ‘Crowd’ and ‘Referee’ were subsumed under the overall category ‘Role of Non-Fighters’. Additionally, ‘Money’, ‘No Point’ and ‘Reason for Fighting’ were combined under the overall main category of ‘Motivation to Fight’. As previously mentioned, some clusters were maintained as main categories and the labels were amended to further indicate meaning. The miscellaneous cluster was excluded from any further analysis as it was not considered meaningful.

Exemplars of codes and categories which emerged from the data are represented in *Table 5*.

*[table 5 goes here]*

For clarity, clusters, categories and subcategories are represented as a diagram, see *figure 1*.

*[figure 1 goes here]*

Once the main categories- Mismatched Fighters, Skill & Technique, Posturing Behaviour, Elements of Competitive Combat, Cheating & Losing, Motivation to Fight and

Role of Non-Fighters- had emerged, descriptions and definitions of each category were developed:

### **Mismatched Fighters**

This category details the fact that it was apparent that the participants considered some of the fighter dyads mismatched. Several comments were made indicating that some fighters were not equal on varying levels:

*“The fighters were mismatched, both in ability and fitness”.*

*“There was a clear mismatch in ability”.*

*“The gap in the fighters’ ability seemed very large”.*

Importantly, this mismatch which could be seen in some fights came as a surprise to participants, as these answers were repeatedly brought up in relation to the surprising aspects of the fights. One participant made it clear that this type of mismatch is difficult to comprehend in a competition milieu:

*“I have trouble seeing why such a small fighter would fight a larger fighter”.*

Overall this category demonstrates the surprise of the participants that there would be a mismatch in size, skill and ability in Irish Traveller boxers during a match. It was not the norm in matches.

### **Skill & Technique**

This category comprises the awareness of the expert participants of the skill and technique demonstrated by some of these Traveller boxers. These participants indicated several instances wherein they felt the fighters were showing tactical fighting and proper technique:



*“Opening piece of fight was very technical.”*

*“Fighters tried to feel each other out.”*

One participant specified that one fight in particular had fighters who were more skilled than the others they had observed:

*“This was probably the best two fighters in terms of ability so far.”*

Part of this skill is endurance. It is impressive when both fighters persevere in a lengthy fight, but lack of endurance can lead to problems:

*“Surprised that both fighters continued.”*

*“Endurance and fitness also seemed to be an issue towards the end of the fight.”*

This category also reveals the value of the expert participants’ eye for technical actions and tactics. They indicated the different techniques being displayed in many of the fights, where a lay person may not have any such awareness. It is evident that many of the Travellers in these fights had real skill:

*“The winner of this fight opened poorly, but it may have been a tactic.”*

*“There seemed to be more defensive grappling in this fight.”*

Participants were attuned enough to spot when fighters were demonstrating misconduct and had the technical terminology to describe it:

*“The amount of grabs and stalls”.*

Overall this category reveals that the participants saw several instances of skilled fighting, wherein the Travelers involved in these fights demonstrated technique, tactic, fitness and endurance.

### **Posturing Behaviour**

This category is somewhat juxtaposed to the previous category pertaining to fighters' skill. Several instances arose throughout analysis whereby participants were indicating how some fighters were often demonstrating posturing behaviour more than actual fighting:

*"There was a lot of posturing and positioning in this fight."*

*"How little they actually fought. Mostly posturing."*

In fact, it was apparent that there was a fight where the fighters barely even used their fists:

*"Wasn't really a fight, not intense and very few punches."*

It appears that in some instances fighters seemed to be afraid of getting hit and this led to demonstrations rather than fighting contact:

*"It was all posturing and neither man wanted to get hit."*

*"Barely any punches thrown by one fighter as if he didn't want to fight at all."*

Posturing was also evident wherein fighters were inclined to pose and show off following a win, in an obvious fashion. This type of posturing was not looked upon favorably by participants:

*"The winner was quite loud in his celebration."*

*"Bad winner, not being gracious in winning."*

It seems that based on the emergence of this category, some of the fights consisted of more 'showing-off' behaviour and posturing, as opposed to intense fighting. This was

unexpected by the participants given that this was repeatedly mentioned in relation to the question pertaining to what was surprising about the fights.

### **Cheating & Losing**

This category pertains to the behaviour of fighters in relation to cheating and losing. The category is divided into two subcategories ('Cheating' and 'Losing'). It is important to note that as these subcategories emerged, it became apparent that they were closely related. They will first be discussed separately and then in terms of how they relate.

### **Cheating**

This subcategory pertains to cheating that occurred in some fights, whereby fighters would appear to break implicit rules of combat. This included offences such as "*head-butting*" and "*biting*". It became apparent to participants that this behaviour was not tolerated:

*"How quick the fight was stopped over a small offence."*

In fact, it was seen to be abhorred by the non-cheating fighters involved:

*"One fighter was unhappy with the way the other fighter was fighting."*

*"One fighter got angry about being kicked."*

And it was abhorred by onlookers also:

*"Not surprising how everyone reacted to the biting"*

It was clear that fights were not continued after such offences had taken place:

*"There was an attempt to stop the fight after the head butt incident. Some rule may have been broken."*

Evidently this subcategory demonstrates that although cheating does occasionally occur in these fights, it is not accepted as appropriate behaviour by fighters or onlookers. There is a potential for development here. One thing that was noticed is that experienced fighters often made contact with non-knuckle parts of the hand. We discuss this in more detail below (although it was not picked up on by fighters or referees).

### **Losing**

This subcategory pertains to how the participants perceived losing fighters in these matches. It was apparent from the text that participants were aware of the decisions losers have to make when they begin to fail. Repeatedly it appears that this decision centered around acceptance, or non-acceptance of defeat. Some fighters were accepting of their loss:

*“The heavier fighter was willing to admit defeat quickly.”*

*“The loser was willing to admit defeat.”*

But in general it was evident that losing fighters were not willing to neither admit their loss nor accept their defeat. This was the case even when serious pain or injury was being inflicted:

*“The loser was unwilling to admit defeat despite sustaining significant injury.”*

*“That the guy who was being beaten badly didn’t want to give up.”*

Evidently the participants found that fighters differed in their willingness to concede defeat.

While these subcategories have thus far dealt with aspects of cheating and losing independent of each other, it became very apparent that participants quite often noticed a

relationship between these two occurrences. Indeed, participants indicate repeatedly that losing is often closely followed by cheating and rule-breaking:

*“The losing fighter went to kick the groin twice.”*

*“The underperforming fighter head-butted the other.”*

It emerged that regardless of whether they were already losing, cheating does not in fact improve a fighter’s chances and actually speeds up the losing process- cheating can lead to an automatic loss:

*“The biting was a real breach of rules. This resulted in a loss straight away.”*

Yet one participant suggests that although cheating disqualifies the fighter, it may save them from actually losing outright, possibly explaining why a losing fighter would turn to rule breaking:

*“Given the size difference, the smaller fighter cheated frequently- possible as a way out without losing decisively.”*

Overall it is apparent from this category that losing and cheating have a close association. Both can occur independently of each other but it was interesting to note how often participants indicated the interaction of each occurrence.

### **Motivation to Fight**

This category pertained to the many instances whereby participants became aware of or estimated why these fighters were involved in a match in the first place. The reasons participants suggested that had motivated these fighters were manifold. Most prominently, it seemed that fighters were motivated by “*personal reasons*”, as well as a sense of prestige or honor:

*“This match seemed to be very personal.”*

*“It seemed to be a mix of prestige and personal reasons for fighting.”*

Indeed, it was proposed that fighters were motivated to compete in order to resolve a personal matter between them:

*“The fight appeared to be a resolution between two men.”*

However, there was also some ambiguity as to what motivated the fighters to partake. Although personal reasons for fighting like honor and pride were evident, participants were unclear about this motivation when money was involved:

*“I was unsure if it was money or pride keeping the losing fighter in the fight.”*

*“The fight seemed to be more personal yet there was money put on the outcome.”*

Conversely, there were instances where motivation to fight was not at all apparent and the fights seemed meaningless:

*“It didn’t seem to have any obvious purpose.”*

*“No point to a few of the fights.”*

This category indicates that participants generally saw personal reasons like pride, prestige, and an attempt at conflict resolution, as being motivations to fight. Yet it was certainly unclear at times whether cash bets were incentivizing fighters or if in fact there was no point to the match whatsoever.

### **Elements of Competitive Combat**

This category emerged in relation to how participants perceived the different elements of competition in relation to bare-knuckle boxing. It became apparent that as expert fighters,

participants were aware of various aspects of the fighting and context that contributed to the structure and execution of each match. For example, it seemed that there were fights wherein fighters had back-ups or seconds, ready to take their place if necessary:

*“Other fighters ready in the background.”*

In keeping with such structural and organizational elements of the fighting, it was clear that there was an awareness among fighters and onlookers as to when a fight should be stopped. Fights were not allowed to persist over a certain length of time (although this length of time was not indicated) and this was evidently implemented:

*“I would say it was stopped because both men were physically fit enough to continue and not because a winner had been decided or a resolution reached.”*

*The fighters were both given the opportunity to end the fight”*

Participants also indicated elements of fighting relating to fair play. Indeed, participants took note of when fighters were fighting fairly and also when something considerably unfair occurred in a competition:

*“The fighters both fought fairly at all times.”*

*“The fight should have been stopped when one of the fighters was grounded.”*

Most notably participants were cognizant of the intensity of the competition, particularly whether or not a match was violent. This level of violence and intensity appeared to differ across fights:

*“Nothing violent about the fight.”*

*“Both appear not to be that fit but this fight was sustained and brutal.”*

*“Much more intense than other fights.”*

Overall this category demonstrates the intricacies of competitive combat and the inherent structural and organizational elements of bare knuckle boxing matches. Moreover, it may be presumed that once again the knowledge and expertise of participants contributed to the emergence of this category and gave them insight about aspects of which a lay person may be unknowledgeable.

### **Role of Non-Fighters**

This category emerged in relation to the different attributes of external bodies at the fights and their repeated contributions to the execution of matches. Participants made several observations in relation to non-fighters at the matches and this was the most prominent category to emerge. The category is divided into subcategories based on the two external bodies indicated, the Crowd and the Referee.

#### **Crowd**

Participants made several references to the fact that the audiences at these fights had a surprisingly influential role in the action. The size of the crowd present differed between fights:

*“Big following/audience.”*

*“Massive crowd of spectators.”*

*“There were fewer people watching.”*

Yet there were several instances in which the crowd had decisive power in relation to fight outcome:

*“The crowd decided when the fight was over.”*



*“No crowd intervention until the very end.”*

*“The referee and crowd attempted to get the loser to quit repeatedly.”*

Conversely, one participant indicated that there was a particular fight in which the crowd was less involved:

*“There was very little crowd interaction.”*

It is clear overall, that participants frequently observed a pivotal role being undertaken by spectators.

### **Referee**

It became abundantly clear that participants perceived the referees as authoritative, both in relation to fighters and indeed the spectators:

*“Referees were so strict.”*

*“The referees intervened before any severe damage took place.”*

*“The crowd followed the direction of the ref.”*

As previously mentioned, referees were seen to actually encourage “losers” to quit. This shows the power they have in fight outcome. However, participants also observed certain difficulties referees had in maintaining control over the fighters and the action at hand:

*“The refs controlled the fight as best they could.”*

*“The difficulty the referee had in intervening in the fight.”*

Overall this category was seen to be prominent and the role of non-fighters at these matches was clearly a salient feature for these participants. It reveals the power of the referee and crowd in these fights and indicates the rule-keeping and structural context central to each

match- something which is monitored by these non-fighting bodies. In addition it was repeatedly observed that referees gave fighters opportunities to withdraw from the fight with honor, e.g.

*He's had enough*

*You've both done enough*

## Discussion

The goal purpose of this study was to explore Traveller bare-knuckle boxing as an example of a ritualized, in-group contest in a traditional society. Five putative theories of in-group aggression were proposed as possible ways to understand the activity. These were the 1) anti-social behaviour theory--encompassing elements of the frustration-aggression hypothesis and the excitation transfer model, 2) the inter-sexual display theory, 3) the group selection theory, 4) the intra-sexual display theory, and 5) the culture of honor theory. These explanations were not all mutually exclusive.

In terms of the proposed theories of aggression, the results showed that items on the scale representing theories 2, 3, 4 and 5 were all observable throughout the videos. However, closer analysis of the items themselves revealed that item 10, 'There are women present' was never observed. This strongly negates the theories of inter-sexual display (theory 2) and somewhat undermines group selection (theory 3) as having any bearing on bare-knuckle boxing. The (direct) inter-sexual display theory requires that females be present to witness the contest between males in order to evaluate potential mates and they were never observed to be present.

In relation to the group selection theory, Boehm (2000) proposes that deviant behaviour such as attempted alpha-male domination would incentivize the community to unite and administer punishment. Yet if no females are present at bare-knuckle boxing matches in order to help facilitate or witness the proposed punishment, it can be assumed that said community is not well represented. Although social egalitarianism in Travellers was not specifically itemized in the rating scale, the fact that no women attended the fights further signifies the lack of support of this theory in explaining this particular practice. Item 20 'This fight punished a bully in the group' was only endorsed as occurring 3.33% of the time, with raters

generally indicating that it was not occurring or that they did not know. Further work might distinguish the posturing of fighters from someone perceived as an in-group bully, per se.

Theories 4 and 5, intra-sexual display theory, and culture of honor theory, respectively were both well represented by raters' observations. Several elements of these theories were observed more than half the time. Theory 4, intra-sexual display, was particularly well represented, especially considering the elements of such contests as outlined by Romero, Pham, & Goetz (2014). Raters noted that fights largely occurred between equals, for example 90% of the time opponents were considered to be of similar age and ability. Moreover, 90% of the time raters found that there was a group of onlookers present who were not part of the fight. Again this ties in well with accounts of intra-sexual displays in humans and non-humans, which are noted to involve an audience who may constitute part of the hierarchy.

Romero, Pham, & Goetz (2014) additionally claim that audiences will often intervene in the fight, and have a role in the outcome. This element of intra-sexual display emerged as a subcategory in the content analysis of participants' answers to open questions, under the Role of Non-Fighters category. Participants observed audiences at these fights as having a surprisingly influential role in the action. It was apparent that the crowd sometimes had decisive power in relation to fight outcome, and would encourage or discourage certain actions. In addition, they were often seen as actually demanding that a loser admit defeat when it was clear he would not be successful. The fact that participants frequently observed a pivotal role being undertaken by spectators adds value to the theory of intra-sexual display as helping to explain Traveller boxing.

The intra-sexual display explanation also predicted that rules should be enforced. This was generally supported by raters' observations, given that 100% of fights were refereed, referees were observed as preventing rule-breaking 90% of the time, and indeed that the

audience was seen to intervene during rule-breaking. This element of in-group contest was also indicated by content analysis. The *Cheating and Losing* category highlighted how any breaking of the implicit rules of combat was not tolerated. Participants observed that even minor rule-breaking could lead to a fight being stopped. Moreover, rule-breaking and cheating was clearly seen as being abhorred by both opponents and onlookers, particularly one instance of a kick to the genitals--something which was predicted would cause outrage if it occurred. Rule-breaking was closely related to losing, in that cheating often resulted in an immediate loss. Sometimes rule-breaking was a way to forfeit a match without being formally defeated. There is one interesting exception to this. Close (sometimes slowed-down) examination of some of the fights revealed that some of the more experienced fighters often hit with areas of the hand which, if in traditional boxing, would not count as scoring—e.g. the knuckle part of the glove. Areas such as the palm heel or ridge edge of the hand have significantly fewer breakable bones, in them and have long been known to pro-boxers as a non-scoring but damaging way to hit an opponent. This accords well with what we know of hands as strike tools (King, 2013) as well as noticing the differences between gloved and bare-fist fights in general.

The culture of honor theory was represented by some of the elements already outlined in relation to intra-sexual display. For example, the presence of an audience was also predicted by the culture of honor explanation. It was proposed that since being part of a culture of honor requires a man to have a reputation for aggression, then defense of one's honor should occur in a public setting, and be publicly approved, in order that a man's aggression is made known to onlookers.

The culture of honor explanation for bare-knuckle boxing was also well represented by observations emergent from the open-ended questions posed to participants. The *Motivation to Fight* category highlighted how fighters were often seen to be motivated by

personal reasons like *prestige* and *pride*. This is consistent with the culture of honor explanation, which describes males who must defend their honor with violent retribution (Cohen et al., 1996). In keeping with this, participants noted some opponents as fighting in order to reach a resolution. Again, given that the culture of honor theory predicts that males from such a community will fight aggressively in order to settle disputes; these observations support such an explanation.

The culture of honor explanation also predicted that fighters' families would be represented in the fight either through mention or presence. Indeed, individuals from a culture of honor are thought to be very family oriented; a man's name is central to his honor (Cohen et al., 1996). Item 14 'The fighters appear to have a history of grievance' was endorsed 53% of the time, as was item 15 'The fighters' families appear invested in the fight'. This indicates that fighters' families were observed as being invested in these bouts of violence little over half the time, which is lower than would have been expected if culture of honor was the only contender for a proximate explanation of in-group violence in this community. However, investment, presence, and interest are different things and subsequent work should reflect this.

Items 11 and 21 referred to the ritualistic aspects of competition predicted by hypothesis 9, including wearing protection (hand-wraps) and hand-shaking to signify resolution. Given that bare-knuckle boxing in Irish Travellers is proposed to be a pro-social, structured event, it was presumed that certain formal ritualistic elements would occur. Raters witnessed fighters as wearing hand-wraps 84% of the time and hand-shaking at the end occurred 67% of the time. High endorsement of these items further supports both the intra-sexual display explanation and the culture of honor explanation.

Both theories of intra-sexual display and culture of honor predicted that a fight should begin with a challenge or insult. Challenge of the honor or status of an opponent was endorsed as occurring 53% of the time across videos. While this still lends support to these explanations, this rating is relatively lower than other items which have been previously outlined. It was presumed based on the literature that the occurrence of a formal challenge or insult would occur much more frequently. However, such challenges did not often form part of the videos found on Youtube.com. This is a proposed limitation of the study. Given that these videos are often recorded just as the fight starts, precedent actions like formal insults may not form part of the uploaded version. Quite often it was noted that challenges could be found on separate videos, but these were available for very few fights. Future work could look at the fuller expression of these encounters.

The Posturing Behaviour category, which emerged from content analysis, was supportive of an intra-sexual display explanation of bare-knuckle boxing. Participants observed many fighters as displaying their strength, celebrating success loudly, and even spending more time posturing than actually fighting. If intra-sexual display based contests provide men with a way to evaluate potential allies and rivals (Lombardo, 2012), then posturing behaviour and strength displays are certainly indicative elements of this explanation. This behavior is also consistent with culture of honor explanations, given that fighters from a culture of honor should be intent on displaying their strength and making their success known.

It was hoped that a difference between elements of in-group and out-group competition, as outlined by Maynard-Smith & Price (1973) could be observed in this study. There were some factors throughout which indicated that this occurred. Rule-keeping frequently allowed appeasement rituals to occur, while limiting the degree of damage that might take place in a fight. As previously mentioned, fighters were observed as shaking

hands at the end of the fight over 66% of the time, an action noted as being an appeasement ritual. Moreover, in relation to video 4, one participant commented that referees intervened 'before any serious damage took place.' This indicates that the amount of harm suffered by any one opponent was certainly limited, there were no fatalities and no recourse to use of weapons. However, it should be noted that not all Traveller fights end in the ring. Subsequent work might look at the circumstances under which this does and does not occur.

### **Anti-Social Behavior?**

The overall results are highly indicative of this behaviour being in-group and pro-social, Raters never assessed the fights as being random and antisocial. Categories emergent from content analysis were supportive of the behaviour being highly structured, formal and ritualized. Fighters often came accompanied by seconds or backups. The intensity of fights differed, and were regularly monitored and stopped when violence was escalating. The Skill and Technique category further indicated that the structural elements of these fights as showing tactical skill and proper technique. Were this behaviour to be explained by a random outburst of built-up frustration or excitement, or displacement onto others where goals are frustrated, it would be difficult to explain why fighters appear so well prepared to endure the fight and apply technical skills in their fighting. These results suggest that bare-knuckle boxing does not represent an anti-social behaviour for Irish Travellers.

Overall the results are indicative of bare-knuckle boxing among Irish Travelers as being a pro-social, in-group activity, which is highly structured and functional. In terms of which theories were best represented, the ultimate explanation of intra-sexual display theory was very well supported both by ratings and categories emergent from open-ended questions. The culture of honor theory was also repeatedly represented by both item ratings and



qualitative categories, suggesting a proximate explanation for the ultimate mechanisms of combat worked out by Maynard-Smith and Price (1972).

## **Limitations**

This was a small-scale study and should be seen in the light of piloting methods, materials, and ways of analysis for an interesting population that will reward future study. We believe we have achieved this. However, even within these restrictions, the usual terms and conditions of scientific humility still apply. For example, there is an undeniable level of subjectivity associated with the procedure of rating combatants through observers. Inter-rater reliability was reasonable but bias is unavoidable in places.

Ensuring that items were representative of the theories and related hypotheses being explored posed difficulties. Describing certain behaviors and contextual aspects of in-group competition differed in difficulty depending on the behavior in question. For example, describing the fight as being a public affair was relatively easy to itemize and thus this element is well represented in the scale. Conversely, trying to ascertain whether the group as a whole was punishing a member of the group was more difficult to convey as a rateable item.

The methodology was limited in relation to the antecedent and consequent events. Although raters were given the opportunity to estimate the reasons for the fight occurring—such as a challenge being issued or history of grievance, there was no way of ascertaining whether these events happened if they were not present in the video. There may well be events beyond the video that were simply not assessed. Further work might look at challenges and even correlate birth rates with fighter success.

In some ways we considered this a proof-of-concept study rather than anything definitive. The number of fights initially coded was low, although sufficient to establish clear protocols and discriminate analysis validity between interpretations.

## **Conclusion**

It is plausible that from an evolutionary-anthropological perspective, bare-knuckle boxing among Irish Travelers is characterized by elements of an intra-sexual display and behaviors associated with cultures of honor. Further research in this area is recommended, particularly if including Travellers becomes a feasible option for researchers. This would serve to further our understanding not only of in-group violence in a traditional community, but also of Travellers themselves. Understanding this community is one step in reducing the marginalization they experience in Ireland. While many in the settled community may see this behaviour as anti-social and abhorrent, it appears to be pro-social and functional for this culture. Policy makers and *Gardaí* (Irish police) may be aware of this to an extent, but stating this from a scientific standpoint should further indicate the importance of this activity for Irish Travellers. While the danger and disruption of disorder associated with this activity are undeniable, and the efforts of *Gardaí* and other agencies are invaluable, it is suggested that learning from this study may be applicable to policy making around bare-knuckle boxing in Ireland. This may aid in the reduction of the eruption of consequent violence.

We would like to follow-up with further studies, especially those integrating the distinctive call-out challenges that these fights often display. It might also be possible to correlate fight success with reproductive success in this pre-demographic transition population that eschews the use of contraceptives. This would enable scholars to more directly test some interesting and contentious hypotheses. We welcome discussion and suggestions in this area.

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<sup>i</sup> “Traveller” is the preferred term today, “gypsy” being often seen as somewhat insulting. However, it would be anachronous and patronising to force this update retrospectively. Gorman referred to himself this way, and all references to him in literature and film are to “gypsy” rather than “Traveller”. However, the rest of this paper will use the preferred modern term. Note that “Traveller” (rather than “Traveler”) is the preferred Irish spelling. At times we will use Irish dialect—specified by italics—but then give a translation.