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Creating the conditions for psychological safety and its impact on quality coach-athlete relationships

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ABSTRACT

In this study, we investigated the notion that giving voice to athletes is an important aspect to creating a psychologically safe environment which can then feed into maintaining good quality coach-athlete relationships where every athlete feels heard, valued, and connected. 379 athletes completed a multi-section questionnaire that assessed their (a) capacity to be open and manage conflict with their coaches, (b) perceptions of psychological safety within their team or group, and (c) perceptions of the coach-athlete relationship quality. Structural equation modelling revealed that openness and conflict management positively predicted psychological safety which, in turn, positively predicted coach-athlete relationship quality. Psychological safety was found to explain the association between athletes' communication (i.e., capacity to be open, honest and transparent as well as manage interpersonal conflict effectively) and coach-athlete relationship quality regardless of athletes' gender. These findings highlighted that if athletes have the capacity to have candid discussions and can navigate conflict with their coaches, then it is possible to feel psychologically safe and thus able to engage in risky interpersonal interactions (e.g., raise concerns, admit mistakes) within their group context without fear of intimidation and humiliation. Furthermore, it was revealed that such a psychologically safe group environment fostered athletes' trust and respect, as well as commitment and cooperation with their coach. The discussion provides links to theory, research and practice.

Sport can be a stressful environment for athletes. In competitive sport, athletes have to continuously prove themselves to their coaches and fellow athletes or teammates. The irony of this is that often athletes are expected to cooperate with the same individuals they compete against for a place in a team or squad. Such an inherently competitive environment coupled with bad leadership, poor relationships and dishonest communication, not only can induce animosity, dislike, antagonism, hostility, and loathing but it can also erode group functioning (Salcinovic et al., 2022). This may inevitably lead to individual athletes experiencing poor mental, psychological and/or physical health including stress and anxiety, burnout and injury, feelings of detachment and loneliness as well as suboptimal performance (see Rice et al., 2022). Deutsch (2006) has described the links of cooperation and competition as follows, "if you're positively linked with another, then you sink or swim together; with negative linkage, if the other sinks, you swim and if the other swims, you sink" (p. 24). He went on to say that competition is part of life and "competition in a cooperative, playful context can be fun" (p. 29). This study aimed to explore whether athletes feel valued and connected within an inherently competitive environment. Overall, the objective was to investigate the antecedents and consequences of psychological safety.

Psychological safety as a concept has attracted the interest of researchers working in diverse domains including schools, business, hospitals and more recently in sport. While the term "psychological safety" was cited for the first time by Schein & Bennis, 1965 and subsequently by Kahn in 1990, it was the work of Edmondson around 2000 that popularised the term. In her recent book, psychological safety is described as a social environment within which individuals take interpersonal risks by speaking up, sharing concerns, raising questions, and offering ideas because they feel safe to do so (Edmondson, 2019). Based on her twenty years of research, she explained that psychological safety is essential to learning, engagement and performance in volatile, unpredictable, complex and ambiguous (VUCA) contexts just like competitive sport. The appeal of psychological safety has found its way into the sport-related literature as researchers search for safe (as opposed to harmful and fearful) environments that enhance learning,

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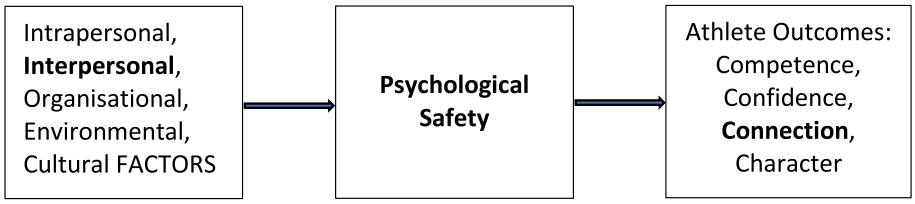

Figure 1. An adapted version of the descriptive model conceptualising safety in sport (Vella et al., 2022). Text in bold identifies variables of interest in this study.

engagement and performance (Fransen et al., 2020; Gosai et al., 2021; Smittick et al., 2019) while protecting athletes' (and coaches') health and wellbeing (Henriksen et al., 2020; Reardon et al., 2019; Rice et al., 2022). Only a handful of studies have empirically examined psychological safety in sport thus far, and these are briefly discussed next.

Fransen et al. (2020) investigated the role of psychological safety in explaining the impact of identity leadership on team performance and athlete wellbeing. The results from a structural equation modelling analysis from a cross-sectional design of 289 handball players indicated that their perceptions of leadership quality (as exercised by coaches, team captain, and informal athlete leaders) nurtured a sense of social identity (being part of, and integrated member of a team) and in turn fostered a psychologically safe environment that led these players to experience optimal team functioning defined as teamwork, resilience and satisfaction on one hand and individual functioning defined as good personal health on the other hand. They concluded that "team identity promotes shared values and norms as well as similarity-based attraction among group members, the chances of experiencing negative repercussions if one has a differing opinion, makes a mistake, or asks for help are likely to be lower than in an environment in which such a shared sense of 'we' and 'us' is lacking. In turn, this psychologically safe environment appears to provide the basis not only for good team functioning, but also for enhanced well-being." (p. 51).

In another study conducted by Gosai et al. (2021), the effects of coach leadership behaviours on both team psychological safety and on coach-athlete relationship quality, as well as the role psychological safety and relationship quality played in predicting athlete positive outcomes, were examined. The data from 166 athletes from team sports revealed that coach transformation leadership behaviours (i.e., individual consideration, intellectual stimulation, fostering acceptance of group goals and teamwork) predicted team psychological safety and coach-athlete relationship quality (closeness, commitment and complementarity; see Jowett & Shanmugam, 2016) and both these psychosocial states predicted athletes' perceptions of functioning well and feeling good. They summarised that in the eyes of the athletes, coaches need to possess sound interpersonal skills to create better quality relationships and psychologically safe team environments where athletes can freely communicate, propose new ideas, admit to errors, and voice their feelings. Ultimately, this research highlighted that good coaching is about people sharing knowledge and constantly learning from each other. A coach and an athlete need the information each holds to support and challenge one another towards flourishing and subsequently thriving in sport and life.

In contrast, Smittick et al. (2019) focused on exploring athletes' perceptions of coaches as leaders whose leadership is less than ideal. Since the sport world can be VUCA including ruthless, controlling and aggressive so can the coaches as leaders of sports. There are numerous high-profile examples to illustrate not just the dark reality but the hideous reality of the ultra-competitive nature of sports across the world (e.g., Argentina/Football: supporting-players/safe-working-environments/sexual-abuse/fifa-ethics-committee-decision-argentina-coach/" title="https://fifpro.org/en/supporting-players/safe-working-environments/sexual-abuse/fifa-ethics-committee-decision-argentina-coach/">FIFA Ethics Committee Decision: Argentina Coach - FIFPRO World Players' Union; United Kingdom/Gymnastics: Gymnastics abuse claims: British Gymnastics steps aside from independent review - BBC Sport; United States of America/Athletics: Nike investigates claims of 'emotional and physical abuse' at Oregon Project | Athletics | The Guardian). Their analyses from data collected from 204 athletes participating in team sports revealed that perceptions of coaches' uncivil leadership behaviours (e.g., condescending, unprofessional, demeaning) negatively linked with their perceptions of team psychological safety. Moreover, psychological safety fully mediated and explained the relationship between leader incivility and team performance. It was concluded when coaches engage in rude, discourteous behaviours their actions are likely to disintegrate the sense of psychological safety athletes experience in the team context. As a result, athletes may be less likely to question strategies and assumptions, engage in innovative decision making and problem solving, or express their differences resulting in decreased performance. Collectively, the findings of these studies suggest that cooperation (e.g., good leadership, healthy team processes, shared values, strong relationships) in an inherently competitive setting is far more rewarding and fulfilling. It also transpires that psychological safety can explain the empirical associations between the coaches and athletes' behaviours or attitudes and performance and wellbeing-related outcomes. These sets of findings are also consistent with conceptual arguments put forward by organisational psychologists whose research has focussed on psychological safety in different settings (e.g., Edmondson, 1999; Edmondson & Lei, 2014; Nembhard & Edmondson, 2006).

Two recent papers challenged the concept of psychological safety and questioned its meaning in sport (Taylor et al., 2022; Vella et al., 2022). While Vella and colleagues proposed an alternative definition whereby "psychological safety in sport is the perception that one is protected from, or unlikely to be at risk of, psychological harm in sport" (p. 15), Taylor and colleagues acknowledged that multiple definitions are problematic resulting in misinterpretation and ineffective use. Both teams of researchers agreed that more research is required to further understand the conceptual and practical significance of psychological safety in sport. Thus, we employed Vella et al.'s (2022) evidence-informed model (see Figure 1) to capture in a graphical form the objective of this study which is to explore the antecedents and consequences of psychological safety by applying the definition and measurement forwarded by Edmondson's (2019) long-standing work in this area.

As depicted in the graph, the "interpersonal factor" was operationalised through two communication strategies (Rhind & Jowett, 2010) that athletes can utilise to interact with their coaches: *Conflict Management* defined as efforts made by the athlete to identify, discuss, monitor, and resolve possible areas of disagreement, misunderstanding or incompatibility; and *Openness* described as efforts by the athlete to engage in and maintain free-flowing, reciprocal and open lines of communication that are honest and transparent. It has been previously postulated that communication strategies athletes and coaches employ affect, and are affected by, the quality of the coach-athlete relationship (see Jowett & Poczwardowski, 2007). Empirical work has started to provide evidence of these purported associations (e.g., Davis et al., 2019, 2022; Rhind & Jowett, 2011). However, there is no research to

Table 1
Summary of bivariate correlations, scale ranges, means and standard deviations.

Variables	Communication Strategies		Psychological Safety	Relationship Quality		
	1	2	3	4	5	6
1. Conflict Management	–	.23**	.26**	.19**	.28**	.36**
2.Openess		–	.31**	.43**	.29**	.29**
3. Psychological safety			–	.30**	.29**	.35**
4. Commitment				–	.74**	.70**
5. Closeness					–	.81**
6. Complementarity						–
Mean	5.76	4.84	5.28	5.16	6.02	5.79
Standard deviation	.97	1.15	.92	1.10	.95	.91
Scale range	1–7	1–7	1–7	1–7	1–7	1–7

*$p < .05$, **$p < .01$.

our knowledge that has examined the potential associations between these communication strategies and psychological safety in sport.

Edmondson (2019) has ascertained that communication is fundamental while an interpersonal climate of silence is a dangerous culture. She has further explained that candid, honest, clear, direct, open communication including capacity to listen and ask good questions as well as one's capacity to be curious (as a leader or as a follower or member of a team) can lead to psychological safety. It is further highlighted that communication and a leader that encourages talking to each other makes people more comfortable in doing so and while navigating conflict (including failure) is not always easy, when it is managed well psychological safety is heightened and the benefits accrued from it magnify. Therefore, we proposed the following three hypotheses:

- *Conflict Management* and *Openness* will positively influence *Psychological Safety* within the context of the coach-athlete communication (H1) and
- *Psychological Safety* perceived in the group (team or squad) will influence athletes' *connection* with their coaches as defined by the constructs of closeness, commitment and complementarity (H2)
- *Psychological Safety* in the group (team or squad) will be a mechanism by which the communication strategies of Conflict Management and Openness associate with athletes' perceptions of the coach-athlete relationship quality across gender (H3).

The practical significance of this study lies in the idea that giving voice to all athletes or allowing athletes to feel free to express themselves and manage conflict, regardless of their gender may be key to feeling more psychologically safe (e.g., valued, supported, accepted, cared, spirited) within a group environment that can be inherently competitive by its very nature. In turn, perceived psychological safety within a group, team or squad, may be an important condition for healthy, long-term and collaborative relationships among coaches and their athletes. The interpersonal relationship developed and maintained between coaches and each one athlete is an important aspect to effective coaching (e.g., Côté & Gilbert, 2009; Jowett, 2017) and success in sport and life (e.g., Felton & Jowett, 2013; Gosai et al., 2021).

1. Method

1.1. Participants

Three hundred and seventy-nine participants from both individual and team sports participated in the study (e.g., hockey, cricket, rugby, handball, basketball, archery, javelin, trampoline). The top four sports with the greatest number of participants were hockey (n = 78; 20.6%), cricket (n = 60; 15.8%), rugby (n = 54; 14.2%), and handball (n = 41; 10.8%). Participants included 170 female (44.9%) and 209 male athletes (55.1%) with ages ranging from 17 to 35 years old (M = 21.36; SD = ± 2.66). Participants reported training in their respective sport for an average of 8 years (SD = ± 4.8). The participated athletes competed at "university/first team" (n = 213; 56.2%), "international" and "national" (n = 77; 20.04%), "club" (n = 53; 14%), "county" (n = 20; 5.3%), or "regional" (n = 16; 4.2%) levels.

1.2. Procedure

Ethical approval was granted by the University's ethical committee prior to the data collection phase. Prospective participants (including athletes, coaches and other related sports stakeholders) were contacted via onsite visits and e-mails to raise their interest to the study. Participants (athletes) who expressed an interest in the study were then supplied a participant information sheet which contained detailed information about the study including the aims, requirements, and expectations for participation as well as a consent form. Consented athletes were subsequently asked to complete a multi-section on-line survey. This study forms a part of two larger projects.

1.3. Instrumentation

The Coach-Athlete Relationship Questionnaire (CART-Q; Jowett & Ntoumanis, 2004) was employed to measure the direct perspective of the quality of the coach–athlete relationship. The 11 items assessed: (a) closeness (4 items; e.g. I trust my coach), (b) commitment (3 items; e.g. I am committed to my coach) and (c) complementarity (4 items; e.g. When I am coached by my coach, I am responsive to his/her efforts). These three sub-scales were merged to create a composite variable of relationship quality. The psychometric properties of the CART-Q have been examined in previous research (see, e.g. Jowett & Ntoumanis, 2004; Yang & Jowett, 2013) demonstrating sound reliability and validity. Confirmatory Factor Analysis (CFA) was conducted with this sample revealing acceptable fit for the items of the CART-Q: [$X^2(41) = 5.39$; $p = .001$; $X^2/df = 3.95$; CFI = 0.95; RMSEA = 0.08; P (rmsea<0.05) = 0.001]. Values of composite reliability (CR) were also satisfactory: Closeness = 0.78; Commitment = 0.87; and Complementarity = .83.

The Coach-Athlete Relationship Maintenance Questionnaire (CARM-Q; Rhind & Jowett, 2012). For the purpose of this study, only the two scales of the CARM-Q were utilised: conflict management and openness. Five items assessed conflict management (e.g., I am patient during disagreements.) and 4 items assessed openness (e.g., I state my opinion when we are setting goals). The psychometric properties of CARM-Q have been examined and found sound (e.g, Rhind & Jowett, 2012). CFA showed that the 2-factor model of openness and conflict management presented acceptable fit for this sample: [$X^2(22)$; $p = .013$; $X^2/df = 1.79$; CFI = 0.99; TLI = 0.98; RMSEA = 0.05; P(rmsea<0.05) = 0.593] with satisfactory values of CR for internal reliability: Conflict Management = 0.88; and Openness = .79.

The Psychological Safety Scale (Edmondson, 2019) comprising 7 items was employed to measure athletes' perceptions of psychological

Table 2
Goodness-of-fit indexes of the measurement and structural models.

Model	χ^2	*df*	χ^2/df	*B–S* p	RMSEA (C.I. 90%)	CFI	TLI
Measurement Model	277.02	136	2.037	<.001	.05 (.04–.07)	.95	.94
Structural Model	313.99	138	2.28	<.001	.05 (.05–.06)	.94	.93

Note. N = 379. χ^2 = Chi-Square; df = degrees of freedom; RMSEA = root mean square error of approximation; C.I. = confidence interval; CFI = comparative fit index; TLI = Tucker-Lewis index.

safety within the team. The scale contained items such as "It is safe to take a risk on this team"; and "if I make a mistake on this team, it is not held against me". The psychometric properties of the psychological safety scale have been examined and found sound in sports contexts (see Gosai et al., 2021). CFA showed that the 7-item psychological safety scale reported acceptable fit for this sample: [$X^2(12)$; p = .001; X^2/df = 2.90; CFI = 0.96; TLI = 0.93; RMSEA = 0.07; P(rmsea<0.05) = 0.094] with a satisfactory CR for internal reliability 0.77.

2. Data analysis

2.1. Preliminary analysis

Means, standard deviations (SD) and Pearson correlations were conducted through SPSS 23.0 (see Table 1). Preliminary analysis verified univariate and multivariate normality, missing values, and outliers for all study variables following the procedure outlined by Tabachnick and Fidell (2013).

2.2. Main analysis

Main analysis investigated whether psychological safety mediated the association relationship communication (independent variable) and coach-athlete relationship (dependent variables), which we investigated through a covariance-based structural equation modelling (SEM) on software Amos 23.0 following the two-step model building approach recommend by Anderson and Gerbing (1988). The first step involves testing the measurement model by using a Confirmatory Factor Analysis (CFA), while in the second step the hypothesized structural model is tested. The internal reliability of the measurement model (Step 1) was assessed by composite reliability (CR; Hair et al., 2019), whilst average variance extracted (AVE) was estimated to assess convergent validity (Fornell & Larcker, 1981). CR equal or higher than 0.7 and AVE equal or higher than 0.5 are considered reliable and valid constructs (Fornell & Larcker, 1981).

We used several fit indices to assess the fit of the measurement and structural models according to Hu and Bentler (1999) recommendations: chi square (χ2), Normalized Chi-Square (χ2/df), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and its associated 90% Confidence Interval (CI). CFI and TLI values close to or above 0.95, RMSEA values close to or below 0.08, and the lower end of 90% CI of the RMSEA containing the value of 0.05 represent an excellent fit to the data for the hypothesized model (Hu & Bentler, 1999). Fit quality for the structural model (Step 2) was also assessed through its factor loadings (FL) and individual reliability of items. Based on Kline's (2016) recommendation, the reference for path interpretation included small effect below 0.20; medium effect between 0.20 and 0.49; and large effect above 0.50 (p < .05).

2.3. Mediation analysis

In order to test the theoretical model of the present study, the mediation effects were verified by the indirect effects (Williams & MacKinnon, 2008). Bias-corrected bootstrapped point estimates for the indirect effects of the independent variable on the dependent variable were estimated, considering 95% confidence intervals. Significant indirect effects were considered (alfa = 0.05) if its 90% confidence intervals do not include zero. Bias corrected and accelerated intervals supported by a 1000 samples bootstrapping were used to make inferences. Bootstrapping procedures have been recommended Williams and MacKinnon (2008) as more efficient and powerful detecting indirect effects in smaller samples.

2.4. Multigroup analysis

Once the model demonstrated an acceptable fit to the data, we further tested the invariance of the hypothesized model by systematically constraining the factor loadings and then the factor paths to be equal across gender (Byrne, 2013; Cheung & Rensvold, 2002). When the constraints decreased the model fit by a CFI value of more than .010, and by a RMSEA value of more than 0.015, it was concluded that the hypothesized model was not invariant across groups.

3. Results

3.1. Preliminary analysis

There were no missing values as the lead researcher ensured all surveys were fully completed during data collection. Examination of skewness and kurtosis for all variables indicated univariate normality based on the cut-off values of skewness <3.0 and kurtosis <10.0 (Kline, 2016). Skewness values ranged from −1.49 to 1.34 and the kurtosis

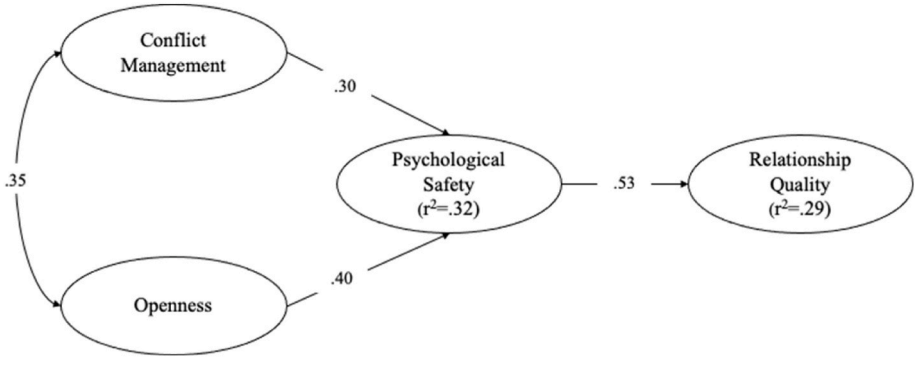

Figure 2. Standardized coefficients are presented; significant at p < .05.

Table 3
Standardized direct and indirect effects for the structural model.

Parameters			β	90% CI	
				Lower	Upper
Direct effects					
Conflict Management	->	Psychological Safety	.30	.16	.42
Openness	->	Psychological Safety	.40	.24	.53
Psychological Safety	->	Relationship Quality	.53	.41	.68
Indirect effects					
Conflict Management	->	Relationship Quality	.16	.06	.21
Openness	->	Relationship Quality	.21	.10	.33

Note: = standardized coefficient; CI 90% = Confidence Interval at 90%.

values ranged from −0.71 to 3.63 (Tabachnick & Fidell, 2013). However, analysis of Mardia's multivariate coefficient (Mardia = 89.23) showed that the data distribution derived from multivariate normality, which justified the use of the Bollen-Stine bootstrap procedure to obtain a corrected Chi-squared value of the estimated coefficients for the Maximum Likelihood Estimator (Bollen & Stine, 1993). We also verified no outliers using the Square Mahalanobis distance (D^2).

3.2. Descriptive statistics and correlational analyses

Table 1 presents the intercorrelations, scale ranges, means and standard deviations for all variables. The mean scores for the CARM-Q sub-scales (Conflict Management and Openness) revealed that athletes perceived relatively moderate to high communication with their coaches (*M* range = 4.84 to 5.76) and for the CART-Q revealed that participants perceive relatively high quality relationship with their coaches (*M* range = 5.16 to 6.02). Further, mean scores showed that players scored relatively high for psychological safety (*M* = 5.28).

The correlations revealed that conflict management and openness were significantly and positively associated with psychological safety (*r* range = 0.26 to 0.31) and all subscales of coach-athlete relationship (*r* range = 0.19 to 0.43). Further, the dimensions of coach-athlete relationship also showed significant and positive correlation with psychological safety (*r* range = .29 to .35).

3.3. Measurement and structural model fit

Initially, we tested a four-factor measurement model through CFA (SEM Step 1) by assessing the relationship of the items/variables analysed with their respective latent factors. Acceptable fit indices were obtained for the measurement model [$X^2(136) = 277.02$; p = .001; X^2/df = 2.04; CFI = 0.95; TLI = 0.94; RMSEA = 0.05; P(rmsea<0.05) = 0.319] (Table 2). Further, local adjustment and the internal reliability of items also proved adequate since all paths had significant factor loadings. In order to assess the convergent validity, AVE was computed. The AVE values were as follows: Conflict management = 0.62; Openness = 0.49; Psychological safety = .30; and Relationship Quality = 0.81 (see composite reliability values under Instrumentation).

In this sense, the latent model was confirmed and enabled for SEM Step 2. Thus, we moved forward on testing the structural model, which also showed acceptable fit to the data (Table 2). As theoretically proposed, positive and significant direct effects were found among variables (Figure 2). Specifically, conflict management and openness positively predicted psychological safety (β = 0.30 and β = 0.40; R^2 = 0.32); which, in turn, positively predicted relationship quality (β = 0.53; R^2 = 0.29).

Hence, we moved forward with examining specific indirect paths, considering conflict management and openness as independent variables predicting relationship quality. All indirect effects were significant via psychological safety. These findings support previous direct effect analysis, showing that psychological safety seems to stand as significant predictor of relationship quality as well as it seems to play a mediating role at the association between conflict management and openness with relationship quality. For detailed information see Table 3.

3.4. Invariance analysis across gender

Multigroup analyses were conducted to examine whether the mediation model differed across gender. The multi-group analysis revealed values of $\Delta\chi^2$, ΔCFI and ΔRMSEA that indicate the existence of invariance between men and women in the factorial structure of the mediation model. It indicates that the direct and indirect effects of the mediation model are invariant across male and female athletes. This was possible to infer based on the ΔCFI and ΔRMSEA between the configurational, metric, structural and residual models (<0.01 and < 0.015, respectively) that there was equivalence of the intercepts of the paths between groups (Wang et al., 2018) (see Table 4).

4. Discussion

Cooperation is key to success (Deutsch, 2006) yet internal competition and pitting athletes or players against each other are an embedded process in competitive sport. It may be that the experience of an interpersonal climate within which athletes (and coaches) are comfortable expressing and being themselves is an important source for thriving in competitive sport (see Gosai et al., 2021). Thus, this study's overarching aim was to explore antecedent and consequent variables of psychological safety in the inherently competitive group environment within which athletes of both team and individual sports operate. With that aim in mind, three hypotheses were formulated. The first hypothesis

Table 4
Goodness-of-fit indexes for the invariance across gender of the structural model.

Models	χ^2	*df*	$\Delta\chi^2$	Δ*df*	P	CFI	ΔCFI	RMSEA	Δ RMSEA
Male *vs* Female									
Configural invariance	449.52	276	–	–	.001	.944	–	.0.041	–
Metric invariance	463.93	291	14.41	15	.001	.945	.001	.0.40	.001
Structural invariance	467.92	294	18.40	18	.001	.944	.000	.0.40	.001
Residual Invariance	478.28	299	28.76	23	.001	.942	.002	.0.40	.001

Note: χ^2 = Chi-Square; df = degrees of freedom; $\Delta\chi^2$ = differences in Chi-Square values; Δdf = differences in degrees of freedom; CFI = Comparative Fit Index; ΔCFI = differences in the Comparative Fit Index values; RMSEA = Root Mean Square Error of Approximation; ΔRMSEA = differences in the Root Mean Square error of Approximation.

proposed that *Conflict Management* (CM) and *Openness* (Op) will positively influence *Psychological Safety* (PS) within a group context, be it a team or squad of athletes. The findings supported this hypothesis and revealed that both CM and Op were associated with PS. In fact, Op was a stronger predictor (.40) than CM (0.30) of PS. On one hand, athletes' capacity to be open with their coaches through stating their opinion when goals are set, providing feedback and sharing openly their feelings, and on the other hand athletes' capability to navigate conflict by managing emotions, being patient, trying to understand and listen during disagreements with the coach were associated with high levels of psychological safety. It is possible that the coach as a leader is the driving force and catalyst in creating a "climate of voice" (Edmondson, 2019, p. 142) whereby athletes feel empowered to open up and thus discuss, share and even deal with challenging interpersonal situations such as conflict and disagreements, as well as failure and errors. This finding also highlights that it is not just coaches' interpersonal knowledge and skills that can impact on psychological safety as purported by Vella et al. (2022) but also athletes' interpersonal knowledge and skills (in this case athletes' capacity to communicate via managing conflict and being collaborative). Moreover, this finding suggests that athletes' interpersonal knowledge and skills, and not just coaches' interpersonal knowledge as Côté and Gilbert (2009) claimed, can be an important dimension to effective coaching.

A climate of voice between a coach and an athlete/s may then transfer within teams or groups of athletes. In a climate of voice, athletes may be willing or empowered to take interpersonal risks (e.g., make mistakes, bring up problems, ask tough questions, embrace diversity) without fear of humiliation or retaliation by their peers. Subsequently, athletes' capacity to communicate with their coaches and feel psychologically safe with their teammates or fellow athletes where everyone's voice is heard and respected is an important ingredient to making the inherently competitive environment of sport happier and kinder (cf. Deutsch, 2006). In such psychological safe environments, athletes are more likely to be able bring their best/whole self to their team/group (cf. Kahn, 1990). Bringing one's best self to the sport field (be it training or competition) translates to maximal learning as athletes are released by the fear of making mistakes or errors and losing or failing all of which can hold them back otherwise (see Edmondson, 2019). Subsequently, talent is less likely to be lost, instead talent is unleashed and nurtured because every athlete believes that the group (team or squad) within which they operate is safe for interpersonal risk taking without fear of embarrassment or retribution – athletes can speak up, can be creative and expressive.

The second hypothesis proposed that *Psychological Safety* (PS) will influence athletes' *connection* with their coaches as defined by the constructs of closeness, commitment and complementarity (3Cs) (H2). This is a hypothesis never tested before to our knowledge. Findings revealed that athletes' relationship quality with their coaches was predicted by their perceptions of PS within the group (team/squad) (.53). Moreover, it was found that all 3Cs defining the relationship quality were positively associated with PS (0.29-0.35). This finding suggests that when athletes find themselves in a psychologically safe group (team/squad) environment, they are likely to maintain quality relationships with their respective coach possibly because PS captures non-toxic, harmless, fearless, and safe athlete to athlete interactions or exchanges. It is possible that coach to athlete communication exchanges (H1) affect athlete to athlete psychological safe exchanges and in turn the quality of the coach-athlete relationship (H2). This is a significant finding as it highlights, that teammates or fellow athletes in a team or squad (group) who feel psychologically safe with one another can predict the quality of the dyadic coach-athlete relationship. Thus, how teammates or fellow athletes interact, relate and communicate may affect the quality of the coach-athlete relationship in terms of trust, respect, appreciation, interpersonal liking (closeness), commitment (long-term orientation toward the dyadic relationship) and co-operative acts of interaction (complementarity). There is also evidence to indicate that coach-athlete relationship quality is associated with athlete subjective performance (e.g., Hampson & Jowett, 2014; Jowett & Nezlek, 2012) and athlete objective performance (Phillips et al., in press), thus psychological safety may relate to athlete performance via coach-athlete relationship quality. This is plausible if one considers Edmondson's (2019) assumption that psychological safety is the engine of performance and not the fuel. Quality coach-athlete relationship by extension as well as communication and coach leadership maybe the fuel in this plausible association. This conjecture warrants investigation in sport to explore the associations of PS and performance accomplishment.

The third and final hypothesis proposed that *Psychological Safety* (PS) will be a process or mechanism by which the communication strategies of Conflict Management (CM) and Openness (Op) associate with perceptions of coach-athlete relationship quality across gender (H3). Analysis revealed that PS mediated the association between the two communication strategies (i.e., CM and Op) and coach-athlete relationship quality and this mediation was invariant for men and women athletes. This finding suggests that psychological safety can explain the association between communication strategies and coach-athlete relationship quality - this association exists because there is psychological safety within the group regardless of the athletes' gender. Thus, practically if the aim is to maintain effective communication via CM and Op and high-quality relationships via the 3Cs, nurturing psychological safety may be crucial. While there is research that has shown that men and women prefer different styles of leadership (e.g., Chelladurai & Saleh, 1978; Cruz & Kim, 2017; Singh et al., 2012) and approaches of relationship and communication (e.g., de Haan & Norman, 2020; Gosselin, 2002; Longshore & Sachs, 2015), this study did not find gender differences. Thus, this finding suggests that both genders value open communication, managing conflict with the coach, psychological safety in the group within which athletes operate, in addition to coach-athlete relationship quality. Moreover, this finding is consistent with Vella et al.'s (2022) evidence-informed model illustrating the antecedents (i.e., interpersonal communication) and consequences (i.e., coach-athlete connection) of psychological safety (see Figure 1).

The model tested resembles an input-process(mediator)-output model known as IP(M)O model (see e.g., Gladstein, 1984; McGrath, 1984; Smittick et al., 2019) of team effectiveness. The basic idea is that at the input stage, athletes communicate freely affecting the team output – in this case relationship quality (team of 2/dyadic coach-athlete relationship quality or team effectiveness) and this association is mediated by psychological safety amongst teammates or fellow athletes. Generally, IP(M)O system models are not linear models and as such all purported associations are expected to affect each other. Correspondingly, it can be said that in our study all the associations hypothesized may affect each other in various ways. Therefore, future research would do well to explore the temporal patterning of these associations as well as cause and effect associations through experimental and/or longitudinal research designs.

Taken together, coaches can influence athletes' outcomes in many ways (e.g., Côté & Gilbert, 2009) and as Edmondson (2019) explained leaders (coaches) are the catalysts for others (athletes) to speak up. The findings of this study would suggest that coaches can create a climate of voice and thus psychologically safety in an inherently competitive sport environment within which athletes (and coaches) operate by encouraging their athletes to engage in candid conversations and in resolving discord. Subsequently, a psychological safe interpersonal environment is not about being "comfortable", instead it is about an environment where everyone is prepared to make valid contributions and as such adhere to high standards, work hard, commit to the objectives set and indeed engage in productive conflict with the aim to learn from different perspective. One way to create psychological safety in a team or squad of athletes requires from coaches to (re)frame what it is like to work in a competitive yet cooperative context. For example, Edmondson explains that, by *reframing failure* (viewing errors and mistakes as parts of the learning process) and by *creating openness* (engaging in candid

conversations), the interpersonal dynamics within a group of people who work together can positively change. Athletes have voice and valuable knowledge that needs to be unlocked by the coaches to allow coaches and athletes alike to create and co-create excellence in competitive sport. The reality is that in competitive sport, neither the coach nor the athlete can do it alone, they both need what the other has to fill the gaps in order to create, innovate and produce extraordinary performances (Jowett & Slade, 2021). Coaching is knowledge-dependent and as a result everyone's voice must be valued and heard (Gosai et al., 2021). There are numerous high-profile examples to indicate that performances at the international stage (e.g., Olympic Games, World Cup) are co-created between coaches and athletes, athletes and athletes and many other individuals (e.g., sport psychologists, biomechanists, physiologists, performance analysts, strength and conditioning coaches) – no one can do it alone in this hyper-connective world of competitive sport.

To truly test the notion of psychological safety and its benefits on learning and innovation in an on-going way is to conduct more research in sport (Taylor et al., 2022; Vella et al., 2022) in the form of longitudinal, experimental and interventional studies. Studies that focus on the potential power of psychological safety to positively change behaviour and to improve performance as well as wellbeing consequentially will be paramount in fully capturing the benefits of psychological safe environments in competitive sport. There is plenty research and theory outside the realm of sport to guide the development and assessment of interventional programmes that can enhance psychological safety in sport groups (cf. Edmondson, 2019). Evidence-based interventions would support coaches to establish healthy environments for their athletes while simultaneously satisfying the directives that sport authorities are calling for, of psychologically safe environments which span all levels of participation and performance (e.g., International Society of Sport Psychology; Henriksen et al., 2020; International Olympic Committee mental health in elite athletes toolkit, 2021; US National Research Council and Institute of Medicine, 2002). Especially, in the presence of numerous reports that uncover the scandalous state of affairs in certain sports across the world (e.g., Gymnastics in UK and US, Athletics/Oregon Project in US, and Football in Argentina), this line of research is practically significant for coaches (and their respective organisations) whose responsibility is to create positive interpersonal environment involving the hearts and minds of their athletes.

This research has limitations, and much work remains to be done. As discussed earlier more sophisticated research utilising quantitative and qualitative designs are needed to understand further the nature, antecedents and consequences of psychological safety in competitive sport. Our study relied on self-reports. Self-reports have the potential for common method variance error. We took steps to alleviate common method variance concerns by conducting factor analysis to establish the discrimination among the constructs employed in this study (Podsakoff et al., 2003). In addition, we ensured that the self-reports were formatted in such a way that the main variables (constructs) under study were presented in alternative order. Combined, these efforts have strengthened our confidence in the validity of the constructs employed and in the results the analysis generated. Another limitation is that the obtained data was analysed at the individual level versus dyadic and/or team level. Despite the size of the sample, its breadth (while useful for heterogeneity) did not allow us to conduct analysis at the different levels. Future work could be done to further test psychological safety as a team/group variable. Last but by no means least, the participants of this study were culturally homogeneous (principally British white) and therefore future research should investigate cultural variations in psychological safety.

Overall, this study highlighted that athletes who have voice and capacity to openly and freely communicate as well as navigate conflict and disagreements effectively with their coaches are more likely to feel psychologically safe with their teammates or fellow athletes and hence more able to take interpersonal risks (e.g., speak up, share information, provide input) without fear of intimidation even in a group environment that is inevitably competitive. Communication that occurs between each athlete and the coach may collectively inform the broader social environment within which athletes operate by setting the culture and interpersonal tone. Such interpersonal conditions further strengthen and maintain one key relationship within sport coaching, namely the coach-athlete relationship. To conclude research suggest that while the coach-athlete relationship and communication are important dimensions to effective coaching (Côté & Gilbert, 2009; Jowett, 2017; Jowett & Slade, 2021), psychological safety may be an aspect in creating cooperative environments in competitive sports and a springboard to athletes' flourishing and thriving in sport and life (Gosai et al., 2021) that must not be neglected.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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