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The development and validation of the Youth Sport Parental Support-Questionnaire (YSPS-Q)

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ABSTRACT

The concept of parental support in youth sport has been well studied, however, the measurement of the construct is not as advanced. Existing sport parenting literature has relied on study-designed instruments and/or psychometric instruments not developed or validated for use in the sport-specific context. The present multi-study research programme sought to develop and validate a theory-informed measure of parental support in youth sport. In study one, athletes’ perceptions of parental support were explored to gain an in-depth qualitative understanding of parental support. The findings from study one were subsequently utilised to inform the generation of initial scale items (70 items) which reflected parental support in study two. Content validity was then established during study two, through an expert panel of judges (n = 5) and members of the target population (n = 7). During study three, retained items (33 items) were administered to a sample of youth athletes (n = 318) for further item reduction and to explore the factor structure of the instrument, utilising exploratory factor analysis (EFA). In study four, a 19-item measure was administered to a second independent sample of youth athletes (n = 319), to confirm the factor structure of the instrument utilising confirmatory factor analysis (CFA). Following minor ad-hoc modifications, the final four-factor, 18-item YSPS-Q (autonomy; emotional; instrumental; informational support) demonstrated excellent model fit. Moreover, the 18-item YSPS-Q demonstrated good reliability, alongside convergent, and divergent validity. The YSPS-Q will enable researchers to effectively evaluate future parent-support programmes, and assist researchers in understanding what factors moderate its effectiveness.

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enjoyment (Furusa et al., 2021; Leff & Hoyle, 1995), and perceived competence (Holt et al., 2008; Power & Woolger, 1994). Similar to social support, parental support can be viewed as a multidimensional construct, comprised of distinct forms of support. Burke et al. (2023b) explored youth athletes’ perceptions of parental behaviours, and subsequently advanced a grounded theory of parental support in youth sport. Results demonstrated that parents provided instrumental, informational, emotional, and autonomy support. Athletes’ personal preferences for support varied across these categories, as perceptions of support were influenced by a multitude of athlete (e.g., performance), parent (e.g., knowledge), and contextual (e.g., sport) factors.

Given the significant body of research devoted to exploring parental involvement in youth sport, it could be assumed that the conceptualisation and measurement of parental support is well advanced. However, the grounded theory developed by Burke et al. (2023b) presents the first theoretical framework detailing constructs of parental support in youth sport. Moreover, previous research has raised concerns over the heterogeneity of instruments being adopted to assess parental support in youth sport, and has identified an absence of theory-informed sport-specific measures, with sound psychometric properties to assess parental support in youth sport (Burke et al., 2021; Knight, 2019).

Initial research investigating parental behaviours in youth sport focused on the impact of parental support on child-athlete outcomes. Leff and Hoyle (1995) examined the influence of parental support on athletes’ enjoyment and self-esteem in sport. The study used a study-designed measure to assess parental support, which comprised of six items assessing athletes’ perceptions of the degree to which their parents spectate at sport events, provide financial assistance, discuss performances, demonstrate pride, provide support following losses, and provide general sport support. Similarly, Van Yperen (1995) examined the impact of perceived parental support on athlete stress. In a similar fashion to Leff and Hoyle (1995), Van Yperen (1995) employed a four-item study-designed measure to assess parental support, which examined athletes’ perceptions of parents’ pride, the parent–child relationship, and general sport support.

Although these study-designed measures in certain instances have demonstrated acceptable reliability (e.g., Leff & Hoyle, 1995), and have allowed researchers to draw conclusions on the impact of parental support on child-athlete outcomes, such study-designed measures have not undergone rigorous psychometric testing. However, inferences drawn from such investigations are only as valid as the psychometric instruments utilised. That is, if the validity of adopted instruments has not been established, it opens the question of the validity of findings (Hagger & Chatzisarantis, 2009). Furthermore, Freeman et al. (2011) stated that the over-reliance on study-designed measures may hinder the synthesis and comparison of research findings across the literature. For example, it is difficult to ascertain whether the results observed are due to properties of the idiosyncratic measures, theoretical support constructs, and/or the context in which the study was conducted (Freeman et al., 2011, p. 56).

Similar to the social support literature (Freeman et al., 2011), one logical explanation for the employment of various questionnaires (i.e., study-designed) to examine parental support is due to the absence of theory-informed sport-specific measures of support, with sound psychometric properties.
Furthermore, previous inventories employed to examine parental involvement in youth sport have failed to assess important dimensions of parental support. For example, the Parental Involvement in Activities Scale (PIAS; Anderson et al., 2003) is a popular inventory commonly employed in sport parenting research (e.g., Azimi & Tamminen, 2022; Dorsch et al., 2017). However, the parental support dimension of the PIAS narrowly assesses athletes’ perceptions of the extent to which their parents facilitate their sport participation and provide choice. Research exploring parental support in youth sport has provided support for the multidimensional nature of parental support, consisting of instrumental, informational, emotional, and autonomy support (Burke et al., 2023a; Holt & Knight, 2014). Although the PIAS (Anderson et al., 2003) seeks to examine athletes’ perceptions of how their parents facilitate their sport participation and provide choice (which one could argue are consistent with instrumental and autonomy support), it falls short of examining athletes’ perceptions of informational and emotional support. Examining aspects of instrumental and autonomy support in isolation provides an incomplete and unreliable representation of parental support. Furthermore, researchers have drawn attention to some significant psychometric concerns with the instrument. Most notably, researchers have reported inconsistent reliability of the measure (Azimi & Tamminen, 2022), and encouraged further psychometric testing on the PIAS to be carried out, to examine the validity of the instrument (Anderson et al., 2003). Moreover, Anderson et al. (2003) did not make reference to any theory or evidence-based literature which informed its development, despite the important role theory plays in the scale development process (Tenenbaum et al., 2012).

A significant advancement within the parenting in youth sport literature has been the development and implementation of parent-education and support programmes (e.g., Dorsch et al., 2017; Lisinskiene & Lochbaum, 2019). These programmes seek to attenuate the stressors experienced by sport parents and promote the provision of positive parental support in youth sport. The implementation of parent-education programmes have contributed to improved parental support and parent–child relationships, and enabled parents to develop interpersonal skills (e.g., communication skills; Dorsch et al., 2017; Lisinskiene & Lochbaum, 2019; Thrower et al., 2017). Moreover, programmes have had a positive impact on athlete-outcomes. For example, following the implementation of a parent-support programme, Tamminen et al. (2020) demonstrated reduced athlete anti-social behaviour, while Dorsch et al. (2017) reported significant changes in child competence and child stress. However, despite the potential of such programmes, Burke et al. (2021) demonstrated that there is a clear absence of validated, sport-specific measures available to examine changes in parental involvement and to evaluate the efficacy of parent-education programmes. For example, general psychometric instruments (e.g., Parent–Adolescent Communication Scale; Barnes & Olson, 1985; Parental Authority Questionnaire; Buri, 1991) are currently being utilised to examine changes in parents’ behaviour and involvement in youth sport, and evaluate the effectiveness of parent-education programmes (Burke et al., 2021). However, such psychometric instruments have not been developed or validated for use in a sport-specific context. As such, the content validity of such instruments in sport may be called into question, as they assess general parental behaviours, and do not evaluate parental behaviours that are of particular pertinence to the youth sport environment. Such findings are consistent with Hagger and Chatzisarantis (2009), who concluded that the validity of psychometric
instruments in sport and exercise psychology research are frequently too far removed from the context of interest to be transferable.

Researchers have purported that psychometric instruments should be developed for a specific purpose, target population, and situational context in which they are employed (Bianco & Eklund, 2001; Collins & Cruickshank, 2017; Freeman et al., 2011). In a review of sport and exercise psychology measurements, Gill (1997) stated that a substantial advancement within the field was the development and validation of sport-specific instruments pertinent to sport and exercise psychology behaviours. Despite such knowledge, general measures continue to be used to evaluate parent-education programmes in youth sport. As a result, Burke et al. (2021) concluded their review by confirming challenges exist in successfully evaluating the effectiveness of parent-support programmes, due to the sparsity of psychometrically sound, theoretically informed measures of parental support in youth sport. Such findings are echoed by Knight (2019) who suggested that, at present, there is an absence of measures available to examine changes in sport parents’ behaviour and/or involvement in youth sport. As such, Burke et al. (2021) encouraged future researchers to engage in systematic and rigorous scale development research, with a view to developing and validating theory-informed measures of parental involvement and parental support in youth sport.

The development and validation of a measure of parental support will enable researchers and practitioners to examine changes in parents’ supportive behaviour (Knight, 2019), and also evaluate the efficacy of future parent-education programmes (Burke et al., 2021). Moreover, as stated, parental support is a multidimensional construct, consisting of informational, instrumental, emotional, and autonomy support (Burke et al., 2023b). Beyond evaluating parent-education programmes, the development and validation of a parental support in youth sport questionnaire will allow researchers to explore which dimensions of support are most beneficial for various athlete outcomes and contexts (Freeman et al., 2011).

Furthermore, the development and validation of a measure of parental support could help address a number of important concerns. For example, it would eliminate the limitations of study-designed measures, and allow researchers to synthesise findings pertaining to parental support across the literature, and investigate if there are any factors which influence or moderate its effectiveness (Freeman et al., 2011). As such, the development and validation of a theory-informed measure of parental support, with sound psychometric properties, is critical to enhancing the understanding of the impact of parental support in youth sport.

The present research programme

The purpose of the present research programme was to develop and validate the Youth Sport Parental Support-Questionnaire (YSPS-Q), which assesses athletes’ perceptions of parental support within the youth sport environment. The process of developing and validating the YSPS-Q encompassed a multi-study approach. Study one included a qualitative exploration of athletes’ perceptions of parental support in youth sport using focus groups. Participants were utilised as “active agents” (Paradis et al., 2014) in this process to gain an in-depth understanding of parental support, and advance a grounded theory of parental support in youth sport (see Burke et al., 2023b). Study two utilised the advanced
grounded theory and a literature review to inform the generation of items which reflected the four dimensions of parental support; autonomy, emotional, instrumental, and informational support. Following this, content validity was assessed using an expert panel and target population panel who were recruited to assess the content validity of the developed items providing both quantitative and qualitative feedback. Study three included exploring the factor structure of the scale through exploratory factor analysis and item reduction. Study four further assessed the factor structure of the YSPS-Q via confirmatory factor analysis. Additionally, measurement invariance, convergent and discriminant validity, and reliability of the YSPS-Q were also established during this final study. Institutional ethical approval was granted from the authors’ institution for all phases of the research (i.e., studies 1–4).

**Study one: qualitative exploration of parental support**

When engaging in scale development and validation research, it is incumbent on researchers to not “overlook the importance of being grounded in the substantive theories related to the phenomenon to be measured” (DeVillis, 2017, p. 103). That is, it is important that relevant social science theories, pertinent to the construct, are considered prior to the scale development process. Moreover, if there is a dearth of theoretical frameworks to guide the development process, researchers should aim to advance their own conceptual models or develop a theoretical model to guide the scale development process (DeVillis, 2017).

Given the infancy of theoretical frameworks to guide research and practice in the area of parental support in youth sport, the authors sought to advance a substantive grounded theory of parental support in youth sport, to guide the development of the YSPS-Q. An in-depth and detailed report of the advanced grounded theory is provided elsewhere (see Burke et al., 2023b), and thus not fully repeated here, however a brief overview is presented.

**Methods**

Within this qualitative research, a grounded theory methodology was adopted (Corbin & Strauss, 2015), whereby youth athletes’ perceptions of parental support were explored. More specifically, 61 female youth athletes participated in 14 online focus-groups. Participants were recruited from seven countries, across three continents (Australia, Canada, England, Finland, Ireland, New Zealand, and Scotland). Data were analysed in three phases consistent with grounded theory: open coding; axial coding; and theoretical integration. During the first phase of open-coding, transcripts were coded line-by-line, whereby the research team identified and categorised data, pertaining to parental support. During axial coding, identified concepts were organised into categories and sub-categories. The final phase consisted of theoretical integration, whereby the core category of the grounded theory was identified (i.e., individual parental support preferences). Furthermore, relationships between the core category and sub-categories of parental support, factors influencing perceptions of support, and bi-directional communication were also identified during this phase (Corbin & Strauss, 2015). Data analysis began following the first data collected, in line with grounded theory procedures, allowing the
authors to identify concepts that required further examination in subsequent data collection (Holt et al., 2008). This iterative process between data collection and analysis allowed the authors to identify when theoretical saturation had been reached.

The following techniques were adopted to enhance methodological rigour: methodological coherence, theoretical sampling, and constant comparison (Corbin & Strauss, 2015). Moreover, co-authors acted as critical friends throughout the data analysis phase (Smith & McGannon, 2018; see Burke et al., 2023a for further details). 

**Results**

The advanced grounded theory of parental support demonstrated that parents provided four types of support in youth sport, namely, autonomy, emotional, informational, and instrumental support (see Figure 1). Autonomy-support included the provision of opportunities and choice for sport participation and development. Emotional support was characterised by behaviours displayed by parents which provide comfort and security and demonstrate unconditional love to their child(ren). Informational support was the provision of advice pertaining to the technical, tactical and strategic elements of sports performance. Instrumental support was characterised by the provision of financial, logistical (e.g., transport and scheduling support) and functional assistance (e.g., preparing equipment). Furthermore, results revealed that bi-directional supportive communication acted as a facilitative process in the provision of parental support.

**Discussion**

This qualitative phase of the research programme explored athletes’ perceptions of parental support and served multiple purposes. Firstly, it allowed youth athletes to be utilised as “active agents” in expressing their meaning of the construct (Paradis et al., 2014), and provided an in-depth understanding of athletes’ perceptions of parental support. This
qualitative exploration of athletes’ perceptions of parental support was subsequently utilised to inform the generation of scale items in study two. Moreover, it enabled the research team to advance a definition of parental support in youth sport, a critical step in the scale development process (Tenenbaum et al., 2012). Parental support was subsequently defined as “behaviours exhibited that demonstrate unconditional love and align with the preferences of their child(ren) that facilitate a safe and trusting environment to freely participate in sport”.

**Study two: item generation and content validity of the YSPS-Q**

In study two, the research team sought to develop an initial version of the Youth Sport Parental Support Questionnaire (YSPS-Q), and examine its content validity, employing an expert and target population panel to appraise the generated items.

**Methods**

**Item generation**

DeVillis (2017) recommended the development of scale items drawing on both inductive and deductive methods. Therefore, in line with best practice, the generation of the item pool was first compiled inductively, utilising the grounded theory of parental support in youth sport outlined in study one (Burke et al., 2023b). Existing literature detailing parental support in youth sport was also drawn upon to inform the development of the item pool (deductive). As such, findings from Burke et al. (2023a), in addition to the sport parenting literature was used to guide the generation of scale items.

The authors developed an initial pool of 70 items, which reflected the construct of interest and represented the various dimensions of parental support, namely, autonomy support (13 items), emotional support (16 items), informational support (16 items), instrumental support (16 items), and supportive communication (11 items). The initial pool of generated items comprised of both positively and negatively worded items. Negatively worded items (e.g., my parent(s) make negative comments when I play poorly) represented low levels, or an absence of parental support. Given that long scale items often increase complexity and decreases item clarity (DeVillis, 2017), care was taken to avoid developing overly long items and double-barrelled items (i.e., items that convey two or more ideas).

Directions given to respondents and the response format was clarified. The following directions were given to respondents: “Please read each of the statements listed below and tell us how much you agree with each statement by ticking the appropriate response. You can only tick one answer per statement. Remember that you are completing this questionnaire anonymously and that there are no right or wrong answers. If you are currently participating in more than one sport, the questions are about the sport that you are most involved in”. A 5-point Likert-type scale was the chosen response format, with the following anchors: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, 5 = *strongly agree*. A 5-point Likert-type scale is widely used in instruments measuring beliefs and attitudes (DeVillis, 2017) and has been identified as appropriate when developing scales for youth (Hall et al., 2009; Martin et al., 2012). As such, a 5-point Likert-type scale was deemed appropriate for the YSPS-Q to assess youth athletes’ perceptions.
**Expert review**

Content validity was examined via two steps. First, in line with best practice guidelines (Boateng et al., 2018), the initial list of items were reviewed by a panel of expert judges \( n = 5 \), who were knowledgeable in the content area. This phase is crucial to the scale development process, as it enables researchers to gain feedback on items’ wording, clarity, conciseness, and relevance (Dunn et al., 1999). Furthermore, it also allows for the identification of missing items (DeVillis, 2017). When developing psychometric instruments in the field of sport and exercise psychology, researchers have historically failed to report the content validity process appropriately (Dunn et al., 1999). In order to avoid this, and enhance transparency, consideration was given to the characteristics and number of expert judges recruited, the procedures utilised to rate the relevance of each item, and the criteria used to establish whether items were discarded, modified, or included in the scale.

**Target population review**

The retained items from the expert panel were further reviewed by a target population panel (i.e., youth athletes). This allowed the authors to establish if the retained items represented parental support in youth sport, were comprehensible by youth athletes, and were appropriate for both team and individual sports (DeVillis, 2017; Harwood et al., 2019).

**Participants**

The expert panel was independent to those who generated the item pool, to ensure that there was no bias in their assessment of items (Boateng et al., 2018; Dunn et al., 1999). A total of 10 experts were invited via email to partake in the item appraisal process. The final expert panel consisted of five recognised academics, all of whom had an extensive portfolio of peer-reviewed published research, pertaining to parenting in youth sport. More specifically, all members of the expert panel possessed a PhD qualification, and had an average of 14.3 years of experience conducting and disseminating research. Job titles held by members of the expert panel included: Professor, Associate Professor, and Senior Lecturer. A minimum panel of five experts is suggested to avoid any chance agreements (Boateng et al., 2018; Lynn, 1986).

Participants on the target population panel were purposefully sampled from National Governing Bodies (NGBs), sport organisations, and sport clubs. The target population panel comprised of seven youth athletes, five male youth athletes and two female youth athletes. The youth athletes were aged 12–17 years \( (M_{age} = 15.0) \). Athletes had been participating in youth sport for 7–12 years \( (M = 9.7 \) years). Members of the target population participated in a range of sports, namely, GAA Gaelic football \( (n = 6) \), GAA hurling/camogie, golf \( (n = 2) \), basketball \( (n = 3) \), soccer \( (n = 2) \), rugby \( (n = 4) \), and fishing \( (n = 1) \). Members of the target population participated in sport at various levels, including recreational \( (n = 2) \), developmental \( (n = 3) \), and high-performance \( (n = 2) \) levels.

**Procedure**

Expert judges were provided with a content validity package, which provided the judges with information pertinent to the project background and development of the scale (i.e.,
inductive and deductive approach). This document also provided the expert panel with definitions of the construct (i.e., parental support) and dimensions (i.e., autonomy support, emotional support, informational support, instrumental support, and supportive communication), alongside the results from the qualitative phase, which informed the development of the instrument (Burke et al., 2023b).

To establish item content relevance (Dunn et al., 1999), expert judges were asked to read each item and rate the degree to which the content of each item reflected the conceptual definition of its dimension, on a 5-point Likert-type scale (1 = poor match − 5 = excellent match). To evaluate the wording of items, expert panellists were provided with a comments section to allow them to provide qualitative feedback and make any additional comments about the suitability and wording of each item (e.g., clarity, conciseness, grammar, reading level, and redundancy). The comments section also enabled panel members to make recommendations in which the item could be improved. The expert judges provided their final recommendation for each item (i.e., modify, retain, remove). Lastly, another service that expert panel members provide is highlighting ways of measuring the construct which the research team may have not considered (DeVillis, 2017). Therefore, expert panel members were provided with a concluding comments section and asked for any alternative items.

Similar to the expert panel, members of the target population were provided with a target population panel package. The first section contained a demographic questionnaire. The target population were asked to complete questions pertaining to their age, gender, sport participation, and ethnicity. The second section contained a copy of the preliminary items, following feedback from expert judges. Participants were first asked to assess the items for clarity, by underlining any words or statements they felt were unclear or confusing (Harwood et al., 2019). Members of the target population were provided with two questions pertaining to item comprehension and applicability: (1) Are there any statements that you find confusing or difficult to understand? If so, what statements and why? (2) Are there any statements that you think do not relate to your sport environment or that are not important for your sport? If so, why? Finally, the third section of the package provided the target audience with the first page of the preliminary YSPS-Q, including directions for respondents. Members of the target population were asked to complete the first page of the questionnaire and answer the following questions: (1) Are the instructions for the Youth Sport Parental Support Questionnaire easy to follow? (2) Had you any difficulties completing the Youth Sport Parental Support Questionnaire? and (3) Is there anything you would change about the format of the Youth Sport Parental Support Questionnaire? (Harwood et al., 2019) The panel completed the package independently.

Results

Expert judges reviewed items independently. The combined scores from all expert judges were calculated. Items with an average rating of 3.0 or more were retained, while items with an average rating of less than 3.0 were removed. In total, 51 items received an average rating of 3.0 or greater, however, 19 items did not meet this threshold and were subsequently removed. Reviewers’ comments were considered. Although 51 items received an average rating of 3.0 or greater, there were 18 items which expert judges felt were redundant, too abstract, or too complex. For example, item 3.4 "My
parents pay fees for me to compete in sport” was considered too similar to item 3.1 “My parents provide me with the financial support that I need for my sport”. As a result, item 3.4 was removed. In total, 18 items were removed following qualitative feedback from expert judges, and 33 items were retained for further analyses. More specifically, 11 items ($M = 3.0–4.4$) pertaining to emotional support, 3 items ($M = 3.4–4.4$) pertaining to informational support, 7 items ($M = 3.8–4.8$) pertaining to instrumental support, 6 items ($M = 3.0–4.2$) pertaining to autonomy support, and 6 items ($M = 3.0–4.6$) pertaining to supportive communication were retained.

Results from the target population panel revealed that there was one item which youth athletes found confusing or difficult to understand. Three members of the target audience revealed that the item “My parents give me welcomed sporting advice” was unclear. More specifically, youth athletes revealed that they were unsure of what the word “welcomed” meant. As a result, the research team amended the wording of the item to “My parents give me helpful sporting advice”. Members of the target population panel revealed that all items were pertinent to their sport environment. Furthermore, members of the target population panel indicated that the respondent instructions provided within the YSPS-Q were easy to understand, and that they had no difficulties completing the YSPS-Q. Finally, youth athletes provided no suggested amendments to the format of the instrument.

Discussion

Study two sought to develop an initial version of the YSPS-Q, and examine its content validity. An expert and target population panel were employed to appraise the generated items, enabling the authors to gain feedback on the developed items’ wording, clarity, and relevance (Dunn et al., 1999), an integral element of the scale development process (DeVillis, 2017). Moreover, this review process allowed the authors to establish if the items were comprehensible by youth athletes. Following the content validity review process, 33 items were retained for exploratory factor analysis of the YSPS-Q in study three.

Study three: exploratory factor analysis of the YSPS-Q

The next step was to assess the factor structure of the YSPS-Q, explore relationships between items, and conduct further item reduction.

Methods

Exploratory factor analysis (EFA) is a multivariate statistical method, that has become a fundamental tool in the development and validation of psychometric instruments (Watkins, 2018). It is a complex statistical procedure (Costello & Osborne, 2005), which allows researchers to examine the factor structure of an instrument and examine the relationships between items. An EFA was employed to examine the factor structure of the YSPS-Q. Following institutional ethical approval (approval number: REC/022/011), participants completed an online survey, available on the JISC Online Survey System. Research has demonstrated that online psychometric data collection procedures are an
accurate and valid alternative to paper-based surveys (Lonsdale et al., 2006). Participants were recruited through the distribution of survey information to National Governing Bodies (NGBs), sport organisations, and sport clubs. Additionally, information pertinent to the survey was distributed on the research teams’ social media channels (Facebook, Twitter, Instagram). Data was collected from May to July 2022.

Participants
When conducting factor analysis, it is suggested researchers should strive to obtain samples of 300 or more for greater confidence in results (Tabachnick & Fidell, 2013). Thus, a sample of 318 participants were recruited for phase three (i.e., EFA). The sample comprised of 160 females (50.3%) and 152 males (47.8%). Additionally, one participant identified as non-binary (0.3%), two participants identified as intersex (0.6%), and three participants did not reveal their gender (0.9%). Participants’ ages ranged from 12 to 18 years ($M_{age} = 14.75$ years; $SD = 1.72$). Participants reported residing in the following countries: Republic of Ireland (49.7%), Northern Ireland (29.5%), United States of America (9.1%), England (2.5%), Scotland (1.9%), United Kingdom (1.6%), Canada (1.6%), Netherlands (1.3%), Sweden (0.9%), Belgium (0.3%), Bermuda (0.3%), Finland (0.3%), New Zealand (0.3%), Poland (0.3%), and Wales (0.3%). Athletes were asked to report the sport that they were most involved in, which included golf (28.9%), GAA Football (18.6%), GAA Hurling/Camogie (12.3%), swimming (9.4%), soccer (6.6%), ice-hockey (5%), rugby (3.8%), cricket (3.5%), athletics (2.5%), netball (2.2%), tennis (1.9%), field hockey (1.6%), basketball (1.3%), triathlon (0.6%), cycling (0.6%), baseball (0.6%), gymnastics (0.3%), and American football (0.3%). Athletes revealed that they were participating in these sports at a recreational level (1.9%), organised competition level (30.2%), development pathway level (36.8%), elite/ high-performance level (29.9%), or professional level (1.3%).

Measures
An online questionnaire package included the participant information sheet, assent form, demographic questionnaire, and YSPS-Q.

Demographic Questionnaire. Prior to completing the YSPS-Q, athletes completed a demographic questionnaire, which gathered the following information: age, gender, ethnicity, sports, level of sports participation, length of time participating in sport, sport most involved in, hours dedicated to playing and training per week, and parent most involved in their sports.

Youth Sport Parental Support-Questionnaire (YSPS-Q). The initial 33-item version of the YSPS-Q employed in study three measured athletes’ perceptions of parental support in youth sport. The preliminary measure consisted of five sub-scales, measuring autonomy support, emotional support, informational support, instrumental support, and supportive communication. Responses were provided on a 5-point Likert-type scale (1 = strongly disagree – 5 = strongly agree).
Data analysis

Factor structure

Exploratory factor analysis (EFA) utilising principal axis factoring (PAF) and an oblique rotation (promax) was conducted using IBM SPSS (Version 28). Factor analysis (i.e., PAF) is preferable to principal components analysis (PCA), as researchers have suggested that PCA does not differentiate between unique and shared variance (Costello & Osborne, 2015). Additionally, Fabrigar et al. (1999) stated that PAF is less sensitive to data that is not normally distributed. An oblique rotation (promax) was selected as it was hypothesised that underlying factors of parental support would be correlated (Costello & Osborne, 2005). The Kaiser criteria, which identifies eigenvalues > 1.0, was initially utilised to identify the number of factors to retain (Tabachnick & Fidell, 2013). However, researchers have suggested that this is an inaccurate method for identifying the appropriate number of factors (Costello & Osborne, 2005; Velicer & Jackson, 1990). Therefore, parallel analysis (O’Connor, 2000) was subsequently employed to identify the number of factors to retain.

Following EFA, scale refinement was carried out. The criteria for item retention were: (1) a pattern loading > .45; (2) cross-loadings < .32; and (3) communalities > .40 (Comery & Lee, 1992; Costello & Osborne, 2005; Tabachnick & Fidell, 2013). Items that did not meet the aforementioned cut-off values were removed.

Reliability and validity

Internal consistency reliability of the YSPS-Q and associated subscales was examined using Cronbach’s alpha coefficient ($\alpha$). DeVillis (2017) stated that $\alpha$ values > .70 is acceptable.

Results

Factor structure

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .932, indicating that the data was very appropriate for factor analysis (Tabachnick & Fidell, 2013). Moreover, the Bartlett’s test of sphericity was significant (< .001), indicating again that the matrix was suitable for factor analysis (Tabachnick & Fidell, 2013). The Kaiser criteria initially identified six factors, with eigenvalues > 1.0. However, due to the inaccuracy of this method (Costello & Osborne, 2005; Velicer & Jackson, 1990), parallel analysis (O’Connor, 2000) was also conducted, which suggested a four-factor model was appropriate.

Factor loadings ranged from .317 to .939 (see Table 1). Comery and Lee (1992) proposed that factor loadings greater than .71 are excellent, .63 very good, .55 good, .45 fair, and less than .32 poor. In line with these guidelines, items with factor loadings < .45 were first deleted, which resulted in nine items being removed. Following this, items that possessed cross loadings > .32 were removed (Costello & Osborne, 2005), which resulted in two items being deleted. Finally, items with extracted communalities < .40 were also removed (Costello & Osborne, 2005), which removed one item. Following item reduction, only two items remained in factor five and zero items remained in factor six. Given the unreliability of factors with fewer than three items (Costello & Osborne, 2005), factors five and six were removed, resulting in a four-factor model. This aligned with the results of the parallel
analysis, which suggested that a four-factor model was appropriate. The four-factor model explained 55.92% of variance in the data. Examination of the model revealed that the four factors represented autonomy, emotional, instrumental, and informational support. Following EFA, it was evident that rather being a distinct subscale, items pertaining to supportive communication were embedded across the four dimensions of parental support. For example, "I talk with my parent(s) about what I need in my sport" loaded onto the autonomy support subscale. In the next phase of the scale validation process, the authors did not attempt to include this factor again. Therefore, the retained factorial structure of the YSPS-Q following EFA included 19 items divided into four factors.

### Reliability

Following EFA, the reliability of the 19-item four factor YSPS-Q was examined. With regards scale reliability, the YSPS-Q exhibited acceptable internal reliability (α = .890).
YSPS-Q subscales also yielded acceptable internal reliability (autonomy support $\alpha = .874$; emotional support $\alpha = .906$; informational support $\alpha = .841$; and instrumental support $\alpha = .805$).

**Discussion**

Building on study two, which examined the content validity of the instrument, study three examined the factor structure of the YSPS-Q and provided preliminary evidence for the factorial validity of the instrument. Results from exploratory factor analysis revealed that a four-factor model, which included autonomy, instrumental, informational, and autonomy support was appropriate. This was subsequently supported by parallel analysis. During the process of EFA and scale refinement, 14 items were removed. The 19-item YSPS-Q was subsequently examined in study four, to confirm the factor structure of the instrument. The four-factor YSPS-Q also demonstrated acceptable internal consistency reliability. Importantly, the factors aligned with the grounded theory of parental support which underpinned the development of the instrument (Burke et al., 2023b).

**Study four: confirmatory factor analysis of the YSPS-Q**

Within study four, the factor structure of the YSPS-Q, utilising confirmatory factor analysis (CFA) was assessed with an independent sample of participants. Furthermore, the reliability, measurement invariance, and convergent and discriminant validity of the YSPS-Q were also established.

**Methods**

A CFA is frequently adopted in the latter stages of scale development research, after the underlying structure of the instrument has been established via EFA (Brown, 2015). A CFA allows researchers to confirm the number of underlying factors in an instrument and the pattern of item-factor relationships (Brown, 2015). Following institutional ethical approval (approval number: REC/22/011), participants completed an online survey via the JISC Online Survey System. Participants were recruited by distributing the survey information to NGBs, sport organisations, and sport clubs. Additionally, information pertinent to the survey was distributed on the research teams’ social media platforms (Facebook, Twitter, and Instagram).

**Participants**

When engaging in scale validation research, is it common for researchers to carry out cross case validation with independent samples ideally consisting of 300 or more (Tabachnick & Fidell, 2013). Therefore, an independent sample of 319 participants were recruited for study four (i.e., CFA). The sample comprised of 123 females (38.6%) and 195 males (61.1%). Additionally, one participant identified as “other” (0.3%). Participants were aged 12–18 years ($M_{age} = 14.65$ years; $SD = 1.77$), and resided in the following countries: Republic of Ireland (38.2%), Northern Ireland (17.5%), United States of America (29.5%), England (4.4%), Australia (3.4%), Canada (2.8%), United Kingdom (1.3%), Belgium (0.3%), Denmark (0.3%), Kenya (0.3%), Latvia (0.3%), Netherlands (0.3%), Scotland
Participants reported the sport they were currently most involved in, which included GAA Football (5.4%), GAA Hurling/Camogie (6.9%), ice-hockey (16.9%), golf (13.5%), rugby (10.3%), soccer (5.3%), athletics (4.1%), cricket (4.1%), field hockey (3.8%), swimming (3.8%), gymnastics (3.4%), volleyball (3.4%), tennis (2.2%), archery (1.6%), triathlon (1.6%), netball (0.6%), martial arts (0.6%), American football (0.3%), baseball (0.3%), basketball (0.3%), curling (0.3%), cycling (0.3%), handball (0.3%), table tennis (0.3%), and squash (0.3%). Athletes were participating in these sports at a recreational level (1.9%), organised competition level (31%), development pathway level (28.8%), elite/high-performance level (37.3%), and professional level (0.9%).

Measures
An online questionnaire package included the participant information sheet, assent form, demographic questionnaire, YSPS-Q, Sport Commitment Questionnaire-2 (enthusiastic commitment, constrained commitment, and sport enjoyment subscales), and Intrinsic Motivation Inventory (sport competence subscale). Information pertaining to the demographic questionnaire and YSPS-Q are detailed in study three, and are therefore not repeated here.

Sport Commitment Questionnaire-2 (SCQ-2). The Sport Commitment Questionnaire-2 (SCQ-2; Scanlan et al., 2016) measures athletes’ commitment to persist in sport over time. The development of the SCQ-2 was informed by the Sport Commitment Model (Scanlan et al., 2013), and is made up of 58 items and 12 subscales, consisting of both enthusiastic commitment; representing athletes’ desire to persist in a sport over time, constrained commitment; representing athletes’ perceptions of obligation to persist in a sport over time, and 10 sources of commitment. Responses were provided on a 5-point Likert-type scale (1 = strongly disagree – 5 = strongly agree). Research has reported acceptable fit of the factor structure and internal consistency of the test subscales, demonstrating the validity and reliability of the SCQ-2 (Sánchez-Miguel et al., 2019; Scanlan et al., 2016). For the purpose of the current research, the sport enjoyment subscale (5 items) of the SCQ-2 was administered to assess the convergent validity of the YSPS-Q, while the enthusiastic commitment (6 items) and constrained commitment (5 items) subscales were administered to assess the discriminant validity of the YSPS-Q.

Intrinsic Motivation Inventory (IMI). The Intrinsic Motivation Inventory (IMI; Ryan, 1982) is an 18-item measure of individuals’ intrinsic motivation, as a function of the underlying dimensions of interest-enjoyment, perceived competence, effort, and pressure-tension. Responses were provided on a 5-point Likert-type scale (1 = strongly disagree – 5 = strongly agree). McAuley et al. (1989) examined the psychometric properties of the IMI in competitive basketball, which demonstrated acceptable fit and internal consistency for the instrument (α = .85), and sport competence subscale (α = .80). The perceived sport competence subscale (5 items) was used to assess the convergent validity of the YSPS-Q.
**Data analysis**

**Factor structure**
A CFA using maximum likelihood estimation was conducted in study four with IBM SPSS Amos (Version 28), to confirm the factor structure of the YSPS-Q. Data were examined for normality, which revealed that the data was not normally distributed. Given that normally distributed data is a prerequisite for CFA, Bollen-Stine bootstrapping was carried out with 5000 samples, to increase the validity of parameter estimates (Nevitt & Hancock, 2001).

The chi-square statistic ($\chi^2$), comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardised root mean square residual (SRMR), have been reported to be the most important indices for reporting model fit (Hu & Bentler, 1999; Tabachnick & Fidell, 2013), and were therefore selected to determine model fit. However, research has suggested the chi-square is sensitive to large sample sizes (Brown, 2015). That is, with large sample sizes ($N > 200$), the chi-square statistic often produces a significant result ($p < .05$; Brown, 2015). Therefore, this statistic was approached with caution. Research has suggested the following scores for model fit indices: CFI and TLI of $\geq .95$ = good fit, $0.90 - 0.95$ = reasonable fit; RMSEA $\leq .05$ = good fit, $0.05 - 0.08$ = reasonable fit, $0.08 - 10$ moderate fit; SRMR $< .06$ excellent fit, $<.08$ moderate fit (Bentler, 1990; Hu & Bentler, 1999).

**Measurement invariance**
Tests of measurement invariance were also conducted using multigroup CFA, to examine if the YSPS-Q measures parental support in the same way across sub-groups (i.e., males and females; individual and team sport athletes; Wang et al., 2018). The procedure for determining measurement invariance of the YSPS-Q was followed as described by Byrne (2010). More specifically, configural, metric, and scalar invariance, were tested.

**Reliability and validity**
Internal consistency reliability of the YSPS-Q was examined using Cronbach’s alpha ($\alpha$) coefficient. Moreover, convergent validity is evidenced when theoretically related constructs are shown to be related (e.g., Martin et al., 2013; Paradis et al., 2014). Research examining parental involvement in youth sport has previously proposed that parental support is associated with sport enjoyment and sport competence (Leff & Hoyle, 1995; Power & Woolger, 1994). Therefore, a measure of sport enjoyment (SCQ-2 enjoyment subscale) and sport competence (IMI competence subscale) were used to examine the relationship between parental support, sport enjoyment, and sport competence, to assess convergent validity. It was hypothesised that scores of parental support would be significantly and positively related to scores of sport enjoyment and sport competence. Correlations (spearman’s rho) were used to examine the convergent validity of the YSPS-Q.

Discriminant validity is evidenced when theoretically probable differences between constructs are demonstrated (e.g., Martin et al., 2013; Paradis et al., 2014). The construct of sport commitment was employed to assess discriminant validity of the YSPS-Q. Sport commitment comprises of two distinct forms of commitment: enthusiastic commitment (adaptive commitment), and constrained commitment (maladaptive commitment; Scanlan et al., 2016). It was hypothesised that parental support would demonstrate
distinct relationships with enthusiastic and constrained commitment. More specifically, it was hypothesised that dimensions of parental support would be positively correlated to enthusiastic commitment, and that dimensions of parental support would be inversely related to constrained commitment. To examine the discriminant validity of the YSPS-Q, correlation analysis (Spearman’s rho) was conducted. To provide further evidence of discriminant validity, correlations between YSPS-Q subscales were also examined, by conducting correlational analysis (Spearman’s Rho). In line with guidelines from Field (2018), correlations of 0.1 were considered small, 0.3 medium, and 0.5 large.

**Results**

**Factor structure**

The CFA demonstrated acceptable fit for the 19-item, four factor YSPS-Q. Results produced a statistically significant model with acceptable fit indices, however as previously indicated, this often occurs with large sample sizes (Kline, 2016): ($\chi^2 = 351.186; df = 146; p < .000; CFI = .940; TLI = .930; RMSEA = .066; SRMR = .0598$). Factor loadings were significant ($p < .000$) and ranged from .581 to .902.

In an effort to identify a parsimonious best fitting model, factor loadings were examined and minor modifications were completed. Given factor loadings > .60 are considered very good (Comery & Lee, 1992), items below this cut-off were deleted. This resulted in one item from the autonomy support subscale with a factor loading .581 being removed (i.e., I struggle to communicate with my parent(s) about my sport). A final CFA was conducted with the 18-item YSPS-Q, which produced a statistically significant model with good fit indices: ($\chi^2 = 296.755; df = 129; p < .000; CFI = .949; TLI = .939; RMSEA = .064; SRMR = .0602$). All factor loadings (see Table 2) were significant ($p < .000$), which ranged from .613 to .902; very good to excellent factor loadings (Comery & Lee, 1992).

**Table 2. Factor loadings for 18-item CFA.**

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>My parent(s) are clearly frustrated with me if I play poorly</td>
<td>.902</td>
</tr>
<tr>
<td>My parent(s) get angry when I play poorly</td>
<td>.851</td>
</tr>
<tr>
<td>My parent(s) clearly show disappointment in me when I play poorly</td>
<td>.858</td>
</tr>
<tr>
<td>My parent(s) shout at me after I play poorly</td>
<td>.807</td>
</tr>
<tr>
<td>My parent(s) make negative comments when I play poorly</td>
<td>.754</td>
</tr>
<tr>
<td>My parent(s) help me get to my competitions if needed</td>
<td>.705</td>
</tr>
<tr>
<td>My parent(s) register me for competitions when I need it</td>
<td>.636</td>
</tr>
<tr>
<td>My parent(s) spend money to support my development in sport</td>
<td>.613</td>
</tr>
<tr>
<td>My parent(s) help me to make travel arrangements if needed</td>
<td>.777</td>
</tr>
<tr>
<td>My parent(s) are open to what I have to say about my sport</td>
<td>.805</td>
</tr>
<tr>
<td>My parent(s) allow me to communicate freely with them about my sport</td>
<td>.828</td>
</tr>
<tr>
<td>My parent(s) respect my decisions in sport</td>
<td>.818</td>
</tr>
<tr>
<td>My parent(s) listen to me when I want to talk about my sport</td>
<td>.770</td>
</tr>
<tr>
<td>My parent(s) let me make my own decisions about my sport</td>
<td>.613</td>
</tr>
<tr>
<td>I talk with my parent(s) about what I need in my sport</td>
<td>.619</td>
</tr>
<tr>
<td>My parent(s) give me helpful sporting advice</td>
<td>.776</td>
</tr>
<tr>
<td>My parent(s) give me technical advice when appropriate</td>
<td>.733</td>
</tr>
<tr>
<td>My parent(s) give me strategic advice if needed</td>
<td>.883</td>
</tr>
</tbody>
</table>

Note: $N = 319$; Factor 1 = Emotional Support; Factor 2 = Instrumental Support; Factor 3 = Autonomy Support; Factor 4 = Informational Support.
Measurement invariance

After determining the best fitting model, tests of measurement invariance were conducted to establish if the factor structure of the four factor model was invariant across both males and females, and individual and team sport athletes. Examining measurement invariance across male and female athletes, the configural (unconstrained) model yielded acceptable fit indices: \( \chi^2 = 503.467; df = 258; p < .000; CFI = .928; TLI = .914; RMSEA = .055; SRMR = .0595 \), providing support for configural invariance. Following, factor loadings were constrained to be invariant across both samples (metric invariance), resulting in: \( \chi^2 = 531.509; df = 272; p < .000; CFI = .924; TLI = .914; RMSEA = .055; SRMR = .0629 \). In order to establish metric invariance, differences in fit indices yielded from the configural and metric models were examined, as recommended by Chen (2007). Given the sensitivity of \( \chi^2 \) to large sample sizes, researchers have instead suggested examining differences in fit indices such as the CFI and RMSEA (Chen, 2007; Cieciuch & Davidov, 2015). Following the recommendations of Chen (2007), \( \Delta CFI < .01; \Delta RMSEA < .015 \) were used as evidence for measurement invariance. Comparison of fit indices yielded from configural and metric models demonstrated that the models did not differ significantly (\( \Delta CFI = .004; \Delta RMSEA = .00 \)). Following, scalar invariance was examined by constraining the factor loadings and indicator intercepts to be equal across groups, resulting in: \( \chi^2 = 540.740; df = 286; p < .000; CFI = .925; TLI = .920; RMSEA = .053; SRMR = .0630 \). In order to determine scalar invariance, differences in fit indices from the metric and scalar models were examined. Comparison of fit indices yielded demonstrated that the models did not differ significantly (\( \Delta CFI = .001; \Delta RMSEA = .002 \)); providing support for scalar invariance across male and female athletes.

Measurement invariance was also examined across individual and team sport athlete groups. The configural (unconstrained) model yielded acceptable fit indices: \( \chi^2 = 451.250; df = 258; p < .000; CFI = .943; TLI = .932; RMSEA = .049; SRMR = .0719 \); demonstrating configural invariance. Following, factor loadings were constrained to be invariant across both samples (metric invariance), resulting in: \( \chi^2 = 476.917; df = 272; p < .000; CFI = .939; TLI = .932; RMSEA = .049; SRMR = .0754 \). Comparison of fit indices yielded from configural and metric models demonstrated that the models did not differ significantly (\( \Delta CFI = .004; \Delta RMSEA = .00 \)). Following, scalar invariance was examined by constraining the factor loadings and indicator intercepts to be equal across groups, resulting in: \( \chi^2 = 494.526; df = 258; p < .000; CFI = .938; TLI = .934; RMSEA = .048; SRMR = .0751 \). In order to determine scalar invariance, differences in fit indices from the metric and scalar models were also examined. Comparison of fit indices yielded demonstrated that the models did not differ significantly (\( \Delta CFI = .001; \Delta RMSEA = .001 \)), providing support for scalar invariance across individual and team sport athlete groups.

Reliability

With regards scale reliability, the 18-item YSPS-Q exhibited acceptable internal reliability (\( \alpha = .901; \) DeVillis, 2017). The internal consistency of each of the YSPS-Q dimensions was also examined. Each dimension yielded acceptable internal reliability (autonomy support, 6 items, \( \alpha = .875 \); emotional support, 5 items, \( \alpha = .916 \); informational support, 3 items, \( \alpha = .837 \); and instrumental support, 4 items, \( \alpha = .771 \)). Furthermore, the research team examined the reliability of the subscales of enthusiastic commitment, constrained commitment, sport enjoyment, and sport competence. Each subscale demonstrated...
acceptable reliability (sport enjoyment, $a = .936$; enthusiastic commitment, $a = .941$; constrained commitment, $a = .840$; sport competence, $a = .799$).

**Convergent and discriminant validity**

To examine the convergent validity of the YSPS-Q, the relationship between sport enjoyment, sport competence, and parental support was examined (see Table 3). In line with guidelines from Field (2018), correlations of 0.1 were considered small, 0.3 medium, and 0.5 large. A significant and medium positive correlation between the YSPS-Q and sport enjoyment was demonstrated ($r = .441$, $p < .001$). Additionally, results revealed that sport enjoyment was significantly and positively related to all four dimensions of parental support: autonomy support ($r = .417$, $p < .001$), emotional support ($r = .318$, $p < .001$), informational support ($r = .302$, $p < .001$), and instrumental support ($r = .326$, $p < .001$). Moreover, the YSPS-Q demonstrated a significant and medium positive correlation with sport competence ($r = .462$, $p < .001$). As such, higher perceptions of parental support were associated with higher perceptions of sport enjoyment and sport competence. Additionally, results demonstrated that sport competence was significantly and positively related to all four dimensions of parental support: autonomy support ($r = .428$, $p < .001$), emotional support ($r = .232$, $p < .001$), informational support ($r = .365$, $p < .001$), and instrumental support ($r = .364$, $p < .001$). Such results provide strong evidence for the convergent validity of the 18-item YSPS-Q.

To examine the discriminant validity of the YSPS-Q, measures of sport commitment (enthusiastic commitment and constrained commitment) were employed. It was hypothesised that parental support would be positively correlated to enthusiastic commitment, and negatively related to constrained commitment. Results (see Table 3) provided support for this hypothesis as parental support (YSPS-Q) demonstrated a significant and medium positive correlation with enthusiastic commitment ($r = .478$, $p < .001$), and a significant and large negative correlation with constrained commitment ($r = -.537$, $p < .001$). Moreover, discriminant validity can be examined by examining the correlations between dimensions. Brown (2015) stated that correlations between dimensions that are >.80 suggest poor discriminant validity. Within the current investigation, correlations between dimensions ranged from .141 to .536 (see Table 4), providing further evidence for discriminant validity of the YSPS-Q.

**Discussion**

Results from the EFA suggested a four-factor model was appropriate, which was subsequently supported from the CFA. The final 18-item YSPS-Q yielded factor loadings

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**Table 3. Correlations between the YSPS-Q (18-item), sport enjoyment (SCQ-2), sport competence (IMI), enthusiastic commitment (SCQ-2), and constrained commitment (SCQ-2).**

<table>
<thead>
<tr>
<th></th>
<th>YSPSQ</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>$\alpha$</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport Enjoyment (SCQ-2)</td>
<td>.441**</td>
<td>.318**</td>
<td>.326**</td>
<td>.302**</td>
<td>.417**</td>
<td>.936</td>
<td>23.65</td>
<td>2.65</td>
</tr>
<tr>
<td>Sport Competence (IMI)</td>
<td>.462**</td>
<td>.232**</td>
<td>.364**</td>
<td>.365**</td>
<td>.428**</td>
<td>.799</td>
<td>20.91</td>
<td>2.98</td>
</tr>
<tr>
<td>Enthusiastic Commitment (SCQ-2)</td>
<td>.478**</td>
<td>.267**</td>
<td>.353**</td>
<td>.316**</td>
<td>.519**</td>
<td>.941</td>
<td>27.44</td>
<td>3.80</td>
</tr>
<tr>
<td>Constrained Commitment (SCQ-2)</td>
<td>-.537**</td>
<td>-.414**</td>
<td>-.314**</td>
<td>-.301**</td>
<td>-.492**</td>
<td>.840</td>
<td>8.25</td>
<td>3.53</td>
</tr>
</tbody>
</table>

Note: * $p < .05$; ** $p < .01$; N = 319; Factor 1 = Emotional Support; Factor 2 = Instrumental Support; Factor 3 = Autonomy Support; Factor 4 = Informational Support.
> .60 (very good), with 14 of the items possessing a factor loading > .70 (excellent), providing evidence that the YSPS-Q is a very good to excellent representation of parental support in youth sport (Comery & Lee, 1992). With regards model fit, results demonstrated excellent fit indices for the CFI, TLI, RMSEA, and SRMR, in line with cut-offs recommended by Bentler (1990) and Hu and Bentler (1999). Internal consistency reliability for the YSPS-Q was excellent (> .90). Moreover, the YSPS-Q subscales possessed acceptable internal consistency, ranging from .771 to .916 (DeVillis, 2017), providing further support for the reliability of the YSPS-Q.

With regards convergent validity, the authors examined the relationship between parental support and sport enjoyment and sport competence. Significant positive relationships were demonstrated between parental support, sport enjoyment, and sport competence, providing evidence for convergent validity, and further support for the utility of the YSPS-Q. Discriminant validity can be determined by examining the inter-factor correlations of the instrument (Brown, 2015), or by examining if theoretically plausible differences emerge between constructs (Martin et al., 2013; Paradis et al., 2014). Within the current investigation, inter-factor correlations were significant and ranged from .141 to .536, demonstrating dimensions of parental support are correlated. It is however important to highlight that some of these correlations are considered small < .30 (Field, 2018). This is consistent with social support research in sport, which has demonstrated that dimensions of social support are correlated (Freeman et al., 2011). However, although dimensions of support were positively and significantly correlated, factors were considered distinct as correlations were < .80 (Brown, 2015). Furthermore, results demonstrated that parental support demonstrated distinct relationships with constrained and enthusiastic commitment, providing further evidence for the discriminant validity and utility of the YSPS-Q.

### General discussion

Research examining parental involvement in youth sport has demonstrated the significant influence of parental support on child-athlete outcomes in youth sport (e.g., Leff & Hoyle, 1995; Power & Woolger, 1994). However, the advancement of research in this area appears constrained by the absence of validated measures of parental support in youth sport (Burke et al., 2021). Therefore, the purpose of the present research programme was to develop and validate a psychometrically sound and theory-grounded measure of parental support in youth sport. The process of developing and validating

<table>
<thead>
<tr>
<th>Emotion \ Instrument \ Information \ Autonomy</th>
<th>Emotional \ Instrument \ Information \ Autonomy</th>
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</thead>
<tbody>
<tr>
<td>Emotional support</td>
<td>Instrumental support</td>
</tr>
<tr>
<td>.916</td>
<td>.771</td>
</tr>
<tr>
<td>20.99</td>
<td>18.77</td>
</tr>
<tr>
<td>4.51</td>
<td>1.90</td>
</tr>
</tbody>
</table>

Note: * p < .05; ** p < .01; N = 319.
the YSPS-Q encompassed a multi-study approach, which included a qualitative exploration of athletes’ perceptions of parental support, item generation, content validity, exploratory factor analysis, and confirmatory factor analysis. The final 18-item YSPS-Q consists of four dimensions: autonomy support (6 items), emotional support (5 items), informational support (3 items), and instrumental support (4 items). To the authors’ knowledge, this is the first multi-dimensional instrument to measure parental support in youth sport.

The emotional support dimension of the YSPS-Q in its current form is measured inversely. That is, the subscale assesses the absence of emotional support, rather than the presence of emotional support, with all items within this factor negatively-worded. As detailed by DeVillis (2017), it is common practice in scale development research to develop negatively worded items that represent low levels or the absence of the construct, in addition to positively worded items which represent the presence of the construct. A set of items which represent a high level of the construct when endorsed, and others that represent a high level when not endorsed is preferable, as it prevents acquiescence, affirmation, or agreement bias (DeVillis, 2017). It should be noted when generating items in study two, the authors developed both positively and negatively worded items to represent emotional support. However, negatively worded items possessed the greatest factor loadings following EFA. It is important however in the advancement of the understanding of what supportive behaviours look like to also know what unsupportive behaviours look like (Burke et al., 2023a). Given that scale validation is a ongoing process (DeVillis, 2017), the authors encourage future researchers to explore the possibility of the conversion of such negatively-worded items, and examine subsequent validity and reliability of the factor.

Previously, a major issue pertaining to psychometrics in sport pertains to misapplication (Collins & Cruickshank, 2017). However, a major strength of the YSPS-Q is its development for a specific purpose, population, and context. That is, the YSPS-Q has been designed and validated for use specifically within a youth sport environment, possesses an underlying theoretical framework, and includes items that have been generated against behaviours, practices, and contexts commonly encountered by youth athletes (Collins & Cruickshank, 2017). The development of psychometric instruments for use amongst a specific population and setting allows for optimum discriminatory power when the instrument is applied (Collins & Cruickshank, 2017).

Researchers have previously stated that validating a grounded theory can often be challenging, however, integrating grounded theory within a mixed methods approach (e.g., scale development and validation) allows researchers to test the developed grounded theory quantitatively (Howell Smith et al., 2020). Within the current investigation, a grounded theory of parental support (Burke et al., 2023b) guided the scale development process. The grounded theory identified four dimensions of parental support pertinent to youth sport: autonomy, emotional, informational, and instrumental support. To this point, the aforementioned grounded theory had not been explicitly tested, however, the excellent fit indices, reliability, and convergent and discriminant validity, demonstrated by the four factor YSPS-Q, also provides evidence for the validity of the advanced grounded theory of parental support, developed by Burke et al. (2023b). That is, psychometric testing is not only pertinent to scale validation, but also has applications for validating theoretical models.
Echoing the sentiments of Tenenbaum et al. (2012), who stated that questionnaire development is essential to science and critical in the advancement of knowledge, the development and validation of the YSPS-Q will enable researchers and practitioners to explore theoretically interesting questions and enhance understanding of parental support within the context of youth sport. For example, the development and implementation of parent-education programmes in youth sport provide a logical avenue to promote positive parental support and diminish stressors experienced by sport parents. However, research has demonstrated that the evaluation of such programmes remains challenging, due to the paucity of validated instruments pertinent to parental behaviours in youth sport (Burke et al., 2021). The development and validation of the YSPS-Q will enable researchers and practitioners to successfully evaluate the effectiveness of future parent-education programmes, and examine changes in parents’ behaviour within the sporting context (Burke et al., 2021; Knight, 2019).

The appropriate evaluation of future parent-support programmes will allow researchers to establish superior intervention components, such as intervention length and delivery method (Knight, 2019). To date, the various psychometric instruments employed to evaluate sport parent interventions has prevented such important critical appraisals. Furthermore, research has demonstrated that the provision of parental support is associated with positive athlete outcomes (e.g., sport enjoyment, self-esteem; Leff & Hoyle, 1995). However, given the multidimensional nature of the construct, the employment of the YSPS-Q may assist researchers in understanding if particular dimensions of parental support (i.e., instrumental, informational, emotional, autonomy-support) lend themselves to producing certain athlete outcomes, or indeed if certain dimensions of support are more relevant to particular contexts. Thus far, quantitative investigations exploring the impact of various parental support dimensions has proven challenging, due to the dearth of valid and reliable psychometric instruments targeting parental support in youth sport. Previous social support research has illustrated that specific dimensions of social support in sport predict certain athlete outcomes. For example, Freeman et al. (2014) demonstrated that emotional and esteem support predicted athletes’ self-confidence and positive affect. The development and validation of the YSPS-Q provides opportunities for researchers and practitioners to enhance both theory and the development of effective theory-led parent support interventions (Freeman et al., 2011).

Furthermore, the development and validation of the YSPS-Q eliminates the limitations of study-designed measures (e.g., Leff & Hoyle, 1995; Van Yperen, 1995), and allow researchers to synthesise and compare research findings pertaining to parental support in youth sport. Moreover, the YSPS-Q allows researchers to explore athletes’ perceptions of parental support across various season time points (e.g., pre-season, competitive season), and investigate if there are any factors which influence or moderate its effectiveness. A grounded theory of parental support advanced by Burke et al. (2023b) illustrated that open bi-directional communication between parents and youth athletes facilitated the provision of parental support in youth sport. The YSPS-Q enables sport parenting researchers to examine what variables, such as communication, moderate the provision of parental support. As such, the YSPS-Q can aid in enhancing the understanding of parental support in youth sport.
Limitations and future directions

Although the development and validation of the YSPS-Q will contribute to the understanding of parental support within the context of youth sport, the current research is not free from limitations. Firstly, data were cross-sectional in nature, and although this is common in scale validation research, it prohibited the authors to examine and provide evidence for criterion or predictive validity, and test-re-test reliability. Future research should consider collecting data across multiple timepoints, to examine the predictive and criterion validity, and test-retest reliability of the YSPS-Q, to provide further evidence of the utility of the instrument, and to also allow for an examination of perceptions of parental support across season time points (e.g., pre-season, competitive season) and athlete development stages (sampling, specialising, and investment). Furthermore, the present study provides evidence for the validity and reliability of the YSPS-Q amongst youth athletes 12–18 years. Given that scale validation is an on-going process (DeVillis, 2017), the authors encourage future researchers to examine the validity and reliability of the YSPS-Q for use amongst younger populations (e.g., 7–11 years). Moreover, a power analysis was not conducted to identify the minimum sample size required for EFA and CFA, and therefore could be considered a limitation. Although guidance from Tabachnick and Fidell (2013) was followed to ensure sample sizes of at least 300 were obtained for factor analysis.

Conclusion

The present research programme sought to develop and validate a theory-grounded measure of parental support in youth sport. The findings provide initial evidence for the validity and reliability of the 18-item YSPS-Q, and also provide support for Burke et al. (2023b) grounded theory of parental support in youth sport. The development and validation of the YSPS-Q allows researchers and practitioners to examine athletes’ perceptions of parental support across both individual and team sport settings, and also provides researchers with opportunities to advance theory and support interventions pertaining to parenting in youth sport.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

The data is available from the corresponding author, upon reasonable request.

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