



Original research

## Intention to use sport concussion guidelines among community-level coaches and sports trainers



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### ABSTRACT

**Objectives:** Sporting bodies have developed guidelines for managing community-level players with suspected concussion in response to international consensus statements on concussion in sport. The purpose of this study was to examine the factors that influence the intended use of concussion guidelines among community-level coaches and sports trainers from two popular football codes in Australia: Australian football and rugby league.

**Design:** Cross-sectional survey.

**Methods:** The survey, based on an extended theory of planned behaviour model, was completed by 183 Australian football coaches, 121 Australian football sports trainers, 171 rugby league coaches, and 142 rugby league sports trainers.

**Results:** Personal norms and self-efficacy were significant predictors of intention to use concussion guidelines, although the relationship between self-efficacy and intention was stronger among Australian football coaches than rugby league coaches. Analysis of the salient beliefs that underpin self-efficacy found that coaches, irrespective of football code, felt less familiar ( $\chi^2 = 25.70$ ,  $p < 0.001$ ) and less experienced ( $\chi^2 = 31.56$ ,  $p < 0.001$ ) than sports trainers in using the concussion guidelines. At the same time, Australian football personnel, irrespective of their team role, felt that they had insufficient time ( $\chi^2 = 8.04$ ,  $p < 0.01$ ) and resources ( $\chi^2 = 12.31$ ,  $p < 0.001$ ) to implement the concussion guidelines relative to rugby league personnel.

**Conclusions:** Programmes aimed at increasing the intended use of sport concussion guidelines should focus on enhancing self-efficacy and leveraging personal norms. Increasing coaches' familiarity and experience in using the concussion guidelines would also be warranted, as would finding ways to overcome the perceived time and resource constraints identified among Australian football personnel.

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## 1. Introduction

In recent years, considerable media and clinical attention has focused on the risk and management of concussion in sport. An important outcome of this attention has been the development and continued revision of international consensus statements regarding the definition, assessment, and management of sports concussion.<sup>1–3</sup> Prior to 2013, the Australian Football League (AFL) and the National Rugby League (NRL) used the 2008 International Consensus Statement on Concussion in Sport<sup>3</sup> to develop

concussion management guidelines for Australian football (AF)<sup>4</sup> and rugby league (RL)<sup>5</sup>, respectively. These guidelines outlined evidence-based best practices for the management of concussion in community-level AF and RL and recognised the role that community clubs, coaches, and other support staff play in ensuring that players with a suspected concussion are managed correctly.<sup>6</sup> The AFL and NRL have stated that those responsible for managing AF and RL players with concussion should adhere to these guidelines at all times.<sup>4,5</sup> While the AFL and NRL do not require coaches and sports trainers to attend education sessions specifically pertaining to the use of these guidelines, such education is increasingly being included in other training and accreditation programmes conducted by these sporting bodies.

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Two groups that play a critical role in contributing to the management of diagnosed sport-related concussions in AF and RL are coaches and sports trainers. Coaches are responsible for managing team strategy and the performance of players, while sports trainers are qualified to provide first-aid assistance.<sup>7</sup> However, while these groups play an essential role in ensuring that AF and RL players with suspected concussion are managed correctly, the factors that influence their intention to use the AFL or NRL concussion guidelines remain unknown. Such information is essential for understanding the context in which the guidelines are being applied and in identifying opportunities for increasing guideline adoption.<sup>8</sup> Additional research is therefore required to understand the factors that influence coaches' and sports trainers' intentions to use these guidelines.

The theory of planned behaviour (TPB),<sup>9</sup> one of the most widely applied models of decision-making in the health<sup>10</sup> and injury prevention<sup>11</sup> literature, provides one means for understanding the factors associated with intention to use concussion guidelines. According to the TPB, intention to enact a given behaviour is determined by three factors: attitude, subjective norm, and perceived behavioural control. Attitude refers to an evaluation of the possible outcomes that could arise if the behaviour was enacted, while subjective norm reflects the behavioural expectations of others. Finally, perceived behavioural control, which is often assessed under the guise of self-efficacy,<sup>12</sup> denotes an individual's confidence in their own ability to enact the behaviour being examined. Attitude, subjective norm, and perceived behavioural control are in turn influenced by behavioural, normative, and control beliefs, respectively. These beliefs reflect the views that individuals hold about the behaviour under examination and are integral to explaining why individuals may or may not intend to enact that behaviour.

While the TPB typically exhibits good predictive utility across a range of behavioural contexts,<sup>13</sup> a number of extensions have been proposed to expand the model's predictive power.<sup>14</sup> One extension that may have relevance to understanding intention to use concussion guidelines is personal norm. Personal norm refers to an individual's values regarding what constitutes appropriate and inappropriate patterns of behaviour as well as any feelings of regret that they may experience should those values be violated.<sup>12</sup> Thus, the purpose of this study was to apply an extended TPB model to understand the factors associated with the intended use of AFL/NRL concussion guidelines by coaches and sports trainers affiliated with community-level AF and RL clubs.

## 2. Methods

Individuals were eligible to participate in the study if they were aged 18+ years and were a registered coach or sports trainer at a community-level AF or RL club. Online recruitment took place between 9 May and 31 August 2012, inclusive. Study recruitment notices for the AF arm of the project were placed in a range of electronic media, including the AFL community website, the website of the Victorian Branch of Sports Medicine Australia (SMA), the AFL School Ambassador Program eNewsletter, and the AFL Community Development eNewsletter. Details of the study were also emailed directly to registered AF coaches through the AFL development network and to registered users of SMA's Sports Injury Tracker, an online sports injury surveillance system. In the RL arm of the project, study recruitment notices were emailed directly to coaches and sports trainers with active accreditation through the LeagueNet database. Details of the study were also included in SMA's Smartplay eflash, a sport safety and injury prevention programme, and sent to registered users of SMAs Sports Injury Tracker. Ethics approval for this study was obtained from the Monash University Human Research Ethics Committee.

**Table 1**

Multiple linear regression analysis of the extended theory of planned behaviour model applied to coaches and sports trainers from community Australian Football and Rugby League and their intentions to use the AFL/NRL concussion guidelines.

Variable	B	SE (B)	$\beta$
<b>Main effects</b>			
Football code (AF vs. RL)	-0.17	0.15	-0.04
Team role (coach vs. sports trainer)	-0.25	0.13	-0.06
Attitude	0.02	0.01	0.08
Subjective norm	0.07	0.07	0.06
Self-efficacy	0.06	0.03	0.08*
Personal norm	0.27	0.04	0.54***
<b>Second-order interactions</b>			
Football code $\times$ team role	0.34	0.20	0.08
Football code $\times$ attitude	0.00	0.02	0.01
Football code $\times$ subjective norm	0.01	0.10	0.01
Football code $\times$ self-efficacy	0.20	0.06	0.19†
Football code $\times$ personal norm	-0.01	0.05	-0.01
Team role $\times$ attitude	-0.01	0.02	-0.01
Team role $\times$ subjective norm	0.14	0.09	0.10
Team role $\times$ self-efficacy	0.09	0.05	0.09
Team role $\times$ personal norm	0.03	0.05	0.05
<b>Third-order interactions</b>			
Football code $\times$ team role $\times$ attitude	-0.01	0.03	-0.02
Football code $\times$ team role $\times$ subjective norm	-0.15	0.14	-0.07
Football code $\times$ team role $\times$ self-efficacy	-0.23	0.09	-0.16†
Football code $\times$ team role $\times$ personal norm	0.02	0.07	0.02

Note: B = unstandardised regression coefficient;  $\beta$  = standardised regression coefficient.

\*  $p < 0.05$ .

\*\*\*  $p < 0.001$ .

Published TPB survey construction guidelines<sup>15</sup> were used to develop scales for intention (three items; Cronbach  $\alpha = 0.84$ ), attitude (nine items; Cronbach  $\alpha = 0.88$ ), subjective norm (one item), and self-efficacy (three items; Cronbach  $\alpha = 0.88$ ). The personal norm scale (six items; Cronbach  $\alpha = 0.81$ ) was constructed following a previously published procedure.<sup>12</sup> All TPB items were assessed using items measured on 7-point scales. A copy of the survey items can be found in the online supplementary material.

Participants were also presented with seven behavioural, 11 normative, and six control beliefs derived from a review of extant literature. For each set of beliefs, participants were asked to select the three that were most important to them. This process provided a means for identifying the beliefs that are personally salient to each participant.<sup>16,17</sup> The study questionnaire was assessed for content and face validity by the research team prior to the commencement of recruitment. The research team included a registered AF coach (AD) as well as experts on concussion in sport (MM, GAD, SJS, HS).

Analyses were conducted using SPSS version 20.0. Multiple linear regression analysis was used to assess whether the predictive utility of the extended TPB constructs vis-à-vis intention varied with respect to participants' football code and team role. Specifically, intention was regressed against attitude, subjective norm, self-efficacy, personal norm, football code (0 = RL, 1 = AF), team role (0 = sports trainer, 1 = coach), and the second- and third-order interactions associated with football code and team role (refer to Table 1 for a complete delineation of the second- and third-order interactions that were tested). Following standard procedures for examining interactions,<sup>18</sup> attitude, subjective norm, self-efficacy, and personal norm were mean centred prior to being analysed. That is, the mean for each variable was subtracted from every value in that variable. Statistical probing of significant interactions was conducted using the slope difference test.<sup>19</sup>

Multiway frequency analysis was used to determine whether the salience of behavioural, normative, and control beliefs differed by football code and team role. Significant second-order effects were probed using chi-square tests of independence. The funding

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