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"I never really felt unsafe": Exploring Aspects of Risk Perception in Elite Canadian Women's Rugby Union

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This study examined women rugby union players' risk perception. A qualitative design was used. 10 elite Canadian women rugby players answered semi-structured interview questions. The concept of psychological protective frames from reversal theory informed study findings. All participants experienced injuries, but they were generally unconcerned about the injury risks involved, although concussion injury was an exception. Players felt safe and confident when pursuing their rugby playing careers. These feelings came from their perception of: their own individual attributes; the experience and competence of coaches; the contribution of team support staff; and the importance of the rugby laws and competent referees. In a similar way to high risk adventure sport participants, protective frames gave players a sense of being in control, feeling safe and also having the confidence to master abrasive physical game situations, thus allowing them to experience positive experiences in elite rugby union. Suggestions for future research are outlined.

KEY WORDS: Risk perception, Elite women's rugby, Injuries, Protective frames.

Introduction

Risk perception is a subjective judgment about the characteristics and severity of a risk made by individuals concerning the potential harm or possibility of a loss originating from a particular behavior (Darker, 2013). For example, in the current COVID-19 pandemic, people are constantly making personal decisions about the risk of contracting the virus infection. The never-ending and varied decisions by individuals around, for example, isolating themselves at home, wearing a face mask in interactive situations, and receiving a vaccination are indicative of individual differences in risk perception.

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In sport, participation in the so-called "high risk or adventure sports", such as skydiving and BASE jumping (free-falling from buildings, antennae, spans and earth (cliffs) and landing safely by releasing a parachute) has been of interest in a number of research studies (e.g., Allman, Mittelstaedt, Martin, & Goldenberg, 2009; Brymer, 2010; Celsi, Randall, & Thomas, 1993; Kerr & Houge Mackenzie, 2014). Among researchers' interests, attention has focussed on participants' perception of the risk of injury or death associated with those sports. Typical research findings from the high risk studies referred to above have shown that experienced participants, while aware of the risks involved, generally did not perceive the activities as being highly risky.

Although not usually bracketed with high risk sports, rugby union is a sport in which participants also voluntarily put their health and wellbeing at risk. Rugby union is a team sport characterized by full physical contact and high levels of physicality. Participants run the risk that they may sustain serious injuries, or possibly loss of life, when playing or training. For example, four male French players died during the 2018-19 season (de Menezes, 2019). While the risk of death in rugby may not be as high as in skydiving or BASE jumping, research evidence from studies of elite players has confirmed that major injuries do occur in women's rugby. For example, one research study examined all the injuries (including type and severity) sustained by the Ontario Women's Senior Provincial Rugby Team over the 1997 season, and for those who played for Canada at the 1998 Rugby World Cup (Carson, Roberts, & White, 1999). There were 31 game-related injuries and four that occurred in practice. Of these, 15 were minor, seven were moderate and 13 were major injuries. Ankle sprains were the most common injury and there were four concussions. Only 12 players from the group of 40 players avoided injury during the recording period. The researchers concluded that the incidence of injuries in women's rugby was comparable to that in other women's contact and collision sports. Doyle and George (2004) analysed the injuries sustained in the England women's rugby squad over the 2001-2002 season. They found that 18 players received a total of 27 injuries (12 were severe), and one particular player was injured three times. Older and heavier players and forwards were injured more than others, with prop-forwards the most frequently injured (prop forwards play in the front row of the 8-player scrum, pushing under pressure in direct contact with the opposition prop and 8-player scrum). Injuries happened most often during tackling and the knee was the body part most injured. In the 2006 Women's Rugby World Cup, all the international teams reported their injuries for analysis (Schick, Molloy, & Wiley, 2008). The results indicated that 16% of players sustained at least one injury, among which were five fractures and four concussions. Forwards had a lower rate of injury than backs, but front-row forwards were the players most often injured. The most common injuries were

to the neck/cervical spine and knee, followed by the head and face. King et al. (2019) carried out a systematic review of 10 published studies on match and training injuries in women's rugby union. The tackle was found to be the most common cause of injury, with the ball carrier recording more injuries at the collegiate and 2006 Women's Rugby World Cup levels of participation. The head/face was the most commonly reported injury site. Women's seven-a-side rugby resulted in a higher injury incidence than women's 15-a-side rugby. Finally, Comstock and Fields (2005) investigated the role of foul play in female rugby injuries among a large sample of US women's rugby players. Almost a quarter of women player respondents believed that they had been injured as a result of foul play. In summary, the results of these studies confirm that there is a considerable risk of being injured in women's rugby and being the target of foul play may increase that risk.

In conjunction with other team contact sports (American and Australian football, North American ice hockey), concussion injuries in both men's and women's rugby have become a pressing problem for the national rugby unions and World Rugby, the governing body (e.g., Gardner, Iverson, Williams, Baker, & Stanwell, 2014; Liston, McDowell, Malcolm, Scott-Bell & Waddington, 2018; Schranz, et al., 2017). Beginning in 2015, World Rugby implemented a number changes to rugby's playing laws, or rules[1] (e.g., dangerous tackles) in an attempt to reduce concussion injuries. In addition, they have developed protocols for the correct assessment and treatment of head injuries by team medical staff. The Liston et al. (2018) interview study was of particular interest because it revealed, among other findings, that the players often had little knowledge about the nature of concussion, tried to downgrade or ignore their symptoms when concussed, and exhibited a desire to keep on playing and training in spite of their injury. Their findings led Liston et al. (2018) to argue that tolerating pain and playing injured is an intrinsic part of the game and becomes normalized (see also Young & White, 1995).

Despite the risk of being injured, women players were found to be against changing the laws to reduce levels of physical contact in womens' rugby. In his study of high-school to international-level Canadian women rugby players, O'Hanley (1998) asked them the question: "Should the laws of rugby be changed so there would be less physical contact in the women's game?" The 162 participants were unanimous in stating that they did not want changes to the laws to reduce the level of physical contact. O'Hanley (1998, p. 42) concluded: "The women wish to play the game using the same laws of the game as men and

[1] Officially, rugby union has "laws of the game" but players tend to use the term "rules".

have no desire to participate in some 'watered-down' version of the game". In Canadian women's ice hockey in 1990, the game's governing authorities changed the rules for women players, banning body checking with the aim of reducing the level of physical contact and risk of injury. This change was not welcomed by some players in Theberge's (1997) study, who felt body-checking was a part of the game and that the change denied them a sense of pleasure and accomplishment in carrying out the skill of body checking an opponent or taking a body check satisfactorily. For them, part of the fun of playing had been eliminated.

Much of the literature referred to above is somewhat dated and reflects a basic lack of research on women's rugby. More up-to-date research is needed, especially given the fact that between 2017 and 2019 the number of registered women players has increased by 28% to 2.7 million (World Rugby, 2019), along with law changes that have recently been introduced.

The psychological concept of *protective frames* from reversal theory (e.g., Apter 1992, 2001; in sport, Kerr, 1997), examines how people experience and interpret situations involving risk and possible danger which allows them to approach the *dangerous edge*. According to reversal theory, protective frames are cognitively-based and subjectively-determined and allow danger and risk to be viewed and experienced as controllable and within a person's ability. Almost all sports take place within some form of protective frame, and sport performers psychologically construct protective frames related to the demands of their sports and to fit their own idiosyncratic needs within their particular sports. Protective frames allow high risk sport participants to deal with fear, concentrate their attention on the situation at hand, make crucial decisions, and take the correct actions to ensure their survival when at the dangerous edge in skydiving, BASE jumping and other high risk adventure sports (Fruchart, Rulence-Pāques, & Mullet 2018; Kerr & Houge MacKenzie, 2014, 2018).

The original concept of protective frames (Apter, 1992) linked them with arousal seeking in a playful motivational state. Subsequent criticism attempted to expand that link to include other motivational states (Hudson, Males, & Kerr, 2016). These authors argued that the protective frame is primarily a function of a mastery motivational state, which operates in conjunction with the other states to create a focused state of mind conducive to performance in competitive sport. The playful motivational state could still play a role, but the mastery state was considered paramount and an important influence on behavior. This different perspective was important not only for participation in competitive sports, but also for how different individuals might appraise any form of risk in those sports. Kerr (1997) argued that protective frames could be applied to team contact sports, such as women's rugby. These frames may be different from those required for high risk sports. In women's rugby, protective frames may be

associated with: (a) the charateristics and safe nature of organized sport playing areas such as rugby pitches (Apter, 1992), the laws of the game governing what constitutes play on those pitches, and the competence of referees applying the laws (Kerr, 1997); and (b) players' sense of being in control, feeling safe and having the confidence to master intense physical contact game situations (Kerr, 1997). To date, there has been no previous psychological research work in rugby or contact sports which has directly applied the concept of protective frames as an aid to understanding research findings.

The present study was important because the participants were elite women rugby players according to criteria proposed by Swann, Moran, and Piggott (2015). Few previous studies of women rugby players have been published. Apart from the injury studies described above, studies examined attitudes to aggression and/or participation motivation (Chase, 2006; Comstock & Fields, 2005; Chu, Leberman, Howe, & Bachor, 2003; Fields & Comstock, 2008; Gill, 2007; O'Hanley, 1998; Scrogum, 2005). Only three of these involved elite women rugby players and none explored their risk perception. Therefore, there was an obvious gap in the current literature and a need to undertake a novel study of risk perception in the team contact sport of elite women's rugby.

This study is the third part of a broad psychological investigation into the attitudes and subjective experiences of elite Canadian women rugby players playing international rugby union. Canada is among the leading countries for developing women's rugby, with 125 club, 20 university and 250 high school teams. At elite level, performances in the Women's Rugby World Cup (WRWC) and other international tournaments indicate that the Canadian women's team is consistently in the top five rugby countries in the world (History of Rugby Canada, 2016). Canada is currently rated as the third best team in the world. The team's best performances were second place at the 2014 WRWC and winning the bronze medal at the 2016 Olympic Sevens competition. Part one of the investigation concentrated on players' experience of and motivation for starting and continuing to play rugby to an elite level (Kerr, 2021). Part two focused on attitudes to and experience of physical aggression in women's rugby (Kerr, 2018). The rationale for the current qualitative interview study was to examine aspects of elite Canadian women players' perceptions of the physical risks involved in playing rugby union (risk perception). In addition, the theoretical concept of protective frames from reversal theory (e.g., Apter 1992, 2001; Males, Kerr, & Hudson, 2015), was used to inform the study findings and provide a means of understanding risk in rugby and possibly team contact sports in general. The Method section below is similar to those described in Author (Kerr, 2018, 2021), with interview questions from a different section of the interview guide.

Method

The current study was a post-positivist exploration of Canadian women players' perceptions of the physical risks involved in playing elite women's rugby union. A qualitative research methodology with inductive and deductive elements was used (e.g., Guba & Lincoln, 1994). Within qualitative research, a number of different approaches are possible. Choices about which methods or techniques to use are often practical in nature (Sparkes & Smith, 2014) and, in this case, the choice was to use one-to-one semi-structured interviews. Practical restraints included a geographically dispersed sample (e.g., ruling out focus group research), and somewhat limited interview time because of other demands on participants (see Participants section below). Limited time might have suited the use of closed interviews in which the interviews were heavily structured, with each interviewee receiving the same direct, precise questions in the same order with a limited set of response categories. However, more open semi-structured interviews were considered preferable because they allowed the interviewer to focus on specific, pre-determined topics, but had the advantage of being more flexible, with the response to each question being left up to the individual interviewee (Amis, 2005). Semi-structured interviews tend to encourage positive interaction and two-way communication between interviewer and participants who are free to express their own views or ask questions. Another practical consideration was that the interviewer had considerable experience in successfully conducting semi-structured interviews, including an initial interview with a former Canadian women's rugby captain (Kerr, 2019). This case study allowed the research method, semi-structured interview technique, and the interview questions (including those in the current study) used in the 3-part investigation of elite Canadian women rugby players, to be trialed.

Participants

The participants were elite Canadian women rugby players (n =10; M age = 32.3 years; age range 27-36 years; M total years playing rugby = 16.1, SD = 3.9; M years playing international rugby = 7.2, SD = 2.9; M international games played = 23). Five players were forwards and five were backs. Four were current players, six had retired within the previous five years. Four players had also played for Canada in international seven-a-side tournaments. Although playing international rugby for Canada, the elite players were amateurs studying or working full time and, in some cases, raising young children, in addition to training and playing. Two of the retired players were involved in coaching young players.

All study participants had experienced injuries. Ligament tears were the most common injury, with two requiring surgery. In total, there were seven torn medial cruciate ligaments (two players tore ligaments in both knees), one anterior cruciate ligament tear and one posterior cruciate ligament tear (player no longer has one in her right knee). There were two dislocated shoulders (both requiring surgery) and three separated shoulders, along with one separated and one strained sternum. Fractures to a finger, hand, cheek, ankle and two fractured feet were also reported. Five players received head injuries resulting in concussion. There were two neck injuries and a back injury involving a slipped or bulging disc. One neck injury was a pulled muscle in a player's neck, but the other was more serious.

Procedure

Sampling And Recruitment

The sample of volunteer elite women rugby players was generated using a "snowball" procedure. The first participant was emailed and recruited, following a suggestion to the author

by a mutual friend. At the end of her interview, she was asked for suggestions for further interviewee names and contact information. This procedure was continued in subsequent interviews. A total of 16 players were contacted and 10 agreed to be interviewed. The author interviewed eight players in undisturbed face-to-face semi-structured interviews and two others in semi-structured phone interviews. Prior to each interview, participants were informed that they could choose not to answer a question or retire from the interview at any time. The confidential nature of interview statements was emphasized and participants were asked to sign an informed consent form. Telephone interview participants gave their verbal consent, which was recorded. All participants consented to recorded interviews and for interview statements to be used in scientific publications. An interview guide was used. The research procedure, including interviews, was guided by ethical guidelines outlined in the Canadian Psychological Association's Code of Ethics for Psychologists (2000). Interviews lasted approximately 45 minutes and were audio-recorded and transcribed verbatim. Filler sounds or words (e.g., "umm", "like", "you know") were excluded. Later, member checks were used to check with players that the transcripts were an accurate record of their interviews. The participants approved the transcripts, and two expanded on two particular interview responses to clarify meaning.

Data Analysis

A thematic analysis of the interview statements was undertaken. This followed recommended analysis protocols for analyzing and interpreting qualitative data (Denzin & Lincoln, 2000; Patton, 2002). The statements, supported by brief descriptive notes written during interviews were reviewed and categorized independently by the interviewer and a female research colleague. The notes were made to record any important observations about the context of the interview and responses of the interviewee (e.g., regarding locations, initial reactions of the interviewees, non-verbal aspects of interview interactions, anything surprising or interesting). The purpose was to assist recall and record any additional information that might need to be taken into account in the analysis. The interviewer and research colleague were both experienced in the analysis of qualitative data and had an extensive knowledge of rugby. First, they repeatedly read the players' interview responses for familiarization, immersing themselves in the data. They progressively identified the relevant data and compared, coded, grouped and labeled it into initial categories or sub-themes through a process of open and axial coding developed in grounded theory (Strauss & Corbin, 1990). The open coding process started with forming initial categories or sub-themes from statements made in the player interviews (e.g., "I feel safe with the way tackles are being refereed these days" was coded under the sub-theme of *feeling safe*; "I'm very serious about taking the rules seriously" was coded as *laws in general*.) The five open coding sub-themes identified were: *risk perception*; *feeling safe*; *feeling threatened*; *laws in general*; *World Rugby's recent changes to physical contact/foul play laws*. The next step in the coding process involved the further refinement of these five sub-themes into two meaningful categories or themes by looking for connections between them through what Strauss and Corbin (1990) termed axial coding. These were: *risk perception and feeling protected*, and *attitude to the laws of rugby*.

Staying open and critically aware during the interviews themselves and during interpretation and analysis procedures was important. During the interpretation of interview statements, general agreement was achieved after minor points of disagreement were resolved through careful discussion. In practical terms, this involved engaging in ongoing discussion about players' descriptions of game events and their experiences, with the two researchers shifting back and forth in their discussion about the meaning of player statements and their interpretation with pauses for individual reflection (e.g., Sparkes & Smith, 2014). Post-interview reflective consideration during data analysis initially focused primarily on the meaning of players' interview statements. Subsequently, interview content in terms of: (a) Apter's protective frames, and (b) the overall role of the interviewer was also considered. For example, was there a possible "power imbalance" in interviews making them overly biased towards the interviewer (Bolton, 2010; Kvale & Brinkman, 2009). It was thought that any concerns about interview bias could be off-set by attempts to promote participant-interviewer interaction by making the environment open, inviting, and safe

for both female rugby players and male interviewer. Interviews were conducted in public locations, mostly windowed library study rooms, where interactions were visible but not audible to others. Rapport between interviewer and players was aided by the fact the interviewer was a former rugby player and coach who was able to communicate with these elite players about their robust team contact sport on their own terms. The research colleague also acted as a "critical friend", challenging the author's interpretations where necessary, in addition to auditing the complete interview and data analysis process (e.g., Cresswell & Eklund, 2007; Sparkes & Partington, 2003).

In short, independent analysis procedures by the two experienced researchers, supported by member checks, analyst reflection and auditing of the entire interview and data analysis process, helped to ensure the trustworthiness of data and minimized researcher bias in its interpretation (Biddle, Markland, Gilbourne, Chatzisarantis, & Sparkes, 2001; Cresswell, 1998; Guba & Lincoln, 1994, Patton, 2002). Readers can also make their own conclusions about the quality and trustworthiness of data and evaluate possible transferability from the thick description of the data included in the manuscript (Biddle et al., 2001; Cresswell, 2007).

Results and Discussion

The Results and Discussion sections of the manuscript have been combined to provide a better understanding of the study's key findings in the light of previous research results and reversal theory's concept of protective frames (Apter, 1992, 2001). There were two major themes and five sub-themes identified from the interview statements. These are listed below with example supporting illustrative statements from individual players.

Theme 1: Risk Perception And Feeling Protected

Among their interview statements, all players commented on their perception of the risk of getting injured in rugby and what made them feel safe while playing. It became evident that these players were not overly concerned about the physical risks, as illustrated by these short player statements: "I have never been seriously injured, so I just never assume it to be a high risk situation"; "I know it's a possibility, but it seems remote and it's not something I consider on a daily basis when I step onto the field"; "When I'm playing I'm never worried about it [getting injured] because that's when you become most vulnerable"; "Sprained ankles and stuff happened all the time. I don't count those [as real injuries]". Player statements also indicated that there was a degree of individuality about which aspects of their involvement in elite competitive rugby were most important for their perceptions about feeling confident, protected, and safe.

Feeling Safe

Good preparation, high levels of fitness and and being able to deal with

physical contact were important for allowing players to feel safe when playing and training. Player eight put it neatly when she said:

> I *guess my sense of safety just came from the training that I've had. When you are learning contact you learn how to do it properly and efficiently. I never really felt unsafe. It never really crossed my mind because I can take the hit or get bounced around a bit, but it was never a safety thing for me. . . . What else kept me safe? Being prepared, being fit and strong, knowing that I'd done my time at the gym and my time at the track and my body was in good enough condition to play rugby at that time. I was used to the contact, I was used to the strain and I was used to the running.*

Coaches and support staff such as physiotherapists had an important contribution to make to players' perceptions of confidence and feeling safe. For example, with regard to coaches, player four stated:

> *Players' safety always has to be important and we have to continue coaching that, especially as we try to get more athletes involved at younger ages. We have to make sure that we are providing a safe environment for athletes to learn the sport and to learn how to make contact and take contact in the safest way possible.*

Player three highlighted the important role that team support staff could play:

> *Experience and training. I have been fortunate I don't carry many injuries, but I think that has to do with preparation and incredible support team for strength and conditioning and physio, massage, and whatever that might be.*

Some players appeared to accept the likelihood of being injured. Player seven, for example, took a fatalistic view of her personal safety and getting injured playing rugby and was confident she could cope with any negative consequence:

> *I think that accepting the fact that I may get injured allows me to be OK with getting injured. I can jump in the lineout and have no regards for my body and that's something that's constant. I think that's because I have accepted that I will get injured and that's OK and I will deal with it.*

Feeling Threatened

While, five players did not mention concussion, the one type of injury that did concern the remaining five and threatened their feelings of safety was head injury resulting in concussion. By way of illustration, two of these players made important statements about their attitude to concussion and sustaining brain damage:

> *I always thought if I ever got a concussion that was bad enough I'd have no problem walking away because in fact it's brain damage and if you want to keep coming back and playing*

> *you are putting yourself at a higher risk for increased brain damage and for me that wasn't worth it. I mean, I love the sport, I loved the life and the people I played with, but it was my brain and if I ever got anything that was remotely serious I was going to walk away. So, it didn't stop me from playing how I played. It didn't make me less aggressive. It didn't stop me from going head first into things, literally. But I was very aware of the possibilities of what could happen and I was prepared to handle it a bit differently from how I saw other people handling it. (player 8)*
> *I - comes back to where rugby fits in my life. I love playing rugby and I'll continue playing rugby if I can, but it's so mething I'm not willing to lose my job over. My career is more important. That's the biggest one; the other stuff I can deal with. (player 9)*

In terms of risk perception, study participants' interview responses suggested that players were not generally concerned about being injured while playing elite level rugby. Players felt safe and confident when competing on the rugby field. These feelings arose from: their own individual physical abilities and skills; the experience and competence of coaches; the contribution of team support staff; and the importance of rules and referees in a contact sport. If some players had any apprehension about being injured, it concerned the possibility of sustaining a serious concussion injury. Recent research evidence suggests that concussion injuries are a cause for concern in both men's and women's rugby (e.g., Gardner et al., 2014; Liston et al., 2018; Schranz et al., 2017).

Theme 2: Attitude To Rugby Laws (Rules)

Laws In General.

A number of interesting statements were made by players in response to the question: "How important are (were) the rules to you in determining the way you behaved on the field?" All the players recognized the importance of rugby laws or rules, and by implication referees, the arbitrators of those rules during games, need to be respected to keep players feeling protected and safe. As player four commented:

> *One of the great things about rugby is that we respect the rules and we know that they are there for safety. Obviously, in some situations, you know in the heat of the moment, you're going to push those boundaries, but I think a lot of them are around safety, which is important if you are playing a contact sport.*

However, some players adopted a pragmatic approach: "Well it wasn't so much that that I was a stickler for the rules. I definitely – it's not cheating until the ref sees you kind of thing"; "Pretty important because to know them and find my way around them"; "The rules were important, but I always wanted to test them a little bit". As the laws can be interpreted by referees in

slightly different ways, players were aware that they needed to adapt to individual referees during matches. As one player pointed out:

> *Every referee will call a game a little bit differently so we need to see where they control the game, what are their limits and so, when we talk about pushing it, you just keep playing until the referee pushes back. Once it's known that the referee has an eye open for that then we won't go back for that because penalties can be very detrimental to your team's success. (player 7).*

Decisions to follow the laws were not always straightforward. Player nine alluded to this in her answer and stated that she followed the laws in general play, but in the scrum she was less compliant:

> *It's always a complex question. I would say I am more of a rule follower than most of the people in my team at a national team level. I mean, I do try to stick to the rules when going into a ruck and I don't necessarily try to do anything dirty. . . . That said, certainly in the front row it's a battle and we are all doing things. I want to isolate the scrum from the rest of the game. For the rest of the game I'm pretty much following the rules, trying to use techniques and that sort of thing. Scrum is fair game; we try to play games the whole game. Typically, trying to make the other individual really uncomfortable so that they lose their body position so that we can dominate them. (player 9).*

This forward also emphasized that while she might break the laws in the scrum, it did not extend to foul play. A similar point was made by another player, but again it was not straightforward. While she did not involve herself in punching opposition players, she was not averse to completing a tackle on a player who had just passed the ball:

> *You'd be very hard pressed to see me throw a punch in a game. I couldn't even imagine myself going there. If I'm thinking about punching somebody on the field then I'm off my game; that doesn't help us get to our end goal. . . . Again it's a fine line. Not when the pass has gone, the players are standing and watching it and you're taking three extra steps to take them. But if I'm launching in, close enough to tackle them and I'm on my lead foot and the pass goes - well. These are hits I don't get called on. (player 3).*

By way of explanation, if a player is close enough and already committed to a tackle before a pass is made, it is impossible for the player to pull out of the tackle and the tackled player has to take the "hit". In this case, the tackle is considered acceptable and laws have not been broken. However, a second or two later and the tackle is an unacceptable "late" tackle that breaks the rugby laws. Referees adjudicate whether a tackle is late or not and penalize the tackler if the tackle is deemed dangerous. The margin between the two can be small.

In brief, players had respect for the laws and generally adhered to them, but some did admit to trying to flout particular laws in specific game situations if they could get away with it. In other words, they were prepared to test the limits on some laws without violating their feelings of safety. The majority of these elite

women players were also resistant to any change in the rugby laws on physical contact for women. In Canadian women's ice hockey in 1990, rules for women players were changed to ban body checking and reduce the level of physical contact and risk of possible injury (Theberge, 1997). When the possibility of introducing similar changes in women's rugby came up, in seven out of the ten interviews participants all were totally against such changes, thus maintaining parity with men's rugby. This result supported the findings from a previous sample of Canadian women rugby players obtained by O'Hanley (1998).

World Rugby's recent changes to physical contact/foul play laws

World Rugby's recent changes to the laws in 2015 have resulted in players in general accepting more responsibility for opposition players' well-being. For example, the laws now prohibit dangerous high tackles around the head and neck and tackling a player while she is off the ground catching a ball in the air (both offences punished by immediate dismissal from the field). The onus is now firmly on the players themselves to bring opposition players safely to the ground after aerial challenges. In addition, new head injury assessment and concussion protocols for players who sustain head injuries in tackles or other play were also introduced in 2015. Player two, for example, stated that: "The rules that have come in around concussion management have changed a lot of the culture around head injuries and violent tackles and so on. I feel safe with the way tackles are being refereed these days." Player five confirmed this view, stating:

> *I can remember when I first started playing that [foul play] was definitely more commonplace than it is now. I think there's greater safety, but the game itself has evolved. It's a faster game now than it used to be, players are getting bigger and hits are getting bigger. So I think safety has to be paramount, especially with everyone's awareness around concussions and those sorts of protocols that you see at international level.*

The recent law changes appeared to be having a positive influence on players' perceptions of the risks involved in these specific dangerous playing situations and their feelings of being protected and safe. As a result, participants approved of and were reassured by these changes.

Reversal Theory's Protective Frame Concept Informing the Study

Interview statements were also examined from the perspective of reversal theory's concept of protective frames (Apter, 1992, 2001). According to reversal theory (Kerr, 1997), developing protective frames would be crucial in allowing these elite women players to perceive the risk of injury in a physically

dangerous sport context as acceptable. Players needed to develop individual protective frames that both allowed them to deal with the usual demands of non-contact sport performance, and incorporate the aggression, physical confrontation, and robust physical contact characteristics of rugby. Based on the current findings, it is protective frames that provide women rugby players with the confidence and the perception of safety and control required to pursue a rugby playing career. There was evidence from the player interviews that the confidence to master elite level competitive rugby skills and play situations while feeling safe came from a number of factors. These included: rugby practice and training over their playing careers which taught them the necessary skills and how to manage physical contact competently; the development of good physical condition, being match fit and generally prepared pre-game; confidence in coaches to provide safe practice and training environments; players' personal experience; confidence in the team's support staff to provide the training advice and physiotherapy when required; respecting the rugby laws, especially those that safeguard players and having confidence in the capabilities of referees to apply those laws with player safety a priority. All these factors were mentioned by participants and could contribute to forming players' protective frames. However, different players highlighted specific factors that were important to them, suggesting that protective frames are individually-based and founded on individual perception. These findings generally support the criticism of the original formulation, and subsequent elaboration of the protective frame concept to include the the importance of the mastery, as well as the playful arousal seeking, motivational state (Males, Kerr, & Hudson, 2015).

In a similar way to high risk sport participants in general, and a female skydiver in particular (Kerr, 2007), a woman rugby player's protective frame might fail if her perception of the risks involved in playing the game increased significantly. Among other possible reasons, this change might occur as the result of a serious injury. Several study participants stated that they would stop playing if they received a serious concussion injury. This suggests that such an injury would cause their protective frames to fail; the sense of being in control, feeling safe and having the confidence to master abrasive game situations necessary to maintain their protective frames would have been lost. The protective frame or "psychological bubble" encasing rugby is destroyed when players realize the real-world implications of their injuries, as happened to the skydiver mentioned above when a friend was killed in a freak accident. This accident brought home to her the real-world implications of the risks involved in skydiving, shattering her protective frame and she was unable to continue skydiving. It also had a major effect on other aspects of her life. She stopped work, became severely anxious and depressed, and contemplated suicide (Kerr, 2007).

Although the circumstances around the failure of a protective frame are

likely to be different for different individuals, there is some common ground between activities. The perception that the activity is low risk or safe and allows an individual to experience pleasure (even though others may consider it high risk and unsafe) is changed, often by an event which brings about a new realization of what the implications of continuing to participate in the activity could be. In this sense, it seems that there is similarity in the way that protective frames fail whether it be the possibility of dying during risk sport participation, or being seriously injured in rugby. Beyond sport, similar protective frame failure can be seen in a variety of human activities, including sexual behavior (Gerkovich, 2001), gambling (Brown, 1991) and watching dangerous or threatening television programs (Portell & Mullet, 2014).

A Note of Caution About Injuries

It became apparent from the player interview statements that all players had experienced both major and relatively minor injuries. However, they were all strongly motivated to continue playing as soon as possible after injury and their urge to keep playing was linked to a tendency to underestimate the seriousness of their injuries. Ignoring or denying pain and/or playing with injury was not uncommon in these women players (see also O'Hanley, 1998; Liston et al., 2018; Young & White, 1995). Similar results were obtained by Theberge (1997) in her study of Canadian women ice hockey players. Injuries were found not to be a reason for giving less than full effort or producing top performance. Withstanding pain and playing while injured were considered a measure of their commitment to the game. In the current study, players showed similar attitudes to pain and injury that sometimes contributed to delayed consultations with medical doctors, accurate diagnoses, and subsequent injury rehabilitation. For example, one player who had a serious neck injury explained in detail how she was injured and how she did not seek proper medical attention until nine months post-injury:

> *I had my head down in a ruck and I was hit from behind - not a good idea - and then my teammate came and pushed from behind and my neck hyper-extended and I had ligament damage along my spine. I was dealing with student athlete trainers and they are saying, "Oh well it will be fine". I didn't actually go to the doctor until nine months later. It was one of those things - you often get that pain at the front row, but reflecting back now it was pretty bad. I couldn't sleep, it was very difficult for me to sit at a desk and work, but I kept on trying to play through it. It was almost as if I didn't believe it was real. I went to see the doctor and saw the x-ray and said 'that's why my neck is hurting so much'; my spine was curved like this [indicated with her hand]. It was almost like that visual was necessary to show me that this is real. (player 9)*

This example quote and other player interview statements suggested that the players in general had a rather unrealistic perception of the seriousness of

their injuries. What is of further concern is that players' attitude to injury was exacerbated by the way the injuries were sometimes mismanaged by athletic trainers, chiropractors, or physiotherapists. This sometimes resulted in delays in obtaining accurate medical diagnosis and appropriate treatment and rehabilitation for injuries, despite the risk of possible permanent damage. Realistically, while medical team back-up for Canadian women players at the elite level may well be satisfactory, it should be acknowledged that in women's rugby at club level the support and infrastructure to facilitate access to good quality injury management may be lacking. In the absence of good quality injury management, the players themselves should be responsible for taking alternative action. The need to visit their doctors or hospital accident and emergency departments when injured should be a priority.

Conclusion

The current study contributes to the body of knowledge of women's participation in organized sport activities in general and, specifically, to the very modest research literature on women's team contact sports. Players' interview statements produced valuable insights into their personal perceptions of the physical risks involved in rugby. In terms of theoretical development, the findings have shown that the concept of protective frames (Apter, 1992, 2001; Kerr, 1997) is relevant to understanding behavior in team sports involving physical contact, like elite women's rugby. Performance at that level demands that players' perception of any physical risks to their health and welfare are offset by their confidence that the performance environment is safe, allowing them them to maintain a sense of control and master any playing situations that arise. The findings of this study also extended the concept of protective frames beyond its more common application to high risk adventure sport experience.

There are several options available for further research on this topic. Studies of elite women rugby players from other countries would allow cross-national/cultural comparisons in risk perception. Samples of Canadian women rugby players at sub-elite level, as well as elite and sub-elite Canadian male rugby players, could be investigated, providing possible within-sport gender comparisons. Elite players in other team contact sports (e.g., Australian football, ice hockey, water polo) could also be the subject of similar future research, allowing between-sport comparisons. Finally, future research study could focus on the factors which led players to retire or withdraw from women's rugby and examine the possible influence that changes in perception of injury risk and diminution of protective frames had on the decisions to end their playing careers.

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