

'The fog soon clears': Bodily negotiations, embodied understandings, competent body action and 'brain injuries' in boxing

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Abstract

Boxing is 'all about bodies'; beautiful bodies, broken bodies and, sometimes, brain-damaged bodies. And while a lot of research has explored the physiological side of 'punch drunk' syndrome, far less work has attempted to consider how boxers experience brain injuries. Perhaps surprisingly, considering the sports historical and symbolic ties to concussion and degenerative brain diseases, contemporary socio-cultural explorations of the sport tend to be largely devoid of theoretically nuanced discussions of such phenomena. Within this paper, as a means of partly addressing this issue, I examine the 'bodily negotiations' that were part of personal understandings of 'brain injuries'. By considering the manner that such embodied *knowhow* is shaped by risky notions about the body, I demonstrate how culturally specific competent bodily actions are developed. Such an analysis provides insights into the ways that boxers might symbolically neutralise, pragmatically manage or 'fight through' what they considered to be relatively 'run of the mill' neurological disruption. This helps to demonstrate how their embodied engagement provides the basis by which 'outsider' knowledge, including that provided by medical personnel, might be largely excluded and otherwise diminished.

Keywords

boxing, brain injury, concussion, embodiment, sport, violence, CTE

Introduction

There is a long history of academics and medical scholars attempting to understand and manage the damaging physical effects of boxing (Courville, 1962; Critchley, 1949, 1957; Joki, 1941; Martland, 1928; also see Sheard, 1998, for a historical discussion). Continuing this focus, researchers have drawn on more recent advances in technology to detail the

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traumatic, chemical and neurological mechanisms that underpin earlier propositions about ‘punch drunk’ syndrome and pugilistic dementia (Guterman and Smith, 1987; Roberts, 1988). Such works often draw from, and can contribute to, research outside of sporting contexts that explore both chronic and acute damage to the brain (for an example see Roberts et al., 1990). And while boxing’s infamy as a physically damaging activity resulted in it being the first sport to have such critical attention cast upon it, there has been a recent proliferation of research that explores epidemiological (Bryan et al., 2016; Daneshvar et al., 2011), clinical (Valovich McLeod and Register-Mihalik, 2011), gendered (Kroshus et al., 2017; Sanderson et al., 2017) and other socio-cultural dimensions that shape brain injuries in a variety of sports (Iadevaia et al., 2015; Liston et al., 2016; McGannon et al., 2013; Malcolm, 2009; Marshall and Spencer, 2001).

While ‘pugilistic dementia’ (Roberts, 1988) is still a recognised medical term, researchers now typically refer to definitions of chronic traumatic encephalopathy when studying the long-term neurological effects of brain injury. Furthermore, some have chosen to focus on the broader category of mild traumatic brain injuries (MTBI)¹ in order to highlight the potential dangers of both concussive and sub-concussive blows to the head (Cantu, 2017; Galgano et al., 2016; Ling et al., 2015). In so doing, the specific danger of lower-level, ‘everyday’ hits in sport has been evidenced in large part as a product of the cumulative nature of such action (Erlanger, 2013). With this in mind, the regular and often-normalised heavy contact that characterises a number of the most popular Western sports becomes increasingly problematic in its relationship to brain health. Alongside this focus has been a concomitant rise in public awareness about such issues, as evidenced in the regular and normalised use of medicalised language by those connected to sport and within the media (Ventresca, 2019).

Yet, Loosemore et al. (2007) conclude that there is a lack of strong evidence linking amateur boxing with brain damage, and despite some evidence of such links in previous generations of professional boxers, McCrory et al. (2007) argue that no current epidemiological evidence exists. Both these papers highlight problems with study design, sample selection and various other methodological issues across attempts to prove causal links between the sport and damage to the brain. Therefore, I would argue that this lack of evidence does not necessarily demonstrate the lack of a link between boxing and brain damage, but rather, the lack of sufficiently nuanced scientific methods that are needed for more rigorous evidence to be collected. Indeed, Gaetz (2017) lays out a detailed analysis of a number of potentially conflating variables, including drug use, the loss of athlete identity, and pain and injury, that undermine attempts to make firm conclusions about heavy contact sports’ connections to brain injuries.

While the search for medical certainty continues (see Malcolm (2009) for a discussion), an important contribution to the research exploring the area has come from scholars drawing on sociological understandings of sport and medicine, who have examined the relationships and cultures that shape the diagnoses and management of sports-related concussions (Liston et al., 2016; Malcolm, 2018, 2019). In focusing on the social interactions which lie at the foundation of such medical treatment, Malcolm (2009: 201) highlights how sports medics come to diagnose such injuries ‘in a way that they know will be acceptable to others’, namely players, coaches and club officials. And this process is a fundamental part of problems that sports medics have when attempting to detect, understand

and treat concussions and other brain injuries (Malcolm, 2018). It appears then, that specific cultural norms and pressures associated with sport, in particular the focus on performance outcomes, impinge upon the diagnoses and subsequent treatment of concussion. This has led Liston et al. (2016: 4) to argue that within rugby, 'club doctors replaced medical/clinical definitions of concussion with a lay understanding and definition of it dominant in the sports subculture'. As such, I contend that these context-specific lay understandings should be a central feature of scholarship exploring brain injuries, and that such a focus would provide an important window into the social milieu that can contribute to athletes' ill health, injury and recovery.

Yet, embodied experiences and sub-cultural understandings of such injuries have received little scholarly interest. In this regard, while Safai (2003), Malcolm (2009) and Liston et al.'s (2016) work contains interesting data from athletes, their focus on medical provision means that much of this data is used to contextualise the difficulties which club doctors face, rather than being a specific target of critical study in its own right. Recent work from Valocich McLeod et al. (2017), Caron et al. (2017) and Dean (2019) appears to be among the first published research that explicitly seeks to contribute to the field by exploring in detail the lived experiences of those who have suffered a sports-related concussion. In so doing, these works have begun to shed some light on what Marshall and Spencer (2001) describe within rugby as 'the hidden epidemic'.

This paper seeks to further such analysis by detailing the ways in which boxers experienced and understood concussion and MTBIs. In this regard, I draw on a theoretical discussion of the embodied nature of knowledge which is employed to frame how boxers developed their understanding of 'brain injuries' via bodily negotiations. Such an analysis provides insight to the ways that boxers might symbolically neutralise, pragmatically manage or 'fight through' what they considered to be relatively 'run of the mill' neurological disruption. This helps to demonstrate how their embodied engagement provides the basis by which 'outsider' knowledge, including that provided by medical personnel, might be largely excluded and otherwise diminished. As a point of departure, I focus on literature that explores violence, pain, injury and cultures of risk in sport.

Violence, pain, injury and risky body cultures

That sub-cultures persist as sites where forms of violence, pain and injury are relatively common and accepted as 'part of the game' is something of a truism within critical social scientific accounts of performance-orientated elite sport (Hughes and Coakley, 1991; Matthews and Channon, 2016, 2017, 2020; Matthews and Maguire, 2019; Messner, 1990; Roderick, 2004; Safai, 2003; Young, 2012; Young et al., 1994). Indeed, boxing is replete with particularly dramatic and often brutal examples (Matthews, 2014, 2016, 2018; Mennesson, 2000; Paradis, 2012; Sheard, 1998; van Ingen, 2011; Wacquant, 2004; Woodward, 2007). Woodward's (2007) key text does much to explore the social origins and significance of physical cultures that sit at the foundation of the sports relationship with violence, pain and injury; she argues:

Boxing, even more than other sports presents an activity in which the body is central. . . the whole schema of boxing is achieved, experienced and inscribed on [and in] the boxer's body. . .

it also manifests some of the most extreme versions of embodiment through the beautiful body and the broken, damaged body. (Woodward, 2007: 63–64, with my addition in brackets)

Perhaps the most striking example of the beautiful/broken bodies that Woodward discusses can be found when one contrasts images of elite boxers' bodily prowess with the physical weakness of retired boxers who struggle with basic movements and comprehension due in part, so the argument goes, to repeated punches to the head. These dichotomous images act to frame and limit cultural understandings of boxing bodies and, as such, become a normalised, if dramatic, part of the pugilistic game.

This cultural understanding of the body resonates with Nixon's (1992) argument that sporting environments are often dominated by 'cultures of risk' which serve to normalise certain forms of violence and valorise an individual's ability to tolerate pain and injury. In this way, Hughes and Coakley (1991: 309) suggest, 'the idea is that athletes never back down from challenges in the form of either physical risk or pressure, and that standing up to the challenges involves moral courage'. Such understandings are learned by athletes as they spend time in sporting spaces. Within boxing, these experiences become shaped by the 'normal' ways that gym denizens manifest the culture of risk within their daily bodily routines (Matthews, 2014, 2016; Matthews and Jordan, 2019; Sugden, 1996; Wacquant, 2004; Woodward, 2007). These risky body cultures, although taking different forms, are a relatively well-engrained element of most performance sports and boxing is no exception. Indeed, these understandings of the body are more often than not loosely coded in boxing spaces around tough, stoic notions of working-class manhood (Matthews, 2014, 2016, 2019; Paradis, 2012; Sugden, 1996; Woodward, 2007).

Adopting such risky attitudes towards the body might help prepare athletes to succeed within their chosen sport, but doing so also increases the likelihood of chronic and acute physical damage. Safai (2003: 129, my emphasis), drawing on Gillian Bendelow's work, describes the paradoxical nature of this process when she argues that, 'as the *body is built up* to move through the competitive hierarchies of modern sport, the *body is increasingly worn down* – in essence, an athletic career also becomes a "pain career"'. Here, the 'posture of physical invulnerability' (Young et al., 1994: 185) that many athletes develop as a dimension of their sporting performance acts to cast a symbolic shadow over the realities of their worn down bodies. Think, for example, of the manner in which athletes might curate their online identity through stylised imagery of powerful, honed and vibrant bodies versus the lived realities of injury, rehab and exhausting training demands that dominate their lives. And in this and other ways, the damaging physical consequences that accompany the acceptance of risky ideas about the body can be hidden, marginalised and ignored (Matthews and Channon, 2016).

Risky body cultures can be understood as socially hegemonic within a variety of sports, yet the narratives and interpersonal interactions that shape and frame such processes are contested, negotiated and open to subversion. Indeed, Safai (2003: 140) highlights the culture of precaution that sat alongside the risky practices she evidenced. This was particularly the case when athletes and sports medics were asked to consider concussions as there was a 'zero-tolerance for playing with head/brain injuries' at the university where she conducted her work. While the educational setting certainly acted to shape the student-athletes' willingness to self-sacrifice, this data is illustrative of nuances that

accompany specific injuries, and particularly ones that are neurological in nature. Indeed, if we accept Malcolm and Sheard's (2002: 159) argument that there is 'increasing player awareness of health issues connected to sports injuries and recent attention, both scholarly and in popular media, that has been paid to concussion', we might expect to see shifting understandings of risky attitudes to the body, especially in relation to brain injuries. As a means of gaining some theoretical insight into how such body cultures might shape and, can in turn, be shaped by boxers' interactions, I now consider how social worlds become intelligible via experience and embodied engagement.

Experiences, embodied understandings and bodily negotiations

As I argue in earlier work (Matthews, 2014, 2016), sometimes dramatic and often-times ordinary stories about boxing become reified within routine performances inside and around the ring. It is within these lived experiences that risky body cultures are given an 'illusion of fixity' (Matthews, 2016: 326) that acts to mark them out as legitimate, normal and even natural. Across these ethnographic studies (Matthews, 2014, 2015, 2016, 2018, 2019) I have attempted to flesh out Woodward's (2007) focus on the centrality of the body to understanding boxing and boxers. Boxing is then, of course, 'all about bodies' (Woodward, 2007: 63) and various research has drawn on embodied methodologies and social theories of embodiment to detail these corporeal worlds (de Garis, 2000; Heiskanen, 2012; Jump, 2017; Mennesson, 2000; Paradis, 2012; van Ingen, 2011; Wacquant, 2004; Woodward, 2007; Wright, 2018), yet, perhaps surprisingly given the centrality of such issues to the sport, what is less well explored is how boxers experience and understand concussion and brain injuries. While others (Paradis, 2012; van Ingen, 2011; Wacquant, 2004; Woodward, 2007) have drawn both explicitly and implicitly on well-developed social theories of embodiment, I have found more utility for structuring and exploring the data in this study by pulling together theoretical contributions, which might broadly be understood as inspired by phenomenology, to frame an understanding of the embodied nature of knowledge. In using ideas that draw attention to *how* something is learned via an embodied negotiation, rather than simply that something *is* embodied, I hope to detail a relatively unique portrayal of concussion in boxing and sport more broadly.

In *Theory of Mind* (1984 [1949]) Gilbert Ryle provides a useful theoretical start point in his example of a boy learning to play chess:

It should be noted that the boy is not said to know how to play if all that he can do is to recite the rules accurately. He must be able to make the required moves. But he is said to know how to play if although he cannot cite the rules he normally does make the permitted moves, avoid the forbidden moves and protest if his opponent makes forbidden moves. His knowledge *how* is exercised primarily in the moves that makes, or concedes, and in the moves that avoid and vetoes (Ryle, 1984 [1949], 41).

Ryle highlights the difference here between knowing *that* something is the case versus knowing *how* something is the case. And it is clear that such *knowhow* has an embodied dimension as Ryle differentiates between the ability to effectively play, as opposed to

reproduce abstract propositions about, chess. Continuing his analysis, he discusses the learning that underpins this process:

Learning *how* or improving an ability is not like learning *that* or acquiring information. Truths can be imparted, procedures can only be inculcated, and while inculcation is a gradual process, imparting is relatively sudden. (Ryle, 1984 [1949], 58, my emphasis)

Here, Ryle is discussing the need to physically and psychologically engrain ones know-how in ways of doing and perceiving. While such bodily understanding is left relatively implicitly theorised within Ryle's account, we can align with Merleau-Ponty's (1962) discussion of the embodied nature of being-in-the-world to shed light on this process. In this regard, Crossley's (1995: 55) discussion is particularly illustrative:

We say that we have understood, [Merleau-Ponty] argues, when we are able to do certain things. . . These meaningful and embodied actions may be accompanied by vague sensations or a 'click or comprehension' but it is action which is critical in relation to 'understanding'. To understand, in this sense, consists of competent bodily action. . . It is an attribute of meaningful and embodied behaviour and not of a disembodied consciousness.

Taking this form of competent bodily action and embodied knowhow forward, it is possible to draw on O'Donovan-Anderson's (1997) work which considers in detail how 'bodily negotiations' with the world are formative of understanding. So while Ryle might talk of 'knowing that' something is the case, it is through our embodied interaction with such ideas that we begin to organise such propositional knowledge into useful and pragmatic *knowhow*. This 'epistemic sorting is the product of active interference in the world' (O'Donovan-Anderson, 1997: 120) and helps us to personalise abstract ideas into lived pragmatic understandings; to '*use them in a meaningful way*' (Crossley, 1995: 56). This is similar to Lakoff and Johnson's (1991: 6) argument in *Philosophy in the Flesh*, that 'meaning is ground in and through our bodies. . . truth is mediated by embodied understanding and imagination'. What we come to consider as the truth, is then, *meaningfully known through, and with, the body*.

Following Polanyi's (1966) classic work, the static nature of 'knowledge' can be replaced with a more dynamic process of 'knowing'. And embedded in this process we can find a window into the conditions which shape ones experiences and understandings of the world and, in so doing, give them meaning. As Parviainen (2002: 12) argues of bodily knowledge in dance:

Since all knowers are situated – historically, culturally, socially, spatially, temporally, kinaesthetically – all the dimensions of situations become part of the epistemological context. Each being has its own life history and perception, its own pattern of structurally coupled interactions with the world. This implies that knowledge is always self-referential and reveals something about the knower. In other words, knowledge bears marks of its producer.

And it is here, within the self-referential (taken here to mean based on personal experiences, reflections and known though the person's body) and culturally situated nature of knowing, that we can re-join with the previous discussion of risky body cultures.

Athletes develop their understanding of the ‘normal’ ways to consider violence, pain and injury within their sports through their bodily negotiations and repeated physical interactions with such ideas. Their experiences are thus rendered meaningful, and over time, through iterative engagement, athletes can develop embodied expertise and competent bodily action. Importantly this process is coded by what is ‘normal’, legitimate and rewarded in such cultural spaces.

In this way, cultural values underpin the development of embodied knowledge of, and competent action in relation to, ‘brain injuries’ and are therefore formative to the ways the athletes develop personally meaningful and significant understandings of such experiences. By exploring this process it is possible to illustrate in detail boxers’ embodied lay understandings of concussion and brain injuries. Furthermore, in considering such experiences, the manner in which risky body cultures might be maintained or recast through iterative embodied performances is highlighted as an important feature of such phenomena. The remainder of this paper focuses on illustrating the development of such knowledge after a discussion of key methodological considerations.

Methodology

If, as I have just argued, key elements of knowing are embodied, and that this might especially be the case in boxing sub-cultures, we are left with a key methodological issue which Polanyi (1966: 4) highlights, in that ‘we know more than we can tell’. If it is the case that someone might have an embodied knowhow, which, however, remains beyond clear linguistic articulation, how is it possible to discuss such understandings in the written format required in an academic paper? This is an issue that I have wrestled with since my first forays into the field. The simple answer is that it is impossible to truly reproduce embodied, or perhaps more accurately, tacit, knowledge in the format presented here.

However, a more nuanced and useful answer comes when we dissolve the distinction between embodied and disembodied knowledge (Crossley, 1995; Merleau-Ponty, 1962). In seeking to transform rather than solve this issue (Crossley, 1995) it is possible to accept that all knowledge has an embodied dimension and that, as such, we are able, through attempts to empathise with the bodily experiences and understandings of others, to reach common intersubjective understanding of phenomena, in Merleau-Ponty’s (1964: 173) words a ‘carnal intersubjectivity’. Of course there is room for misinterpretations and errors within this process, and it is the task of researchers to attempt to manage such issues of validity through detailed observations, thoughtful questioning and considered reflections about the opportunities, as well of problems, that are presented by striving after intersubjectivity via immersive research methodologies (Matthews, 2015, 2018; Woodward, 2008).

With such thoughts in mind, in Matthews (2015, 2018) I consider a number of issues connected to conducting ethnographic research. I highlight the embodied research strategies that I have employed in order to gain a relatively privileged closeness to the lives of boxers and experiences inside and around the ring. In particular, I describe how the body is an important but fundamentally flawed tool for research. In paying attention to this idea I was able to detail the ways in which my male, able-bodied, heterosexual and white body ‘constrained the relationships, experiences, sensations and emotions that I could document’ (Matthews, 2015: 141). While it is certainly the case that a similar process

will have shaped the data presented in this paper, my embodied engagement with the sport, which shifted across different sites during multiple projects, offers important personal experiences that underpin my ability to work with boxers to explore their bodily negotiations within, and carnal understandings of, their world. And these personal experiences have in many ways informed both my motivation and methodological approach to gaining insights into boxers' understandings of 'brain injuries'.

On my way to 'becoming' a boxer² (Matthews, 2018) I underwent various liminal experiences. A part of this journey included me learning to embody and negotiate some of the risky body cultures that I discussed above:

I knew going into tonight's sparring that it was going to be tough, that was the point, it was a test to see if I could stand up to hard sparring. This was one of the final tests I had to pass if I wanted to fight. I went in [the ring] with a really keen lad who'd had 20 odd fights. He took it steady at first, but eventually he landed a right hand straight through my guard. I ducked into the shot and as I rose up from it I noticed someone had come into the ring. As I looked over to see what was happening I realised there wasn't anyone in the ring at all, but there was a large grey rectangle in my peripheral vision. It was similar to when you crack the screen of your laptop and one side of it goes blank as it's no longer getting a signal. I remember thinking to myself 'that's brain damage then', before refocusing on surviving the round. Luckily the big grey rectangle didn't hang around for too long. (Matthews, 2018)

This experience and others like it provided me with a personal understanding of how easily someone can learn to forsake their body (and brain) in order to be involved in the sport. They were useful for developing my status as a cultural 'insider' who appreciated the relatively unique set of circumstances and influences that underpin boxing, and aided my ability to encourage discussions about dimensions of the sport that are usually left tacit. As such, my own engagement with boxing was a key element in the coproduction of the data that is present in this paper and it represents an attempt to reproduce a carnal intersubjectivity. It is important to state that I do not include this information as a means of claiming authenticity based on my embodied knowledge; rather, I am attempting to situate myself in relation to the participants' experiences of boxing while also demonstrating some of the methodological tools that were available to me.

As a start point for exploring issues connected to brain injuries I revisited transcriptions from previous projects and searched for relevant extracts. This involved searching over 250 separate interviews for terms such as concussion, head, brain, knock-out, K.O. and a range of culturally normative terms which boxers use to describe brain damage (some of these will be discussed later). Where possible I tried to reconnect with participants who had discussed such issues in order to conduct supplementary interviews; this provided 16 interviews with people with whom I had remained in contact due to my continued involvement with the sport. Because of these pre-existing relationships, and the shared experiences they were built on, interviews with these participants often proved to be very informative. I built on these interviews by asking contacts within the boxing clubs where I had connections to speak with me; sometimes this involved formal 'sit down' interviews, but I also recorded some chats and 'talk fragments' from conversations that happened during and after training sessions. This process contributed a further 20 participants to the study.

All of the 36 participants were male, lived in England and could appropriately be considered experienced in their engagement with boxing. They had all competed and those that no longer planned on competing ($N=18$) were committed to staying involved in boxing via coaching, volunteering or simply carrying on training for the sport. While interviewing these men I presented myself as someone who is broadly 'pro-boxing' and happy to identify with most of the cultural norms that dominate the sport. I readily adopted culturally appropriate ways of articulating the key issues I wished to explore. In so doing, I believe I was able to probe experiences that might more usually be left either unspoken or perhaps even hidden to cultural 'outsiders'. I begin exploring this data by providing some context through a discussion of stereotypical understandings of brain injuries, before considering the ways in which the boxers negotiated such ideas through embodied engagement.

Stereotypically 'knowing that' versus experiential 'knowhow'

One of the first things that I tried to establish was how, before they had fully experienced them, the participants understood the risks that are associated with boxing. To use Ryle's terminology I was attempting to see if they knew *that*, in an abstracted sense, boxing could cause brain injuries. This required the boxers to think back between 6 and 20 years to when they first started the sport. Clearly such retrospection means that their answers were shaped by their contemporary experiences; given that they'd all been involved in boxing for a while, it is perhaps no surprise that they all told me they understood the association with brain damage. Notwithstanding such contemporaneous shaping of their reflections, the degree of coherence across the responses makes this data a useful start point. The following extracts are particularly illustrative of the answers I received: 'yeah, of course, but if I didn't know at first, my mum soon let me know, 'cus although she wanted me to start 'cus she knew it'd be good for me, she was scared as well, and she'd all'as tell me not to get hit [laughs]' (Nick³); 'that's common knowledge ain't it? People just assume that if ya gonna box ya gonna end up with dementia or whatever' (Johnno⁴); 'err, yeah, of course, who doesn't. . . when people think o'boxing they either think o'someone getting KO'ed or someone like Tyson KO'in someone, that's what people see don't they, the sport's famous for that' (Shaun⁵).

So, while the boxers, somewhat predictably, informed me that they had an appreciation for the potential neurological problems that could accompany their engagement with the sport, what was of more interest was how they tended to qualify such acknowledgements. They were often quick to defend what they considered to be unfair or unknowledgeable stereotypical understandings about the sport either in general terms or in relation to their own personal experiences. As Dave⁶ stated, boxing is 'nowhere near as dangerous as people think'; in a similarly vein, Nick argued, 'it's only gonna cause serious damage if ya don't looking after ya'self, and that includes ya 'ead as well as ya body'. Here, after accepting some potential risks, both boxers used different narratives to shore up the apparent safety of the sport. It is not surprising to find 'insiders' defend their chosen sub-culture, but the manner in which this was achieved provides an important insight into the normalisation, naturalisation and justification of potentially damaging social norms.

The boxers overwhelmingly suggested that while there was a certain amount of ‘common sense’ knowledge associating boxing with brain damage, this was often sensationalised, overly simplistic and did not come from a ‘real’ (read practical embodied knowhow) appreciation for the nuances of the sport. In this way, the boxers often felt the need to defend themselves and their sport against an unspecified ‘them’ (see Dave’s comment above); what Iain⁷ told me captures such discussions well:

People just assume don’t they? They don’t actually know, most of ’em just assume they know all about what boxing does to ya, but they’ve never set foot in a gym never mind a ring. It’s all stories and gossip by people who don’t like the sport, that’s all it is, if it was really like what they think, do ya reckon there’d be as many people boxing as there is? I can count on one hand how many times I’ve been caught properly in the last two seasons, that’s it, but you try telling someone who don’t like boxing that, where would you even start, they think a nose bleed is bad.

There was then, a broad understanding that being involved in boxing came with an acceptance of certain risks, but that such behaviours were not captured by narrow stereotypes that the boxers believed were common among the public. To use Ryle’s (1984 [1949]) language, they made a distinction between the knowledge *that* boxing could cause injuries and ‘insider’ *knowhow* based on lived realities. They believed they had a more complete understanding of such risks due in large part to their embodied engagement with such experiences. It is these ‘bodily negotiations’ (O’Donovan-Anderson, 1997) coded by risky body cultures that provided the boxers with what they understood to be competent bodily action in relation to, and meaningful *knowhow* about, ‘brain injuries’ in boxing. And this process provided the basis of their rejection of outsiders’ understandings of brain injuries within the sport.

Experiential knowhow and bodily negotiations of ‘brain injuries’

The boxers I spoke with had all suffered various degrees of pain and injury during their training and competing, and these experiences were often believed to be the basis for developing various skills within the sport. For example, Daniel⁸ referred to one of boxing’s many epithets, when he told me, ‘it’s the “hurt business” ain’t it, you learn to take it and give it out’. Safai’s (2003) comments around sporting careers becoming careers in pain are, then, particularly prescient. There was a clear acknowledgement that accepting, coping with and even enjoying certain forms of pain and injury were not only normal within boxing sub-cultures, but that such abilities were required, developed and rewarded.

While it was clear different gyms and coaches inculcated different ways of considering pain and injury, there were many overlapping experiences between the boxers. One clear pattern was that their continued engagement with the sport was predicated upon a negotiated personal acceptance of culturally shaped notions of appropriate bodily risk, which required various degrees of sacrifice, enduring and overcoming. When considering punches to the head and ‘brain injuries’ the boxers described experiencing such risks using ‘matter of fact’ language:

- CRM: Remember me trying to explain to you what it felt like when I had that well bad head shot? You ever had anything like that?
- Casey⁹: Not like that, but worse in some ways, 'cus you knew what was 'appen- ing to ya, whereas I remember feeling like I was in a fucking portaloos that was bein' pushed ova. When I watched the video [of the fight] back I was hardly moving actually, I thought I was all over the place, I couldn't really see, but it won't like I had my eye closed, it was more like that I was looking but stuff I was seeing didn't make sense any- more. I carried on though, the fog soon clears.
- CRM: 'Ave you taken many heavy punches to the head?
- Johnno: [laughs] Yeah of course, but only buzzing shots, nothing serious, you know the ones like where it feels like you've just blinked for a second or two, then you're back, you can carry on with them no problem, that's just a shock thing at getting caught rather than anything serious.
- Wayne¹⁰: I've been wobbled a bunch of times, but I've never been out, I've seen a few bad KOs live and they can be pretty brutal, but it's usually in a mismatch or if someone is doing something stupid, they just rarely hap- pen in a well-matched fight.

So, while the boxers could all tell stories of taking and often fighting through punches to the head, partially echoing Safai's (2003) findings, they also differentiated between the 'run of the mill' neurological disruption, where sight and equilibrium might be temporarily effected, and what they considered to be more serious damage. Words like 'buzzed', 'wobbled', 'groggy', 'dazed' and 'stung' were used to highlight the transient and/or insignificant status attached to symptoms of 'brain injuries' that regularly accompanied their participation (similar use of language is reported within other sports, see Liston and Malcolm, 2019; Liston et al., 2016; Malcolm, 2019; Safai, 2003; Sanderson et al., 2017). Such consequences were to be expected and, in large part, ignored, learned from and/or battled through. During the interviews this use of language went some way to neutralise my attempts at problematising the regular and largely normalised acceptance of sub-concussive blows to the head. Such a process diminishes the likelihood of these neurological effects being considered critically by the boxers and, I would contend, enabled them to learn to manage, overcome and fight through the temporary results of getting punched in the head without an excessive need to reflect on the potential health implications.

While such discursive neutralisation was an important part of how the boxers managed their acceptance of risky body cultures (see Matthews and Channon (2016) for a more detailed theoretical and empirical exploration of such processes in ice hockey fans), there was an embodied understanding and bodily negotiation that lay at the foundation of this process:

- Iain: If you've never boxed getting jabbed in the nose will make you cry and put you on ya ass [knock you down], you get used to those shots after a couple of sessions and it's the same if you get buzzed, the first time you're all like 'fucking hell' and ya arms'll be all over the place, after

- you've taken them sorta shots you get used t'em, you get ya legs back under ya quicker.
- CRM: What about when it's more than a buzzing shot?
- Iain: That's when you tek a knee,¹¹ if you've been caught properly and you're not already out [laughs], that's when you've got to know the right time to tek a knee.
- Peter¹²: I was, err [pause] just thinking, it was like my fifth fight or something, I was beating this lad up right, and I got cocky, and he threw this daft uppercut which knocked my head back, it was an alright shot, but I didn't see it coming and it looked worse than it really was 'cus my head flew back, I was fine a second later, I wasn't out AT ALL and the ref came in and gave me a standing eight, I'm still not sure to this day if he was even allowed to do that, I think he was coming in to save me or something and then when I just carried on like nothing happened he probably didn't want to stop the fight, it just looked bad but I was fine.
- Simon¹³: You need to know what it's really like to get hit and what to do when someone lands a proper punch on you, that's why we spar hard sometimes, if you're not pushed at all that's no good, you'll soon see lads that melt when they get proper hit for the first time and that's no good. My coach always used to look for these lads from [rival gym in a nearby town] 'cus he reckoned they didn't spar hard enough so you could get in their early and just blast them 'cus they wont use to someone coming in hard.

All the boxers had similar stories of experiencing and becoming accustomed to the effects of what they understood to be 'run-of-the-mill' blows to the head. They described this as an iterative process whereby being exposed to an increasing level of intensity in training and competition had a concomitant set of learning experiences. As the boxers progressed their abilities to parry, jab and hook, they also developed embodied knowledge and expertise in recognising and managing 'brain injuries'. This process was based on their appreciation of the norms embedded in the risky body cultures they found themselves within and resulted in a specific and culturally logical physical competency.

These experiences, and others like them, formed the basis from which the boxers developed a personal understanding of what was, and was not, an appropriate level of risk. There was also some evidence of coaches setting up specific practices to work on their boxers' abilities to know how to deal with the signs of a 'brain injury'. Nick told me the following:

- Nick: Have you ever thought about this right? Boxing is the only sport where coaches teach you to be able to carry on after getting a 'concussion' [ironic use of quotation marks], you ever do that thing where you get dizzy [from spinning around] then have to hit pads?
- CRM: Yep, I was almost sick doing it once.
- Nick: Well, we used to do that then fucking sparring mate!
- CRM: Really?

Nick: Yeah man, it was light [sparring] 'cus it was dangerous like, we'd bump into each other and the lot. But when I got wobbled in a fight it was nuthin' new, well its different init, but you've got like a memory of what to do, so you go into robot mode and keep your hands up and throw the odd right 'and [punch] if it's safe so the ref thinks you're alright still.

While this is a relatively dramatic example of boxers' learning to temporarily manage and hide the effects of punches to the head, many of the other interviewees described developing their abilities to continue in such situations. This was mainly discussed in terminology with a similar meaning to that which Daniel used when he described, 'getting conformable in uncomfortable situations'. This was understood by the boxers as important because what they considered to be relatively minor and commonplace 'brain injuries' from punches needed to be prepared for in order to (a) have a chance of winning despite such neurological disruption and (b) to more adequately protect oneself from further and potentially more significant harm. These bodily negotiations lay at the foundation of the manner in which the boxers understood 'brain injuries'. Through such embodied engagement they were able to develop experiential knowledge that taught them to identify and manage what they considered to be acceptable risks. This process produced a physical competence that was informed by a specific cultural understanding of risk and an acceptance of bodily sacrifice; as such, developing this proficiency, while important for sporting success, opened them up to taking regular blows to the head.

There was an understanding that while it was important to experience the 'acceptable' risks that came with punches to the head, there was a point of diminishing returns whereby once a boxer had an understanding of this process, continuing to take such physical risks became unproductive. The following conversation with Tony¹⁴ is particularly illustrative of what the boxers thought in this regard:

Tony: You have to pick your spots when you dig deep, if you're consistently teking shots and trying to prove how 'ard you are, you're gonna get ground down eventually, I used to do it, bloody wars in sparring, but once you start competing you get a difference sense for things, no-one wins in sparring so what's the point in leaving a piece of your body in the ring for that?

CRM: How do you mean?

Tony: It's tough is boxing, it's tough on ya, it takes it out of ya, and there's only so much you can tek right? You've got to save yourself for when ya really have to dig deep into ya reserves and sparring ain't the time to do that, there's no point getting knocked about in sparring, once ya can prove ya can take a shot you've got to save that for when you really need it.

CRM: Like when you were telling me about having to bite down [on your mouth piece] and just throw?

Tony: Yeah, I was probably gonna lose that one and I needed the win, so that trade off was worth it 'cus of the win, if I'd lost it still would have been worth it 'cus it was the right situation, but there's no point doing that in sparring, why bother?

Peter¹⁵ told me something similar about wanting to preserve his health after starting to feel the consequences of being involved in overly competitive sparring:

I used to think I could take any shots, I'd let people land on me so I could just wack'em back but I soon realised that was fucking stupid when I started not being able to concentrate at work after sparring, serious is that, it took me a while to realise and it was my mate who was giving me shit about it that made me realise it was the boxing, I toned sparring down a bit, and really I don't need tough sparring anymore, I know what I'm doing so I just need it to be sharp rather than hard.

Furthermore, all the boxers made a clear differentiation between these 'acceptable' risks and the damaging consequences of what they understood to be more serious injuries. Here, an important symbolic line was drawn if someone lost consciousness. Such events were, without fail, marked out by the boxers as fundamentally unhealthy and to be treated seriously and in some cases following guidelines outlined by authorities and medical professionals. These injuries instantly moved outside of the normally accepted risks, which were common across the participants' understandings of boxing culture, Ben's¹⁶ thoughts provide a useful insight:

There's always been a thing in the gym that we push as hard as our bodies will let us and then push some more, but it's never been like that with hard head shots, [the coaches] would push you in sparring, they'd make you work and they weren't afraid of a shot being landed, but we always respected that ya head's different 'cus you can't push through being knocked out and you can't get better at practising getting knocked out.

It is important to note here that due to a lack of strong supportive evidence a loss of consciousness is not typically viewed as a reliable indicator of injury severity (McCrea et al., 2002; McCrory et al., 2001). Yet, as with findings from research with sports medics (Malcolm, 2009), the apparently clear line that marks out a loss of consciousness as a significant brain injury resulted in the boxers treating this most obvious symptom with extreme caution. Their vociferous defence of the need to treat such 'real knock outs' (Gary) with respect stood in stark contrast to their understanding of other apparently more minor 'brain injuries' which, as highlighted earlier, were to be ignored, worked through and/or trained for. The dramatic physical reality attached to the loss of consciousness left no space for the athletes to physically negotiate with such events. As such, the options to symbolically neutralise and manage such actions were heavily reduced and this acted to shift them into a different, more health-focused, gear.

Concluding remarks

It might be tempting to interpret the preceding analysis as suggesting that boxers' understandings of brain injuries are more developed or better than cultural 'outsiders'. Such an interpretation would be overly simplistic and miss a critical element of this study; that is, that while boxers can draw on experiential engagement to develop their understandings and bodily competencies, this process is shaped by risky body cultures which dominate the sport. Such social framing adds layers of meaning to these experiences and acts to

largely recreate the traditional patterns of physical risk that are often engrained within boxing and performance sport more broadly. What has been evidenced here is not the boxers' objective expertise in understanding concussion and 'brain injuries', but rather, the process of negotiation whereby their embodied knowhow comes to develop within, and largely recreate, a risky attitude to the body.

In demonstrating the difference between knowing *that* and knowing *how* the sport might cause concussion and MTBIs, I have tried to highlight certain important elements of lived experiences that enabled boxers to value their own 'insider' knowledge above that of 'outsiders'. Indeed, specific sub-cultural understandings of how to manage these experiences appeared to be almost entirely coded by ideas passed from coach to boxer and boxer to boxer within the gym. This process enabled the boxers to develop culturally specific knowledge about how to fight through what they considered to be minor 'brain injuries'; this was largely framed by the apparent need to continue to perform the sport despite such neurological disruption. This focus on boxing performance, rather than maintaining brain health, dominated until the dramatic physical realities of being rendered unconscious manifest. Interestingly, there was little space for knowledge from medical professionals to filter into the interviewees' understandings until someone was KO'ed. At this point, doctors' recommendations were loosely referred to and sometimes followed. Further research is required to fully unpack this process; I expect, in so doing, that more detail will be added to the existing evidence of the exclusion of 'formal' medical knowledge from sporting spaces (Channon et al., 2019; Liston et al., 2016; Malcolm, 2018, 2019).

The boxers could work through, prepare for and largely normalise and neutralise certain signs of 'brain injury'. Yet, the dramatic physical reality of losing consciousness meant that such opportunities for embodied negotiation and subsequent symbolic framing were shifted into a different tone for these experiences. The finality of this material failure of the body marked such consequences out for the boxers. Furthermore, the spectre of losing consciousness cast a long symbolic shadow over the un-dramatic nature of accumulating 'run of the mill' blows to the head. In effect, the symbolic attention that was directed towards dramatic concussions resulted in less, if any, significance being placed on sub-concussive blows, enabling them to be largely neutralised of their damaging potential, labelled using language that diminished their seriousness, and even 'overcome' by engaging in specific training practices designed to prepare boxers for their immediate physical consequences. This is a specific example of the development of the competent bodily actions that are foundational to Safai's (2003) notion of a 'pain career' in sport.

What the methodology employed here cannot confirm is to what degree such actions are deleterious to boxers' health, yet it does demonstrate the manner by which risky body cultures are reified, normalised and given an 'illusion of fixity' (Matthews, 2016: 326). As Liston et al. (2016: 15) argue of rugby, 'player's decisions about risk and concussion are framed by an institutional structure and a set of cultural values which prioritise sporting over health-related values and which reward serious risk taking'. Hoping to further develop this argument, I have evidenced how athletes understood such values as legitimate through an embodied negotiation, and this process could form the basis from which they produce culturally specific competent bodily actions. The problem comes when this

form of physical competence is coded by risky understandings of the body and, when this is the case, a focus on health, along with knowledge from medical professionals, can be largely excluded.

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Notes

1. No attempt is made within this paper to provide physiological or neurological definitions of brain injuries. Neither I nor the boxers I interviewed, despite having personal understandings and experiences to draw upon, are qualified to do this. Indeed, attempting to provide an either/or definition/diagnosis of brain injuries often mired me and the boxers in unproductive discussions. And as Malcolm (2009) has shown, medics also find such discussions problematic. Rather, a wide and inclusive definition of brain injuries is preferred to enable explorative discussions about lay understandings and experiences from the field. In this regard, punches to the head that affected the balance, sight, comprehension and/or memory are discussed as brain injuries alongside more traditional understandings of the term, such as concussions, and are usually qualified with examples to provide clarity. At various times the term 'brain injuries' is used in parenthesis to highlight that it is used in this undiagnosed, 'catch all' and relatively informal manner.
2. See Matthews (2018) where I problematise this notion of 'becoming' while researching. While I certainly shared important experiences with other boxers, such as undertaking hard and sustained training, making weight and competing, I did not attach the same cultural significance to the notion of being a boxer due in part to the primacy that I attached to other areas of my life.
3. A 30-year-old former boxer from the East Midlands who, alongside running his own joinery business, currently works as a part-time boxing coach.
4. Is from the Midlands and in his 20s. He had 10 fights as a junior and another five as a senior. Since finishing college and starting work in an estate agent he has had less time for boxing, but he hopes to continue competing at some point.
5. A 22-year-old competing amateur boxer from the South West, he has had over 50 fights and works doing various jobs in a local pub.
6. A 35-year-old former labourer, who has had amateur and white collar boxing bouts, and currently trains to keep in shape.
7. Is 21 from the East Midlands and works part time in a local supermarket; he is also studying at college and hopes to work in a gym. He has competed in amateur boxing since he was 15 and boxed at a national level.

8. Is in his 30s and coaches at a club in the South East of England. He boxed for over 10 years and had over 40 bouts, winning around half of them.
9. Is a barber from the Midlands in his 20s; he stopped boxing competitively after six fights due to work commitments. He still likes to train and spar at his club, but also enjoys golf and lifting weights.
10. Is a former competing amateur boxer in his 30s who does some part-time coaching to stay connected to the sport. He currently runs his own plumbing company and often helps out at the club when they need things fixing.
11. 'Taking a knee', putting ones knee on the canvas, is scored as a knock down in a competitive bout and results in the referee stepping in to either stop the fight or to restart the fight after the fighter stands before a count of ten.
12. Is a former amateur and professional boxer from Yorkshire in his 40s. He prefers running to boxing as a means of staying fit, but he stays involved with a couple of local clubs through his contacts in boxing.
13. Is 36 and works in engineering; he used to compete in amateur boxing but after taking a break he became involved in coaching and competing in white collar boxing.
14. Is 23 and works for a local window cleaner company in the East Midlands; he had 30 amateur boxing bouts and now spars with friends for fitness and enjoyment in a body building and combat sport gym.
15. Is 20 and currently working in a health food shop in South Yorkshire. He has recently started taking professional fights after taking up amateur boxing in his late teens.
16. Is in his late 20s and works as a firefighter in the East Midlands; he took up white collar boxing 6 years ago in order to get fit, he has since had 10 fights and plans on continuing to compete till his mid 30s.

References

- Bryan MA, Rowhani-Rahbar A, Comstock RD, et al. (2016) Sports- and recreation-related concussions in US youth. *Pediatrics* 138(1): e20154635.
- Cantu RC (2017) Secondary impact syndrome. *Clinics in Sports Medicine* 17(1): 37–44.
- Caron JG, Schaefer L, Andre-Morin D, et al. (2017) A narrative inquiry into a female athlete's experiences with protracted concussion symptoms. *Journal of Loss and Trauma* 22(6): 501–513.
- Channon A, Matthews CR and Hillier M (2019) Medical care in unlicensed combat sports: A need for standardised regulatory frameworks. *Journal of Science and Medicine in Sport*. Epub ahead of print 31 October. DOI: 10.1016/j.jsams.2019.10.014.
- Courville CB (1962) Punch drunk. *Bulletin of the Los Angeles Neurological Society* 27: 160–168.
- Critchley M (1949) Punch drunk syndromes: The Chronic Traumatic Encephalopathy of boxers. In: *Hommage a Clovis Vincent*. Paris: Maloine.
- Critchley M (1957) Medical aspects of boxing, particularly from a neurological standpoint. *British Medical Journal* 1(5015): 357–362.
- Crossley N (1995) Merleau-Ponty, the elusive body and carnal sociology. *Body and Society* 1(1): 43–63.
- Daneshvar DH, Nowinski CJ, Mckee AC, et al. (2011) The epidemiology of sport-related concussion. *Clinical Sports Medicine* 20: 1–17.
- Dean NA (2019) "Just act normal": Concussion and (re)negotiation of athletic identity. *Sociology of Sport Journal* 36: 22–31.
- de Garis L (2000) Be a buddy to your buddy. In: McKay J, Messner M and Sabo D (eds) *Masculinities, Gender Relations and Sport*. London: Sage.

- Erlanger DM (2013) Exposure to sub-concussive head injury in boxing and other sports. *Brain Injury* 29(2): 171–174.
- Gaetz M (2017) The multi-factoral origins of Chronic Traumatic Encephalopathy (CTE) symptomatology in post-career athletes: The Athlete Post-Career Adjustment (AP-CA) Model. *Medical Hypotheses* 102: 130–143.
- Galgano MA, Cantu R and Chin LS (2016) Chronic Traumatic Encephalopathy: The impact on athletes. *Cureus* 8(3): e532.
- Guterman A and Smith RW (1987) Neurological sequelae of boxing. *Sports Medicine* 4(3): 194–210.
- Heiskanen B (2012) *The Urban Geography of Boxing: Race, Class, and Gender in the Ring*. London: Routledge.
- Hughes B and Coakley J (1991) Positive deviance among athletes: The implications of over conformity to the sports ethic. *Sociology of Sport Journal* 8(4): 307–325.
- Iadevaia C, Roiger T and Zwart MB (2015) Qualitative examination of adolescent health-related quality of life at one year postconcussion. *Journal of Athletic Training* 50(11): 1182–1189.
- Joki E (1941) *The Medical Aspects of Boxing*. Pretoria: Van Scalk.
- Jump D (2017) Why we should think some more. A response to ‘when you’re boxing you don’t think so much’: Pugilism, transitional masculinities and criminal desistance among young Danish gang members. *Journal of Youth Studies* 20(8): 1093–1107.
- Kroshus E, Baugh CM, Stein CJ, et al. (2017) Concussion reporting. Sex and conformity to traditional gender norms in young adults. *Journal of Adolescence* 54: 110–119.
- Lakoff G and Johnson M (1991) *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*. New York: Basic Books.
- Ling H, Hardy J and Zetterberg H (2015) Neurological consequences of traumatic brain injuries in sport. *Molecular Cell Neuroscience* 66(Pt. B): 114–122.
- Listen K and Malcolm D (2019) Sports-related brain injury: Concussion and chronic traumatic encephalopathy. In: Young K (ed.) *The Suffering Body and Sports: Shifting Thresholds of Pain, Risk and Injury* (Research in the Sociology of Sport, Vol. 12, pp. 89–104). Bingley: Emerald Publishing.
- Liston K, McDowell M, Malcolm D, et al. (2016) On being ‘head strong’: The pain zone and concussion in non-elite rugby union. *International Review for the Sociology of Sport*. Epub ahead of print 7 December. DOI: 10.1177/1012690216679966.
- Loosemore M, Knowles CH and Whyte GP (2007) Amateur boxing and risk of chronic traumatic brain injury: A systematic review of observational studies. *British Medical Journal* 335(7624): 809.
- McCrea M, Kelly J, Randolph C, et al. (2002) Immediate neurocognitive effects of concussion. *Neurosurgery* 50: 1032–1042.
- McCrory P, Johnston K, Mohtadi NG, et al. (2001) Evidence based review of sport related concussion: Basic science. *Clinics in Sport Medicine* 11: 160–165.
- McCrory P, Zaryn T and Cameron P (2007) The evidence for chronic traumatic encephalopathy in boxing. *Sports Medicine* 37(6): 467–476.
- McGannon KR, Cunningham SM and Schinke RJ (2013) Understanding concussion in socio-cultural context: A media analysis of a National Hockey League star’s concussion. *Psychology of Sport and Exercise* 14: 891–899.
- Malcolm D (2009) Medical uncertainty and clinician athlete relations: The management of concussion injuries in rugby union. *Sociology of Sport Journal* 26: 191–210.
- Malcolm D (2018) Concussion in sport: Public, professional and critical sociologies. *Sociology of Sport Journal* 35: 141–148.
- Malcolm D (2019) *The Concussion Crisis in Sport*. London: Routledge.

- Malcolm D and Sheard K (2002) “Pain in the assets”: The effects of commercialization and professionalization on the management of injury in English rugby union. *Sociology of Sport Journal* 19(2): 149–169.
- Marshall SW and Spencer RJ (2001) Concussion in rugby: The hidden epidemic. *Journal of Athletic Training* 36(3): 334–338.
- Martland HS (1928) Punch drunk. *Journal of American Medical Association* 91: 1103–1107.
- Matthews CR (2014) Biology ideology and pastiche hegemony. *Men and Masculinities* 17(3): 99–119.
- Matthews CR (2015) Being nose-y – The body as an effective but flawed tool for research. In: Wellard I (ed.) *Researching Embodied Sport – Exploring Movement Cultures*. London: Routledge.
- Matthews CR (2016) The tyranny of the male preserve. *Gender and Society* 30(2): 312–333.
- Matthews CR (2018) On (not) becoming: Involved-detachment and sports violence. In: Malcolm D and Velija P (eds) *Figurational Research in Sport, Leisure and Health*. Abingdon: Routledge, pp. 102–114.
- Matthews CR (2019) Becoming a “decent man” learning through boxing. In: Barker-Ruchti N (ed.) *Athlete Learning in Elite Sport: A Cultural Framework*. Abingdon: Routledge, pp. 59–71.
- Matthews CR and Channon A (2016) ‘It’s only sport’: The symbolic neutralisation of ‘violence’. *Symbolic Interaction* 39(4): 557–576.
- Matthews CR and Channon A (2017) Understanding sports violence: Revisiting foundational explorations. *Sport in Society* 20(7): 751–767.
- Matthews CR and Channon A (2020) The ‘male preserve’ thesis, sporting culture, and men’s power. In: Gottzén L, Mellström U and Shefer T (eds) *Routledge Handbook of Masculinity Studies*. London: Routledge, pp. 373–383.
- Matthews CR and Jordan M (2019) Drugs and supplements in amateur boxing: Pugilistic amateurism and ideologies of performance. *Qualitative Research in Sport Exercise and Health*. Epub ahead of print 3 October. DOI: 10.1080/2159676X.2019.1664623.
- Matthews CR and Maguire J (2019) Sports, violence, and society: Some sociological observations. In: Maguire J, Falcous M and Liston K (eds) *The Business and Culture of Sports: Society, Politics, Economy, Environment. Vol. 2, Sociocultural Perspectives*. Farmington Hills, MI: MacMillan Reference USA, pp. 113–125.
- Mennesson C (2000) ‘Hard’ women and ‘soft’ women: The social construction of identities among female boxers. *International Review for the Sociology of Sport* 35(1): 21–33.
- Merleau-Ponty M (1962) *The Phenomenology of Perception*. London: RKP.
- Merleau-Ponty M (1964) *Signs*. Evanston: Northwestern University Press.
- Messner M (1990) When bodies are weapons: Masculinity and violence in sport. *International Review for the Sociology of Sport* 25(3): 203–221.
- Nixon HL (1992) A social network analysis of influences on athletes to play with pain and injuries. *Journal of Sport and Social Issues* 16(2): 127–135.
- O’Donovan-Anderson M (1997) *Content and Comportment: On Embodiment and the Epistemic Availability of the World*. London: Rowman & Littlefield.
- Paradis E (2012) Boxers, briefs or bras? Bodies, gender and change in the boxing gym. *Body and Society* 8(2): 82–109.
- Parviainen J (2002) Bodily knowledge: Epistemological reflections on dance. *Dance Research Journal* 31(1): 11–26.
- Polanyi M (1966) *The Tacit Dimension*. New York: Doubleday and Company.
- Roberts GW (1988) Immunocytochemistry of neurofibrillary tangles in dementia pugilistica and Alzheimer’s disease: Evidence for common genesis. *The Lancet* 24–31(2): 1456–1458.

- Roberts WG, Allsop D and Brunton C (1990) The occult aftermath of boxing. *Journal of Neurology, Neurosurgery and Psychiatry* 53: 373–378.
- Roderick M (2004) The sociology of pain and injury in sport: Main perspectives and problems. In: Loland S, Skirstad B and Waddington I (eds) *Pain and Injury in Sport: Social and Ethical Analysis*. London: Routledge, pp. 17–33.
- Ryle G (1984 [1949]) *The Concept of Mind*. Chicago: University of Chicago Press.
- Safai P (2003) Healing the body in the ‘culture of risk’: Examining the negotiation of treatment between sport medicine clinicians and injured athletes in Canadian intercollegiate sport. *Sociology of Sport Journal* 20(2): 127–146.
- Sanderson J, Weathers M, Snedaker K, et al. (2017) “I was able to still do my job on the field and keep playing”: An investigation of female and male athletes’ experiences with (not) reporting concussions. *Communication and Sport* 5(3): 267–287.
- Sheard KG (1998) ‘Brutal and degrading’ – The medical profession and boxing 1838–1984. *International Journal of the History of Sport* 15(3): 74–102.
- Sugden J (1996) *Boxing and Society: An International Analysis*. Manchester: Manchester University Press.
- Valovich McLeod TC and Register-Mihalik JK (2011) Clinical outcomes assessment for the management of sports-related concussion. *Journal of Sports Rehabilitation* 20: 46–60.
- Valovich McLeod TC, Wagner AJ and Welch Bacon CE (2017) Lived experiences of adolescent athletes following sports-related concussion. *Orthopaedic Journal of Sports Medicine* 5(12): 1–10.
- van Ingen C (2011) Spatialities of anger: Emotional geographies in a boxing program for survivors of violence. *Sociology of Sport Journal* 28: 171–188.
- Ventresca M (2019) The curious case of CTE: Mediating materialities of traumatic brain injury. *Communication and Sport* 7(2): 135–156.
- Wacquant L (2004) *Body and Soul: Notebooks of an Apprentice Boxer*. Oxford: Oxford University Press.
- Woodward K (2007) *Boxing, Masculinity and Identity: The ‘T’ of the Tiger*. London: Routledge.
- Woodward K (2008) Hanging out and hanging about – Insider/outsider research in the sport of boxing. *Ethnography* 9(4): 536–561.
- Wright E (2018) Fast-track fisticuffs? An ethnographic exploration of time and white-collar boxing. *International Review for the Sociology of Sport*. Epub ahead of print 29 November. DOI: 10.1177/1012690218815139.
- Young K (2012) *Sports Violence and Society*. London: Routledge.
- Young K, White P and McTeer W (1994) Body talk – Male athletes reflect on sport, pain and injury. *Sociology of Sport Journal* 11: 175–194.