Reducing Injury in Sport with Kids (RISK): An interpretive investigation into coaches' real-world experiences of injury prevention coach education.

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Abstract

Background

Injury prevention research has often failed to account for the ecological nature of sports injury prevention interventions (Donaldson et al., 2019). In addition, qualitative investigations delivery agent experiences with interventions are scarce (O'Brien and Finch, 2016) despite evidence of their usefulness in developing injury prevention programmes (McGlashan et al., 2018; Quarrie et al., 2020). As such, there remains limited understanding of the processes behind sports coaches' engagement with injury prevention interventions and programmes. Coach learning research may aid in that understanding, with authors recently finding that a coach's biography, experiences and learning dispositions impact their learning from formal and nonformal opportunities (Leeder et al., 2019; Stodter and Cushion, 2017). Recognising these influences may help uncover 'what works, why and for whom' (Leeder et al., 2019, p. 2) in sports injury prevention.

Methodology

This study aimed to evaluate county pathway cricket coaches' experiences with three Reducing Injury in Sport with Kids workshops at different locations in the UK. Under the interpretivist paradigm, mixed-method qualitative approaches were used to collect data at three points. Three focus groups immediately after the RISK workshops, and two follow up interviews 10-12 weeks after the RISK workshops, were undertaken. One semi structured interview was conducted with the Key Stakeholder, 6 months after the RISK workshops. There were 19 focus group participants, 2 follow up interview participants and 1 Key Stakeholder. Data were analysed using inductive and deductive approaches and coded to find high and low-order themes. The RE-AIM framework was used to organise the high-order themes.

Results

At the individual level a process model is presented to better understand and explain how participants interacted with RISK. Using the RE-AIM dimensions two distinct stages were identified, the Process of Adoption and the Process of Implementation, and the interacting nature of the data was evident. The findings also suggest the influence of biography and professional context on county pathway coaches'

perceptions towards RISK. Minor county coaches identified a lack of resources, time and management buy in as key barriers to implementing RISK, however these were not necessarily present in the follow up interviews suggesting a mismatch between perceptions and actual practice. Key facilitators identified by participants in both minor and first-class settings were additional workshop resources and external support, which were corroborated in the follow up interviews.

At the setting level, data emphasised the journey that a Key Stakeholder from the English Cricket Board went on to his adoption, and subsequent implementation, of RISK at three coach development days. Notable findings were the influence of professional experiences on the Key Stakeholders adoption of RISK.

Conclusion

This study evidenced the complex processes behind coach engagement with an injury prevention intervention. This research also contributed to a wider research project examining RISK and demonstrated how coach learning theory can complement sports injury prevention research. To address a potential research to practice gap (Bekker et al., 2016) recommendations for the implementation of RISK are made. These include: understanding that coaches may cherry pick aspects of RISK to fit with their practice, how a coach understands their role may impact their adoption of RISK, and coaches from different contexts will adopt, implement and maintain RISK in different ways and at different rates.

At the setting level, evidence of the impact that a Key Stakeholder can have on the Implementation and Maintenance of a programme is provided, emphasising the ecological nature of injury prevention interventions and coach education initiatives.

Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other education institution in the United Kingdom or overseas.

Any views expressed in the thesis are those of the author and in no way represent those at of the University.

Signed - 

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1.0 Introduction

1.1 Background on RISK

Sport is the main cause of injury in adolescents (Abernethy and Bleakley, 2007), and LaBella and Myer (2017) comment on a change in training patterns as a reason for youth sport injury rates. Longer and more frequent training sessions are becoming common in modern youth sport (LaBella and Myer, 2017), and combined with a larger focus on skill acquisition, which leaves less time for the learning of fundamental movement patterns, presents more opportunity for children to get injured while playing sport (Emery and Tyreman, 2009; LaBella and Myer, 2017). Sports injuries can have economic ramifications for parents through medical costs, rehabilitation and time taken to care for injured children (Abernethy and MacAuley, 2003). Sports injuries can also prevent future participation in sport, leading to long-term physical and psychological health risks (Abernethy and Bleakley, 2007).

Despite the short- and long-term impact that sports injuries can have, there is an identified lack of injury prevention resources in the UK, especially for grassroots sports coaches (De Ste Croix et al., under review). Indeed, in injury prevention literature, the interventions or education programmes that have been reported on have overwhelmingly taken place in other countries (Saunders et al., 2010; White et al., 2012; Finch et al., 2011; Quarrie et al., 2007; Gianotti et al., 2009; Steffen et al., 2013; Cook et al., 2003; Tee et al., 2018; Emery and Meeuwisse, 2010). Of the injury prevention intervention studies undertaken in European countries, one was based in an elite junior football academy (O'Brien and Finch, 2016), two examined adult athletes (Bollars et al., 2014; Myklebust et al., 2013; Myklebust et al., 2003) and two looked at handball players aged between 15 and 17 (Olsen et al., 2005; Wedderkopp et al., 1999). Grassroots athletes and coaches are not often considered, and when they are, authors tend to investigate adult teams (Steffen et al., 2008).

In addition, interventions using younger athletes are rarely reported or reviewed (Abernethy and Bleakley, 2007; Caine et al., 2008), with Faude et al. (2013) finding that separate data for athletes aged under 11y was essentially non-existent across fifty-three studies. This is surprising, as although the 5-9 age group sustains less injuries compared to 10-14 and 15-18 groups (Leininger et al., 2007), lower limb

injuries make up a significant portion of those sustained by athletes aged 5-9 (Adams and Schiff, 2006). Further to this, Leininger et al. (2007) found that the 10-14 age group had the highest proportion of injuries in their study, yet in the European injury prevention studies cited above, no participants were under the age of 15.

The lack of concern for youth sports injury prevention in the UK is even more stark when considering the above data, yet there are some injury prevention resources available. The FIFA 11+ is the most widely shared resource in youth sport and has been shown as effective in preventing injuries in football by several authors (Steffen et al., 2013; Bizzini and Dvorak, 2015; Silvers-Granelli et al., 2015; Barengo et al., 2014; Owoeye et al., 2012), and even in elite basketball (Longo et al., 2012). The FIFA 11+ is a set of movements designed to be used as a warm up, and is available online (FIFA Medical Network, 2020), but it is still unclear how many coaches are aware of it, and how many coaches use the programme correctly (Donaldson et al., 2019; Wilke et al., 2018). In addition, adherence to the FIFA 11+ has been found to be low when provided through an unsupervised website, and much higher when delivered as a workshop (Steffen et al., 2013). Steffen et al.'s (2013) study is one of the few to deliver a FIFA 11+ course, and there are currently no taught versions of a FIFA 11+ course available in the UK. Finally, as the name suggests, the FIFA 11+ is not suitable for children under 11, who are also susceptible to lower limb injury.

Reducing Injury in Sports with Kids (RISK) is a grass roots focused coach education programme. Encompassing the EU Youth Strategy (European Union, 2019), RISK provides a three-hour workshop aiming to teach grassroot youth sport coaches how to recognise healthy fundamental movement patterns, and incorporate them into sessions (The RISK Project, 2017a). Unlike traditional injury prevention programmes that are designed to complement current training regimes or have been developed as warm ups (Mandelbaum et al., 2005; White et al., 2012; Bizzini and Dovrak, 2015), RISK teaches coaches to use injury prevention techniques within their sessions, encouraging the use of games to facilitate the development of movement quality. Sets and reps are not prescribed, as the focus is on movement quality and player engagement. RISK is designed to be used by coaches of all youth sport age groups, which is especially prevalent because of the minimal interventions targeting

the youngest age groups. In addition, potential injury risk factors in youth sport include modifiable factors such as neuro-muscular control (Theisen et al., 2014) and fitness (Caine et al., 2008), which can be influenced at young ages to impact injury risk (Myer et al., 2011). Therefore, developing fundamental movement patterns from a young age can be extremely beneficial for future health and performance (Myer et al., 2011).

The injury prevention gap that RISK aims to fill is large in the UK, with potentially little coach awareness of resources such as the FIFA 11+ (Wilke et al., 2018; Donaldson et al., 2018), and often no focus on injury prevention or fundamental movement patterns during early career coach education courses (England Hockey, 2020; English Cricket Board, 2020b; The FA, 2020). Past research suggests that injury prevention content is best received as a continuous professional development (CPD) style course (Steffen et al., 2013), but this is an under-developed field, and supports the need for more in-depth investigations into RISK as a viable coach education opportunity.

1.2 The sports injury prevention landscape

1.2.1 Defining sports injury

Defining injury in sport and physical activity has long been considered difficult and inconsistent (Noyes et al., 1988; Timpka et al., 2014), with different operational definitions often being developed for separate studies (Chalmers, 2002). This is problematic for research that assess injury rates, as a lack of consensus means that comparisons of injury rates between studies and sports cannot truly be made (Timpka et al., 2006). It is most common to define sports injury based on its effect on participation (Spinks and McClure, 2007), but this presents issues due to the varied requirements of each sport. For example, a wrist sprain would disable a gymnast, reducing their participation, but would not have the same effect on a figure skater (Noyes et al., 1988). In addition, this definition lacks precision and certainty as the same injury may affect athletes in the same sport differently (Noyes et al., 1988; Timpka et al., 2006).

For studies that do not target the 'end beneficiaries' (O'Brien et al., 2014, p. 1267) of interventions directly, or seek to quantitively measure injury rates, the definition of 'sports injury' is less important. Authors have instead focused on the toll that injuries can take and understanding the target of the intervention, which are typically sports coaches (Frank et al., 2014; Lindblom et al., 2018; Norcross et al., 2015; O'Brien and Finch, 2016). Considering the context of this study, which does not measure injury rates, it is less important to use a definition that matches other studies because comparable injury rates are not a feature of this research. Furthermore, a general definition is appropriate for RISK, as it is an intervention aimed at reducing the risk of general injuries in youth sport, not one specific type of injury such as ACL damage (Frank et al., 2014) or lower extremity injuries (Norcross et al., 2015). This study understands the term sports injury as 'any unintentional or intentional damage to the body resulting from participation in any pastime or game requiring physical effort that is undertaken for amusement, diversion, or fun' (Chalmers, 2002, pp. 22).

1.2.2 Research context

Considerable time has been spent investigating the positive effects of injury prevention interventions on player injury rates, and studies have investigated interventions targeting ACL injuries, female, male, junior and senior athletes and elite performers (Bahr et al, 1997; Bizzini and Dovrak, 2015; Junge et al, 2002; Michaelidis and Koumantakis, 2014; Myklebust et al., 2013; Myklebust et al., 2003; Olsen et al., 2005). Injury prevention interventions are generally reported as successful and are often presented in the form of progressive warm up programmes (e.g. Frank et al., 2014; Myklebust et al., 2003; Steffen et al., 2008). Some authors, however, find outlying results that show no effect on injury rates from an intervention (Steffen et al., 2008). Steffen et al. (2008) hypothesise that low compliance is a key reason, noting that just 14 out of 58 teams completed more than 20 injury prevention training sessions in their study.

In this plethora of efficacy research, data is collected almost unanimously through quantitative randomised controlled trials ([RCT] Hanson et al., 2014; Lauerson et al., 2013; O'Brien and Finch, 2014; van Reijen et al., 2016). This method of data collection consists of pre- and post-intervention recordings of injury rate in a certain

group, alongside measurements of injury rates in a control group that has not received an intervention (van Reijen et al., 2016).

While several authors have found injury prevention programmes to be efficacious in controlled settings, the use of RCTs when examining interventions makes the real-world connotations of such research unclear (Hanson et al., 2014). This is because RCTs do not consider the real-world factors that influence adoption and implementation of injury prevention interventions by coaches (Hanson et al., 2014). The research conducted by Steffen et al. (2008) is evidence that the success of an intervention is not solely dictated by its efficacy, and that many factors can influence programme effectiveness in a social setting (Hanson et al., 2014).

1.2.3 The RE-AIM Framework

Figure 1: *RE-AIM Framework (adapted from RE-AIM.org, 2020)*

RE-AIM Dimension				
Reach	**E**ffectiveness	**A**doption	**I**mplementation	**M**aintenance

The RE-AIM framework has been touted as an effective tool for evaluating sports injury prevention interventions in real-world settings (Collard et al., 2010; Finch et al., 2011; Finch, 2011). RE-AIM contains five dimensions (Gaglio et al., 2013, p. e38): 'Reach is the absolute number, proportion, and representativeness of individuals who are willing to participate in a given initiative. Effectiveness is the impact of an intervention on outcomes, including potential negative effects, quality of life, and economic outcomes. Adoption is the absolute number, proportion, and representativeness of settings and intervention agents who are willing to initiate a program. Implementation refers to the intervention agents' fidelity to the various elements of an intervention's protocol. This includes consistency of delivery as intended and the time and cost of the intervention. Maintenance is the extent to which a programme or policy becomes institutionalized or part of the routine organizational practices and policies. Maintenance also has referents at the individual level. At the individual level, it is defined as the long-term effects of a programme on outcomes 6 or more months after the most recent intervention contact.'

While in theory the RE-AIM framework allows researchers to conduct in depth evaluations of injury prevention interventions, it is rarely used to its full potential (Kessler et al., 2012; O'Brien and Finch, 2014b). In their systematic review, O'Brien and Finch (2014b) found that reporting across all RE-AIM dimensions was limited, especially in the cases of Adoption and Maintenance at the individual and setting (organisational) levels. No studies considered Maintenance at the setting level, and just 1% of trials reported it at the individual level (O'Brien and Finch, 2014b). In addition, Klügl et al. (2010) found that just 1% of the reviewed studies assessed injury prevention programmes in a real-world context.

The RE-AIM Sports Setting Matrix (SSM) (Finch and Donaldson, 2010; *Figure 2*) may provide a solution the issues of real-world efficacy and limited framework use (Hanson et al., 2014; O'Brien and Finch, 2014b). The RE-AIM SSM explicitly considers several different levels for each category, from the National Sporting Organisation (NSO), down to the participating players (Finch and Donaldson, 2010). In their seminal paper, Finch and Donaldson (2010) also provide an example of how the RE-AIM SSM could be applied to the evaluation of a coach led injury prevention programme, with measures for each level under each dimension.

Figure 2: *RE-AIM SSM (Finch and Donaldson, 2010, p. 975)*

RE-AIM Dimension	**Level of assessment/intervention setting or target**					
	National Sporting Organisation (NSO)	**State/Provincial Sporting Organisation (SSO)**	**Regional Association or League**	**Club**	**Team**	**Participant**
Reach						
Effectiveness						
Adoption						
Implementation						
Maintenance						

These dimensional measures at each level should inform both the intervention implementation plan, and the evaluating study design, although the authors note that their examples are not exhaustive, and instead show the range of factors that should be considered (Finch and Donaldson, 2010).

While Finch and Donaldson's (2010) work provides a blueprint for a successful and thorough evaluation, the RE-AIM SSM has not been used as much depth as the authors originally envisioned. Frank et al. (2014) employed the RE-AIM SSM in their evaluation of an ACL injury prevention programme in an elite youth soccer club, which incorporated a workshop and accompanying resources to train participating coaches to use the programme. While their application of the RE-AIM SSM did evaluate Reach, Adoption and Implementation at the setting level, targeting Club Administrators, Frank et al. (2014) did not evaluate Maintenance at either the setting or individual level. This suggests that incomplete intervention and programme evaluation permeates sports injury prevention research, even in studies that employ frameworks designed to allay this issue.

Frank et al. (2014) do, however, give insight into how to approach setting level Reach, Adoption and Implementation in a real-world environment. The authors' work highlights the difficulties of injury prevention implementation in an active sporting environment, rather than using an RCT, as although behavioural determinants were high and the club policy was clearly defined, the implementation by coaches was comparatively low (Frank et al., 2014). These results highlight a disconnect between club policy and coaching practice, and show that coaches are integral to the implementation of injury prevention techniques in structured sport. Frank et al. (2014) also provide potential methods to measure implementation, in the form of an evaluator that assessed the level and quality of ACL prevention programme implementation (Frank et al., 2014).

1.2.4 The Role of the Coach

Multiple studies have found that coaches play a significant role in the delivery of, and team attitude towards, injury prevention programmes (Brown et al., 2015; Ekstrand et al., 2018; Langan et al., 2013; McKay et al., 2014; White et al., 2014). In addition, coaches are reported to be receptive towards injury prevention interventions and concepts (Frank et al., 2014; O'Brien and Finch, 2015). When required to act, however, coaches can block or inhibit interventions (Frank et al., 2014). It is therefore important to understand how best to facilitate implementation of injury

prevention techniques by coaches, and why they may be unwilling to use such techniques.

The importance of local and contextual factors on injury outcomes is becoming more evident (Tee et al., 2020). Coaches have a profound impact on player behaviour and hold insight into the context of their environment (Stodter and Cushion, 2017), so their inclusion in injury prevention interventions offers a direct route in to the 'unique and dynamic' implementation contexts that exist in youth sport (Tee et al., 2020, pp. 689). However, understanding of coaches' perceptions towards implementing injury prevention programmes is mostly limited to descriptive characteristics (O'Brien and Finch, 2014). These do not give insight into how coaches interact with injury prevention resources, or how they adopt, implement and maintain injury prevention techniques. Just three studies have investigated coaches' experiences with, or perceptions towards, injury prevention using methods other than quantitative surveys (Bell, 1992; Lindblom et al., 2018; McGlashan et al., 2018), while only one has done so under the RE-AIM framework (Brown et al., 2016).

Bell (1992) investigated the awareness of spinal stress fractures in first-class county cricket coaches and found that all participants were aware of back injuries to some extent. However, now nearly 30 years old and with just three participants, Bell's (1992) study has little relevancy to this thesis.

Similarly, to Bell (1992), McGlashan et al. (2018) interviewed just three coaches, however these participants worked at adult community level, rather than in professional settings. McGlashan et al. (2018) found that coaches believed several strategies were important for dissemination and scale-up of injury prevention programmes, which spanned individual and organisational levels, and were formed from a mix of past experiences and personal beliefs. The findings were in line with current injury prevention promotion practices, and the authors emphasise the importance of considering the programme deliverer when designing injury prevention interventions to enhance their provision (McGlashan et al., 2018).

Brown et al. (2016) and Lindblom et al. (2018) used qualitative methods to investigate adoption of injury prevention practices after an intervention, and both aim to provide follow up qualitative data to previous quantitative studies. Linblom et al.'s (2018) paper is the second follow up to a large scale RCT study of a neuromuscular warm-up programme designed to reduce ACL injuries, called Knee Control (Lindblom et al., 2014; Waldén et al., 2012). The first follow up study found that, while familiarity with and Maintenance of the programme was relatively high, large numbers of coaches reported modifying the warm-up (Lindblom et al., 2014). Lindblom et al. (2018) found that coaches modified the warm-up to improve player buy-in and ensure that it fit with their team's current practices. In addition, coaches' adoption of Knee Control was strongly influenced by a complex combination of perceived barriers, facilitators and their beliefs surrounding football injuries, injury prevention and the warm-up itself (Lindblom et al., 2018).

In Brown et al.'s (2016) case, the authors sought to understand coaches and referees' perceptions towards BokSmart, a nationwide injury prevention programme in South Africa. This study was part of a larger research project spanning several papers which evaluated different aspects of BokSmart implementation (Brown et al., 2015; Patricios and Collins, 2010; Viljoen and Patricios, 2012). BokSmart is delivered through a compulsory workshop to mixed groups of coaches and referees, and Brown et al. (2016) found that differences in socioeconomic status (SES) impacted coach perceptions towards the workshop, as well as results across all five of the RE-AIM dimensions. High SES coaches were far less receptive towards, and more critical of, the BokSmart workshops, whereas low SES coaches generally felt that the workshops were much more useful and reported adopting and maintaining BokSmart practices (Brown et al., 2016).

While these types of studies are still limited in number, Brown et al. (2016) and Lindblom et al. (2018) show that some authors are starting to move past descriptive statistics of effectiveness. There is now a widely recognised need for real-world injury prevention programmes to be implemented, with investigations that gather detailed data on Adoption, Implementation and Maintenance (Hanson et al., 2014; Lindblom et al., 2018; O'Brien and Finch, 2014). Further to this, McGlashan et al.'s

(2018) assertation that coaches' perceptions and views can enhance sports injury prevention strategies has been echoed by several authors (Frank et al., 2014; Hanson et al., 2014; Lindblom et al., 2014; McGlashan and Finch, 2010; Poulos and Donaldson, 2015; Saunders et al., 2010; Timpka et al., 2006), and was used as a successful strategy for RugbySmart, a compulsory rugby workshop on safe tackling and injury prevention in New Zealand (Gianotti et al., 2009; Quarrie et al., 2020). This provides compelling evidence for the need to investigate the experiences and beliefs of injury prevention programme deliverers (O'Brien and Finch, 2016).

Brown et al. (2016) present the only paper to date that uses qualitative methods within the RE-AIM framework to evaluate a coach education workshop, and therefore provide interesting interpretations of each dimension of the framework. For example, the authors split Implementation to consider both the delivery and content of the BokSmart workshops (Brown et al., 2016). In addition, Brown et al.'s (2016) study offers a model to investigate a real-world coach targeted intervention, and recognises the ecological influence that coach perceptions, and experiences, of an injury prevention intervention can have on each other. However, while at the individual level Brown et al. (2016) provide interesting detail across all the RE-AIM dimensions, setting level data, in the form of wider organisational Adoption, Implementation and Maintenance, is not considered, further emphasising a pervasive gap in literature.

1.3 The wider research project

Similarly to Brown et al. (2016) and Lindblom et al. (2014; 2018), this study contributes to a larger research project that examines RISK. A pilot study formed the initial investigation, measuring the effects of the RISK workshops on attitudes towards, confidence to deliver and knowledge of injury prevention techniques (De Ste Croix et al., under review). The pilot study collected data from participants in the UK, Spain and the Czech Republic, and used immediate pre- and post-course surveys, as well as a five month follow up survey (De Ste Croix et al., under review). High response rates were recorded for the first two surveys, which was to be expected as participants were presented with the surveys on the day of the course

(Nash and Sproule, 2012). The response rates were considerably lower for the follow up interviews, at an average of 23.3% across all three participating countries.

The pilot study found improved attitudes towards injury prevention techniques, increased confidence to deliver injury prevention techniques, and increased knowledge of injury prevention techniques due to the workshop (De Ste Croix et al., under review). However, these results did not develop understanding of the experiences of coaches during and after the RISK workshops. More specifically, there are barriers and facilitators to implementing injury prevention techniques in the real world (Hanson et al., 2014), and while coaches in the pilot study felt more knowledgeable and confident, the results do not indicate the barriers and facilitators that they experienced during implementation.

Regarding attitudes, these findings are supported by several authors in the injury prevention realm, who also report that pre intervention attitudes are relatively poor compared to post intervention results (Saunders et al, 2010; White et al, 2012; Frank et al, 2014; McKay et al, 2014). However, to date no data has been collected as to why attitudes are so poor initially. One hypothesis could be that knowledge and attitudes are linked, and that the lack of knowledge meant injury prevention was not highly valued by coaches (De Pretto et al, 2015; Bhadana et al, 2015; Whatman et al, 2018). This theory is tenuous however, with some researches finding no significant link between knowledge and attitude (Evans and Durant, 1995; Aminrad et al, 2013).

An increase in confidence to deliver injury prevention techniques is perhaps unsurprising, as most coaches in the study (94%) had not delivered any sort of injury prevention programme before attending RISK (De Ste Croix et al., under review). Research into continuous professional development (CPD) supports the pilot study's findings on increased confidence, which is typically linked to the acquisition of new knowledge (Davies and Preston, 2002; Powell et al, 2003; Harlen and Holroyd, 1997; King and Smith, 2000; Chase et al, 2005).

Similarly to the results on confidence, it is no shock that increased knowledge was reported, as many participating coaches had not heard of any injury prevention programmes before attending the RISK workshop (De Ste Croix et al., under review). Coach education literature helps to explain why coaches believe their knowledge has increased, for example the introduction of content that complements a coach's practice (Chesterfield et al, 2010), or the varied learning environments presented on a course, allowing for discussion with other coaches or tutors (Deek et al, 2013). While literature on coach education aids the discussion around RISK, there is a key difference between RISK and courses that are typically included in literature. RISK aims to incorporate the content into participants current practice, whereas the education courses typically researched aim to teach coaches 'how' to coach (Cassidy et al, 2006). This difference, as well as the content presented, means that conclusions on why knowledge was improved cannot be taken just from current literature.

There are established challenges that coaches may face when adopting and implementing injury prevention techniques (Hanson et al., 2014; O'Brien and Finch, 2014), and maintenance is severely under researched (O'Brien and Finch, 2014). The pilot study, while demonstrating the surface level effect of the RISK workshops, still left uncertainty as to the barriers and facilitators that coaches may experience. This uncertainty formed the initial goal of this thesis, which was to understand the barriers and facilitators that coaches experience when adopting, implementing and maintaining RISK.

2.0 Literature review

2.1 Learning opportunities in sports coaching

The coaching process is often described as dynamic and influenced by various 'situational, contextual and social factors' (Stodter and Cushion, 2019, p. 2087). This is mirrored in how coaches learn, which is understood to be highly idiosyncratic (Werthner and Trudel, 2009), and influenced by a multitude of experiences from a variety of sources (Gilbert et al., 2006; Winchester et al., 2013). These learning experiences are often categorised as either formal, informal or nonformal (Coombs and Ahmed, 1974), conceptualised for sports coaching by Nelson et al. (2006).

Formal learning refers to an 'institutionalised, chronologically graded and hierarchically structured education system' (Coombs and Ahmed, 1974, p. 8). These types of programmes typically have prerequisite guidelines, involve a course of some sort, compulsory attendance and a curriculum, and results in some form of accreditation (Nelson et al., 2006). Formal opportunities, namely National Governing Body (NGB) coach education programmes, are the subject of most coach learning research, following the trend of such programmes gaining prominence as a way to upskill coaches to a perceived professional standard (Duffy et al, 2011). Coaches are often critical towards formal coach education and place low value on these opportunities compared to other means of acquiring knowledge (Irwin et al., 2004; Lemyre et al., 2007). Coaches have reported that courses give them limited autonomy over their learning (Chesterfield et al., 2010); offer content that is not easily applied to individual contexts (Cushion et al, 2003; Knowles et al, 2001; Lemyre et al, 2007; Trudel et al, 2010); are presented in disengaging and dyadic classroom orientated formats (Mesquita et al., 2014); and give too much information in short amounts of time (Lemyre et al., 2007). Furthermore, authors have described formal coach education as a form of indoctrination, more focused on presenting a right way to coach than offering meaningful learning opportunities relevant to actual coaching practice (Cushion et al., 2010; Nelson and Cushion, 2006; Piggott, 2012).

Informal learning opportunities make up most other learning situations, as they are considered a 'lifelong process by which every person acquires and accumulates knowledge, skills, attitudes and insights from daily experiences and exposure to the

environment' (Coombs and Ahmed, 1974, pp. 8). Indeed, in sports coaching, most reported learning occurs outside of formal situations (Stoszkowski and Collins, 2016). Informal learning reported by coaches includes; practical coaching experience (Abraham et al., 2006; Erickson et al., 2008); playing experience (Werthner and Trudel, 2009; Wright et al., 2007); observations (Mesquita et al., 2014); informal mentoring (Bloom et al., 1998; McMaster et al., 2012); and interactions with others, such as parents, coaches and players (Callary et al., 2012; Watts and Cushion, 2017). In addition, Nelson et al. (2006, p. 253) introduced the term 'self-directed learning', which has been used interchangeably with informal learning, but suggests more of a purposeful search for knowledge than informal learning does (Cushion et al., 2010). Research shows that coaches engage with internet resources (Erickson et al., 2008; Wright et al., 2007); read coaching texts such as books and journal articles (Abraham et al., 2006; Schempp et al., 2007); access sports science videos (Reade et al., 2008); watch footage of coaching sessions (Irwin et al., 2004); and sometimes footage of their own, and their athletes, performances (Irwin et al., 2004; Schempp et al., 2007). These informal and self-directed sources make up the bulk of learning opportunities for coaches because they spend much more time engaging in some form of coaching practice compared to participating in formal education (Rynne and Mallett, 2012). This perhaps offers an explanation as to why coaches value these sources of learning above formal opportunities (Cushion et al., 2010; Erickson et al., 2008).

Nonformal learning was conceptualised as 'any organised, systematic, education activity carried on outside the framework of the formal system' (Coombs and Ahmed, 1974, p. 8; Nelson et al., 2006). The line between formal and nonformal opportunities is blurred at times, such as with BokSmart (Viljoen and Patricious, 2012), a short format injury prevention workshop that is compulsory for coaches and referees in South Africa to receive certification for their role (Brown et al., 2016). Nelson et al. (2006) recognise the similarities between formal and nonformal learning but explain that nonformal learning targets a subgroup of a population, like Frank et al.'s (2014) recruitment of female youth football coaches for their injury prevention workshop intervention. In addition, sources of formal learning are far more structured, with the aim of providing a qualification in a general area (Cushion et al., 2010). Therefore,

BokSmart can be considered a formal opportunity, whereas workshops, seminars and conferences that investigate specific themes are classed as nonformal opportunities (Leeder et al., 2019). RISK, therefore, and most other injury prevention coach interventions, can be considered nonformal learning opportunities as they are delivered as short format workshops, have accompanying resources, and use no formal evaluation or certification (Aerts et al., 2013; De Ste Croix et al., under review; Frank et al., 2014; Saunders et al., 2010).

While categorising and describing learning experiences in sports coaching is useful to understand the mediums that coaches' value, this identification does little to further knowledge on 'what works, why, and for whom' (Leeder et al., 2019, p. 2). Descriptive research treats learning to coach as linear, and views the process as merely acquisition of, and participation in, various experiences to explain how coaching is learnt (Cushion et al., 2010; Sfard, 1998). These assumptions fail to encapsulate the wider influences of culture, experience and context on learning (Hager and Hodkinson, 2008), and therefore paint a narrow picture of the process and complexities of becoming a sports coach (Leeder et al., 2019). This type of categorisation is reminiscent of the approaches taken in the pilot study and injury prevention literature, where the understanding of 'why' phenomenon occur is often not considered (Hanson et al., 2014).

2.2 Nonformal learning and continual professional development

Although coaches consistently report learning from nonformal experiences (Falcão et al., 2017; Erickson et al., 2008; Lemyre et al., 2007; Vargas-Tonsing, 2007; Cushion et al., 2003), formal and nonformal learning opportunities are often grouped together under the wider term of 'coaching courses' (Cushion et al., 2010). This has meant that nonformal opportunities remain a relatively underdeveloped topic in coach learning literature, with few studies on the subject compared to the plethora of research into formal coach education (Langan et al., 2013).

While nonformal learning is rarely explicitly referenced in literature, especially around the time of publication, in their review of literature Cushion et al. (2010) point to coach interventions, specifically set up as research projects, to understand

nonformal learning. Conroy and Coatsworth (2006) used the concept of Coach Effectiveness Training (Smoll and Smith, 1984) to inform the Penn State Coach Training Programme. The programme aimed to directly impact coach behaviour based on interpersonal theory (Pincus and Ansell., 2003) and self-determination theory (Ryan and Deci, 2000), and sought to propose that coach training involves internalisation (Conroy and Coatsworth, 2006; Cushion et al., 2010). The authors used experimental designs with randomised groups, delivering the intervention programme to a treatment group, and a sports science programme to a control group (Conroy and Coatsworth, 2006). Differences in behaviour were found in the experimental group, using pre- and post-measures of coaching behaviour (Cushion et al., 2010). Similarly, Kidman and Carlson (1998) used action research to change the coaching behaviour of five participants (Cushion et al., 2010). Coach behaviour analysis, self-reflective analysis and feedback from a knowledgeable other were all used (Cushion et al., 2010), and the authors reported changes in coaching behaviour, and that coaches believed that they benefited from the experience (Kidman and Carlson, 1998).

The lack of control group and low participant numbers in Kidman and Carlson's (1998) case somewhat stunts their conclusions, and Conroy and Coatsworth's (2006) experimental design potentially excludes the varied factors that can influence learning, which is widely accepted as nonlinear (Cushion et al., 2010). However, the use of pre and post measures of behaviour go some way to evidencing a change due to an intervention (Cushion et al., 2010). These two studies, early in the context of coach learning research that was to come, emphasised a need for research to employ rigorous methodologies when evaluating interventions (Cushion et al., 2010).

More recently, Eather et al. (2019) evaluated the impact of a coach development intervention (MASTER) on the practice of youth football coaches. Like the above studies, the authors used pre- and post-intervention measures, employing a modified version of the Coach Analysis and Intervention System ([CAIS] Cushion et al., 2012) to assess coaching behaviours (Eather et al., 2019). Changes in coaching behaviours related to the MASTER programme were observed, especially in the time spent using small sided games, and the types of feedback delivered to players

(Eather et al., 2019). While these results are promising in the context of nonformal learning, this research falls to the same criticisms made of Kidman and Carlson (1998) regarding low participant numbers and a lack of control group. In addition, the use of post-intervention coach observations immediately after the programme does not provide longitudinal evidence of learning (Goodall et al., 2005), and there is no attempt from the authors to understand why such changes in behaviour may have occurred. The above studies are similar to the pilot study, which found that RISK workshops improved confidence, knowledge and attitudes towards injury prevention, but did not investigate why such changes occurred (De Ste Croix et al., under review). This lack of consideration prevails in both injury prevention and coach education studies (Cushion et al., 2010), and therefore offers a gap in current research.

Nonformal learning opportunities, such as workshops, seminars and conferences, have also been classified as forms of continuing professional development (CPD), where specific content is delivered to a subgroup of practitioners in short formats, after initial qualifications have been gained (Nelson et al., 2006). CPD opportunities are often presented in the form of one-off workshops, and the few studies that have examined CPD in sports coaching have found positive changes in behaviour as a result of the workshops (Falcão et al., 2017; Koh et al, 2017). Using post-intervention semi structured interviews, Falcão et al. (2017) and Koh et al. (2017) evaluated 2-hour CPD workshops, one on a values-based training programme for school children in Singapore (Koh et al., 2017), and one on humanistic coaching methods (Falcão et al., 2017). Both papers found that the respective CPD opportunities had benefitted participants in several ways, such as increased awareness of the importance of certain training methods (Koh et al., 2017) and increased use of workshop techniques and principles (Falcão et al., 2017).

Blair and Capel (2011) also found positive results in their evaluation of a CPD programme for primary physical education (PE) coaches. The authors used a mixed-methods approach, collecting data through questionnaires and semi structured interviews at several points throughout the 12-month programme. Baseline data was collected at the start of the intervention, through questionnaires on knowledge,

understanding and perceptions regarding key issues to be explored over the subsequent 12 months (Blair and Capel, 2008). Semi structured interviews were also used at this point, to further explore questionnaire responses (Blair and Capel, 2008). Data was then collected throughout the programme to assess perceptions towards coaches learning and the CPD programme, using semi-structured interviews and questionnaires (Blair and Capel, 2011). Finally, questionnaires were used at the end of the programme to investigate the development of coaches' knowledge, skill and understanding related to programme content, as well as perceptions towards the CPD intervention (Blair and Capel, 2011). The authors found that awareness of the importance of the four core CPD aspects was increased (Blair and Capel, 2011). In addition, coaches believed that their knowledge and ability to use the four core components had been developed, but recognised areas of their practice with which they needed more support (Blair and Capel, 2011).

Clearly, there is substantial data on coach perceptions towards formal, informal and nonformal learning sources, and how these sources have impacted their learning. However, the mere identification of such perceptions does little to evidence if, or how, those sources impact coaching behaviour (Stodter and Cushion, 2017; 2019). In addition, data collected using retrospective interviews is fuelled by opinion, and shows perceived, self-reported learning (e.g. Blair and Capel, 2011; Falcão et al., 2017; Koh et al., 2017), rather than empirical evidence of change in coaching practice because of an intervention (Deek et al., 2013; Stodter and Cushion, 2019). Therefore, prescriptions for how coaches should be developed are hollow (Stodter and Cushion, 2017).

Few studies have used longitudinal, multi-faceted data collection methods to compare practice over time, and these tend to be small in scale (Stodter and Cushion, 2019). Gilbert and Trudel (1999) and Stodter and Cushion (2014) used coach observations, pre- and post-intervention interviews and stimulated recall, finding limited changes in coaching practice from formal learning experiences. However, the studies did not use comparison groups, and therefore it is difficult to separate the impact of the coach education interventions from simultaneously occurring experiences and moderating factors (Stodter and Cushion, 2019).

Stodter and Cushion (2019) present the best attempt at evidencing coach learning from formal education. The authors used systematic coach observations and video-stimulated recall interviews with two groups of youth sport coaches, one containing coaches that were completing a formal education programme, and one containing coaches that were not, but had comparable characteristics (Stodter and Cushion, 2019). They found that coaching behaviours changed over time in the group that participated in the formal coach education programme, and that coaches in this group linked their experience of the formal programme to their practice (Stodter and Cushion, 2019). Primarily, the formal coach education programme influenced coaches' practice with individual players and their use of tactical knowledge (Stodter and Cushion, 2019). There was also evidence of changes in knowledge related to practice structure, learning principles and questioning, among other things, but coaching behaviour was relatively consistent, suggesting minimal deep learning (Moon, 2004) in these areas (Stodter and Cushion, 2019).

Stodter and Cushion (2019) provide promising data on the impact of formal learning experiences, but it appears that there is little evidence on what constitutes effective for nonformal opportunities (Armour et al., 2015; Griffiths et al., 2018). As Griffiths et al. (2018, p. 3) explain, 'literature is certainly replete with arguments about what kinds of CPD are most likely to 'work'', but 'identifying the processes and mechanisms of 'effective' models remains elusive'. That being said, Stodter and Cushion (2019) present a feasible mixed-methods approach to evidencing coach learning, which could readily be applied to nonformal learning opportunities.

It is important to note that coach education literature rarely employs recognised frameworks to guide research. Indeed, just one coach education study exists that employed the RE-AIM framework; a systematic review by Evans et al. (2015) which examined interpersonal Coach Development Programmes (CDP) against the RE-AIM dimensions. Evans et al. (2015) found that reporting of Maintenance was generally poor, especially at the setting level, mirroring injury prevention studies evaluated against the RE-AIM framework (O'Brien and Finch, 2014). As an evaluation model considered useful in real-world settings (Collard et al., 2010; Finch

et al., 2011), the RE-AIM framework presents an underused but effective tool for evaluating coach education programmes (Evans et al., 2015).

2.3 Nonformal Injury Prevention CPD through the lens of coach learning

Injury prevention literature is at a similar juncture to coach learning research. There has been limited recognition of the complexity of coach learning, and in fact this lack of depth is a recognised phenomenon in injury prevention (Gielen and Sleet, 2003; McGlashan and Finch, 2010; Trifiletti et al., 2005). Current research provides surface level descriptions of coaching workshops, assuming that coach participation in these workshops will automatically translate to behaviour change (Aerts et al., 2013; Frank et al., 2014; Saunders et al., 2010). These learning experiences are often in the form of short format workshops with no follow up other than data collection (Brown et al., 2016; Gianotti et al., 2010), with some workshops as short as 1 hour long (Saunders et al., 2010). At the heart of this simple interpretation of coach learning are Randomised Controlled Trials (RCT), as discussed in the introduction to this thesis. RCTs use two groups, one receiving a coach intervention and one not, and then compare implementation rates (Aerts et al., 2013; Aerts et al., 2015; Kerr et al., 2015). While these studies are effective at showing implementation rates between different groups, they do not provide insight into why changes in behaviour occur. Furthermore, studies of this nature often collect data on implementation from coaches as opposed to observations of their practice, failing to objectively determine if a programme had been adopted and implemented successfully (Stodter and Cushion, 2017).

This limited understanding of the mechanisms behind coach adoption has led to investigations into knowledge, attitudes and beliefs of coaches towards injury prevention programmes (e.g. Mawson et al., 2018; Norcross et al., 2016; O'Brien and Finch, 2015), and literature claims that these act as predictors of injury prevention adoption (White et al., 2012). However, it is still unclear how best to train coaches to deliver injury prevention techniques, despite their recognition as a key partner (Myklebust et al., 2013). For example, some authors have found low adoption of injury prevention practices despite high intent to adopt after a workshop (Frank et al., 2014), and that beliefs do not significantly affect adherence to injury

prevention programmes (McKay et al., 2014). This lack of clarity has resulted in claims that coaching workshops are ineffective at influencing injury prevention behaviours (Frank et al., 2014), despite research finding that workshops with, or without, support from a knowledgeable other are more effective at facilitating adoption than unsupervised online resources (Steffen et al., 2013). These results also further evidence the need for research using more than just self-reported data, as perceptions of practice and attitudes towards an injury prevention programme or workshop clearly do not correlate with actual behaviour or knowledge (Millar et al., 2011; Partington and Cushion, 2013). In addition, there is a tendency to quantify and isolate aspects of coach learning, such as beliefs, knowledge and attitudes, that are arguably too complex and multifaceted to be understood fully using such methods (Cushion, 2010; Nelson, 2010; Stodter and Cushion, 2016). Few studies recognise how past experiences, perceptions and wider contexts can impact Adoption, Implementation and Maintenance (Lindblom et al., 2018), and therefore the underlying mechanisms that dictate engagement with injury prevention workshops remain unidentified.

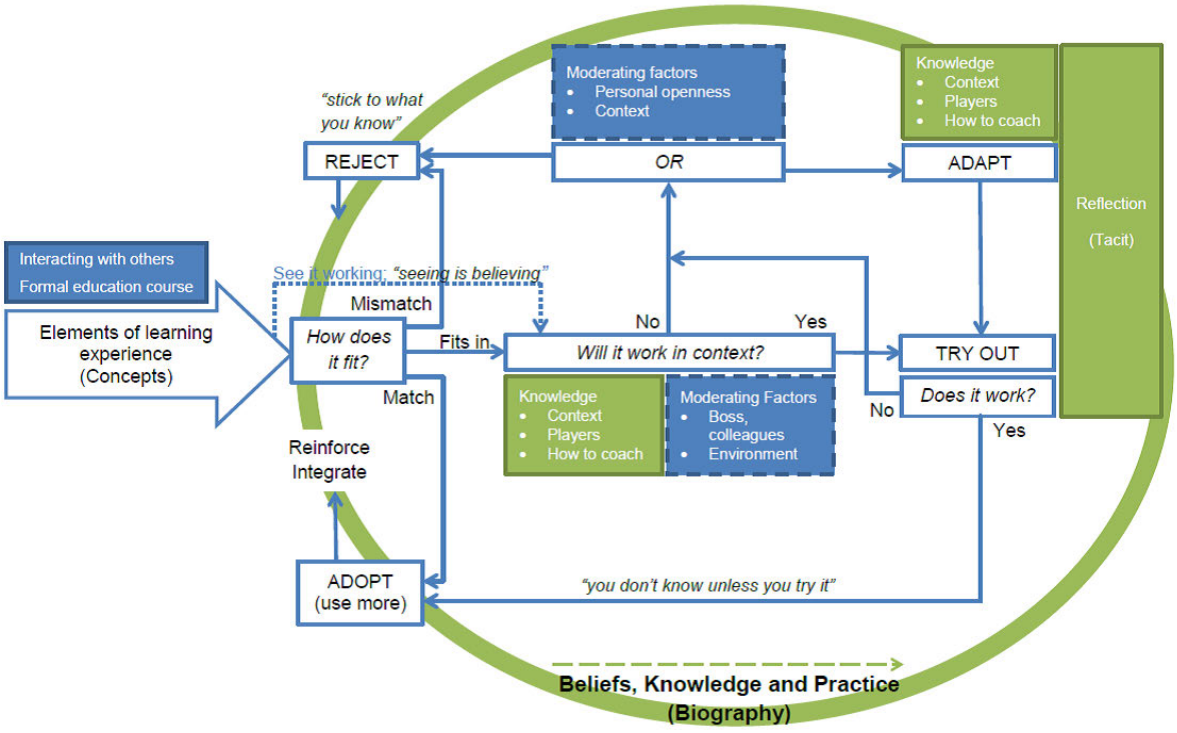
2.4 The wider context of coach learning

More recent research recognises that learning is embedded in a coach's biography of knowledge, beliefs and practice (Stodter and Cushion, 2017), and their dispositions to learning situations (Leeder et al., 2019; Phelan and Griffiths, 2019). Griffiths and Armour (2013) found that coaches' dispositions of intentionality (being open minded, inquisitive, awareness of support) and reciprocity (importance of co-operation with others, willingness to accommodate alternative perspectives) directly contributed to engagement, or lack of, with formal development opportunities. Phelan and Griffiths (2019) noted the role that the inherent culture of a workplace, and personal dispositions, played in high performance coaches' perceptions towards their role and in-situ learning opportunities. Further to this, Leeder et al. (2019), using the work of Bourdieu (1984; 1986), demonstrated how individual learning from the same nonformal experience can differ between coaches, due to dispositions, capital (economic, cultural and social power; Bourdieu, 1986) and the social context that coaches are in. This research significantly furthers understanding on coach

engagement with learning opportunities, and why learning can differ between coaches in similar situations (Leduc et al., 2012).

Further to this, Stodter and Cushion (2017) produced an integrative grounded theory model to explain how coaches in their study learned, accepted and rejected knowledge while engaging in professional learning opportunities. Using semi-structured interviews and practice-linked video stimulated recall interviews the authors established a filter process that coaches used, displayed in Figure 3 (Stodter and Cushion, 2017).

***Figure 3**: Grounded theory of the learning 'filter' process (Stodter and Cushion, 2017, p. 326).*



The coaches' biography encases the whole learning process, playing a key role at the individual level, contextual level and during the reflective feedback process (Stodter and Cushion, 2017). For Stodter and Cushion (2017), learning experiences passed through the individual and contextual levels before being 'tried out' (p. 326) in practice, which then led to either rejection, adaptation or adoption into the coaches' biography.

Stodter and Cushion (2017) present the first framework for coach learning, demonstrating how coaches may 'dynamically interact with the learning environments they encounter' (Stodter and Cushion, 2016, p. 40). This is a significant step towards sports coaching literature recognising that there are different types of learning (Tusting and Barton, 2003) and understanding 'what works, why, and for whom' (Leeder et al., 2019, p. 2). However, this grounded theory has not yet been widely tested apart from in Stodter and Cushion's (2017) initial study, meaning its validity to coaches 'in general' can still be debated.

Some injury prevention studies have suggested conclusions like those of the authors above (Griffiths and Armour, 2013; Leeder et al., 2019; Stodter and Cushion, 2017), but often incompletely and with little consideration for wider contextual factors. For example, different practice behaviours have been identified in coaches that have access to the same injury prevention resources (O'Brien et al., 2017), and that alterations to these resources were dependent on coaches' implementation context (O'Brien and Finch, 2016), and how well a programme 'fits' with a team (Lindblom et al., 2018; Norcross et al., 2016). Furthermore, Brown et al. (2016) found that coaches from different socio-economic backgrounds perceived BokSmart workshops differently, and reported using resources to different degrees after the workshops, hinting at societal power relations and cultural influences as a mediating factor for workshop engagement (Leeder et al., 2019).

From the above literature, it appears that injury prevention is moving, if slowly, towards the understanding that coach learning is complex and multi-faceted (Werthner and Trudel, 2009), and deserves deeper consideration for interventions to translate to adoption and implementation. There is, however, still limited and incoherent understanding of the processes behind coach engagement with injury prevention interventions, when compared with research into coach education (Stodter and Cushion, 2017). It is possible that this is because most injury prevention coach intervention studies are concerned with applied use of a program, as opposed to the 'road' to implementation. Nevertheless, this presents a gap in current literature, and shows that coach learning research can inform injury prevention literature.

2.5 Conclusion and research questions

There is a clear knowledge gap in sports injury prevention literature, relating to the contextual and social facilitators and barriers to Implementation experienced by programme deliverers at the individual level (Hanson et al., 2014). Because of this, there is limited understanding of how to best equip coaches to deliver interventions in real-world settings. In addition, Maintenance of a program, at either the individual or setting level, is almost never considered (O'Brien et al., 2014). With regards to the wider research project governing this thesis, more understanding of coaches' experiences of taking part in, and subsequent use of, the RISK workshop is needed if it is to be used in a range of sporting contexts. Brown et al. (2016) showed that qualitative data collection methods, within the RE-AIM framework, can provide valuable data on participants perceptions of an injury prevention education program, yet their study lacked depth at the setting level. Nevertheless, their paper, and that of Lindblom et al. (2018), offer useful models to draw on when considering a wider research context.

This study aimed to understand coaches' experiences with RISK in the context of coach education and injury prevention, which the pilot study did not examine in detail. In addition, this study aimed to consider the setting level factors that contributed to RISK's initial implementation, and the possibilities for its Maintenance, which is a sorely under researched topic (Hanson et al., 2014; O'Brien and Finch, 2014). In order to maintain consistency with the larger research project, and in line with criticisms of injury prevention research approaches, the RE-AIM framework (Glasgow et al., 1999) was employed when establishing the research questions, and was also used during the data collection process. More specifically, the RE-AIM SSM (Finch and Donaldson, 2010) was used throughout this thesis, because of its consideration of setting level factors under each heading.

While this investigation may not produce empirical evidence of learning (Stodter and Cushion, 2019), there is still value in considering participants perceptions towards RISK (McGlashan et al., 2018). Indeed, as has been shown, RISK can benefit from a wider understanding of coaches' experiences with the workshops, and an investigation into how coaches perceive, interpret and block this injury prevention

knowledge (Brown et al., 2016; Leeder et al., 2019; Lindblom et al., 2019; Quarrie et al., 2020). Future research could consider the impact that RISK has on coaching practice, but at present it was deemed appropriate to 'lay the groundwork' to understand how coaches may engage with RISK workshops. To examine participant experiences with the RISK workshop the following research questions were developed, using a pragmatic set of sources (Brown et al., 2016; Finch and Donaldson, 2010; Glasgow et al., 1999; Hanson et al., 2014; O'Brien and Finch, 2014):

What influences coaches' adoption of RISK?

What influences coaches' implementation of RISK?

What perceived facilitators and barriers to coaches expect to experience when adopting, implementing and maintaining RISK?

What actual facilitators and barriers do coaches experience when adopting, implementing and maintaining RISK?

What role does the Key Stakeholder play in the development and delivery of RISK?

3.0 Methods

3.1 Context

Junior cricket at county level is often referred to as pathway cricket or county age group cricket (Cheshire Cricket Board, 2020). First-class and minor counties often have pathway cricket teams of ages U11 to U17, and an Emerging Players Pathway (EPP) for players aged up to 19, which acts as a route to first team county cricket (Cheshire Cricket Board, 2020). EPP squads can also act as a way for minor county players to be selected for first-class county teams, either to first-class EPP squads or Academy/2nd XI teams (Cheshire Cricket Board, 2020). Each age group team will have a member of the county's coaching staff responsible for running that team, and their tasks include leading training sessions, coaching on match days and coordinating fixture lists to parents.

3.2 Paradigm

Considering the research questions, interpretivism is the most appropriate paradigm to employ and consider throughout this thesis. Interpretivism distinctly separates the social world and the physical world, rejecting the notion that people, social practices and social institutions (the social) can be examined and understood through the same methodologies used to investigate the physical world (Potrac et al., 2014). The interpretive paradigm holds a foundational belief that the social world is complex (Jones and Wallace, 2005), and 'that people, including researchers and their research participants, define their own meanings' within their various settings (Markula and Silk, 2011, p. 31).

Understanding experiences, of both individuals and groups, is the main goal of interpretive enquiry (Coe, 2012). To this, interpretivists hold the belief that there is no one correct route to knowledge (Willis, 1995), and the idea of correct or incorrect learning theories is likewise rejected (Walsham, 1993). Use of this lens gives the researcher in this study freedom to apply, compare or ignore previous research as they see fit, to understand an individual's experience.

This study is not looking to provide an objective truth, but rather actively comment on and understand participant experiences of a nonformal coach education workshop, with a specific group of coaches (Purdy and Jones, 2011). The freedoms given by using the interpretive paradigm allow the application of the RE-AIM evaluation framework (Glasgow et al., 1999), used in the larger research project investigating RISK, as a tool to understand participant perceptions, and to maintain consistency with the overarching research context. In addition, interpretive researchers' concern with depth of detail from small sample groups speaks strongly to the design of RISK, which is currently targeted at few coaches, relative to the number of active practitioners in the country (Potrac et al., 2014).

Due to the interpretive nature of this study, claiming that the results provide clarity to the entire coach learning realm is difficult. Rather, the results give the researchers insight into how a workshop of this nature, introducing injury prevention research and techniques, may be received by coaches at junior county level. This contributes to the wider research project that has already been mentioned, which, in a previous study, used solely quantitative methods in a paradigm more reminiscent of positivism (De Ste Croix et al, under review).

3.3 Methodological Approach

Interpretive research typically employs qualitative data collection methods (Willis, 2007), which allow for rich, contextual data to be collected (Purdy, 2014). The same methods can be seen in studies that examine coach learning, such as Nash et al. (2017) and Watts and Cushion (2017), where freedom was required to explore participant perceptions, and for themes to emerge naturally from the data (Purdy, 2014). Semi-structured interviews are the most common form of data collection that appear in coach earning research (e.g. Nash et al., 2017; Watts and Cushion, 2017; Erickson et al., 2008; Lemyre et al., 2007; Vargas-Tonsing., 2007; Cushion et al., 2003), and are often employed in injury prevention research concerning coaches (e.g. Donaldson et al., 2018; McGlashan et al., 2018; Saunders et al., 2010). However, as previously discussed, the intention of some of the above references is different to that of this thesis. At the time of writing there are no studies with the same research goal as this thesis; purely to understand participant experiences of a

real-world injury prevention coach intervention, framed in the interpretive paradigm, and with no concern for quantitative measures or generalisable prescriptions. In fact, most studies employed surveys when assessing injury prevention coach interventions (Aerts et al., 2013; Frank et al., 2014; Norcross et al., 2016), which fall to the same criticisms made of self-reported data collection methods made in this thesis' Literature Review (Stodter and Cushion, 2017; 2019).

When investigating perspectives and perceptions of coaches, focus groups are used by some authors (Winchester et al., 2013; Gould et al., 2008; Wiersma and Sherman, 2005). Gould et al. (2008) and Wiersma and Sherman (2005) exclusively used focus groups, employing inductive content analysis, and allowing themes to emerge from the data. In contrast, Winchester et al. (2013) first interviewed their participating coaches, later using focus groups to explore themes that emerged from the initial interviews. In addition, the authors used theoretical, rather than inductive, content analysis (Braun and Clarke, 2006), guided by Jarvis' (2006; 2007) theory of human learning to identify how life experiences shaped their participants' learning (Winchester et al., 2013). Winchester et al.'s (2013) use of focus groups is atypical to Purdy's (2014) suggestions, the latter advocating that focus groups be used singularly, or initially to explore ideas that will be investigated later in a study. Despite this, qualitative researchers tend to refute prescriptive methodologies, so reversing the above process is still acceptable for collecting valid data (Thanh and Thanh, 2015; Gill et al., 2008).

For this thesis, the researcher looked to Nash et al. (2017) and McGlashan et al. (2018) for methods to emulate. McGlashan et al. (2018) contrast with traditional injury prevention studies, presenting a method more reminiscent of coach learning studies by interviewing coaches to understand their perceptions. Specifically, the authors aimed to gain insight into what strategies community-Australian Football (community-AF) coaches' thought would enhance implementation and scale-up of injury prevention exercise programmes (IPEPs) (McGlashan et al., 2018). Nash et al. (2017) had a similar goal, but their concern was with coaches' perspectives of CPD. Both studies aimed to contribute to understanding why coaches would or would not engage with IPEPs or CPD respectively (McGlashan et al., 2018; Nash et al., 2017),

and while ontology is not discussed in either study the research goals represent interpretive or constructivist paradigmatic approaches (Paquette et al., 2014; Potrac et al., 2014). Interpretivists and constructivists assume, ontologically that reality is not separate from perception, and epistemologically that knowledge is constructed subjectively from the social world (Potrac et al., 2014). Therefore, to understand engagement with a phenomenon, such as CPD or IPEPs, insight into potential or actual participants perceptions of those phenomenon is crucial. To that end, semi-structured qualitative data collection methods, namely focus groups and individual interviews, were appropriate to this thesis' aims and paradigmatic position (Thanh and Thanh, 2015; Purdy, 2014; Trudel et al., 2014; Winchester et al., 2013).

3.4 Participants

In terms of participants, the key difference between this study and the pilot was the use of junior county cricket coaches, as opposed to grassroots youth football coaches. Therefore, the inclusion and exclusion criteria from the pilot study were used, but in an adapted form to reflect the participants in this study. Initially the intention was to mimic the pilot study's use of grassroots coaches, but this was not possible to do due to the limited opportunities to deliver the RISK workshop that were afforded to the researcher and their supervisors. Small, last minute changes to the inclusion and exclusion criteria were made to accommodate for the workshop demographic, which are detailed below.

All participants were either county pathway cricket coaches, Strength and Conditioning practitioners working in the county pathway or county pathway developers with limited coaching hours in their role.

Inclusion Criteria

i) Participant is willing and able to give informed consent for participation in the project.
ii) Aged 18 years and above.
iii) Have participated in a RISK workshop.

iv) Are actively involved in the development or coaching of youth sport (ages 17 and below).

Exclusion Criteria

i) Participants have not completed the full days training.
ii) Are not currently involved in youth player development or coaching.

Drawing on several systematic reviews, O'Brien et al. (2014) explain that injury prevention intervention literature often lacks information on the target of an intervention, what the intervention is and who delivered the intervention. Therefore, this intervention is a coach education workshop, described as a non-formal learning opportunity (Nelson et al., 2006), and was directly targeted at first-class and minor county pathway cricket coaches, with the intended end beneficiaries being their players (O'Brien et al., 2014). As explained above, however, not all workshop participants were cricket coaches. The workshops were delivered by the researcher and their supervisors.

3.5 Procedure

RISK Workshop

Fifty-two participants from three ECB CPD days (Hampshire n = 18; Kent n = 12; Staffordshire n = 22) attended a 2-hour workshop. Ages ranged from 21 to 66y (M = 35y) with 100% of the total sample being male. All participants completed a quantitative data collection procedure undertaken on the day of each workshop; a survey immediately pre-intervention, and a survey immediately post-intervention.

The planning of the intervention was coordinated between one of the author's Supervisors and the Head of Strength and Conditioning (S&C) for the English Cricket Board (ECB), with discussions related to implantation starting 2 months prior to the planned delivery dates. Through email a rough implementation plan was outlined by the Supervisor, and the Head of S&C organised the dissemination of the workshop at three CPD days for county cricket pathway coaches. The coaches were from a variety of first-class and minor counties, who travelled to their local respective CPD days for two interventions, the RISK workshop being the second and taking place in

the afternoon on all three occasions. Members of the researcher's supervisory team adapted the generic RISK presentation to make it more specific to cricket, which included using injury data relating to youth cricket players and changing language and media used in the presentation. In addition, during the delivery of the workshop the members of the supervisory team would relate their key points, and the movements that were taught, to cricket wherever possible. The researcher and their supervisors delivered all three workshops, and are hereby by referred to as 'research-educators' (O'Brien et al., 2014). The Head of S&C put the research-educators in touch with the Regional Talent Developers (RTD) prior to the delivery of each workshop, and the RTD's would introduce the research-educators and concept of RISK before delivery. Initially the research-educators envisioned the workshop taking 3 hours, with half an hour allowed immediately after for the author to conduct focus groups. However, on the day of each workshop the RTD's asked the research team to shorten the delivery time to between 2 and 2 ½ hours, meaning some elements of the theory and practical were shortened or not delivered to accommodate the revised time frame.

The theory section of the workshop provided data on injury rates in youth sport and types of common injuries in cricket, introduced the importance of movement quality for young performers, gave examples of poor movement and provided evidence of the effectiveness of injury prevention programmes. Other topics were briefly mentioned, such as early specialisation (Malina, 2010), and maturation in youth sport (Malina et al, 2015), however these topics were not discussed in any significant detail. The practical section of the workshop was dedicated to teaching participants RISK's fundamental movements to reduce injury, and included participants performing the movements and giving feedback to each other, with instruction and support from the research-educators. At the end of the workshop, and after the focus groups for the benefit of those that participated in them, the RISK online resources were shared with the coaches on the workshop.

3.6 Data collection

The qualitative data collection process consisted of three methods at three time points, initially with semi-structured focus groups immediately after the RISK

workshops. Three focus groups were conducted in total, consisting of 7, 6 and 6 coaches respectively (n = 19), with ages ranging from 21-56 (M = 36). The participants in each focus group had all completed the RISK workshop and represented 16 minor or major county cricket junior academies from across the UK (6, 5 and 5). Participants in the focus groups were purposefully sampled by the researcher, who used the pre workshop surveys to identify suitable candidates (Patton, 2002). The researcher aimed to vary the participants in each focus group based on the ages that the participants reported that they coached, if they were from major or minor counties and if they reported access to injury prevention techniques or programmes prior to attending the workshop. This was necessary to understand how RISK was perceived by coaches from different contexts, with access to varying amounts of resources and with different ranges of experience.

The focus group guide had three main parts, structured loosely around the RE-AIM framework. Firstly, the participants were asked what they enjoyed and valued from the course, which related to potential Adoption. The second part focused on 'potential facilitators'; aspects of the workshop that participants felt would be useful when delivering aspects of RISK. This transitioned into the final part of the focus group guide, which was centred around 'potential barriers'; participants were asked what they foresaw as problems when delivering content from the workshop. The last two sections were in relation to perceptions towards Implementation. While this guide is presented linearly, due to the nature of semi-structured interviews, and the flow of each focus group, the three topics of the guide were not necessarily discussed in that order. In addition, various prompts and additional questions were used throughout the course of each focus group. These helped the researcher explore the guide topics, gain a better understanding of responses, and allowed new topics considered relevant to the study to emerge and be explored further (Jones et al, 2013).

The focus groups were recorded and transcribed using a denaturalised approach where the idiosyncratic speech elements of each participant were removed or altered for coherence (Oliver et al, 2005). This was an appropriate transcription method as the aim of this study is to organise unstructured data to investigate the impact of a

coach education workshop, therefore the focus was the content of the focus groups, rather than how the data was delivered by participants (Hennink et al, 2011).

The second data collection method used was semi-structured interviews conducted six to eight weeks after the RISK Workshops. Interviews were used, rather than focus groups again, because focus group participants were from different parts of the country, so bringing them together again was not feasible. Two interviews were conducted, and participants were aged 29 and 47 respectively. Only two were conducted due to workshop participants either being unavailable for interview or not responding to numerous emails. The interview participants had taken part in the post-intervention focus groups, and some themes that were familiar to each participant were drawn from the respective focus groups to inform the interviews. Participants were contacted via email, which had attached an information and consent sheet for willing coaches to sign. Upon confirmation of consent, dates and times for interview were organised, and took place over skype.

The interviews followed a guide, with the structure based on the last three elements of the RE-AIM framework; Adoption, Implementation and Maintenance (Glasgow et al, 1999). Using the basic structure of AIM, and generic questions, the interviews were tailored slightly to each participant, using discussions that had taken place during the respective focus groups. This was deemed appropriate by the researcher and thesis supervisors due to how the focus group data had been themed, and that this thesis employed the RE-AIM framework as its evaluation tool. The Adoption section of the guide considered participants' willingness to use RISK elements in their practice after completion of the workshop. The Implementation section questioned participants' use of RISK content in their sessions, any challenges or support they had encountered and if there had been implementation at the setting level of the coaches' respective organisations. Lastly, Maintenance was covered; participants were asked if they intended to keep employing injury prevention techniques, the potential barriers and facilitators to continuing implementation, and what they thought they needed for successful implementation. Similarly to the focus group guide, this interview guide is presented linearly, but due to the nature of semi structured data collection the researcher did not use it in a strict order. Prompts and

additional questions were also used, again like the focus groups, to explore certain answers in more detail, and to aid the flow of the interview. The interviews were recorded and transcribed using the same denaturalised approach as the focus group transcriptions (Oliver et al, 2005).

In addition to semi-structured interviews following up with focus group participants, a semi-structured interview was undertaken with a key stakeholder at the English Cricket Board (ECB). This key stakeholder was the original contact and driving force behind the inclusion of the RISK workshop in the coaching CPD days. This stakeholder was interviewed to address criticisms of injury prevention research levelled by Hanson et al. (2014) and O'Brien and Finch (2014). These criticisms have been covered at length in the introduction section of this thesis, but broadly the authors explain that very few studies consider the setting level of their target groups, and almost no papers consider maintenance at either the individual or setting level (Hanson et al., 2014; O'Brien and Finch, 2014).

As with the follow up interviews, the participant was contacted, and consent was gained, via email, which was the only feasible method at the time due to the stakeholders' work-related travel commitments. An interview guide was used, this time encompassing all elements of the RE-AIM framework minus Effectiveness; Reach, Adoption, Implementation, and Maintenance (Glasgow et al., 1999). This was done to maintain a narrative and procedural consistency within this thesis and the wider research project, which is often considered challenging when using qualitative data collection methods (Holloway and Todres, 2003; Selvin and Sines, 1999). The guide was informed by Holtrop et al.'s (2018) paper on using qualitative approaches with the RE-AIM framework, which outlined potential questions to consider during the data collection process. The Reach section of the guide was concerned with which other stakeholders in the organisation were aware of RISK, with Adoption focusing on the initial interest of the key stakeholder, and subsequent interest from other members of the organisation. This section also considered barriers to introducing the concept of RISK, and the process of including RISK in the CPD days. Implementation focused on the initial delivery of the RISK workshops at the CPD days, including observations from the stakeholder, and potential future

implementation options for RISK content. There was some cross over between the latter section of Implementation and Maintenance, which considered how RISK may fit into the organisations coach education framework. This guide was presented linearly but was not discussed in that manner during the stakeholder interview.

Quantitative data was also collected in the form of pre- and post-intervention surveys, but other than to collect contact details and to inform the Reach section of the results and discussion this data was not used in any formal capacity. These surveys also provided some informal feedback on the RISK workshop to the research-educators.

3.7 Data analysis

Inductive and deductive approaches were used to analyse the data, following research by Edwards et al. (2002) into catastrophic performances of elite sports performers. Using a deductive approach allowed the researcher to structure emergent themes within a pre-determined set of dimensions (Patton, 1980), namely the RE-AIM framework. This approach meant that consistency and coherence could be maintained throughout the thesis, and with the larger research project, by structuring the data around RE-AIM. Using an inductive approach allowed for flexibility in the data collection, and for themes to emerge from the data (Patton, 1980), in line with this thesis' paradigm (Potrac et al., 2014).

Using the inductive approach, thematic analysis was employed when examining the focus group and interview transcriptions, following the first five of Braun and Clarke's (2006) six phases, used by authors of similar research styles (Vella et al, 2011; Werthner and Trudel, 2009). Firstly, the researcher familiarised themselves with the data, through transcription and checking for errors in the text. Secondly, codes were initially generated; codes are elements of raw data that can be evaluated in a significant way (Vella et al, 2011). An example from the focus group data is 'If we had anything to share as a resource, of what's happening nationally and particularly with maturation and injuries happening around that stage, that's quite a big buy in for parents that they can hopefully push that message at home as well ' (DC6). Thirdly, the codes were collated into higher order themes. The code above generated three

higher order themes: Recommendations for future workshop practice, under Adoption; Buy In, under Implementation; and Facilitators, also under Implementation.

The fourth phase was the review of themes, during which time the data was further organised into lower and higher order themes and structured under the predetermined general dimensions. Due to the complexity of the focus group, follow up and Key Stakeholder data it was deemed appropriate by the researcher to use higher and lower order themes to organise the data, as the initial themes contained codes relating to several aspects of one theme. For example, for the focus groups, 'Buy In' as a higher order theme under the general dimension 'Adoption', and 'Player', 'Parent', 'Coach' and 'Structural' buy in as lower order themes under 'Buy In'. Further to this, 'Buy in' could potentially relate to the higher order themes under Adoption, or even Implementation; 'Barriers' and 'Facilitators'. However, there was a significant amount of data concerning 'Buy in', so it was determined that it would be a separate higher order theme. Figure 4 shows all general dimensions, higher order themes and lower order themes from the focus group data.

Figure 4: *Higher and lower order themes organised under the RE-AIM dimensions*

General Dimensions	**Higher Order Themes**	**Lower Order Themes**
Effectiveness	Perceived effectives	Validation of current practice
Adoption	Facilitators (to adoption)	Workshop practical Workshop messages Workshop theory
	Barriers (to adoption	Coach role frames
	Buy in	Player Parent Coach Structural
Implementation	Facilitators	Perceived Actual
	Barriers	Perceived Actual
	Active Implementation	Future implementation planned Currently implementing
Maintenance	Not evaluated at this stage	

The final phase employed by the researcher was defining and naming themes (Braun and Clarke, 2006). This had already been done in part during phase 4, so in

addition to defining the themes, and organising them under the general dimensions, evidence in the form of quotes was also attributed to each lower order theme. The sixth phase is ‘Producing the report’ (Braun and Clarke, 2006, pp. 87), and was considered irrelevant by the researcher as this stage was ongoing.

The above process highlighted the challenge of using such a structured framework to organise data from participants. The RE-AIM model (Glasgow et al., 1999) and its ecological conceptualisation, the RE-AIM SSM (Finch and Donaldson, 2010), proved too structured to organise the emerging data themes. The author drew on several sources to try to organise themes under RE-AIM, such as Holtrop et al.’s (2018) guidance for using qualitative methods with RE-AIM, Finch and Donaldson’s (2010) work on the RE-AIM SSM, and O’Brien and Finch’s (2014b) systematic review of injury prevention research under RE-AIM. This pragmatism, however, led to extreme uncertainties as to where themes should be placed. Themes often crossed over multiple RE-AIM dimensions, depending on different interpretations of the framework, and participants would make references to themes while discussing other topics. It was therefore more appropriate to create a process model to show the dynamic nature of coach engagement with RISK, and how perceptions of certain dimensions influenced each other, and were influenced by biography. Calls have been made for ecological understanding of injury prevention interventions (Donaldson et al., 2017; Finch, 2011; O’Brien et al., 2014), and sports coaching authors have argued for the need to model the coaching process utilising sound theoretical perspectives (Cushion, 2007; Stodter and Cushion, 2017), and the following model presents such an attempt at the individual level.

The data from the Key Stakeholder presented itself as differently, offering a ‘story’ in a similar fashion to Hussain et al.’s (2012) presentation of their data. Hussain et al. (2012) investigated the experiences of a Key Stakeholder attempting to set up and deliver a novel coach education programme. They produced a narrative of this Stakeholder’s experiences, including how he had developed the underpinning principles, the various barriers and facilitators to implementing a new programme, and how his experiences and life story had an impact on this process (Hussain et al., 2012).

4.0 Results and Discussion

4.1 Introduction

This discussion is organised into several key sections to explain the process model. The first section details the whole process model, while the second explains Reach as the starting point. Section three focuses on Stage 1, the Process of Adoption, and demonstrates the complex, interacting nature of the elements within that process. Section four details how participants then acted after the Process of Adoption, while section five, using prior research, explains the Process of Implementation and how participants used, or did not use, RISK. The final section of this discussion focuses on the Key Stakeholder's journey, and their significant influence on the adoption of RISK into the ECB CPD days that the workshops were delivered at.

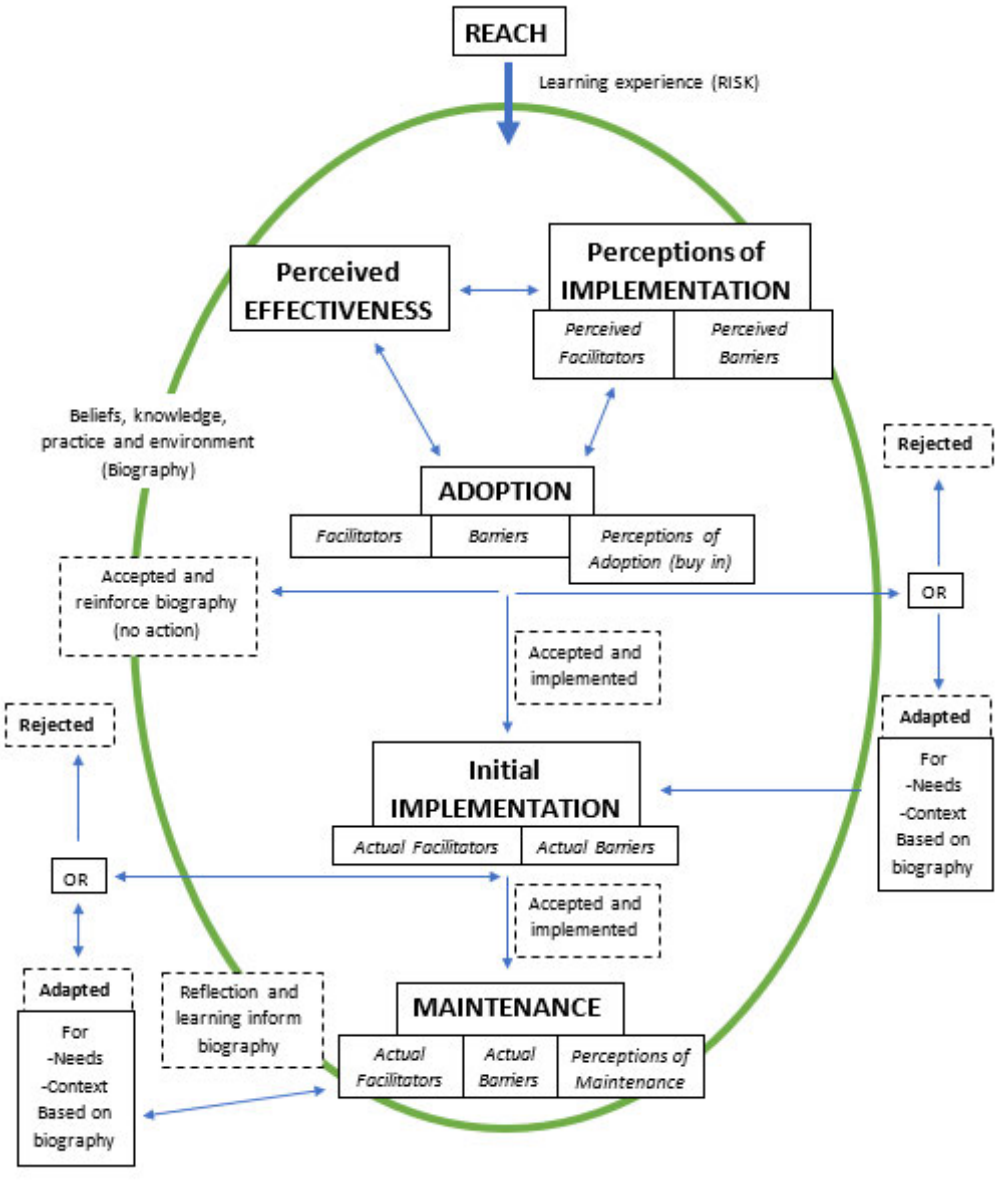
Key to these sections are the perceptions of the participants, especially in relation to the facilitators and barriers to implementing RISK that were identified. This model aims to present complex interacting elements in a readable format, and therefore offers large amounts of detail. There may be repetition of some data throughout this Discussion, and this serves to emphasise how the dimensions of the RE-AIM framework interlink with each other.

4.2 Two stage process of coach engagement with RISK

Figure 5 is a process model of coach engagement with RISK, starting with Reach and then formed of two stages; the Process of Adoption, and the Process of Implementation. The Process of Adoption consists of Perceived Effectiveness, Perceptions of Implementation and Adoption, while the Process of Implementation consists of Initial Implementation and Maintenance. Solid boxes represent the dimensions of the RE-AIM framework (Glasgow et al., 1999) and the higher order data themes underneath them, whereas the dashed boxes show the actions that participants can take, or the consequences of each stage. The arrows represent the links between these dimensions and actions or consequences, indicating the direction that coaches may take in a similar fashion to linear presentations of the RE-AIM framework (e.g. Frank et al., 2014). In line with both the data and previous research into coach learning (Stodter and Cushion, 2017), the beliefs, knowledge,

practice and environment of coaches encase both stages, which, all together, are known as a coaches' biography (Taylor et al., 2014). In this case, the biography is understood to be 'an unfinished product constantly undergoing change and development…and will affect the way that we respond to experiences and continue to learn' (Jarvis, 2009, p. 25). This model is largely underpinned by previous research into coach learning (e.g. Stodter and Cushion, 2017), reflection (e.g. Gilbert and Trudel, 2001), concepts of ongoing learning (e.g. Callary et al., 2012) and the implementation science theory Diffusion of Innovations (Finch, 2011).

***Figure 5**: Two stage process of coach engagement with RISK*



This process does not present a model of learning, as this was not the research goal, and data collection methods were not conducive to measuring learning (Stodter and Cushion, 2019). Rather, this is a diagrammatical representation of the data, under the RE-AIM dimensions, showing how coaches engaged with RISK and injury prevention practices at various time points.

4.3 Reach

Reach, in this model, is intended to consider the factors effecting individual participation in RISK (Glasgow et al., 1999). Setting level examination is crucial (O'Brien and Finch, 2014b), and therefore will be discussed in the final section of this Discussion. It should be noted at this point, however, that the Key Stakeholder was a major driving force behind the inclusion of RISK in the ECB CPD days.

When employing qualitative methods with the RE-AIM framework these questions are considered necessary to further investigate barriers to non-participation (Holtrop et al., 2018). For example, collecting quantitative data is useful for understanding the demographics of participants, such as their gender, race, level of coaching qualification and who they coach. This data, however, omits 'characteristics that impact participation versus non-participation' (Holtrop et al., 2018, p. 179) that can be difficult to quantify. Factors like minimal interest in the subject matter (Lindblom et al., 2018), and negative experiences with previous nonformal opportunities (Griffiths et al., 2016) may be factors contributing to non-participation, which quantitative data would not recognise (Holtrop et al., 2018). Therefore, to assess Reach at the individual level three key questions from Holtrop et al. (2018, p. 178-179) will be discussed;

Who was intended to benefit from RISK at the end point, and who actually participated in the workshops?

What factors contributed to the participation or non-participation in the RISK workshops?

What might have been done to get more of the actual target audience to participate in RISK?

In answering the questions above, the connotations for future RISK planning is discussed, along with setting level data from the Key Stakeholder relating to participation barriers that were observed during the workshops.

4.3.1 Who was intended to benefit from RISK at the end point, and who actually participated in the workshops?

The ‘end beneficiaries’ (O’Brien et al., 2014, p. 1267) of RISK were county cricket age group players, but, in line with other injury prevention studies, county age group coaches were the actual audience of RISK (Donaldson and Poulos, 2014; Donaldson et al., 2017; Donaldson et al., 2019). Using coaches as delivery agents of RISK was considered appropriate due to the nature of RISK as a coach education workshop (De Ste Croix et al., under review). In addition, coach-led injury prevention interventions are established to be effective at reducing injury risk (Pfile and Curioz, 2017), with coaches having a significant effect on the injury prevention attitudes of players (Brown et al. 2018), and the reduction of player injuries (Hendricks and Lambert, 2010).

40 participants across all three workshops completed the post-intervention survey, of which most were coaches, some held setting level positions as well as coaching roles, and some were S&C coaches rather than cricket coaches. The exact number of each demographic is unclear because that question was not asked during the workshops, or in the pre-intervention surveys. The surveys mentioned above were not used in this study for data collection purposes, but purely to purposefully sample participants for focus groups.

More specific data was collected on the focus group participants, who were asked to introduce themselves at the start of each focus group. Most participants were pathway coaches, making up twelve out of the nineteen total interviewees. These coaches reported working with teams aged under 11 up to emerging players (EP), where ages range from 17 to 19, either holding roles such as Head Coach and Assistant Coach, or working across multiple age group teams with no real clarity given as to their coaching position. Six focus group participants reported working in

pathway or coach management roles, including Head of the Talent Pathway, two Performance Managers, an Academy Director, a Coach Development Manager, and a Pathway Manager. While holding these roles, the participants coached teams within their pathways, from ages 14 to EP, and in one instance a County Second XI adult team. This variety of roles presents quite extreme connotations for the potential Reach of the RISK content to players and coaches outside of the initial workshops and, in some cases, to entire county pathways. However, as this was not formally evaluated or considered in the focus group interviews, the potential Reach of RISK remains conjecture.

The participants in management roles add another setting level to this thesis. Working within Finch and Donaldson's (2010) RE-AIM SSM, the highest level is identified as the National Sporting Organisation (NSO) which, in this thesis, is the Key Stakeholder, who is in a senior management position at the ECB. The next level, in this thesis, is the pathway and coach managers in the focus groups, who can be considered representatives of the 'Club' in the RE-AIM SSM. The final level in this thesis is the pathway coaches, who represent the 'Team' in Finch and Donaldson's (2010) work. No data was collected on State Sporting Organisations, Leagues, or individual Participants (players), which make up the other levels of the RE-AIM SSM (Finch and Donaldson, 2010). There was some crossover between pathway managers and pathway coaches in that managers also held coaching roles, which led to their responses reflecting that of a point of view of a coach. Due to this, the themes that emerged from the focus groups were largely related to coaching, rather than management.

4.3.2 What factors contributed to the participation or non-participation in the RISK workshops?

Reaching the actual audience was mostly successful, but conversations with the Regional Talent Developer (RTD) at each workshop revealed that the key reason for non-participation was that some participants had to leave early due to coaching commitments, and therefore did not complete the course. 40 participants completed the post-intervention survey, compared to 52 that completed the pre-intervention

survey, making a difference of 12 participants that either left early or did not complete the post-intervention survey.

Regarding the nonparticipation of participants, the Key Stakeholder recognised that, during the workshop that he attended, some coaches left, observing that *'towards the end, when things started moving on, then you could see people drifting off and talking. And some of those conversations were probably good - they were probably around the "How can we bring this into our environment?", but then they also might've been talking about "I'm ready to kind of shoot off now".'*

This lack of interest observed by the Key Stakeholder has been recognised in previous studies (Labella et al., 2011), and presents a key barrier to engaging coaches to participate in and use injury prevention interventions (O'Brien and Finch, 2014b).

4.3.3 What might have been done to get more of the actual target audience to participate in RISK?

RISK was delivered after a morning workshop on another subject, which may have hindered engagement, and certainly meant that coaches had to leave the afternoon sessions before the end of the RISK workshops. The Key Stakeholder believed that a solution to non-participation in the RISK workshops could be the organisation of a *'dedicated day'* or *'half a day'* for RISK, which could mean that participants would be *'a hundred per cent focused'* on the workshops.

While literature has, although minimally, documented reasons for non-participation (O'Brien and Finch, 2014b), there has been limited consideration of how to overcome these barriers, and the Key Stakeholder's suggestions are not present in past research. Norcross et al. (2016) note that, in the state which their study took place, in order to practice coaches did not have to receive injury prevention coach education, and such programmes were not promoted. Indeed, this is similar to current requirements of cricket coaches in the UK. To coach in the UK, practitioners must hold an ECB coaching qualification such as a Level 1, attend a Good Practice

and Child Protection course, or a similar safeguarding workshop that provides a certificate, and attend an emergency first aid course, that likewise offers certification (BBC, 2020). At no point are cricket coaches required to attend an injury prevention workshop, such as RISK, and to date there are no formal or nonformal injury prevention coach education opportunities available for cricket coaches.

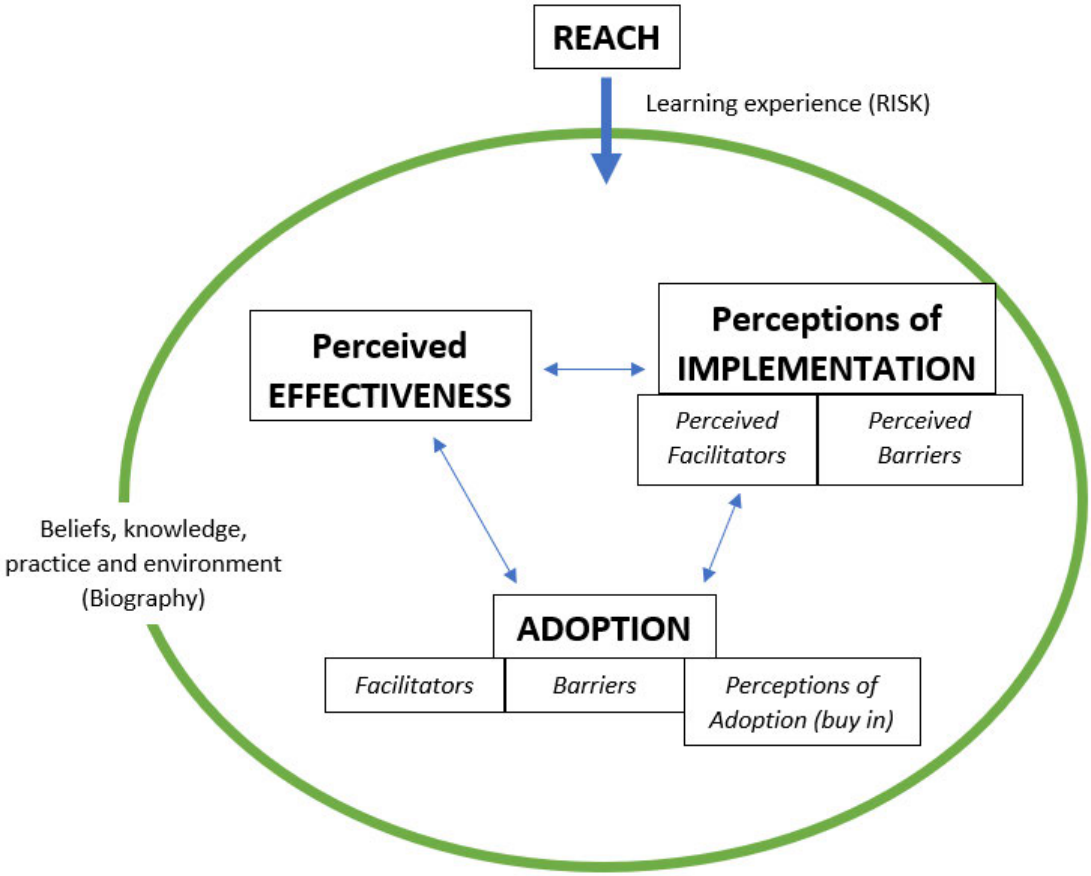
According to the Diffusions of Innovations theory (DOI; Rogers, 2003) communication channels between a source, such as an institution, and receiver are one of four key elements to the diffusion of knowledge (Sahin, 2006). The lack of a communication channel from a source, in this instance a formal or nonformal NGB workshop for cricket coaches, means that diffusion of an innovation, such as injury prevention practices, is passive, and therefore ineffective (Norcross et al., 2016). Indeed, formalising an injury prevention intervention through the creation a compulsory workshop has been shown to have dramatic impacts on Reach (Brown et al., 2016; Quarrie et al., 2007; Viljoen and Patricios, 2012). Therefore, to increase the Reach of, and participation in, RISK it may be appropriate to design centralised versions of the workshops, delivered by the ECB, that contribute to or are compulsory for qualification.

4.4 Stage 1 – Process of Adoption

Adoption is considered the absolute number of participants that are *willing* to instigate an intervention (Glasgow et al., 1999), however there is limited scope in the RE-AIM framework to understand why adoption does or does not occur. Indeed, the authors of RE-AIM recognise the need for a better understanding of contextual factors that can influence Adoption (Glasgow et al., 2019). The term ‘Adoption’, in coach learning research, can be considered the process of accepting and contextualising new knowledge (Nash and Sproule, 2009) before ‘trying it in practice’ (Stodter and Cushion, 2017, p. 328). As has been established, how coaches interpret learning experiences is complicated and highly individual (Mohamadinejad and Mirsafian, 2013), due to the impact of existing biographies and dispositions towards learning (Leeder et al., 2019; Stodter and Cushion, 2017). Using the RE-AIM dimensions in a nonlinear, integrative fashion, this first stage of the process

shows that Adoption of RISK was significantly influenced by several interacting factors, that were encased in participants' biographies.

***Figure 6**: Stage 1, the Process of Adoption*



Perceived Effectiveness, Perceptions of Implementation and Adoption are depicted as interacting because of the heavy crossover of higher order themes between the three dimensions. Some themes fit just as well in different dimensions, showing that the linear model of RE-AIM that is typically presented was not suitable for understanding coaches' experiences with RISK.

4.4.1 Perceived Effectiveness

This study did not intend to show the efficacy of RISK as an intervention, which it has been suggested can be measured through mixed methods that incorporate longitudinal observations and semi-structured interviews (Holtrop et al., 2018; Stodter and Cushion, 2017). Rather, this section focused on participants Perceived

Effectiveness of RISK. Diffusion of Innovations theory (DOI) acts as one of the underpinning assumptions that contributes to this model, and has a history of validated study and use (Dearing, 2009; Donaldson and Poulos, 2014; Donaldson et al., 2017; Donaldson et al., 2018; Owen et al., 2006; Trifiletti et al., 2005; Stephenson et al., 2018). According to this theory, the rate of translation of an innovation, in this case the participants' use of RISK content, is more dependent on perceptions of effectiveness, rather than on the evidence of an interventions efficacy (Donaldson et al., 2018).

Validation of current practice emerged as a higher order theme, as focus group participants perceived RISK to be effective because it matched or complimented their current practice. DC6, an Academy Director at a first-class county, explained that his pathway was *'reprogramming and resetting'* after initial implementation of injury prevention practices *'didn't work'*. For DC6 *'a day like today really confirms the fact that we can possibly go back now and justify it to parents.'*

For HC3, who was already using injury prevention and movement quality with players aged 14-17, RISK served to compliment his current practice. HC3 recognised the *'importance of starting at an early age'*, and that it *'makes sense just to start from the beginning of the Pathway'*. In the Kent focus group, KC1 made similar comments, explaining *that 'we do movement competency on the understanding that they're all running properly, so we actually don't go to the detail and actually going back to the starting point.'* His attendance at the RISK workshop lead KC1 to ask questions of his county's practice: *'rather than getting them to run and change direction, actually are they doing it right?'*

Practice is heavily imbedded in a coaches' biography, and the fact that RISK either validated or complimented participants' practice impacted their perceptions towards the workshop content. Stodter and Cushion (2017) evidenced a similar process, describing how learning experiences either 'fitted in' (p. 329) or 'matched' (p. 328) with coaches' biographies, then progressed through a contextual filter to be rejected, accepted or adapted. DOI theory supports these conclusions, suggesting that adoption is more likely if an intervention is 'consistent' with existing values and

practice (Finch, 2011, p. 1255). However, this acceptance is not black and white, and participants may have just cherry-picked aspects of RISK that confirmed their biographies, and rejected concepts that conflicted with them (Cushion, 2013). This can lead to coaches merely appearing to accept aspects of new learning experiences, while enabling them to maintain their normal practice (Stodter and Cushion, 2017). To date, there is limited understanding of this process in sports coaching, but the danger exists that new knowledge may become diluted or even discarded (Cushion et al., 2003). Potential evidence for this selectivity can be seen in DC6's use of RISK to confirm his pathway's approach to injury prevention practices, but this is not conclusive. Furthermore, while RISK showed participants that they were 'on the right track' (Leduc et al., 2012, p. 142), research suggests that when practice is validated, coaches feel that they do not have to change their behaviour, even if some conflict exists between the learning experience and the coaches practice (Leduc et al., 2012). While this may apply to DC6, in the case of HC3 and KC1, RISK validated *and* complimented their practice, which may have a different effect on behaviour (Leduc et al., 2012).

4.4.2 Perceptions of Implementation

Implementation is described as the degree to which an intervention is used as intended (Glasgow et al., 1999), however, in this study Implementation was split into two parts; perceived and initial. This was necessary to organise the data, as it was clear that perceptions towards Implementation influenced Adoption of RISK, and that these perceptions were influenced by participants' biographies. More specifically, coaches identified several *perceived facilitators* and *barriers* to implementing RISK, which acted as higher order themes under Perceptions of Implementation. The term 'biography' was expanded from previous understanding (Christensen, 2014; Jarvis, 2009; Stodter and Cushion, 2017) to include 'environment', as coaches perceived *facilitators* and *barriers* differently if they worked at either first-class or minor counties.

Perceived facilitators

Accompanying resources was a consistent theme across the focus groups, with participants believing that *'takeaway resources'* (DC6) in various formats would be

beneficial to implementing RISK. The ECB coach education platform iCoach Cricket, which provides a variety of cricket coaching resources (Wiltshire Cricket, 2020), was considered a *'brilliant'* (DC7) format to provide resources on.

Related to the theme of resources, *ongoing CPD*, that was *'regular'* (DC4), was perceived to be *'really handy'* in facilitating Implementation. *'CPD days'* (DC4), where participants could *'show the games and drills that they had been using'* (DC4), would result in coaches *'sponging off everyone else'* (DC4). In a similar vein, having e*xternal support* was identified as a *facilitator* for Implementation, as coaches from minor counties reported not having an employed S&C coach. Rather, they would sometimes use *'undergraduates or a physiotherapist specialist'* (DC3) to support when needed. In the follow up interviews, Coach 2 also spoke of *external support* in the form of *'interns'* that coaches at other counties had used. Coach 2 viewed this *external support* as particularly beneficial for counties that couldn't afford to employ full time members of staff. This in fact acted as a *barrier to implementation* for Coach 2, as the minor county that he previously worked at couldn't *'afford the expertise on site'*, yet they needed that expertise to *'grow the programme'*. Indeed, some coaches identified the need to have *'someone to deliver it (RISK) properly'* (HC6) as a facilitator. This presented a key barrier for minor counties that did not have this type of support, despite participants showing a willingness to adopt RISK.

Perceived barriers

Even more so that *perceived facilitators, perceived barriers* were influenced by coaches working in either first-class or minor county environments. Having enough time with players was *'always a challenge'* (DC3), especially for minor county coaches who had *'a set amount of time with each child'* (HC2). With only *'an hour and 45 minutes a week'* that KC5 had with each of his teams, he believed that implementing *'half an hour of S&C at the start of every session'* would be unrealistic and would have a negative impact on his sessions.

In addition, resources for minor county coaches were described as *'limited'*, with participants *'having to borrow and beg schools' for hall space'* (HC5), compared to access to *'a set facility'* (HC5) that first-class counties were afforded. Additionally,

participants from minor counties, in all three focus groups, reported having *'no Strength and Conditioning budget'*, and that as *'a minor county'* is was difficult to *'draw on funding'*. From the follow up interviews, Coach 1 provided comments that were related to the *perceived barrier* of *county resources*. While coaches at Coach 1's county were receptive to the injury prevention information disseminated by Coach 1, *'a couple of squads don't have full time members of staff, they have casuals'*. This meant that the core coaching group weren't able to *'see all the sessions'*, and *'there might be some squads that do more of it than others.'* This, however, was considered *'reality'* by Coach 1, *'unless you had the same coach throughout'*.

Two more themes emerged which were not necessarily related to participants' environments. The first, *incomplete knowledge*, was evident in the concern of *'only being able to remember half the stuff'* (DC5) from the workshops. This may then lead to participants getting *'people to move in a completely different way than we've been told today'* (DC6). Furthermore, being confronted with a player that had *'issues with something that's beyond my ability to have it resolved'* (DC6) affected participants belief in their ability to disseminate workshop content to other coaches in their pathway, with DC6 stating that if participants were *'going to look at training our coaches to be able to notice issues'* sometimes they *were 'not going to be able to (recognise issues).'* Indeed, when responding to a question on the volume of content presented during the workshop, DC7 argued that while *'we're (participants) all able to handle it'*, passing it on to other coaches may be *'a little bit threatening because they haven't been on the course.'*

The last theme present under *perceived barriers* was that some coaches may be *uncomfortable with RISK content*, with Coach 2, from the follow up interviews, believing that it might be *'completely out of their comfort zone'* for an *'unfit coach'* to demonstrate various movements. This opinion appeared to have been formed from Coach 2's experience of running a regional England Development Pathway programme. Coach 2 explained that *'it's either me or (second coach) that does the warm ups, the physical stuff'*, but *'(third coach) never does it'.* Coach 2 thought this was *'probably because he's a bit older'* and that the third coach *'would consider his condition not conductive to that (warm ups).'*

Stodter and Cushion (2017) describe coaches in their study agreeing with aspects of their formal learning experience, but not implementing them because of the belief that they would not work in context. A similar process is observed above, as perceptions towards implementation were embedded in participants' understanding of their environments. Working for a minor county almost acted as a contextual filter that dominated and overruled coaches' adoption of RISK (Stodter and Cushion, 2017). This was clearest in KC5's beliefs surrounding how much time *'S&C'* would take out of his already limited sessions, despite reporting that his county was going to run fielding sessions as a *'disguise'* for S&C content. Brown et al. (2016) found similar results, with participants in their study holding different perceptions towards BokSmart injury prevention workshops depending on their socio-economic backgrounds. The above data further evidences the idiosyncratic nature of coach perceptions towards a learning experience (Leeder et al., 2019), which is rarely accommodated for in coach education opportunities that assume that all participants require the same knowledge (Cushion et al., 2010; Cushion and Nelson, 2013). Coaches within the same course or workshop can have drastically different needs (Paquette et al., 2014), and the impact of participants' environments on their perceptions towards implementation adds another layer to understanding how county pathway cricket coaches may engage with RISK.

Participants perceptions towards *facilitators of implementation* are supported by authors finding that supporting resources for an intervention are useful for facilitating Implementation (Longo et al., 2012; Soligard et al., 2008). Development of RISK resources should be considered, especially on to readily available platforms such as iCoach Cricket. However, it should be noted that the focus groups took place before the participants were given the link to the RISK website, which contains videos of all the movement patterns covered in the workshop (The RISK Project, 2017b), and the PowerPoint presentation delivered by the research-educators. This occurred at all three focus groups, to maintain research consistency, but meant that participants assumed that they were not receiving any resources, which potentially affected their responses.

The above data is also consistent with previous literature that reports coaches needing follow-up sessions to reinforce messages from coach education courses (Vella et al., 2013), which is supported by injury prevention research finding that ongoing support has a positive impact on Implementation (Padua et al., 2014). In addition, coaches often report learning from other practitioners, and that this informal learning is a preferred source of knowledge (Cushion et al., 2010). Indeed, even in formal or nonformal settings, coaches have reported learning from a variety of sources such as having conversations with, and observing, other practitioners (Stodter and Cushion, 2017). Further to this, sustained CPD that supports long term growth is considered much more effective than one off workshops that offer no follow up (Desimone, 2012; Little, 2012; Armour et al., 2017), therefore there may be value in offering continued nonformal, or even informal, opportunities.

4.4.3 Adoption

Adoption makes up the final interacting dimension in Stage 1 and holds the same meaning that was described in the description of this first stage; the willingness of participants to implement RISK (Glasgow et al., 1999). While Adoption played a part in effecting coaches' willingness to adopt RISK, it was not the sole influence as has previously been assumed (Brown et al., 2016). It is necessary to consider Adoption at this more micro level, part of a larger 'machine', that contributes to broader acceptance or rejection of RISK. In this section several implicit facilitators and barriers emerged, influenced by participants' biographies, as well as explicit perceptions towards *buy in*, which was considered crucial for wider adoption in participants' respective contexts.

Facilitators

Three interacting elements from the workshop acted as *facilitators of adoption*. The workshop *practical* gave participants *'a very clear idea of what good looks like'* (HC6), and they found beneficial *'having a breakdown of the hotspots and what to look for in terms of form'* (DC1). This clarity allowed for application *'into our environments depending on the players that are in front of us'* (DC7), and the practical sections were considered a *'key source'* because of the *'technical*

specification' (HC2). In addition, participants praised the simplicity of the movements, with DC2 commenting that he *'liked the fact that, barring the balloon, basically it was all bodyweight. You didn't need a gym, you didn't need weights, you didn't need machines.'* Indeed, the fact that the workshop *practical* showed participants that they did not have to *'worry about excess equipment'* (DC2) was perceived as extremely positive.

The *core workshop messages* were enhanced by the practical section of the workshops. The messages that movement quality and injury prevention can be *'very simple'* (DC5), and that *'you don't have to be an S&C coach'* (DC5) to deliver such content, was recognised by coaches, with the practical enhancing this understanding. Indeed, the practical appeared to contradict preconceived notions of what injury prevention can look like, as shown by DC2's comments above, and by DC3 stating that RISK is *'just a really basic yet useful aid for us to have on days where equipment and stuff isn't necessarily available.'* Furthermore, DC4 resonated with RISK's aim of reducing the time junior players spend away from sport due to injury: '*the amount of time a kid gets injured in the preseason or the winter programme and you don't see them again until halfway through the year… Trying to limit that to, like (research-educator) said, time you can afford, like 3 days, 6 days. Just want to get kids on the field for as long as possible don't you really.'*

The last interacting facilitator was *workshop theory*, which helped participants to *'understand the why*' (HC2) behind injury prevention and movement quality, while also providing *'empirical evidence that shows if you start early then it's obviously going to help'* (KC3). The majority of participants did not *'know a lot about S&C'* (DC3), and while all three elements of the workshop provided new knowledge in some form, the theory section gave more specific information, such as *'understanding that they (boys and girls) mature differently'* (DC3).

Research on coach education has reported that coaches enjoy some practical elements of courses (Lemyre et al., 2007), and data from DC4 shows how workshop messages can connect with, and 'match' (Stodter and Cushion, 2017, p. 328), participants experiences. For Stodter and Cushion (2017), this led to the matched

concept being used more in practice. Coaches with less experience tend to value coach education courses more highly, because they gave detailed information on what to do with teams (Lemyre et al., 2007; Wright et al., 2007). This suggests that the three workshop elements were perceived as useful because they offered information on a topic that participants were unfamiliar with. Although this information challenged some previously held assumptions, which can cause coaches to reject content (Chesterfield et al., 2010; Townsend and Cushion, 2016), DOI theory suggests that the three elements of the workshops showed participants that RISK was easier that they may have thought (Finch, 2011), hence no overt evidence of rejection.

Barriers

A key barrier that presented itself, closely linked to participants' beliefs, was the notion of *coach role frames*. Some participants in the focus groups believed that, while injury prevention is *'really important'* (DC7), a pathway coach's role was *'maintenance more than anything else'* (DC7), and that the responsibility *was 'on other people to do it'* (DC7). Participants shifted the responsibility of delivering injury prevention and movement quality practices to club coaches, believing that *'stripping it right back to the clubs'* (KC6) was the avenue to explore. Pathway coaches already had *'an understanding of how important physical fitness is',* and the need was *'to educate…the grass roots level'* (KC6).

It is interesting to note that the one participant with direct experience of delivering a sustained injury prevention programme was clear that *'the coach has got to learn'*, and that the *'coach needs to lead'* (KC4). This belief was formed from his understanding that minor counties *'haven't got the money as it is'*, meaning that eventually the practitioner responsible for delivering the programme *'needs to leave'* (KC4) and the responsibility falls to the pathway coaches.

This is evidence of a *core message* conflicting with coaches' beliefs of their practice, which is recognised to present a significant barrier to adoption (Cushion, 2013). KC4, on the other hand, evidences the opposite end of the spectrum, where his experience of his environment and the injury prevention programme in his pathway

meant this his beliefs matched the workshops *core messages*. Both viewpoints illustrate that coaches' perceptions of their roles are built on their biography (Nash et al., 2008), and if future delivery of RISK can be informed by this understanding of how coaches perceive their responsibilities towards injury prevention, then this may have significant impact on Adoption (Nash et al., 2008). The above data on both facilitators and barriers to adoption also further evidences that expecting universal adoption of all RISK practices is potentially unrealistic (Cushion et al., 2003), as participants connected with different aspects of the workshop. Rather, it is more likely for participants to adopt aspects of RISK (Cushion et al., 2003).

Buy in

Buy in emerged as a significant theme under Adoption, that participants believed could act as both a facilitator and barrier at several levels. In addition, *buy in* was believed to address some of the previously identified barriers to Implementation, further emphasising the interacting nature of the three dimensions within this Process of Adoption stage.

Player buy in was considered important to foster *'player ownership'* (DC3) and encourage *'player led'* RISK practices (DC3). Indeed, KC5 mentioned that his junior girls' team *'came up with their own sort of warm up'*, and that this ownership was important to *'making it fun'*. As well as encouraging player engagement with RISK, *player buy in* could act as an alleviant for the Implementation barrier *time* as it would mean *'spending less time'* (KC1) in sessions delivering RISK.

Parental buy in was deemed important by participants, as *'getting the parents to understand the reasons why'* (HC6) was important to avoid resistance to injury prevention practices if players weren't perceived to be playing enough cricket at *'a cricket camp'* (KC3). In addition, facilitating *parental buy in* was also seen to *'back up our message'* (HC6), as parents' attitudes towards injury prevention practices were believed to have a knock-on effect to players. Negative perceptions exhibited by parents could potentially result in *'disengaged'* (HC6) participants, whereas getting parents to buy in would result in the injury prevention *'message'* being *'consistent from every viewpoint'* (HC6).

The last theme under buy in is *structural buy in*. KC5's minor county pathway was *'gonna give it a go with an S&C coach'* during the upcoming programme, in order to facilitate cricket sessions that incorporated S&C practices. This was due to *'buy in'* from the Head of Cricket Development, and KC5 noted that *'a change of leadership'* to a manger who was *'quite open minded'* to S&C practices was a key factor in the employment of an S&C coach. Negotiation for the employment of this knowledgeable other with the Head of Cricket Development was rooted in KC5's perceptions towards these types of cricket sessions, which KC5 described as having *'immense'* improvements on players *'all-round game'.*

While interpretation of RISK has been shown to be highly individual, and based largely off participants' biography (Leduc et al., 2012), the identification of *buy in* as a key influence on wider contextual adoption shows that coaches can also have shared understandings during coach education workshops (Abraham et al., 2006). *Buy in* was consistently raised, and was considered important by participants, suggesting that time spent on this topic during RISK workshops could be beneficial to facilitating Adoption.

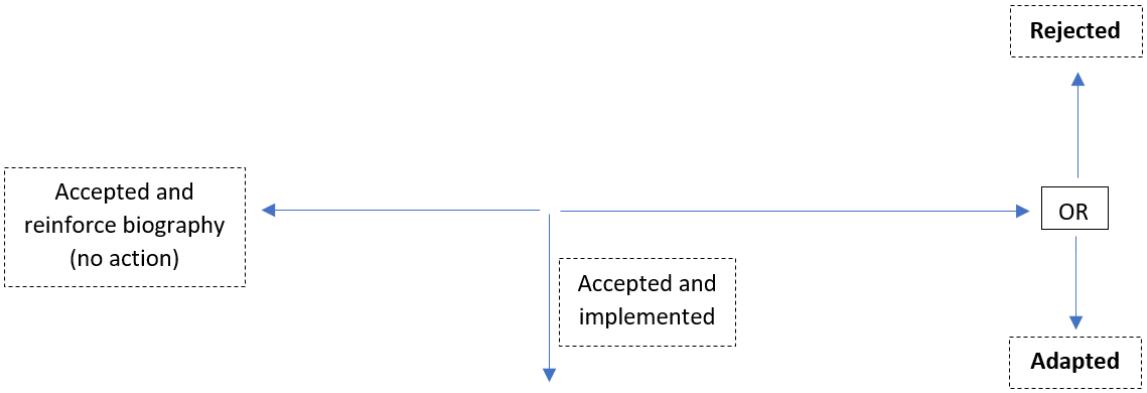
KC5's experience with *structural buy in* speaks to Stodter and Cushion's (2017) observations that coaches would bypass their individual biography when presented with knowledge from other practitioners that was usable in context. Dubbed 'seeing is believing' (Nelson et al., 2013, p. 210), this also presents a way of avoiding potential barriers to adoption. Discussion based tasks in formal and nonformal coach education are considered extremely valuable by coaches (Bertram et al., 2017; Nelson et al., 2013; Leeder et al., 2019), and some coaches in the workshops, most notably KC4, had experience of managing injury prevention programmes. This, alongside the data from KC5, suggests that if participant discussion was facilitated Adoption could have been significantly influenced because of how sharing experiences of certain practices working in context can impact perceptions towards those practices (Leeder et al., 2019; Stodter and Cushion, 2017). Further to KC5's quotes, some form of structural change is often considered necessary for adoption of evidence-based programmes and practices (Fixsen et al., 2005). In KC5's situation this was from a change of leadership, but also includes a change in management

perspectives that can be influenced by investment and involvement of leadership figures in the implementation process (Fixsen et al., 2005). For Padua et al. (2014, p. 618), achieving 'permission to implement' their programme a necessary step in the implementation of an injury prevention programme, and therefore understanding of how to negotiate with those in management positions should be considered.

4.5 Transition from Adoption to Implementation

Transitioning out of Stage 1 (the Process of Adoption) happened in four different ways, with participants either; accepting RISK but not changing their practice, rejecting RISK, accepting RISK and implementing it as intended, or accepting and adapting RISK. A key limitation of this study was a lack of follow up data, therefore these four 'paths' out of Stage 1 were built using focus group and follow up data, as well as pragmatic assumptions formed from previous research. In addition, acceptance of RISK was not assumed to have happened totally. Rather, it is more likely that aspects of RISK were accepted and either implemented or adapted (Cushion et al., 2003).

***Figure 7**: Actions and consequences from Stage 1*



4.5.1 Accepted and reinforce biography (no change)

Some focus group participants were employing injury prevention practices before the workshops, therefore it was assumed that while RISK concepts were accepted and reinforced their biography (Stodter and Cushion, 2017), their practice would not change. For example, DC6 mentioned how RISK *'backs up what we're doing sort of pre-Christmas and New Year'*, which was *'all movement, strength and conditioning'*,

and *'very little to no cricket'*. Indeed, as previously mentioned, RISK gave information that meant DC6 could *'go back and justify'* their approach to parents, which connects to the theme of *parental buy in*. While DC6's practice may not have changed, it was validated and justified by RISK (Nelson et al., 2013).

KC4, who spoke in detail of his experiences with implementing and sustaining an injury prevention programme, saw injury prevention as having *'a big role'* in pathway cricket, and would especially *'make a difference'* in minor county settings. Again, while KC4's injury prevention practice may not change, as he could *'certainly see its working'*, RISK served to reinforce his beliefs, while matching his knowledge, practice and environment (Leduc et al., 2012).

4.5.2 Rejection of RISK

It must be assumed that, after the Process of Adoption, RISK can be rejected, even though no explicit evidence was found to support this. Coach learning research has found that knowledge is rejected because it conflicts with a coach's existing biography (Chesterfield et al., 2010; Stodter and Cushion, 2017; Townsend and Cushion, 2017), or because it is considered too challenging to implement (Cushion, 2013). Coach education is consistently reported to be poorly designed (Cushion et al., 2010), and shows limited understanding of how biographies and past experiences play a role in coach learning (Chesterfield et al., 2010). At present, consensus appears to be that coach education is largely ineffective because of these factors (Cushion et al., 2010). Providing formal and nonformal learning opportunities that are situated in participants' contexts is considered important (Armour et al., 2015; Nelson et al., 2012), and Chesterfield et al. (2010, p. 310) propose that coach learning in formal and nonformal environments should be considered 'a negotiated and contested activity' that recognises biographical influences.

Public health intervention research is remarkably similar in its descriptions of why interventions may fail to enact change. Finch (2011) summarises that programmes can fail because an intervention is considered too complex for the proposed context or is designed poorly to achieve its aims. These issues can stem from lack of consideration for the realities of the implementation context and the behaviour of the

implementers (Finch, 2011), which speaks to coach educations assumption that all coaches attending a course need the same knowledge (Piggott, 2012). Indeed, this research has shown that working in either first-class or minor county environments significantly impacted participants' perceptions towards the feasibility of RISK, and therefore the perceived knowledge needed to implement RISK.

Simply put, understanding the broader ecological systems that influence coaches' biographies and perceptions is imperative for the success of an intervention (Finch, 2011; Stodter and Cushion, 2017), and research shows that not doing so can lead to rejection of new knowledge (Chesterfield et al., 2010).

4.5.3 Accepted and Implemented

Similarly to the route of accepting RISK but taking no action, this path is founded on the notion that RISK resonated participants' biographies, but this time may instigate some change in practice (Stodter and Cushion, 2017). Indeed, Stodter and Cushion (2017, p. 328) describe the process of 'matching concepts' that coaches in their study went through, where knowledge from a learning situation matched existing cognitive structures, serving to increased use of a certain method. DC3 described how he had delivered a *'fielding masterclass'* that included *'S&C and fundamental movements.'* RISK's message that it should be *'integrated into normal practices rather than a standalone'* was therefore *'quite a good fit'* for his practice and pathway. This understanding of accepting new knowledge is similar that of Stodter and Cushion (2017), who recognise their process as a form of assimilation of congruent ideas to a coaches' cognitive structures (Moon, 2004), based on surface level similarity.

In this route it is not assumed that the entirety of RISK is accepted, but instead various concepts and knowledge from the workshop are accepted and potentially implemented. 'Wholesale alterations' (Cushion, 2013, p. 66) to coaching practice is unlikely, and coaches have instead been described as 'magpies' (Abraham et al., 2006, p. 560) that pick up aspects of learning experiences that fit with their beliefs. While data is not conclusive, DC3's comments suggest that this may be the case. This route to Initial Implementation, however, assumes that the aspects of RISK,

picked up by coaches, are implemented as intended without significant adaptations (Glasgow et al., 1999). This may not be the case (Cushion, 2013), and future workshops should therefore consider which elements of RISK different coaches may implement.

4.5.4 Adaptations

Adaptations of RISK forms the last road that coaches may take from Stage 1, the Process of Adoption, to Stage 2, the Process of Implementation. Coaches often adapt injury prevention programmes or interventions (Donaldson et al., 2018; Fortington et al., 2015; Lindblom et al., 2018; O'Brien and Finch, 2016), and this was also clear from the follow up interview data, with Coach 2 intending to *'tailor the content'* of coaching workshops to incorporate *'injury prevention, or skill acquisition'*. As a Coach Development Manager at a first-class county, Coach 2 intended to create workshops that included *'injury prevention bits'* alongside *'hot topics'* such as fielding and fast bowling, rather than delivering workshops solely focused on injury prevention and RISK.

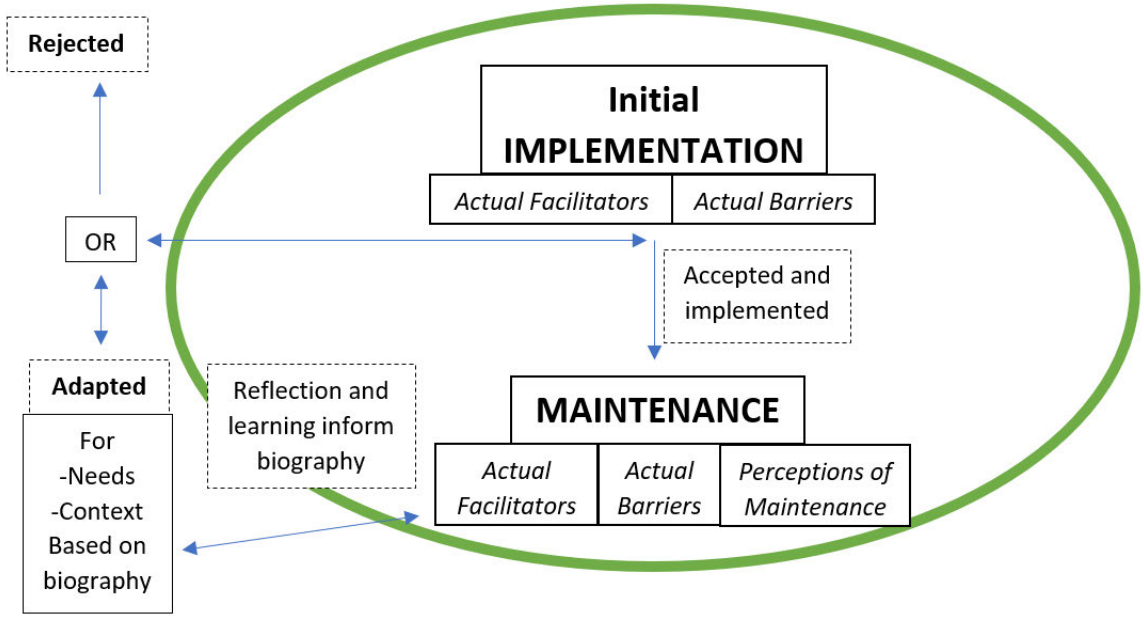
Adaptations of injury prevention interventions are deemed necessary by coaches to suit their context ('O'Brien and Finch, 2016), which ensure that a programme or intervention will more suitably align with the perceived needs and goals of teams (Lindblom et al., 2018; Norcross et al., 2016; O'Brien et al., 2017). For Coach 2, his adaptions were more engrained in his beliefs surrounding coach engagement with injury prevention workshops (Stodter and Cushion, 2014). Coach 2 believed that *'you'll never get coaches to turn up to an injury prevention course… unless they've already got an interest in the subject'.* Data suggests that Coach 2 was speaking from experience: *'So what we found was…skill acquisition's another one. If we put a skill acquisition course on, or workshop…we get nobody turning up.'* This speaks to the recognition that biography plays on acceptance and subsequent use of new knowledge (Stodter and Cushion, 2017), which for Coach 2 was his beliefs that were seemingly influenced by previous experiences of poorly attended coach education workshops. Furthermore, data from Coach 2 touches on the theme of 'edutainment' identified by Griffiths et al. (2018, p. 291). Coach educators worked to re-contextualise and translate information from their organisation for coach education

within sports clubs, which required in-depth understanding of different clubs' cultures, and believed that they had to deliver content in the most entertaining way (Griffiths et al., 2018). Coach 2 acted in a similar way, planning to change his delivery of RISK to suit the coaches that he often engages with, with his perceptions and beliefs acting as justification for doing so.

4.6 Stage 2 – Process of Implementation

Implementation is understood as the level to which a programme or intervention is delivered as intended (Glasgow et al., 1999). In terms of coach learning research, Implementation is synonymous with the process of applying new knowledge in practice (Stodter and Cushion, 2017). Stage 2 details how this may or may not occur, building from Stage 1's understanding of the complex and integrated process associated with participants' Adoption of RISK. This stage is also encased in a coaches' biography, which acts as a constantly interacting, and potentially changing, force on Implementation.

***Figure 8**: Stage 2, the Process of Implementation*



4.6.1 Initial Implementation

Data from the follow up interviews suggested that coaches went through a phase of initial implementation which revealed *actual facilitators* to employing RISK. *Actual facilitators* were also evident in the focus group data, from participants that spoke of their experiences with delivering injury prevention interventions. In some cases, these matched *perceived facilitators*, however new *facilitators* were also identified. While coaches in the follow up interviews did not identify any *actual barriers* to implementation, focus group participants with experience of injury prevention delivery did offer some insight.

Coach 1's *initial implementation* of RISK to players was limited, reporting that he used *'some of the movements'* with a group of U11 players in a technical focused session. Coach 1 explained that this consisted of *'just sort of the basics; direction, turning, etc.'*, as well as *'lunging into sweeping'* during pre-Christmas batting sessions. To fellow coaches, however, Coach 1 disseminated substantial amounts of the RISK content through *'CPD events'* and a *'WhatsApp group'*. He also reported using a *'working document'* with *'links to exercises'* and *'some of the things out of (research-educators) PowerPoint presentation'*, which were *'simplified a bit'*.

Coach 2 provided more detail on his initial Implementation of RISK, which was into a *'coaching skills course'* that he was running, with Coach 2 getting coaches *'to greet as a gorilla, or as a giraffe…we did a bit of bear crawl.'* This implementation *'worked really well'*, likely because *'a lot of them haven't seen it before'*. For the coaches on the skills course *'it was something new so they liked it'*, and Coach 2 explained that *'it just put people out of their comfort zone'*. Coach 2 believed this element of fun was central to the coaches' positive reception to the workshop content, even though he originally *'wasn't gonna do it (use RISK)'*, before deciding to *'see what happens'*.

For Coach 1 and 2 there was an initial phase of implementation where RISK was tried out in their respective contexts (Stodter and Cushion, 2017). It appears that, for Coach 1, his trial attempt may not have been significantly influenced by the needs of his context (O'Brien and Finch, 2016), compared to his intended use of RISK, as discussed in the Adaptations section. Moreover, Coach 1's use of RISK was more

akin to Stodter and Cushion's (2017) understanding that coaches' try a concept out to see if it will work in their real-world environments, after establishing in the 'virtual world' (p. 331; Gilbert and Trudel, 2001) that it would be appropriate. For Coach 2 however, his initial implementation, while on somewhat of a whim, was dictated by his belief that coaches would not attend workshops solely on injury prevention, as discussed under Adaptations.

Coach 1 and 2 also show evidence of DOI theory at work. DOI focuses on how new ideas, that require some form change, are communicated within multilevel organisations (Stephenson et al., 2018). Along with the impact of perception on adoption, this theory identifies five categories of members, characterised by their rates of adoption; innovators, early adopters, early majority, late majority, and laggards (Laminski, 2011). Coach 1 and Coach 2 act as innovators, with Coach 1 in particular putting noticeable effort into disseminating content and facilitating further coach adoption and implementation within his county. These attempts to spread RISK are likely to have been influenced by participants experiences through Stage 1, where RISK matched the needs of personal and wider organisational contexts (Stephenson et al., 2018), and was therefore accepted and disseminated.

Actual facilitators

Workshop resources were useful to Coach 1, further evidencing the importance of takeaway resources for the implementation of injury prevention interventions (Longo et al., 2012; Soligard et al., 2008). Coach 1 had used them in his dissemination of RISK content and reported that he *'had looked through the slides'* before implementing the RISK content at various pre-Christmas sessions. While there was content that he *'hadn't really used'* since the workshop*, 'pulling stuff out about the early specialisation'* had also been useful when *'talking with parents'*. Coach 1 also identified having *'more time to plan'* as a facilitator due to a change of roles within his minor county. Coach 1 believed that to use RISK effectively *'you…have to switch on'*, and having more *'time to watch the videos and make the notes'* was perceived to be very beneficial, so to avoid *'delivering this stuff and not knowing what I'm doing.'*

Coach 2 did not mention any *actual facilitators* relating to his initial implementation, but instead spoke of previous professional experiences with a minor county pathway. A key facilitator for this was *internal support*, as *'one of the coaches they (minor county) were working with was S&C (qualified), and physio (qualified) as well.'* This coach took on responsibilities to *'run workshops and things like that'*, which meant that injury prevention practices became *'more and more influential on the pathway'.* Coach 2 believed that the minor county were *'very lucky'* that one of their coaches was a qualified S&C coach and Physiotherapist, and considered having a member of staff with additional knowledge *'the only way to do it (implement injury prevention practices) with minor counties.'*

This experience is seemingly consistent with some *perceived facilitators* and *barriers* discussed earlier, namely that employing external practitioners was difficult for minor counties because *'the resources are quite limited'* (HC1), which means that *'you find yourself, as coaches, doing a lot of the work yourself anyway'* (HC1).

Yet, these perceptions may not be universal to all minor counties, as KC4 demonstrated that initially employing an external knowledgeable other was crucial for the implementation of his pathway's intervention. However, KC4 was clear that he believed coaches within a pathway had to responsibility to migrate to the position of delivery agent, as long-term employment of a knowledgeable other was not possible for minor counties.

Actual barriers

When disseminating RISK to fellow coaches Coach 1 reported encountering very little resistance, although he did recognise the humour that introducing some of the workshop content resulted in: *'I guess when you start talking about giraffe walks or something, then it does take a little bit, doesn't it, to get used to.'* Coach 1 believed that there was *'no real problem'* because *'most of the other stuff we probably do without even thinking. You know like your lunges, your movement patterns'*. Wider adoption was a result of just *'linking it all together'*. This data further evidences that when RISK matches biography, at least to some extent, it is likely to be adopted (Leduc et al., 2012; Stodter and Cushion, 2017), and in this instance it was current

practice that was matched (Stephenson et al., 2018). Coach 1 may also have encountered little resistance because RISK was presented to other coaches by a peer, which authors have suggested is a factor in coaches accepting new knowledge (Gilbert and Trudel, 2001; Stodter and Cushion, 2017). Indeed, Lindblom et al. (2018) found that social support from other coaches acted as a substantial external facilitator in coaches adopting and using an ACL injury prevention programme.

In an interesting contrast to the *perceived barrier* of *time*, identified in the focus groups, Coach 1 believed that it was *'an easy cop out'* to say that time constraints acted as a barrier to implementation. This was because *'even within half an hour fielding you cover a lot of the movements'*, and *'you integrate it (RISK) without even realising'*. Here, Coach 1 shows his understanding of one of the workshop messages, namely that RISK is designed to be integrated into a coach's current practice, rather than being considered a separate entity. Furthermore, this is a clear mismatch between what participants perceived would be a barrier, and the reality of RISK when applied in context, and can be understood as the difference between experimentation in a 'virtual world' versus in the 'real world' (Gilbert and Trudel, 2001, p. 24). In the present model, Stage 1 represents a world formed of Perceived Effectiveness, Perceptions of Implementation and Adoption, all encased in biography, hence virtual (Gilbert and Trudel, 2001). Stage 2 is the equivalent of the real world, where Initial Implementation reveals whether perceptions were accurate or not, and any new facilitators or barriers to Implementation (Gilbert and Trudel, 2001). While for Gilbert and Trudel (2001) coaches experimented with coaching concepts virtually through conversations with peers, it is unclear if this happened with Coach 1, or if it was an example of 'instinct' (Stodter and Cushion, 2017, p. 331).

It may be possible to develop RISK strategies that can address perceived facilitators, now that there is some understanding of what these may be, and how they match with actual facilitators. For example, giving coaches tools to further disseminate RISK within their organisations could be a potential route to increasing Adoption and Implementation (Padua et al., 2014). Indeed, the fact that *resources* were identified in both perceived and actual facilitators, as well as by injury prevention intervention

literature (Longo et al., 2012; Padua et al., 2014; Soligard et al., 2008; Vella et al., 2013), shows that development of this aspect may be beneficial for Implementation.

4.6.2 Transition to Maintenance

The transition from Initial Implementation to Maintenance mirrors the roads that can be taken from Stage 1, where new knowledge or concepts can be rejected, accepted and implemented 'as is', or adapted to better suit coaching context and team needs. This, and the following section on Maintenance, are based largely on previous research on reflection (E.g. Gilbert and Trudel, 2001), with some limited data from both the focus groups and the follow up interviews to support tentative conclusions. It is important to critically consider reflection, rather than blindly assuming that it takes place in a certain way, or even at all (Cushion, 2018). Therefore, before the sections Adaptations, Acceptance and Rejection, reflection is discussed in conjunction with the available literature.

Gilbert and Trudel (2001) present an integrated and theoretically informed explanation of how coaches engage in informal learning through reflection. The authors present a model comprising of six stages; coaching issues, role frame, issue setting, strategy generation, experimentation and evaluation (Gilbert and Trudel, 2001). Strategy generation, experimentation and evaluation form a cyclical process that Gilbert and Trudel (2001) showed was ongoing until a coaching issue had been resolved. The second stage, role frame, encompasses stages three to six, and is described as a 'perceptual filter' (Gilbert and Trudel, 2005, p. 21) that influences how coaches define their responsibilities, somewhat similar to the use of biography by Stodter and Cushion (2017) and this study. Gilbert and Trudel (2001) found that evaluation was often undertaken individually by coaches, but also had other contributors such as peers, parents, athletes or members of a coaches' organisation. Further to this, Gilbert and Trudel (2001) demonstrated the presence of in-action, on-action and retrospective on-action reflection (Schön, 1983) within their data, recognising that the interpretation of Schön's (1983) theories of reflection needed to be changed slightly for application to their study. The two former concepts were considered forms of learning 'through' experience (Gilbert and Trudel, 2001, p. 31),

whereas the latter represents learning ‘from’ experience (Gilbert and Trudel, 2001, p. 31).

This work from Gilbert and Trudel (2001; 2005) was considered the best appreciation of reflection in sports coaching for some time (Cushion et al., 2010), but recently authors have commented that this work does not consider wider influences on reflective practice (Hall and Gray, 2016). Cushion (2018) notes that it is important not to assume that knowledge, which reflection is considered to alter, is separate from the social and cultural position of the person that holds it. As such, reflective models, such as Gilbert and Trudel’s (2001), present experience as unproblematic and authentic, removed from bias, beliefs and perceptions (Cushion, 2018). Gilbert and Trudel (2001), while providing interesting insight into reflective practices under concepts by Schön (1983), fail to ‘operationalise the more complex, social and cultural processes involved’ in reflection (Hall and Gray, 2016, p. 366). Experiencing a learning opportunity does not guarantee reflection, as step-by-step models may suggest (Hall and Gray, 2016), and there are often barriers to reflection, experienced by coaches, that go unconsidered (Knowles et al., 2006).

Reflection may be somewhat of an enigma in coaching research (Cushion, 2018), but some studies do provide insight into the multitude of interacting factors at play when coaches are reflecting. Using action research, Hall and Gray (2016) show the emotional nature of reflecting on coaching practice, and how these emotions came from the subject, Hall, recognising himself as both the ‘actor in and critic of’ his own performance through watching video footage of himself coaching (Hall and Gray, 2016, p. 370). This disjuncture (Jarvis, 2012), the conflict between the subject’s perception of his practice versus the reality, is described as a moment of potential learning, which in this case was taken (Hall and Gray, 2016). Even though conflict between new knowledge and a coach’s biography can lead to rejection of that knowledge (Leeder et al., 2019), understanding this conflict as a potential moment of learning, in line with Jarvis (2012), can help explain why not all conflict leads to rejection. Indeed, Partington et al. (2015) show how video footage gave coaches the opportunity to ‘move beyond their reliance on self-perceptions’ (Partington et al., 2015, p. 708). Coaches often struggle to critique their practice that has become

‘integral to their sense of self’ (Cassidy, 2010, p. 143), with Hall and Gray (2016) and Partington et al. (2015) evidencing the impact that external stimuli can play in facilitating formalised and supported critical reflection. When considering more informal modes of reflection, Stodter and Cushion (2017) describe moderating factors that contributed to coaches either adapting or rejecting coaching concepts, after establishing whether they did or didn’t work in context. For coaches in Stodter and Cushion’s (2017) study these moderating factors were; personal openness to change, their context, reflection and if they had seen concepts work elsewhere. Interactions with other practitioners, as well as an environment that supported or thwarted ‘collaborative adaption’ (Stodter and Cushion, 2017, p. 333), acted as facilitators or barriers to adapting coaching concepts. Contextual variations and personal openness significantly influenced coaches’ reflective processes, which in turn effected the overall learning of coaches (Stodter and Cushion, 2017).

The above research is the setting for assuming that informal reflection may occur throughout the Process of Implementation, and that informal reflection is influenced by a multitude of factors. However, the author recognises that limited data means that understanding how participants in this study engaged in reflection is unclear, and that further research is needed to justify the following assumptions.

4.6.3 Adaptations

Data showed that, for Coach 1, his planned adaptation of RISK to *‘mainly warm ups’* differed from his Initial Implementation of integrating RISK within cricket movements such as *‘lunging into sweeping’*. This suggests that Coach 1 ‘Accepted and Implemented’ RISK to try it in context, found that it had worked enough to continue Implementation, but had then planned to adapt RISK to better suit the needs of his context (Lindblom et al., 2018; Norcross et al., 2016; Stodter and Cushion, 2017). Indeed, Coach 1’s perceived needs certainly played a key factor in his adaption of RISK, as some of his teams could be *‘quite chilled’*, and when asking his players to warm up *‘some of them will do it, some of them won’t’*. Therefore, Coach 1 believed that making warm-ups *‘more fun, or challenging’* by using RISK introducing *‘little competitions’* and more engaging activities would act as a solution to these issues.

4.6.4 Accepted and implemented

Coach 2 appeared to walk a slightly different route to Coach 1, Adapting RISK immediately after Stage 1 to a *'warm up'* and *'ice breaker'* for coaches during a workshop, which was shown to be heavily influenced by Coach 2's beliefs surrounding the format and design of injury prevention workshops (Griffiths et al., 2018; Stodter and Cushion, 2017). Coach 2 then reported that he *'would use elements of it (RISK) again'* in a similar way, because *'it worked really well'*, which suggests that this type of RISK Implementation was to be Accepted and Implemented further.

However, this process may not be as black and white as simply accepting or adapting RISK. As was discussed under Adaptations, Coach 2 also planned to *'tailor the content'* of skill delivery workshops so that there would be *'injury prevention bits'* linked in with specific cricket skills. Again, Coach 2 decided on these Adaptations largely because of his belief that coaches would not attend workshops solely on injury prevention, which may have been formed from previous experience of delivering poorly attended workshops on specific coaching concepts. It is possible, then, that separate aspects from the same learning experience, or maybe even the same aspect, can be interpreted and used in different ways (Stodter and Cushion, 2019). Coach 2 would continue to use RISK movements as ice breakers for some coaching workshops, while also integrating them into the cricket specific content of others, showing that he both 'Accepts and Implements' and 'Adapts' RISK to suit two different needs. Research has identified that coaches perceive learning opportunities differently to each other (Leeder et al., 2019), and that coaches take on different pieces from coach education workshops and courses (Cushion, 2013; Stoszkowski and Collins, 2016; Stodter and Cushion, 2017), but the notion that the same concept can be interpreted and used in multiple ways can only be seen in inference (Stodter and Cushion, 2017).

4.6.5 Rejected

This rejection of RISK concepts forms the final consequence of reflection on Initial Implementation. No data was collected that showed RISK being rejected at this

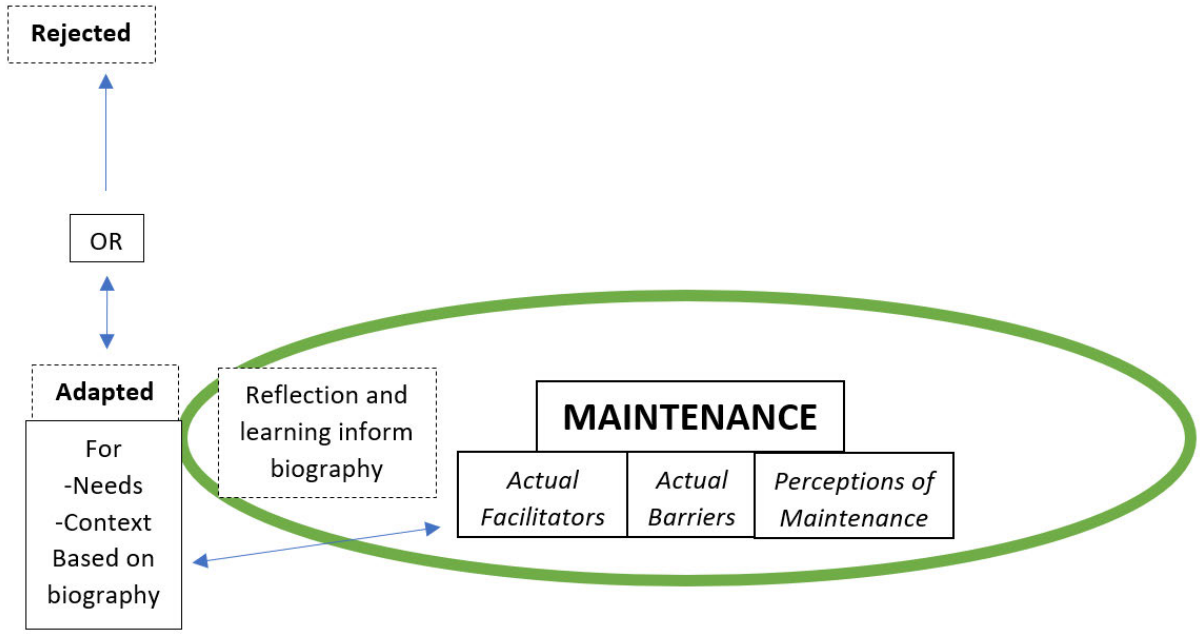
stage, but research from Stodter and Cushion (2017) justified this assumption. Whether a coach rejects or adapts a concept, after it has not worked in practice, depended on moderating factors (Stodter and Cushion, 2017), which have been discussed earlier. Stodter and Cushion (2017) found that, when coaches rejected new coaching concepts, it was because of the freedom and responsibility that they were afforded in their contexts. A 'well-established structure in a pressured climate of accountability' (Stodter and Cushion, 2017, p. 332) aptly describes a key barrier to coaches being able to adopt new concepts; coaches working in environments that are controlled by power relationships and ingrained anti-change and anti-intellectual beliefs (Abraham et al., 2009). This can even be seen, in part, in the focus group data when KC5 mentions not having club management figures that were *'open minded'* to hiring S&C coaches, which created a barrier to KC5 using S&C practices in his sessions. Stodter and Cushion (2017, p. 332) cite Schön (1984, p. 338) to explain that reflection is most likely to occur in a context in which there is 'a high priority on flexible procedures, differentiated responses, qualitative appreciation of complex processes, and decentralised responsibility for judgement and action'. Therefore, for KC5, individual understanding of correct and incorrect ways to coach, formed from knowledge provided by authority figures in clubs, was not conducive to reflection, adaptation and adoption of new coaching concepts (Stodter and Cushion, 2017).

It is important to note that rejection after Stage 1 may well be subject to the same cultural influences as rejection is at this point, and vice versa regarding the influence of biography. The expectations of participants from their respective environments and authority figures may have played a part in how responsibilities of delivering RISK was perceived. As discussed in *Barriers to Adoption*, where *coach role frames* was an evident barrier, RISK conflicted with participants' beliefs of their practice (Cushion, 2013). How these beliefs have been formed is unknown, but insight into how cultural influences of a coaches' workplace influence their openness to change may help with understanding of this phenomena (Abraham et al., 2009; Stodter and Cushion, 2017), and subsequent planning of RISK to negate such barriers.

4.6.6 Maintenance

Maintenance is described as the extent to which a programme is sustained over time (Aerts et al., 2013), and is essentially an extension of Implementation (Glasgow et al., 2019). While Maintenance is rarely considered in sports injury prevention literature (O'Brien and Finch, 2014b), understanding Maintenance as 'sustained Implementation' (Harden et al., 2018, p. 2) means that the multi-faceted and complex factors related to Implementation need to be considered for Maintenance (Glasgow et al., 2019). As such, this final part of this model, presented as an interactive process of Maintenance, takes inspiration from Jones' (2007) suggestion that learning to coach is a lifelong endeavour (Christensen, 2014), and Jarvis' (2009; 2012) emphasis on lifelong learning, where the opportunity to learn is present in every experience (Duarte and Culver, 2014; Taylor et al., 2014).

***Figure 9**: The ongoing process of Maintenance*



After Initial Implementation, and the following consequences, Maintenance continues to interact with Adaptations, depending on the facilitators and barriers that are experienced with ongoing Implementation. This is evident in data from KC4 when he detailed his experiences of maintaining a pathway wide injury prevention programme. KC4 explained that barriers such as players *'dropping in late'* to miss the programme, which would be delivered at the start of every training session, and *'awful'* communication to parents of pathway players negatively impacted

Maintenance. To overcome the first barrier, the programme was adapted so that it was delivered *'towards the middle or the end of a session'*. For the second barrier, KC4 explained that a presentation and Q&A was delivered to parents by the external practitioner that was delivering the programme: *'to sit 100 odd parents down…in a lecture studio…he sold it all'*. This served to allay *'fearful'* parents and resulted in *'an easy sell'* of the programme. Data from this study does not explain how KC4 went through the process of adapting his programme to overcome barriers, but it is possible to speculate.

Understanding of how coaches learn throughout their practice is extremely limited (Cropley et al., 2012), although authors have positioned that coaches learn through experience (Callary et al., 2012; Cushion et al., 2003) and reflection (Gilbert and Trudel, 2001), often in conjunction (Gallimore et al., 2014; Turner et al., 2012). Stodter and Cushion (2017) evidenced a reflective feedback loop, where if coaches found that new knowledge did not work in practice, they would reject it, or enter an ongoing cycle of adaptation and experimentation. The authors link these findings to Gilbert and Trudel's (2001) reflective model and draw on Schön's (1983; 1987) concept of reflective conversation, which is described as a cycle of appreciation (problem solving), action (trying it in practice) and reappreciation (problem setting). Taking lessons from Cushion's (2018) reading of Schön (1983), reflection is offered as a 'intuitive, personal, non-rational activity' (Akbari, 2007, p. 196 in Cushion, 2018). For Schön (1983) reflection is implicit, embedded in practice and does not come from 'prior intellectual operation' (Schön, 1983, p. 51). To that end, Schön may well dispute the nature of this process model presented by the author, that identifies an almost linear progression of Implementation to Maintenance, integrating reflection between each dimension. However, this process of Maintenance is intended to be contextually situated in the individual's practice (Gallimore et al., 2014), subject to influence from biography, social settings and cultural practices (Cushion, 2018; Stodter and Cushion, 2014; Stodter and Cushion, 2017), and shows that at any point knowledge can be discarded, adapted or ingrained in biography. The latter consequences speak to the concept of lifelong learning (Duarte and Culver, 2014; Kolb, 1984), and also to Schön's notions of practice-based knowledge and reflection in action in the face of 'complex and ambiguous problems' (Cushion, 2018, p. 85)

present in the messiness of everyday practice (Schön, 1983). To that end, both Stodter and Cushion (2017) and Gilbert and Trudel (2001) may well hold relevance to KC4's experiences. Stodter and Cushion (2017) by demonstrating the ongoing process of adaptation and experimentation, and Gilbert and Trudel (2001) with their focus on reflecting on coaching issues.

At a counterpoint to both models, this process of Maintenance is not considered to 'end' as such. Stodter and Cushion (2017) found that if new knowledge was accepted it was adopted and reinforced coaches' biographies, and similarly Gilbert and Trudel (2001) present a definite end to the reflective process once an issue has been resolved. This model, however, presents Maintenance as ongoing rather than reaching an outcome (Kolb, 1984), and shows that while injury prevention practice may be established and fairly 'set', it can still be altered at any point to react to barriers, as was the case with KC4. Furthermore, this pragmatic interpretation of various reflective concepts contributes to understanding the dynamic nature of a coach's biography, which can act as the influenced and the influencer in an ongoing process of change (Jarvis, 2009). The above work offers at least a surface level suggestion of how KC4 continued to *'grow'* and *'learn'* with his programme.

4.6.7 Perceptions of Maintenance

Uncritical acceptance of reflection as a naturally occurring phenomena is pervasive in sports coaching literature, with research failing to unpack both the assumptions that underpin reflective practice, and the complexities involved with such a socially and culturally embedded process (Cushion, 2018; Hall and Gray, 2016). Stodter and Cushion (2017) are perhaps the exception here, as they showed that the culture of a coaches' environment impacted their openness to change, reflection and integration of new knowledge. In most other examples, however, experience is seen as infallible and authentic, with reflection described as unbiased and objective because of that (Cushion, 2018). Indeed, how reflection can reinforce existing beliefs as opposed to challenge them is rarely considered (Cushion, 2018). Therefore, it was important for this model to consider how perceptions and beliefs towards Maintenance, in context, may impinge or bias a coach's reflection and 'strategy generation' (Gilbert and Trudel, 2001, p. 24) when barriers are encountered (Hall and Gray, 2016). At the

time of data collection, participants had not implemented RISK significantly enough to discuss actual facilitators and barriers, so perceptions towards each were considered. The data from Coach 1 and 2 showed how their beliefs surrounding their context acted to influence their perceptions towards facilitators and barriers of Maintenance.

Perceived facilitators

Both coaches viewed *access to new content* as a facilitator to sustained use of RISK in their coaching practices. Coach 1 wanted information on *'the next step'* and how to progress to more advanced content, either delivered by the research-educators via email, or *'through ECB videos on iCoach.'* Coach 1 believed that this new content meant that his delivery would not *'get stale'*, and he likened developing S&C as the same as *'developing batting, bowling, fielding'*. Coach 2, on the other hand, wanted different information to what was presented during the RISK workshops, as opposed to a progression of that content. Coach 2 wanted to know what the *'danger areas'* were; *'if in whatever skill we're getting more injuries in this way'* which *'warm ups would be appropriate for them.'* Coach 1 also believed that *access to a knowledgeable other* would benefit Maintenance of RISK, which was on the horizon as part of Coach 1's funding bid for an Emerging Players Pathway (EPP). With that funding for an EPP his county would *'have to allocate the money to a specialist',* which would allow Coach 1 to seek feedback and support, asking the knowledgeable other if he was putting RISK into practice effectively.

These *perceived facilitators*, in a way, reflect each coach's practice and perceived needs (O'Brien and Finch, 2017; Paquette et al., 2014). Coach 1 worked primarily with junior pathway players in a minor county, with no access to external support, where his players would not have received this sort of intervention before. His *perceived facilitators* for sustained implementation reflect this, as well as Coach 1's understanding of his responsibility to deliver injury prevention content. Conversely, Coach 2 supported a regional programme of the England Development Pathway (EDP), alongside his role as Coach Development Manager. Players in the EDP are bordering on elite performance, had received support from a multidisciplinary team of coaches, Physiotherapists and S&C coaches, and were aiming to play for the Young

Lions, who represent England Cricket at U19 level (ECB, 2020). Coach 2's perceived need for information on specific injuries represents his context, where elite cricketers often sustain localised injuries (Goggins, 2020).

Perceived barriers

Coach 1 recognised that a *lack of focus on S&C* from his county had acted as a barrier to prior engagement with injury prevention practices and could continue to do so in the future. This lack of focus stemmed from not having *'the resources, or the money, even the knowledge or the expertise'*, and specifically not having a *'proper S&C (coach)'* because Coach 1's county was *'not a (first-class) club'*. Coach 1 recognised that these *'restrictions'* could have the potential to halt Maintenance, echoing past comments from focus group participants who worked at minor counties. In a similar vein, Coach 2 identified a *lack of stakeholder buy in* as a key perceived barrier to Maintenance of injury prevention practices. Speaking from his experience with a minor county, Coach 2 believed that *'if I went to the Board of Directors…and went "We need to invest in S&C or this kind of stuff", they'd go "No chance".'* Coach 2's former county *'couldn't afford'* S&C support, and the fact that one of its coaches had additional S&C and Physiotherapy knowledge considered lucky by Coach 2.

Gilbert and Trudel (2001) describe advice seeking and joint construction with others as ways that a coaching strategy can be developed, and Coach 2's beliefs surrounding his minor county board's openness may well lead him to avoid this process. Indeed, if Coach 1 or 2 were to encounter a barrier that required either organisational support or means outside of their perceived range, such as not receiving more advanced content or the support of a knowledgeable other, their perceptions, heavily imbedded in context and culture (Cushion, 2018), may well impinge reflection and problem solving (Hall and Gray, 2016).

To conclude how such beliefs and perceptions actually impact the reflective process, or indeed if Maintenance occurs as was described in the previous section, more data from a larger range of participants would need to be collected. However, this does emphasise that reflection and ongoing learning is far from 'unproblematic' (Cushion, 2018, p. 7). Coaches' continued use of RISK may be influenced not only by

biography, but also workplace culture (Irwin et al., 2004; Stodter and Cushion, 2017) and power relations (Cushion, 2018), and therefore coaches subjective understanding those phenomena (Cushion, 2018).

4.7 The Key Stakeholder's 'Journey'

In line with the flexible nature of the interpretive approach employed by the researcher (Hussain et al., 2012), this section is written with the RE-AIM dimensions out of order compared to other studies that have employed the framework (e.g. Brown et al., 2016). This presentation was appropriate to create a linear narrative for sensemaking (Weick et al., 2005) of how a Key Stakeholder (KS) at the ECB got to the point of adopting and implementing RISK, as well as to gain insight into how RISK may be developed within the ECB. Furthermore, Implementation is not considered in this section. Rather, KS's perceptions towards the RISK workshops were categorised under Perceived Effectiveness, and his ideas for future workshop Implementation are described under Maintenance.

Similarly to Hussain et al. (2012), an interpretive approach to collecting data was used in this thesis. This approach is used to understand the human experience (Crist and Tanner, 2003), and therefore offers a way to capture the messiness of such experiences (Hussain et al., 2012). Collecting data under this approach, and using a semi-structured interview, resulted in a narrative being evident in the data. As has been mentioned in the Methods section, using both an inductive and deductive approach to analysing the data allowed for narrative themes to emerge, while using RE-AIM as an overarching organisational framework. The results further evidence the unique journeys that stakeholders may go on, which leads to the implementation of a novel coach education programme (Hussain et al., 2012).

4.7.1 Reach

The Key Stakeholder (KS) acted as a key influence in the Reach of RISK. Firstly, KS was responsible for building awareness of RISK within the ECB, having *'spoken to the guys who run the Level One and Two'* coaching qualifications. These coach education Administrators were *'keen to get something involved'*, but the KS

explained that *'they were kind of going through a cycle where they had to wait for a certain number of years…before they could re-jig the syllabus'*. However, there was going to be *'a gap where this (RISK) could be added in'*. Secondly, KS was instrumental in organising the delivery of RISK at the three ECB CPD days. KS described the RTDs as *'all over it'* when he pitched RISK to them, as *'they're always looking for content to fill the day'*. According to KS, RISK provided the RTDs with an opportunity to *'fill the day properly'* and was a deviation from *'just kind of doing boring cricket stuff.'*

With both interactions, there was no resistance KS introducing RISK, contrasting significantly with previous research that has described organisational barriers to novel coach education initiatives (Griffiths et al., 2018; Hussain et al., 2012). One reason might be that, at the point of interview, RISK was in the formative stages of being included in ECB practices. Hussain et al. (2012) showed how a constructivist informed coach education opportunity was met with several challenges throughout its development, such as acquiring stakeholder buy in, whereas with RISK's inclusion into ECB coach education was not actively being developed when this interview took place.

Another possible reason for KS experiencing apparent acceptance of RISK is that incorporating RISK into ECB practices does not require a significant philosophical shift in organisational perspectives. RISK is not designed to change coaching, tutor or educative philosophy. Rather, RISK encourages coaches to incorporate injury prevention techniques into their practice where they see fit (De Ste Croix et al., under review). This is potentially significant, as Sport National Governing Bodies (NGB) are often categorised by networks of interlinking practice, and communication between these networks is influenced by the NGBs operational and philosophical culture (Forster, 2006). Indeed, in Hussain et al.'s (2012) study, through the creation of a constructivist-informed coach education course, the High Performance Director (HPD) was attempting to facilitate a major ideological shift in Triathlon Canada's approach to coach education. The de-emphasis on evaluation and certification deviated significantly from traditional coach education (Piggott, 2015), and the HPD encountered several barriers during the development process due to embedded

organisational culture (Hussain et al., 2012). Furthermore, Griffiths et al. (2018) found that organisational culture acted as a barrier to acceptance of an evidence-based coach education programme developed by an NGB. The authors describe how at each level, from NGB to county, and then on to academy level, these organisations held their own contexts, emotions and cultures which dictated and filtered the intended learning from the NGB (Griffiths et al., 2018).

Revisiting the KS's comments, the coach education Administrators work in cycles, waiting several years before considering new content that could be included in ECB programmes. There is a chance that KS will experience barriers to implementing RISK when the time comes for the Administrators to consider it for ECB Coach Education programmes, but at this time point none presented themselves.

4.7.2 Adoption

Adoption, in this case, explains the factors that influenced how KS came to Adopt and actively Implement RISK. While this section is presented in a linear fashion, the life experiences of KS described below did not necessarily occur as such.

Professional experiences

KS's professional experiences in elite junior cricket gave him clear cut evidence that movement quality and S&C training was needed. Through initial involvement with U19 England players, the Key Stakeholder found *'that over a four-year period, the young cricketers' athletic ability or movement competency was just going through the floor.'* This was despite *'more resource, actually, coming into the game from a S&C coach point of view'*, and KS discovered that *'S&C coaches weren't actually getting that far down the pathway to actually get involved with the younger kids.'* This resulted in a large proportion of cricketers, even in county pathways, that had *'just got no movements skills.'*

In addition, KS's experience of implementing fitness standards for elite U19 cricketers, and the positive impact that those standards had, contributed to his understanding as to what solutions were needed to address such ingrained poor movement skills: *'So, funnily enough, as soon as we introduced the minimum fitness*

standards, obviously people's fitness kind of went through the roof. And we're now actually starting to see a change in the movement quality as well, because people are starting to assess that in a slightly different way and people are starting to put some emphasis on it at the academies.' Although the Key Stakeholder recognised that there was *'still work to be done'*, he believed that it was possible to *'influence further down the pathway to make sure that we just keep on improving this all the way through.'*

Perceptions of current practice

In addition to previous experience, KS's perceptions and beliefs towards current injury prevention practice at different club levels contributed to his Adoption of RISK. Data from KS is contrasted with focus group and follow up interview comments in order to establish the level of awareness that KS has, regarding current practice.

Coach education

KS is *'regularly asked to present on the Level 4'* ECB coach education course to explain the processes behind elite S&C, and conversations with coach education Administrators revealed that movement quality and injury prevention did not *'enter the kind of teaching syllabus until Level Four'*. KS viewed this as problematic, because by the time a coach reaches acceptance onto the Level 4 *'you've got an S&C coach in, you've got a physio, you've got a sports med doc - you've got all the resource in place - you don't really need it (his presentation).'*

Comparing the KS's perceptions to those of the workshop participants, several coaches also reported a lack of movement quality or injury prevention content: *'generally up until Level 3 there's nothing'* (DC7). Indeed, for some participants who held a Level 3 qualification, when content on movement quality was presented it *'wasn't as prescriptive as doing exercises around drills, it was more about spatial awareness stuff, body shapes and movement patterns'* (KC1).

Pathway coaches

KS explained that first-class county pathway coaches *'don't always have access to S&C coaches'* as they typically worked with older age groups, and for coaches outside of the first-class system, such as minor counties or clubs, *'they're not going to have the funds for an S&C coach.'*

These beliefs are very similar to the accounts of participants in the focus groups and follow up interviews. HC2 explained that *'as a minor county…we have no Strength and Conditioning budget'.* Speaking during the follow up interviews, Coach 1 explained that he only had the chance to access an S&C coach through a merge of Womens teams with a first-class county: *'most of our training sessions are at (first-class county)s because they've got the venue, but they have S&C, which is obviously a massive part for (coach 1's county) girls.'*

Initial contact with RISK workshop deliverers

These past experiences and beliefs culminated in KS reaching out to the research-educator that created RISK, who KS knew from University and had followed on Twitter. It was *'just one of those academic connections'* that resulted in KS seeing a tweet from the research-educator, initiating discussions and asking: *'Is there anything we can take from what you guys have done in football and then transfer this into cricket? Can we start educating our younger - our cricket coaches - who work in the pathway just to help improve movements qualities through basic movements?'*

The subsequent conversations led to the inclusion of RISK in the ECB CPD days, with KS acting as the primary organiser and communicator between the research-educators and the RTDs. This data reinforces the impact that organisations can have on the implementation of an intervention (Fixsen et al., 2013). Furthermore, establishing organisational support of RISK (Padua et al., 2014) and the alignment between RISK and KS's perceived needs (Donaldson and Finch, 2013) were crucial, as without the proactive actions of KS the RISK workshops likely would not have occurred, especially not in the short time that it took for RISK to be implemented and delivered at the CPD days.

Diffusion of Innovations theory (DOI) has been discussed in conjunction with individual adoption of RISK, but it is also present here. KS believed the inclusion of RISK into the ECB framework to be better than current practices, and that its inclusion would have clear benefits to end users, in this case young pathway players (Finch, 2011). In addition, inclusion of injury prevention and movement quality content was consistent with KS's beliefs, experiences and his perception of what coaches and players need (Finch, 2011). The beliefs that KS held surrounding current practice also appear to match up with the reported experiences of participants in the focus groups and follow up interviews. This is positive, as Griffiths et al. (2018) demonstrated how distortion of their coach development programme occurred because there was a mismatch between a governing body's expectations and the delivery agent's realities. Furthermore, Edwards and Leadbetter (2016) suggest that NGBs must consider how a standardised coach education programme is received and implemented by regional organisations that are relatively small and have limited resources, such as minor counties in this study. The fact that KS is aware the different environments that county pathway coaches' practice in, and their various levels of available support, is extremely positive for future RISK adoption and implementation.

4.7.3 Perceived Effectiveness of RISK

RE-AIM and sports injury prevention literature offers little guidance on how qualitative methods can evaluate Effectiveness at the setting level. However, authors in the coach education realm have found that, as with effectiveness at the individual level, perceptions of a programme are important for its development (Griffiths et al., 2018; Hussain et al., 2012). Therefore, this section discusses KS's perceptions towards a RISK workshop that he attended, which forms the next step in KS's narrative relating to RISK.

At times the interview with KS acted almost to develop RISK, offering a structure remarkably similar to Schön's (1983) concept of reflective conversation, conceptualised for sports coaching by Gilbert and Trudel (2001). Issues with RISK were observed by KS at the workshop, an issue was formally identified, and then strategies were generated (Gilbert and Trudel, 2001). Observation of issues and

issue setting are discussed under *negative perceptions*, with strategy generation considered under *suggested improvements*. It should be made clear that this use of Gilbert and Trudel's (2001) work is not to justify or contribute to understanding of their reflective process. Rather, their work was employed to better describe the nature of the KS interview, and emphasise the early stages of development that RISK was in, with regards to inclusion into the ECB syllabus and delivery to county pathway coaches.

Positive perceptions

KS had some extremely positive comments regarding the content and delivery of the RISK workshop by the research-educators: *'I thought they were spot on. I thought the level of information that was provided for the coaches was great. It was put across in a very coach-friendly manner, which was good.'*

In addition, he reacted comically to the practical section of the workshop: *'It was good to see them all moving around and chasing balloons around and walking like giraffes and stuff like that - I thought it was hilarious to be honest.'*

Negative perceptions

KS did, however, notice some coaching issues regarding the engagement of the participating coaches: *'And, the one main observation that I did have was that the coaches weren't really engaged as much as what they could be in the physical bit. I think they start off engaged and then they drift out a little bit.'*

Expanding on this point to set the issue (Gilbert and Trudel, 2001), the Key Stakeholder explained: *'Then towards the end, when things started moving on, then you could see people drifting off and talking. And some of those conversations were probably good - they were probably around the "How can we bring this into our environment?", but then they also might've been talking about "I'm ready to kind of shoot off now", but yeah. I'm just wondering about how we can keep up that enthusiasm that they start with.'*

Suggested improvements

Based on the observed behaviours of participants, and setting of those as an issue, KS began to formulate strategies through what Gilbert and Trudel (2001) describe as 'creative thought' (p. 26): *'They kind of start talking and I'm just wondering if there's a way to kind of structure the breakout sessions, if you like, to maybe short blocks to maintain the enthusiasm that it got.'*

Questions and input from the researcher, known as 'joint construction' (Gilbert and Trudel, 2001, p. 27), led to the development of these strategies to improve engagement in the RISK workshops*: 'Yeah, you almost want to have a dedicated day towards this or a dedicated half a day towards it where they're not actually - maybe they're just on task for phys-ed, if you like, rather than anything else. And rather than doing other stuff just so they can kind of be a hundred per cent focused on the outcome that we want from it… Yeah, it could potentially be split into kind of three or four different parts of the day, couldn't it? With a little bit classroom chalk and talk, then a move back to a chalk and talk and then move again. Yeah.'*

These observations and subsequent strategies for improvement were offered in a more formalised manner, by the KS, when the interview turned to RISK's inclusion into the ECB framework. Discussed under Maintenance, the interview once again acted as a reflective conversation, but in this case offering a discussion that more clearly defined what RISK may look like in the ECB coach education framework.

4.7.4 Maintenance

Finch and Donaldson (2010) suggest that understanding if and how NGBs plan to develop formal policies is an effective metric for determining maintenance of an intervention. With that in mind, this section presents KS's view of how RISK could be incorporated into ECB framework, rather than concrete information on how it will be incorporated, forming the final part of KS's narrative with RISK.

The higher order theme of *ECB Coach Education* was identified, as KS believed that this was the best way to proceed with RISK within the ECB. Discussed during the

interview was the *structure* that KS envisioned, potential *accompanying resources, barriers to maintenance,* and *facilitators for maintenance.*

ECB coach education

Structure

For KS, if *'some form of movement education or movement competency'* was included in coach education qualifications then he *'would be happy'*. When considering the specific structure, KS wanted *'a version of what you boys (research-educators) presented'* as modules in the Level One and Two courses. This was deemed *'all it takes on the Level One'*, whereas the Level Two could be *'just the complexity…increased'*.

However, this later developed to the Level One being *'even less than…what you presented on the day.'* Instead, KS discussed reducing the content for the Level One to *'a kind of chalk and talk'* that was aimed at *'raising awareness'* of movement competency. KS then envisioned the Level Two as *'a repeat but with additions'* such as a *'practical session on top of that'*. The telling quote here is the following line: *'Maybe, I don't know'*, which emphasises the formative nature of RISK.

With regards to a timeframe on Implementation of RISK practices into ECB Coach Education, the Key Stakeholder believed that January 2021 was when the current coach education content was up for review, although he conceded that he was *'just working off memory'.*

Accompanying resources

For KS, having *'an online resource'* where coaches could *'see examples of exercises, warm-ups, so on and so forth'* was an important accompaniment to RISK. They didn't *'have to be exhaustive'* but did need to cover *'enough varieties of movement patterns'* to *'stimulate thought'* and *'creativity'* around delivery of injury prevention practices.

Barriers

The key barrier to implementation of RISK into ECB Coach Education, that KS foresaw, was the perceptions of participating coaches, who *'wouldn't want to see themselves as a pseudo-S&C coach.'* This conflicted with KS's aims of increasing coaches *'awareness and their knowledge and attitude and belief towards what good physical prep can do'* for players. He viewed successful implementation as encouraging coaches to *'even just start including some different drills as part of their warm-ups'*, and coach perceptions towards their role in delivering injury prevention content was clearly a worry.

Facilitators

The *'way it's (injury prevention coach education) pitched'* was believed to be an important factor in how this new content could be received, therefore acting as a *facilitator* to act against the above *barrier*. Indeed, for the Key Stakeholder, *'how the message is sold'* to coaches was crucial in facilitating coach engagement.

Few studies have examined governing bodies in relation to coach education projects (Edwards and Leadbetter, 2016; Griffiths et al., 2018; Hussain et al., 2012; Paquette et al., 2014; Quarrie et al., 2020), despite several claims that current provision of coach education is ineffective (e.g. Piggott, 2012), and numerous prescriptions for how coach education should be delivered by governing bodies (e.g. Deek et al., 2013). This lack of literature makes comparisons to KS difficult, as organisational perceptions towards coach education have not been considered in a similar way to this study. What is clear, however, is that a programmes content is influenced by its designer (Humphrey et al., 2008; Hussain et al., 2012). Data from KS suggests this, but past studies have focused on the creation of novel coach education opportunities (Griffiths et al., 2018; Hussain et al., 2012), while RISK is an established workshop (De Ste Croix et al., under review). KS did seem to be clear on the direction that he believed RISK could take, but, as emphasised by using Gilbert and Trudel's (2001) reflective process, how RISK would be moulded into the ECB framework was not set at that point.

However, KS's suggestions for how RISK may be developed within ECB coach education is consistent with previous literature. Injury prevention studies have found that resources act as a facilitator (Steffen et al., 2013), which was corroborated by participants in this study. Furthermore, KS's comments on how RISK is *'pitched'* is poignant when considering how the workshop messages acted as facilitators to Adoption for participants. Indeed, Quarrie et al. (2020) describe how the messages of RugbySmart changed to reflect data collected on coaches' perceptions towards the programme, in order to overcome barriers to adoption. For example, RugbySmart creators highlighted the link between injury prevention and performance, rather than focusing on safety, which was connected by some coaches with wanting to make players 'soft' (Quarrie et al., 2020, p. 227).

As RISK, hopefully, progresses to a point where it is a part of the ECB framework, it will be interesting to consider how interactions between stakeholders influence its development. In their overview of the RugbySmart programme and its various evaluative measures, Quarrie et al. (2020) explain that different stakeholders may have different definitions of successful programme. While Quarrie et al. (2020) state this in the context of multi-agency partnerships, it is still an important consideration for how RISK may be negotiated by KS and the coach education Administrators, as translating evidenced-based content for practitioners can potentially be challenging (Bekker et al., 2017). Griffiths et al.'s (2018) notion of 'edutainment' is potentially relevant here, as they evidenced that coach educators worked to translate 'organisational aspirations' (p. 291) to the contexts and cultures of the sports clubs that they were working in. Bearing this in mind, whether KS's perceptions of RISK do or do not match the coach education Administrators' may affect how it is delivered in the future (Quarrie et al., 2020).

5.0 Conclusion

5.1 Summary of findings

This study investigated county cricket pathway coaches' experiences of a novel injury prevention coach education workshop, subsequent Implementation, and perceptions towards Maintenance. Further to this, the role of the organisation, the ECB, in facilitating Implementation and potential Maintenance of RISK was considered.

The creation of an integrated model showed the interacting nature of the RE-AIM dimensions, as opposed to linear discussions of the framework in previous studies. Reach acted as the starting point, and was significantly affected by the Key Stakeholder at both the individual and setting level, through his proactive search for injury prevention practices. Strategies to increase Reach were offered, such as making injury prevention a compulsory element of certification to become a cricket coach.

At the individual level Perceived Effectiveness, Perceptions of Implementation and Adoption were all shown to interact, forming Stage 1 of the model, and all three dimensions were influenced heavily by participants' biographies. Participants in the workshops considered RISK to be effective because it either validated their practice, or it related to their professional experiences, which acted as supporting evidence for the importance of injury prevention and movement quality. Perceived facilitators and barriers were heavily embedded in participants' professional contexts, with minor county coaches perceiving barriers relating to limited resources and access to a knowledgeable other. The workshop messages acted as significant facilitators for Adoption, whereas participants perceptions towards their roles as coaches acted as a barrier, with some passing responsibility to other groups. Follow up interview participants described how they disseminated content to their peers, providing useful insight into how this could be facilitated in the future.

From the available data and previous research, it was assumed that, after Stage 1, participants either accepted RISK but took no action or rejected RISK. Participants from the follow up interviews showed evidence of accepting or adapting RISK for

Initial Implementation. Perceived barriers to Implementation did not appear to match with actual barriers, whereas there was more of a match between perceived and actual facilitators, especially with the reported use of the workshop presentation and website videos. Participants adaptations to RISK were shown to be heavily influenced by their perceived needs in their context, and beliefs surrounding injury prevention workshops, both of which were born from previous experience. Regarding Maintenance, participants planned implementation of RISK, and perceived facilitators and barriers, were significantly affected by their contexts, perceived needs and professional roles. This supports the notion that a 'one size fits all' approach to coach education is not sufficient, and that learning is a socially embedded experience dictated largely by biography (beliefs, knowledge and practice). It was assumed that Maintenance does not necessarily 'end'. Rather, it forms an ongoing partnership with Adaptations, using reflection, allowing for participants to *'learn'* and *'grow'* (KC4) with continued use of injury prevention interventions, and therefore impacting their biography.

At the setting level, data from the Key Stakeholder (KS) was presented through a 'journey', showing that past experiences and perceptions of current practice played an integral part in KS adopting RISK. KS had both positive and negative perceptions towards the effectiveness of the RISK workshop that they observed, which influenced his suggestions for future practice. Data emphasised that RISK was in the early stages of development for ECB purposes, and KS showed awareness of the barriers and facilitators to implementing RISK that coaches may face.

This research provided unique insight into county coaches' experiences of RISK and will be used to support the integration of injury prevention content into the ECB's coach education pathway. Sport is the activity with the highest risk for children and young people to get injured, so engaging and training the coaches that oversee the development of young participants is essential to minimising that risk. In this vein, this study increases understanding of how cricket coaches engage with new injury prevention knowledge. In particular, the finding that coaches from first class and minor county teams perceive barriers and facilitators to RISK differently contributes significantly to how RISK can be tailored and delivered in the future.

Furthermore, this study contributes to the little research available on the organisational processes behind the development of a coach education opportunity, which in this case was driven largely by a Key Stakeholder.

5.2 Considerations for future practice of the RISK workshop

Organisations play a key role in ensuring that knowledge is accessible and applicable to its members and their practice (Bekker et al., 2016; Griffiths et al., 2018). Implementation of new strategies at setting level is often not considered an issue, rather it is the translation from knowledge of a subject to action on that subject that can be challenging (Kreindler, 2016). Participants in Bekker et al.'s (2016) study explain that a barrier to implementation of an intervention or programme is often that 'the end reports…are written for researchers by researchers' (p. 5), which are difficult for organisations to immediately use.

With than in mind, and through a pragmatic use of this study's data, and injury prevention implementation and coach learning research, the following suggestions for future RISK practice were developed by the researcher:

- It was clear that participants' perceptions drove Adoption and Implementation, therefore introduction of RISK could be informed by Diffusion of Innovations theory, which has presented itself as valid and relatable throughout this thesis.
- A key facilitator for coach Adoption was the notion that RISK can be incorporated into current practice; that it 'fits in' (Stodter and Cushion, 2017, p. 326). This should be emphasised for the best chance of coach Adoption and implementation.
- Coaches liked having a reason 'why' for injury prevention and RISK, and this was key in their perceptions towards generating buy in. However, despite having a reason 'why', some coaches still rejected their role as a delivery agent. Literature is unclear why this might be, but emphasising the role of the coach in encouraging good fundamental movement patterns, especially in an environment where there is no additional support, may help. In addition,

including information on the potential performance benefits may also improve coach attitudes (Quarrie et al., 2020).

- Lessons can be learned from KC4 regarding the sustained implementation of an injury prevention program, across the pathway of a minor county. These can feed into the workshop content, helping coaches to understand some of the facilitators and barriers to Implementation that they may be faced with.
- All parties must be careful that the messages of RISK, which emerged as facilitators of adoption, are not lost through the 'top-down' approach of implementing injury prevention content into ECB coach ed (Griffiths et al., 2018).
- Nonformal CPD opportunities, such as RISK, must be grounded in the participants practices, provide opportunities for those from similar groups to collaborate, and, if possible, be longitudinal and provide ongoing support (Armour and Yelling, 2007; Deglau and O'Sullivan, 2006; Ko et al., 2006; O'Sullivan, 2007). This means understanding what contexts the participants are working, what their previous experiences are, and recognising that they may have different needs based on those contexts and experiences are. The best example of this was that first-class and minor county coaches perceived different barriers and facilitators to RISK.
- The focus groups give good insight into what pathway coaches perceive as barriers and facilitators to adoption and implementation of injury prevention content. These should be considered in future delivery of RISK, and this author recommends a discursive format where coaches can present their worries and brainstorm solutions, which can be facilitated by the workshop deliverer. Small groups would potentially encourage greater communication, and research suggests that grouping coaches by their professional demographics has a positive effect on learning, as they have more in common than random groupings.
- The practicalities of implementing an injury prevention programme were often at the forefront of participants minds. As well as giving coaches the 'tools', such as the movements they are being expected to deliver, time should be spent discussing how they can disseminate workshop information throughout

their county club, facilitate player, parent and structural buy in, and incorporate the movements into their sessions.

- Participants perceived RISK to be effective, which influenced adoption and implementation, because it either validated their current practice, or past experiences acted as evidence for its need. This should be considered in future delivery of RISK.
- Resources should be developed to include examples of games, progressions of the movements, and maybe even session plans. Time was considered a crucial barrier for coaches, so having ready-made examples of how to incorporate RISK into a session may help to alleviate this concern.
- While coaches may not necessarily need an S&C coach or Physiotherapist to help facilitate implementation, participants still considered this access important, and lack of a knowledgeable other as a barrier. Therefore, development of an ongoing support system for RISK should be considered.

5.3 Limitations

The key limitation in this study was a small sample size for the follow up interviews, where data on implementation and maintenance was intended to be collected. This led to the later stages of the process model being developed from extant literature and data from the focus groups.

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7.0 Appendices

7.1 Focus Group Consent Form

UNIVERSITY OF GLOUCESTERSHIRE
at Cheltenham and Gloucester

CONSENT FORM

Full title of Project:

Evaluation of a coach education workshop designed to reduce injury in young players.

Please tick/initial box

1. I understand the nature of the study and have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason. ☐

3. I agree to take part in the above study. ☐

		Please tick/initial box	
		Yes	No
4.	I agree to the focus group being audio recorded	☐	☐
6.	I agree to the use of anonymised quotes in publications	☐	☐
7.	I agree that my data gathered in this study may be stored (after it has been anonymised) in a specialist data centre and may be used for future research.	☐	☐

Name of Participant	Date	Signature

Name of Researcher	Date	Signature

7.2 Focus Group Interview Guide

Pre amble

Thanks so much for coming today, and for agreeing to do this focus group. This is just a little follow up to get some of your initial thoughts and feelings around the course, and it will help us massively in improving and refining this workshop. Everything is anonymized, you'll be 'Coach 1', 'Coach 2' for example; I won't use any names in my essay. You can also withdraw at any time, and I'll leave mine and my supervisors contact details if you do want to withdraw. You don't have to have a reason, just get in touch and say you don't want to be a part of this project anymore.

We'll try and keep this quite short, to about half an hour – I've got a timer on my phone, don't worry, and we'll get into some detail about how you found the course and how you think it will impact your coaching going forward. I will be making some notes while we talk, but I am still listening.

Warm up questions

Just go round the group and say who you are, who you coach, and a little bit about your experience with that group.

(Make notes of names)

There will be times where I'll ask specific people questions, but for the most part this will be a bit of a free for all, so with anyone starting, could you just tell me…

1) What did you enjoy about the course?

Prompts…

Can you tell me more?

Does anyone agree? Is that the same for you? Maye the same opinion but for different reasons?

Does anyone disagree? Does anyone have a different opinion?

What did you think?

How did this impact your experience on the course?

Was that helpful?

Was there anything that you didn't enjoy? Did you struggle to understand any part of today?

Why?

Was there anything you enjoyed about the theory side? About the practical side?

What do you know now, that you didn't before you came on the course?

What has RISK helped you to understand? Can you give me some more details?

2) Facilitators – what do you think from this course will help you deliver injury prevention techniques?

Prompts…

Why would that help? Why do you think that's useful?

Is there anything that you will refer back to?

Are there any additional resources you would have liked?

3) Barriers – is there anything that you think would be a barrier to using RISK? Any problems that you think you will come up against when trying to deliver this content?

Prompts…

Does anyone else feel the same way?

Would that also effect you? (directed at others)

Why could that be an issue?

How could you see that causing an issue?

Thinking about your team, your players and support staff, is there any way of overcoming that issue?

Finishing up

That's great, we've got into some really interesting conversations there. Like I said at the start, this will be really useful in helping us refine and improve RISK, your comments from today will directly impact how we go about that. As I mentioned I will be aiming to do some follow up interviews, based on RISK and this discussion, so I'll get in touch in 4-5 weeks time to see if you're interested in participating. To save putting you out of your way the interviews will be over the phone, and again won't be too long.

Hope you enjoy the rest of the day, here, and safe journey home!

7.3 Follow Up Interview Consent Form

INTERVIEW CONSENT FORM

Full title of Project:

Evaluation of a coach education workshop designed to reduce injury in young players.

Page 2 contains information about the interview and relevant contact details.

Please tick/initial box

2. I understand the nature of the study and have had the opportunity to ask questions. ☐

3. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason. ☐

3. I agree to take part in the above study. ☐

Please tick/initial box

Yes No

4.	I agree to the interview being audio recorded	☐	☐
8.	I agree to the use of anonymised quotes in publications	☐	☐
9.	I agree that my data gathered in this study may be stored (after it has been anonymised) in a specialist data centre and may be used for future research.	☐	☐

Name of Participant	Date	Signature

Name of Researcher	Date	Signature

Interview Information

The interview will be over the skype at a time convenient to you.

The interview will be recorded, but your name, and any names mentioned in the interview, will be anonymised.

You can withdraw from the study at any time, without giving a reason, and all your comments will be removed.

I will be following up on some of our discussions from the focus groups; exploring your use of the workshop in your coaching and asking you to think about some of the successes and challenges you've had with implementing the workshop content.

We will also be discussing how you think the injury prevention techniques that you have used can be maintained going forward.

I may ask you to send through some examples of how you have used the content from the workshop, either in the form of session plans or examples of drills or games.

Even if you haven't used the injury prevention methods in the workshop, I want to hear from you; hearing about why coaches don't use resources is just as important as hearing about why they do.

I'm aiming for the interviews to take anywhere between 30 minutes and 1 hour, but this is may change.

Contact Information

Primary Researcher:

Tommy Garwood

MSc by Research, University of Gloucestershire

Email: [redacted]

Project Supervisors:

Mark De Ste Croix – [redacted]

Will Roberts – [redacted]

Jonathon Hughes – [redacted]

7.4 Follow Up Interview Guide

Pre amble

- The aim of this interview is to follow up on your use of the injury prevention workshop from a few months ago. There aren't any correct or incorrect answers; this is just about your experiences over the last couple of months so please be as honest as possible. It's not my course so I won't take any offence!
- You can break or stop the interview at any time; we'll likely be talking for about 30-50 minutes.
- I'm recording the interview and may take some notes throughout.
- Your opinion is what matters, and is what I'm interested in. Ideally, I want to speak as little as possible, and I want you to talk as much as possible.
- Before we begin, do you have any questions?

Adoption

- How willing were you to start using the workshop content in your sessions?

- Why?

- Did you think it would help your team?

Implementation

- Did you use the content from the workshop, and if so, how did it go?
    - What were some of the things that helped you use the workshop?
    - What were some of the challenges?
    - Was there anything else you think you needed when you started to implement?
    - Did you change anything from the workshop when you started implementing things?

- (if didn't use) Why did you not use the workshop?

- Has anyone else you coach with started using injury prevention techniques?
    - How did you find getting coaches/parents/players on board? (buy-in)
    - What does your organisation think of you using injury prevention techniques?

Maintenance

- Will you keep using the injury prevention techniques from the workshop?
    - What do you need to carry on using the workshop content?

- Have you learned anything from implementing it? Is there anything you're going to do differently in the future?

- What do you think will help you maintain the injury prevention methods?
    - What do you need to keep using them?
    - Do you have some of those already?
    - Are those facilitators likely to be available to you?

- What are the challenges to maintaining implementation?
    - How do you think these can be overcome?

7.5 Stakeholder Interview Consent Form

UNIVERSITY OF GLOUCESTERSHIRE
at Cheltenham and Gloucester

INTERVIEW CONSENT FORM

Full title of Project:

Evaluation of a coach education workshop designed to reduce injury in young players.

Page 2 contains information about the interview and relevant contact details.

Please tick/initial box

3.	I understand the nature of the study and have had the opportunity to ask questions.	☐
4.	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason.	☐
3.	I agree to take part in the above study.	☐

Please tick/initial box

		Yes	No
4.	I agree to the interview being audio recorded	☐	☐
10.	I agree to the use of anonymised quotes in publications	☐	☐

11. I agree that my data gathered in this study may be stored (after it has been anonymised) in a specialist data centre and may be used for future research. ☐ ☐

Name of Participant	Date	Signature
Name of Researcher	Date	Signature

Interview Information

The interview will be over the skype at a time convenient to you.

The interview will be recorded, but your name, and any names mentioned in the interview, will be anonymised.

You can withdraw from the study at any time, without giving a reason, and all your comments will be removed.

We will be discussing your initial interest in RISK, how you think the workshops went and were received, and the future directions in the ECB that this sort of content could move.

I'm aiming for the interviews to take anywhere between 30 minutes and 1 hour, but this is may change.

Contact Information

Primary Researcher:

Tommy Garwood

MSc by Research, University of Gloucestershire

Email: [redacted]

Project Supervisors:

Mark De Ste Croix – [redacted]

Will Roberts – [redacted]

Jonathon Hughes – [redacted]

7.6 Stakeholder Interview Guide

Pre-amble

Thanks for getting involved.

I'm recording this, and any quotes will be anonymized.

Can stop at any point.

If at any point during or after this interview you do not want to be involved in the study you can withdraw without giving a reason. I will remove all of your comments upon withdrawal.

Reach

No. of other administrators/other stakeholders aware of RISK?

Effectiveness

Can't measure

Adoption

Why were you interested in RISK?

Was there an initial plan for getting disseminating it?

How was the course received by the Regional Talent Developers when you first pitched it?

- Was there any push back?

Was there any additional interest in the ECB?

- Push back?

(Initial) Implementation

What did you think of RISK when you came to observe?

Did you get any feedback from the Regional Talent Developers after the workshops were delivered?

Have you spoken to any coaches about it?

(Potential future) Implementation

How can this sort of content be delivered going forward? Are there any barriers to that?

How do you think RISK fits into the ECB landscape (coach ed, national programmes)?

- What scope is there for inclusion?
- How would it be delivered? Will it be adapted?
- Who would deliver it?
- Would there be available resources?

What do you think coaches need to be able to implement RISK/injury prevention techniques effectively and correctly?

What sort of impact do you think this style of workshop would have?

(Potential) Maintenance

Can RISK be implemented to the ECB framework?

- How long for?

Do you have an idea of when RISK could be introduced?

- How likely is that?
- What support would you have for this?

What are the barriers to maintaining this sort of workshop?