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9 Evaluating the ‘Optimal Competition Parenting Workshop’ using the RE-AIM Framework: A

10 4-Year Organisational Level Intervention within British Junior Tennis

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12 Sam N. Thrower<sup>1</sup>, Christopher M. Spray<sup>2</sup> & Chris G. Harwood<sup>2</sup>

13 *University of Roehampton<sup>1</sup>*

14 *Loughborough University<sup>2</sup>*

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21 Correspondence:

22 Correspondence concerning this article should be addressed to Sam N. Thrower, School of Life

23 and Health Sciences, University of Roehampton, London, United Kingdom, SW15 4JD. Tel:

24 +44 (0) 20 8392 7381, Email: sam.thrower@roehampton.ac.uk

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**Abstract**

The purpose of the current study was to utilise the RE-AIM framework to evaluate the national-level scale out of the Lawn Tennis Association’s ‘Optimal Competition Parenting Workshop’ across a 4-year period. During 2018, 65 workshops were run across the United Kingdom, 1043 parents registered, and 933 parents attended. Adopting a quasi-experimental design, multilevel analyses revealed significant increases in parents’ ( $n = 130$ ) task goal orientation and competition tennis parenting efficacy, as well as significant decreases in ego goal orientation and unpleasant emotions. Children’s perceptions of both mother and father-initiated ego involving motivational climate and their own ego goal orientation significantly decreased across time. From 2019 to 2021, a further 64 workshops were delivered to 1110 parents with no significant differences in parents’ satisfaction, enjoyment, instructor evaluation, or transfer intention over time. Overall, the OCPW represents a well-received, practical, and effective brief intervention for enhancing parental involvement in junior tennis.

**Key Words:** Youth Sport, Sport Parenting, Achievement Goals, Motivational Climate

1           **Evaluating the ‘Optimal Competition Parenting Workshop’ using the RE-AIM**  
2           **Framework: A 4-Year Organisational Level Intervention within British Junior Tennis**

3   Within the last 50 years, there has been growing interest in parental involvement in organised  
4   youth sport contexts (see Dorsch et al., 2021 for a historical scoping review). Researchers have  
5   provided an in-depth understanding of parents’ roles in children’s sport socialisation (e.g.,  
6   Dorsch et al., 2009), parent’s influence on child outcomes in sport (e.g., Atkins et al., 2013),  
7   coaches and young athletes’ perceptions of parental involvement in sport (e.g., Knight et al.,  
8   2011), parent-child interactions (e.g., Thrower et al., 2022), and factors influencing parental  
9   involvement at both individual and environmental levels (e.g., Harwood & Knight, 2009). Such  
10   literature has generated an increased realisation of the pivotal and complex roles parents play in  
11   young athletes’ development and has led to the design, delivery, and evaluation of several sport  
12   parent education programmes (see Burke et al., 2021 for a systematic review).

13           Initiating this line of inquiry, early interventions with both parents and coaches focused  
14   on creating task-involving motivational climates for young athletes (i.e., Harwood & Swain,  
15   2002; Smoll et al., 2007). Within these programs, educational sessions were based on  
16   achievement goal theory and concentrated on enhancing parents’ knowledge and awareness of  
17   goal orientations, process goal setting, verbal and nonverbal communication strategies, and  
18   behavioural guidelines for parents of children participating in elite junior tennis (Harwood &  
19   Swain, 2002) and community-based basketball (Smoll et al., 2007). Whilst these programs  
20   were successful in increasing young athletes’ task involvement, cognitive appraisal, self-  
21   regulation, and self-efficacy (Harwood & Swain, 2002) and lowering cognitive and somatic  
22   anxiety (Smoll et al., 2007), they did not assess the relative contributions of the parent and  
23   coach, or establish which guidelines had the strongest influence on parents’ behaviour and  
24   consequently athlete outcomes.

1           To address these limitations, researchers progressed to evaluate the effectiveness of  
2 both face-to-face (i.e., Lisinskiene & Lochbaum, 2019; Thrower et al., 2017; Richards &  
3 Winter, 2013; McMahon et al., 2018) and online (i.e., Thrower et al., 2019) programs that  
4 specifically targeted parental outcomes. These studies tended to focus on programs covering a  
5 wide range of topics (e.g., youth sport participation, developmental models of sport  
6 participation, participation rates in sport, working with coaches, communication skills, sport  
7 parent behaviour) representing a range of delivery methods and intervention designs (i.e.,  
8 qualitative, quantitative, mixed method research). Through such intervention efforts, parents  
9 reported improvements in knowledge of their child's sport (Lisinskiene & Loachbaum, 2019;  
10 Richards & Winter, 2013; Thrower et al., 2017), role efficacy (Thrower et al., 2017; Thrower et  
11 al., 2019), and engagement in more task-orientated behaviour and communication with their  
12 children before, during, and after youth sport competitions (Richards & Winter, 2013; Thrower  
13 et al., 2017). However, these studies also highlighted the significant cost, time, and expertise  
14 needed to plan and deliver longitudinal face-to-face education programs as well as the range of  
15 barriers to initiating and maintaining parents' participation (e.g., work commitments, childcare  
16 responsibilities, a lack of understanding of the important role parents play in athletes'  
17 development; see Thrower et al., 2017).

18           In contrast to broader educational programs, recent research has investigated the  
19 effectiveness of briefer, one-off sport parent interventions (e.g., 45mins to 1-hour workshops;  
20 Azimi & Tamminen, 2020; Dorsch et al., 2017; Ford et al., 2021; Tamminen et al., 2020).  
21 These workshops are often accompanied by supplementary readings and have targeted parent-  
22 child interactions (e.g., Azimi & Tamminen, 2020), parent sideline comments (e.g., Sampol et  
23 al., 2019), or respectful behaviour during youth sport competitions (Ford et al., 2012;  
24 Tamminen et al., 2020). Such interventions have led to significant reductions in parents'  
25 negative sideline comments (Sampol et al. 2019) and pressuring behaviours (Dorsch et al.,

1 2017). Furthermore, children with parents who had been in the implementation groups reported  
2 higher levels of enjoyment, perceived competence, and sportpersonship behaviours as well as  
3 reduced stress (Dorsch et al., 2017) and antisocial behaviours towards opponents (Tamminen et  
4 al., 2020).

5         As a collective and growing body of parental intervention research, there is evidence to  
6 suggest that both longitudinal (e.g., Harwood & Swain, 2002; Thrower et al., 2017) and brief  
7 one-off group-based programs (e.g., Dorsch et al. 2017; Azmi & Tamminen, 2019) are well  
8 received and can positively impact on parent (and child) outcomes. Furthermore, the recent  
9 shift towards briefer contact interventions (e.g., Tamminen et al., 2020) with supplemental  
10 support material has made sport parenting education more accessible, convenient, and  
11 economically cost-effective. However, a vital step in the process of knowledge translation and  
12 dissemination is the adoption and tailoring of scientific findings for wide scale application to a  
13 specific population (see the Knowledge to Action framework; Graham et al., 2006). Such a  
14 research impact objective in sport settings typically requires national organisational buy-in,  
15 engagement, and investment (Gould, 2016, 2019). As Thrower et al. (2019) suggested: “large-  
16 scale dissemination of online (and face-to-face) parent education programs is likely to be  
17 achieved only through national governing body backing or promotion to parents directly” (pp.  
18 18). While some progress has recently been made in respect of national-level organizations  
19 integrating sport parent initiatives (see Tamminen et al., 2020), no studies to date have  
20 evaluated the effectiveness of organisational level interventions through experimental designs  
21 or examined the extent and ease with which they can be rolled out and delivered to a large  
22 number of people. As a result, future research needs to draw upon frameworks for intervention  
23 design and evaluation which take a wider view for evaluating effectiveness and pay closer  
24 consideration to sustainable adoption and implementation. For example, The RE-AIM  
25 framework (i.e., Reach, Effectiveness, Adoption, Implementation, and Maintenance) was

1 originally developed to improve the adoption and implementation of evidence-based  
2 interventions and has been widely used in public health and behaviour change research (see  
3 Glasgow et al., 1999; Glasgow et al., 2019).

4       Beyond knowledge translation and dissemination, there is also a need for applied  
5 researchers to help youth sport organizations evaluate large-scale sport parent education  
6 programs. This is important because through evaluation, youth sport providers learn what  
7 features of their programs work, and do not work, as well as where they should invest their  
8 limited resources (Gould, 2016, 2019). As Gould and colleagues (2008) suggested, if resources  
9 are being allocated to large-scale evidence-based sport parent education programs or  
10 workshops, we must understand their impact on parents and children and explore whether they  
11 change parent behaviour. This would require close collaborations between researchers and  
12 youth sport organisations with a joint commitment to the design, delivery, and evaluation of  
13 large-scale evidence-based sport parent education programmes. Once such initiative is the  
14 Lawn Tennis Association's (LTA) (i.e., the national governing body of tennis in Great Britain)  
15 'Optimal Competition Parenting Workshop' (OCPW) which was developed through knowledge  
16 tailoring of the research findings and intervention work of Thrower and colleagues (2016,  
17 2017, 2019), via a contractual knowledge exchange partnership between the LTA, the first and  
18 last authors, and their academic institutions. Therefore, in order to advance this growing field  
19 of sport parent intervention and implementation science, the purpose of the current study was to  
20 utilize the RE-AIM framework (Glasgow et al., 1999) to evaluate the wide-scale  
21 implementation of the LTA's OCPW. Specifically, the current study aimed to: (a) examine the  
22 impact of the OCPW on parents' knowledge, emotions, efficacy, and goal orientations; (b)  
23 explore children's perceptions of the effect of the OCPW on parent-initiated motivational  
24 climates and their own goal orientations; and (c) evaluate the wider *reach, adoption,*

1 *implementation*, and *maintenance* of the OCPW within the context of British Tennis over a 4-  
2 year period (i.e., 2018 to 2021).

### 3 **Methods**

4 The current study was conducted from a pragmatic philosophical perspective.  
5 Pragmatists use research findings to solve practical ‘real-world’ problems and improve the  
6 human experience. As such, pragmatists adopt a relativist ontological position (i.e., truth is  
7 what works at the time) and focus on the practical consequences and outcomes of inquiry  
8 (Creswell & Creswell, 2019; Poucher et al., 2019).

### 9 **Research Framework: RE-AIM**

10 A pragmatic application of the RE-AIM framework (see Glasgow et al., 1999; Glasgow  
11 et al., 2018) was used to evaluate the sustainable *adoption* and *implementation* of the OCPW in  
12 the context of British tennis. Specifically, RE-AIM helps facilitate the development, delivery,  
13 and evaluation of interventions across five dimensions: (1) *reach* (i.e., the absolute number,  
14 proportion, and representativeness of individuals who participate in the intervention); (2)  
15 *effectiveness* (i.e., the impact of an intervention on important outcomes); (3) *adoption* (i.e., the  
16 absolute number, proportion, and representativeness of settings and staff who are willing to  
17 initiate a program), (4) *implementation* (i.e., how closely staff members follow the program that  
18 the developers provide, including: consistency of delivery as intended, adaptations made to the  
19 intervention, and the time and cost of the program); and (5) *maintenance* (i.e., the extent to  
20 which an intervention becomes part of routine organizational practices and policies).

### 21 **Research Design**

22 Within the broader RE-AIM framework, an embedded (or nested) mixed-method  
23 research design was used to evaluate *effectiveness*, which included qualitative data collected as  
24 part of a larger quantitative design (i.e., QUANT(qual); Creswell & Plano Clark, 2017).  
25 Specifically, a quantitative quasi-experimental design with follow up was used to examine the

1 objective *effectiveness* of the OCPW across three separate time points (i.e., baseline, 1-month,  
2 3-months; Creswell & Creswell, 2019), whilst qualitative open-ended questions were used to  
3 explore individual subjective perceptions of behaviour change and further understanding  
4 regarding the contexts in which change occurs (e.g., pre-, during-, and post- competition).

### 5 **Optimal Competition Parenting Workshop (OCPW)**

6 The OCPW forms part of the LTA's national tennis parent education and support  
7 strategy and is aimed at parents with children between the ages of 9 and 14 years who have  
8 either just started competing or who play regularly in LTA competitions. The 2-hour workshop  
9 is based on session five of the 'Loughborough Tennis Parent Education Programme' (LTPEP;  
10 see Thrower et al. 2017; 2019) and focuses on parents communicating effectively with children  
11 before, during, and after a match, as well as managing the emotional demands of competitive  
12 tournaments. By tailoring salient content from earlier LTPEP sessions, the workshop is  
13 scaffolded by an 8-page pre-workshop booklet designed to provide parents with the theoretical  
14 (e.g., Self-Determination Theory, Deci & Ryan 1985; Achievement Goal Theory, Nicholls,  
15 1989) and conceptual (e.g., parents roles; Fredricks & Eccles, 2004) knowledge needed to  
16 achieve the workshop learning objectives. The interactive content includes five main sections:  
17 (a) the psychological demands of tennis; (b) children's preferences for parental behaviour  
18 (Knight et al., 2011); (c) pre-match communication (d) in-match management and support; and  
19 (e) post-match communication (Thrower et al., 2017; 2019).

### 20 ***OCPW Pilot Testing***

21 The OCPW was pilot tested by the LTA during 2017 in 10 different locations within  
22 England. During this period, tennis parents of local clubs were invited to attend a workshop. In  
23 total, 202 parents attended a workshop and 134 of these parents (66.34%) also provided online  
24 feedback using a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Most  
25 parents who completed the online feedback form agreed (58.6%) or strongly agreed (30.8%)



1 that the pre-workshop booklet improved their knowledge and understanding as a tennis parent  
2 (M = 4.17, SD = 0.69). In addition, almost all parents agreed (47.0%) or strongly agreed  
3 (48.5%) that the OCPW improved their skills as a tennis parent (M = 4.43, SD = 0.61).  
4 Furthermore, parents agreed (47.4%) or strongly agreed (47.4%) that the OCPW would  
5 positively influence their overall experiences (i.e., enjoyment, satisfaction) as a tennis parent  
6 (M = 4.40, SD = 0.67). Overall, 44.4% of parents were satisfied and 54.9% of parents were  
7 very satisfied with the OCPW (M = 4.54, SD = 0.52). Parents also provided qualitative  
8 feedback regarding how they thought the OCPW could be improved which resulted in minor  
9 changes being made to the workshop content.

10 All pilot workshops were delivered by the first or last author. The first author is a  
11 British Psychological Society (BPS) chartered psychologist and has over 10 years' experience  
12 of conducting research, and delivering interventions, with tennis parents in Britain. The last  
13 author is a Health Care Professional Council (HCPC) registered sport and exercise  
14 psychologist, a British Association of Sport and Exercise Sciences (BASES) accredited sport  
15 scientist, and a BPS chartered psychologist who had consulted with the Lawn Tennis  
16 Association as well as individual tennis players and parents for over 25 years.

### 17 ***OCPW Launch***

18 Following a review of the 2017 feedback data, the OCPW was launched by the LTA as  
19 the first organisational level tennis parent education workshop in January 2018. The LTA's key  
20 performance indicators (KPIs) for 2018 were 50 workshops and 1000 parents across England,  
21 Scotland, and Wales. To facilitate the programme roll out, tutors ( $n = 20$ ) were recruited based  
22 on being either a Health Care Professional Council (HCPC) registered sport and exercise  
23 psychologist with experience of working in tennis or an LTA affiliated tutor who had  
24 experience of delivering the LTA's coach education suite and an interest in sport psychology.  
25 All tutors attended and completed a 3-hour training session run by the first and last authors. In

1 addition, tutors were given detailed tutor notes, access to key underpinning research articles  
2 (e.g., Thrower et al., 2017; 2019), and a video of the last author delivering the workshop. Since  
3 its launch in 2018, 129 workshops have been delivered and 2043 parents have attended the  
4 workshop.

### 5 **Participants and Sampling**

6 The sampling criteria to evaluate the *effectiveness* of the OCPW included parents or  
7 guardians who had: (a) not previously participated in a sport parent education programme; (b) a  
8 child who regularly competed in tennis competitions (i.e., 20+ matches per year); and (c)  
9 signed up to participate in the OCPW during 2018. Although the OCPW is targeted at parents  
10 of 9-14 year olds, parents of younger or older children were able to attend and subsequently  
11 were included as participants in the current study. Parents who met the criteria and agreed to  
12 participate ( $n = 130$ ) included 84 mothers ( $M_{age} = 43.63$ ,  $SD = 4.63$ ) and 46 fathers ( $M_{age} =$   
13  $45.51$ ,  $SD = 5.44$ ). The majority of participants were married (88%), employed full time (43%)  
14 or part time (36%), and had either an undergraduate (38%) or post-graduate degree (34%).  
15 Parents had between 1 and 37 years of experience as a tennis parent ( $M_{experience} = 4.67$ ,  $SD =$   
16  $3.67$ ). In addition, children ( $n = 130$ ) included 88 boys ( $M_{age} = 10.08$ ,  $SD = 1.68$ ) and 42 girls  
17 ( $M_{age} = 9.98$ ,  $SD = 1.54$ ) ranging from 7 to 14 years of age ( $M_{age} = 10.05$ ,  $SD = 1.63$ ).  
18 Children participated at either club (37%), county (44%), regional (16%), or national level  
19 (3%). The LTA divide Great Britain up into 5 regions in England (e.g., South East), plus  
20 Scotland and Wales, 44 counties (e.g., Bedfordshire), and approximately 2700 clubs.

### 21 **Procedure**

22 Following institutional ethical approval, all parents or guardians who registered online  
23 for the LTA's OCPW (see <https://www.lta.org.uk/compete/parents-area/>) during 2018 were  
24 invited to participate in this aspect of the study (i.e., evaluate the *effectiveness* of the OCPW)  
25 via an automated booking confirmation email. Each individual parent was then responsible for

1 inviting their child to participate and explaining the process of completion. Parents and children  
2 who agreed to participate then clicked on a single online link, provided informed consent  
3 and/or assent, completed the online parent (10-minutes) or child (5-minutes) pre-workshop  
4 questionnaires. Parents were subsequently required to read the pre-workshop booklet (1-hour)  
5 and attend the OCPW (2-hours). Following the workshop, parents and children were emailed a  
6 link to the post-workshop questionnaire at two time points (i.e., 1-month; 3-months). At all  
7 time points (i.e., pre, 1-month, 3-month), parents were instructed to access the link and  
8 complete their sections of the questionnaire first, before allowing their child to complete  
9 responses to their questions independently and unsupported. Once parents and children had  
10 completed the 3-month questionnaires they were sent a £10 Amazon voucher.

#### 11 **Data Collection**

12 Data on the *reach, adoption, implementation, and maintenance* of the OCPW was  
13 collected by the LTA competitions team between 1<sup>st</sup> January 2018 and 31<sup>st</sup> December 2021. All  
14 parents who attended the OCPW workshop across this 4-year period were emailed the online  
15 feedback form. However, *effectiveness* data was only collected during 2018 from parents ( $n =$   
16 130) and children ( $n = 130$ ) who agreed to participate in this aspect of the study. The  
17 *effectiveness* of the OCPW was evaluated by the authors using quantitative and qualitative  
18 measures which were selected based on the previous tennis parent interventions (i.e., Thrower  
19 et al., 2017; 2019) and the current study's research questions. Specifically, the current study  
20 objectively evaluated parents' ( $n = 130$ ) knowledge, emotional experiences, goal orientations,  
21 and predictors of behaviour (i.e., efficacy beliefs) across three time points (i.e., baseline, 1-  
22 month, 3-months). Furthermore, children's ( $n = 130$ ) goal orientations and perceptions of  
23 parent-initiated motivational climate were examined across the same time points. Both parents  
24 and children were also given the option of answering a qualitative open-ended question to  
25 provide subjective perceptions of behaviour change (see below).

1 ***Quantitative Data Collection***

2           **Parent Feedback.** Consistent with training evaluation research (e.g., Cooley et al.  
3 2016), online parent feedback forms were used to measure parents' initial reaction to the  
4 workshop (i.e., Level 1; Kirkpatrick, 1994) and intention to transfer learning (i.e., Level 2;  
5 Kirkpatrick, 1994) across the 4-year period. Specifically, course *satisfaction* was measured  
6 using two-items (e.g., "overall the programme was excellent" and "I would recommend the  
7 programme to a friend"; Filak & Sheldon, 2008). In addition, *enjoyment* was measured using  
8 two-items (i.e., "I enjoyed the activities very much" and "the activities were fun to do"; Ryan,  
9 1982). Furthermore, *instructor evaluation* was also obtained using two-items (i.e., "overall the  
10 tutor was excellent" and "I would recommend this tutor to a friend"; Filak & Sheldon, 2008).  
11 Finally, drawing upon the theory of planned behaviour (Ajzen, 1991) *transfer intention* was  
12 measured using two items (i.e., "I *intend* to use the skills I developed during the workshop  
13 when I next communicate with my child during a competition" and "I *will try* to use the skills I  
14 developed during the workshop when I next communicate with my child during competition").  
15 Despite being separate measures (i.e., *satisfaction*, *enjoyment*, *instructor evaluation*, *transfer*  
16 *intention*), all items were rated between 1 (not at all true) and 7 (very true). Items comprising of  
17 the satisfaction ( $r = .828, p < .001$ ), enjoyment ( $r = .858, p = .001$ ), instructor evaluation ( $r =$   
18  $.945, p < .001$ ), and transfer intention ( $r = 0.858, p < .001$ ) variables were highly correlated with  
19 one another, supporting the calculation of average scores.

20           **Tennis Parent Knowledge.** Five multiple choice questions (MCQs) were developed to  
21 assess parent's knowledge as a tennis parent before and after the OCPW. Participants were  
22 instructed to select only one answer per question. These questions included (*correct answers*  
23 *are highlighted in italics*): (1) In order to develop and maintain long term motivation to  
24 participate in tennis, your child will need to experience feelings of: a) autonomy, b)  
25 competence, c) relatedness, d) *all of the above*; (2) An individual who gains feelings of

1 competence (i.e., a sense of accomplishment) only from personal progress and improvement is  
2 considered to be: a) *task-orientated*, b) ego-orientated, c) task or ego-orientated, c) none of the  
3 above; (3) Prior to and during a match, your child should be focusing on which of the  
4 following: a) outcome goals, b) performance goals, c) *process goals*, d) all of the above; (4)  
5 During a match, your child's opponent hits a forehand cross court winner. Which of the  
6 following do you consider to be the most appropriate way to respond? a) do nothing, b) *clap*  
7 *your child's opponent*, c) communicate to your child not to target their forehand, d) shake your  
8 head in frustration; and (5) After the match, your primary objective is to: a) provide feedback in  
9 relation to the result, b) discuss your child's performance with their coach, c) provide feedback  
10 in relation to their performance, d) *help your child learn from their experience*.

11 **Sport Emotion Questionnaire (SEQ).** An adapted version of the SEQ was used to  
12 measure parents' emotional experiences as a tennis parent within the last month (Jones et al.,  
13 2005). The SEQ examines five emotions, which can be grouped into two higher order  
14 dimensions: (a) unpleasant emotions (i.e., anxiety, dejection, anger) and (b) pleasant emotions  
15 (i.e., excitement, happiness). The SEQ contains 22 items that are scored on a 5-point Likert-  
16 type scale ranging from 0 (not at all) to 4 (extremely). Consistent with previous research (e.g.,  
17 Thrower et al., 2019) the stem was changed to "reflecting on the most recent month where you  
18 were involved as a tennis parent, please indicate how much you have experienced these  
19 feelings." Jones et al. (2005) reported excellent reliability for the SEQ scales (Cronbach's  $\alpha =$   
20 .81–.98). In the present study, Cronbach alpha internal reliability coefficients ranged between  
21 .76 and .93 across the three time points (See Supplementary Material 1).

22 **Achievement Goal Scale for Youth Sport (AGSYS).** An adapted version of the  
23 AGSYS was used to measure the level of task and ego achievement goal orientations that  
24 parents had for their children and young athletes had for themselves (Cumming et al., 2008).  
25 This 12-item measure was chosen because it is sensitive to interventions designed to enhance

1 task orientation and reduce ego orientation and is a reliable and valid measure of achievement  
2 goal orientations in children between the ages of 9 and 14 years. Items were adapted for use  
3 with parents. For instance, “My goal is to learn new skills and get as good as possible” was  
4 changed to “My goal is for my child is to learn new skills and get as good as possible.”  
5 Responses were measured on a 5-point Likert scale ranging from 1 (not at all true) to 5 (very  
6 true). Cumming et al. (2008) provided initial evidence for the factorial validity and internal  
7 reliability of the measure (Cronbach’s  $\alpha = .78-.88$ ). Cronbach’s alphas for the AGSYS in the  
8 current study ranged between .75 – .87 for parents and .75 – .92 for children across the three  
9 time points (See Supplementary Material 1).

10 **Tennis Parent Efficacy Scale (TPES).** The TPES is an applied tool developed to  
11 provide a non-hierarchical scale of parents’ belief in their own ability to perform competently  
12 and effectively as a tennis parent across specific roles and contexts in the sport (see Thrower et  
13 al., 2019). Although the original measure has 11 subscales, only three subscales were relevant  
14 to the OCPW aims and learning outcomes, and subsequently used to measure ‘competition  
15 tennis parenting efficacy’: (a) pre-match role efficacy (e.g., reinforce to your child the  
16 importance of personal improvement rather than the result before a match), (b) in-match role  
17 efficacy (e.g., watch a match without advising or instructing your child), and (k) post-match  
18 role efficacy (e.g., provide appropriate feedback to your child at a time when they are ready).  
19 These three subscales comprised of 14 items and each item used the stem “Rate how confident  
20 you are right now that you can ...” to measure what parents think they can do at a specific time  
21 point (i.e., a judgment of capability). The TPES uses an 11-point Likert scale ranging from 0  
22 (not at all confident) to 10 (extremely confident) to detect subtle differences before and after  
23 interventions (Bandura, 2006). In the present study, Cronbach alphas ranged from .75 – .93 (see  
24 Supplementary Material 1).

1           **Parent Initiated Motivational Climate in Individual Sport Questionnaire (MCISQ-**  
2 **Parent).** The MCISQ-Parent was used to assess the quality of motivation-related parental  
3 involvement perceived by young athletes in the competition setting (Harwood et al., 2019).  
4 This 21-item questionnaire focused on the motivational climate created by mothers and fathers  
5 separately within individual sport competition contexts. The mother dimension consisted of two  
6 factors (i.e., ‘task promoting values and behaviours’ and ‘ego promoting values and  
7 behaviours’) with 10 items, while the father dimension consists of 3 factors (i.e., ‘ego  
8 promoting values and behaviours’, ‘task promoting behaviours’ and ‘task promoting values’)  
9 with 11 items. Players were asked who completed the first section of the questionnaire and  
10 subsequently responded to either the mother or father dimension.

11           The MCISCQ-Parent has been initially validated for use with individual sport athletes  
12 between 13 and 26 years of age with mean readability age of Grade 7 ( $M = 7.46$ ;  $SD = 2.04$ )  
13 (Flesch, 1949). Harwood et al. (2019) reported that the internal consistency coefficients of both  
14 dimensions of the MCISCQ-Parent were above 0.80 for all factors. In the current study,  
15 subscales were combined for analysis into two variables (i.e., task and ego climate) for both  
16 mother and father. In contrast to Harwood et al. (2019), data from the current study suggested  
17 that the junior tennis players could not discern the two father task climate sub-factors, namely  
18 values and behaviours (Cronbach’s alphas ranged from .52 to .90 over time, but 5 out of the 6  
19 coefficients were below .70). Importantly, however, these players were able to reliably discern  
20 a combined task promoting values and behaviours factor, similar to the remaining three  
21 perceived climate subscales across mothers and fathers (Cronbach alphas for the combined  
22 values and behaviours items ranged from .71 to .89) (see Supplementary Material 1). As a  
23 result, this variable was used in subsequent analyses.

24           **Perceived Tennis Competence.** A three-item scale adapted from Conroy et al. (2005)  
25 was used to measure children’s perceived tennis competence. Two-items (e.g., how good at

1 tennis are you?; how good would you be at learning something new in tennis?) were used to  
2 measure children's perceptions of their tennis competence using a 7-point Likert scale ranging  
3 from 1 (not at all good) to 7 (very good). In addition, the third item, 'how confident are you in  
4 your tennis ability?' was rated on a similar scale ranging from 1 (not at all confident) to 7 (very  
5 confident). Within the present study, Cronbach alphas for this measure ranged from .73 – .80  
6 (see Supplementary Material 1).

### 7 ***Qualitative Data Collection***

8 In line with previous mixed method sport parenting intervention research (see Thrower  
9 et al., 2019), qualitative open-ended questions were used to explore both parents' and  
10 children's subjective experiences in their own words. Specifically, open-ended comment boxes  
11 were included alongside the online questionnaires and used to collect additional data about  
12 participants' perception of behaviour change following the OCPW (i.e., 1-month, 3-months)  
13 and the contexts within which it occurred. Parents and children were given specific instructions  
14 about what to include in each open-ended box. For example, children were asked: 'Have you  
15 noticed any changes in your mother (or father) before, during, or after tennis competitions in  
16 the last month since they attended the workshop (e.g., in their behaviour towards you or  
17 others)? If so, please provide some examples below.' Each open-ended comment box offered  
18 unlimited space. Overall, a total of 215 comments were provided after 1-month (i.e., 120 from  
19 parents, 95 from children) and 207 comments after 3-months (i.e., 114 from parents, and 93  
20 from children).

### 21 **Data Analysis**

#### 22 ***Quantitative Data Analysis***

23 Bivariate correlations for all study variables were run at the beginning of the analysis  
24 (see Supplementary Material 2). The main analysis involved testing whether the workshop  
25 brought about change in (perceived) parent behaviours that was then associated with change in



1 players' achievement goals. The data were hierarchically nested with time at Level 1 and  
2 nested within players at Level 2. Consequently, multilevel models were constructed using  
3 MLwiN version 3.05. Unconditional means models (intercept only) were initially conducted to  
4 ascertain the relative amounts of within- and between-person variance for each variable. Time  
5 was then entered into unconditional growth models to examine patterns of change across the  
6 three time points. In these models, the parent workshop was conceived as a dichotomous  
7 predictor indexing a shift from pre- to post-workshop scores. It was anticipated that the  
8 workshop would bring about increases and decreases in perceived parental task and ego climate  
9 respectively within one month, that would remain stable until the final time point, two months  
10 later. Given the relatively short duration of the study, the likely stability of players' goal  
11 orientations, and unknown patterns of change in perceptions of parental climate behaviours  
12 over a three-month period following a brief intervention, there was no reason to expect linear  
13 change in these variables. Thus, time was dummy coded as 0, 1, 1 rather than 0, 1, 2 (as for  
14 linear change). In the main models tested, players' goals served as the dependent variables with  
15 perceptions of mother's or father's ego and task climate serving as the predictor variables.  
16 Perceptions of climate were individual mean centered in order to obtain a pure estimate of  
17 intra-individual effects (Enders & Tofighi, 2007). It was expected that, on average, players'  
18 perception of mother or father task climate would be positively linked with their own task  
19 orientation, and that perceptions of ego climate would be positively associated with their ego  
20 orientation, at the start of the study (before the workshop). Moreover, the authors tested  
21 whether the workshop changed these relationships e.g., whether the relationship between  
22 perceived task climate and players' task goals strengthened or whether the relationship between  
23 perceived ego climate and players' ego goals weakened (for perceptions of mother's or father's  
24 behaviours).

25 ***Qualitative Data Analysis***

1           Qualitative data was analysed using template analysis (aka codebook analysis; Braun &  
2           Clarke, 2021). Template analysis is widely used in pragmatic applied research and combines  
3           the principles of thematic analysis with a more structured or systematic approach to meet  
4           specific pre-determined information needs (e.g., subjective perceptions of behaviour change;  
5           Braun & Clarke, 2021). Specifically, template analysis was conducted using NVivo 12 and  
6           followed six steps (see Brooks et al., 2015): Firstly, all parent and child responses (i.e., 1-  
7           month, 3-months) were read through to promote familiarity with the data. Secondly, broad prior  
8           themes were identified based on the OCPW content (e.g., reinforcing or discussing process  
9           goals, emphasising the importance of effort and attitude) and used to inform preliminary coding  
10          on a subset of the data. Thirdly, initial themes were organised into meaningful and contextually  
11          located clusters. Fourthly, these clusters were subsequently defined (e.g., pre-competition  
12          perceived changes) and formed an initial coding template. Penultimately, this initial coding  
13          template was then used to analyse further data and modified (e.g., inserting new themes,  
14          merging themes). Lastly, the finalised template was subsequently applied to analyse the dataset.

15

## **Results**

### **Reach**

17           In 2018, there were an estimated 7,500 tennis parents available to participate in the  
18           programme (see sampling criteria). This estimation was based on the notion that only the most  
19           involved parent in each child's tennis was likely to attend a workshop due to the  
20           aforementioned logistical challenges associated with both parents' attending (e.g., work  
21           commitments, childcare responsibilities; Thrower et al., 2017). During this period, 5781 unique  
22           users visited the LTA's parents in tennis page and 1043 parents (13.91%) expressed interest by  
23           registering to attend a workshop. Feedback forms during 2018 ( $n = 294$ ) suggested that parents  
24           who participated in the OCPW heard about the programme via email (67.35%), word-of-mouth  
25           (15.65%), LTA website (10.54%), other (e.g., coach referral, posters) (4.76%), or social media

1 (e.g., Twitter posts) (1.7%). The LTA did not have data to directly compare the  
2 representativeness of parent / guardian participants in relation to the wider tennis parent  
3 population in Britain.

#### 4 **Effectiveness / Efficacy**

##### 5 ***Quantitative Results***

6         The effectiveness / efficacy results below include data from children ( $n = 130$ ) and  
7 parents ( $n = 130$ ) who completed the measures across all three time points (i.e., pre-workshop,  
8 1-month, 3-months). However, children's responses to mother ( $n = 46$ ) and father ( $n = 84$ )  
9 initiated task and ego motivational climates were analysed independently. Mean scores for the  
10 study variables are shown in Table 1, along with the response scale range for each variable.  
11 Across the three time points, task goals were generally higher than ego goals for both parents  
12 and players. Players' perceptions of task climate were also above the scale mid-point for both  
13 mothers and fathers, whereas perceived ego climate scores were below the mid-point. Parents'  
14 positive emotions tended to receive higher scores than more negative emotions. Parental  
15 efficacies were generally high across the competition context (pre-to post-match), as were  
16 player feelings about their tennis competence.

17   [Insert Table 1 Here]

18         ANOVA revealed a significant effect of time on parent knowledge,  $F(1.87, 241.73) =$   
19  $23.65, p < .001$ . Bonferroni post-hoc comparisons highlighted how parents were more  
20 knowledgeable 1-month ( $p < .001$ ) and 3-months ( $p < .001$ ) after the intervention. Multilevel  
21 modelling was utilised to explore the main psychological outcomes, specifically to examine the  
22 effect of the workshop, and whether change instigated in perceptions of mother and father task  
23 and ego climates would predict change in players' corresponding achievement goals for tennis.

24         Intercept-only models showed that substantial variance was associated with the inter-  
25 individual level for parent goals, perceptions of mother climate, child ego goals, and perceived

1 competence (see Supplementary Material 1). Unconditional growth models revealed positive  
2 shifts (increases) following the workshop for parent task goals, pre- and post-match parent  
3 efficacy, and negative shifts (decreases) in parent ego goals and parent anxiety, dejection,  
4 excitement, and anger. Moreover, scores decreased for perceived father and mother ego climate  
5 and for players' ego orientation at time points 2 and 3 following the workshop. No changes  
6 were observed in parent happiness, perceived father and mother task climate, and self-reported  
7 player task orientation, and tennis competence (see Table 2).

8 [Insert Table 2 Here]

9 Table 3 shows the results of the main models examining relationships between  
10 perceived parental climate and player goals. Perceptions of both father and mother task climate  
11 positively predicted players' task orientation and these relationships were stable across the  
12 workshop. However, perceived parental ego climate was not significantly associated with  
13 players' ego orientation. The four models explained between 10% and 45% of the intra-  
14 individual variance in players' task and ego orientations.

15 [Insert Table 3 Here]

### 16 ***Qualitative Results***

17 As stated above, parents and children provided open-ended responses on subjective  
18 perceptions of change following the workshop across the two timepoints (i.e., 1-month and 3-  
19 months). Although a small number of parents and children felt that no change had occurred,  
20 and some parents felt the workshop had only reinforced their existing approach, consistent with  
21 the quantitative results the majority felt behaviour change had taken place. The final coding  
22 template comprised of four higher order themes (i.e., general perceived changes, pre-  
23 competition perceived changes, during competition perceived changes, and post-competition  
24 perceived changes). The higher order themes (and lower-level themes) are presented below  
25 alongside example quotations from both parents and children.

1           **General Perceived Changes:** Based on the responses, the general perceived changes  
2 reported (i.e., those not located in a specific context) included parents being calmer, less  
3 focused on outcomes, and more positive and encouraging. As one child explained: “My mother  
4 is much more encouraging than before and tries to show that it does not matter if you win or  
5 lose more”. Similarly, one mother wrote:

6           It's been fantastic. I've adopted the recommendations and my daughter has embraced  
7 them. She's happier on court, my perspective has improved and so I'm enjoying going  
8 whereas I didn't previously. Consequently, my daughter looks more relaxed and is  
9 playing better as demonstrated by her results.

10          **Pre-Competition Perceived Changes:** Specifically, responses across both time points  
11 suggest that before competitions parents are reminding children to enjoy the match, do their  
12 best, and/or focus on their process goals. As one child stated: “Yes! She tries to remind me  
13 about process goals and that winning isn't as important as good behaviour on court”. Similarly,  
14 one parent described the workshop's impact pre-competition in more detail:

15          Absolutely! I realised and have greater respect for how much my child has to take on  
16 when he goes on court. Setting goals before a tournament has been key in shifting our  
17 focus from winning to improvement and progress as well as helping my child become  
18 more consistent in his play (something we struggled with before). As such his results  
19 have improved much to everyone's delight! He now has an increased desire to enter  
20 tournaments and doesn't automatically think he's going to lose. Result!”

21          **During Competition Perceived Changes:** During competition, common responses  
22 referred to parents being more aware of their body language, being more relaxed whilst  
23 watching, showing less emotion, and getting less involved during matches. For example, one  
24 parent wrote: “I have learnt to take a step back during matches. It's not the end of the world if

1 my son misses a shot, he puts enough pressure on himself without me adding to it. My son  
2 seems a lot happier and more confident on court”. The following quote also captures how these  
3 changes were received by children, as one player affirmed: “She has got better at being at  
4 competitions, I used to feel nervous when she was watching now I don’t.”

5 **Post Competition Perceived Changes:** After competitions typical responses suggested  
6 parents were waiting until their child was ready to talk before helping them to review their  
7 performance and learn from their experience. One parent explained the multiple benefits  
8 associated this:

9 My children have actually commented that I've improved. My son mentioned that the  
10 feedback I give them is honest but helps identify process areas to improve, which he  
11 finds really valuable. It is less stressful as a parent to focus on the process rather than  
12 the outcome and is healthier for long term improvement...I have adopted these  
13 approaches across different sports too - hockey and cricket.

14 In addition, one child said: “My mum is more relaxed and we discuss how I would like her to  
15 behave while I’m playing. She now gives her feedback to my coach who then works on that  
16 with me at my next coaching session”.

### 17 **Adoption**

18 In line with the LTA competition team’s KPIs (see above), seven regional tennis co-  
19 ordinators (RTCs) arranged 81 face-to-face workshops across Britain between 1<sup>st</sup> January 2018  
20 and 31<sup>st</sup> December 2018. Specifically, workshops were scheduled in the East ( $n = 22$ ), South  
21 East ( $n = 20$ ), Midlands ( $n = 11$ ), North ( $n = 11$ ), and South West ( $n = 10$ ) regions in England.  
22 At least one OCPW was planned in all 44 counties within England. In addition, five workshops  
23 were also scheduled in Scotland ( $n = 2$ ) and Wales ( $n = 3$ ) and two online. Workshops ( $n = 65$ )  
24 were delivered by either the first and/or last authors ( $n = 13$ ) or OCPW trained tutors ( $n = 52$ )

1 in tennis clubs, leisure centres, academies, or universities. Sixteen of the 20 trained tutors  
2 delivered at least one workshop during this 12-month period.

### 3 **Implementation**

4 During 2018, 150 posters and 10,000 postcards were delivered to 60 week-long holiday  
5 competitions. Tennis parents in Britain also received two emails from the LTA customer  
6 engagement team (i.e., March 2018, August 2018) which contained a reference to the OCPW  
7 and 5-10 emails from RTCs to promote workshops within their region. Of the 81 scheduled  
8 workshops, 65 (83.95%) ran as intended whilst 16 (16.75%) were cancelled in the South West  
9 ( $n = 4$ ), South East ( $n = 6$ ), North ( $n = 2$ ), Midlands ( $n = 2$ ) or East ( $n = 2$ ) due to poor numbers.  
10 There were only two counties (i.e., Surrey and Somerset) in which more than one workshop  
11 was cancelled.

12 Across the 65 workshops, 1043 parents (approximately 13.91% of those available)  
13 signed up for a workshop and the attendance rate was 89.45% ( $n = 933$ ), ranging in each region  
14 from 81.58% (North) to 100% (Scotland). On average 14 parents attended each individual  
15 workshop, ranging between 3 and 36. Over this 12-month period, post-workshop feedback  
16 scores for enjoyment, satisfaction, instructor evaluation, and transfer intention ranged from  
17 5.79 to 6.68 (7-point Likert scale; See Table 4). However, the combined feedback scores for the  
18 first and last authors was significantly higher than trained tutors in relation to satisfaction ( $t$   
19  $[292] = 2.99, p = .003$ ), enjoyment ( $t [257.35] = 3.24, p = .001$ ), tutor evaluation ( $t [246.10] =$   
20  $2.90, p = .004$ ), and transfer intention ( $t [246.10] = 2.46, p = .015$ ). The overall *implementation*  
21 cost of the workshop roll out during 2018 was approximately £15,000 which included the first  
22 and last authors' consultancy fees (i.e., £6,000), printing and promotion (i.e., £2000), and tutor  
23 fees (£600 per month).

### 24 **Maintenance across Three-Years (2019 – 2021)**

1 Due to the overall programme cost, during 2019 a non-profit charge was implemented  
 2 by the LTA competitions team for the OCPW of £10 per session. The LTA's key performance  
 3 indicators (KPIs) for the OCPW in 2019 remained at 50 courses and 1000 parents across  
 4 England, Scotland, and Wales. A total of 72 workshops were scheduled during 2019, 42  
 5 courses ran and 30 were cancelled due to low numbers. Overall, 405 parents signed up for a  
 6 workshop and 377 attended (93.09%). During 2020 and 2021, due to the COVID-19 pandemic,  
 7 22 free online webinars were run by the first and last authors, 1206 parents signed up and 733  
 8 attended (60.78%). Despite differences in the format of delivery across the four-years, average  
 9 feedback scores remained high and stable over time (see Table 4). Specifically, there was no  
 10 significant effect of time on satisfaction ( $F [3, 403] = 2.06, p = .105$ ), enjoyment ( $F [3, 403] =$   
 11  $2.14, p = .095$ ), instructor evaluation ( $F [3, 403] = .56, p = .641$ ), or transfer intention ( $F [3,$   
 12  $403] = .73, p = .536$ ) across the four-year period.

13 [Insert Table 4 Here]

### 14 Discussion

15 The purpose of the current study was to utilise the RE-AIM framework to evaluate the  
 16 LTA's OCPW across a 4-year period. Working in collaboration with the LTA, the current study  
 17 was the first to evaluate the *reach, effectiveness, adoption, implementation, and maintenance* of  
 18 an organisational-level sport parent intervention. Focusing initially on *effectiveness*, results  
 19 highlight how the OCPW increased parents' competition tennis parenting efficacy and task goal  
 20 orientation as well as reduced their ego goal orientation and unpleasant emotions (i.e., anxiety,  
 21 anger, dejection) across a 3-month period. These findings are consistent with previous tennis  
 22 parent education programs (e.g., Harwood & Swain, 2002; Thrower et al., 2017; 2019), and  
 23 suggest that brief one-off interventions can yield comparable results over time to more time and  
 24 cost intensive longitudinal educational initiatives. Although the current study did not explore  
 25 mechanisms, from a theoretical perspective (i.e., cognitive-motivational-relational theory;



1 Lazarus, 2000) it may be that the changes in parents' knowledge, efficacy, and goal  
2 orientations help tennis parents re-appraise prominent competition stressors in tennis (e.g.,  
3 child's performances, watching a match, outcomes of matches; Harwood & Knight, 2009;  
4 Harwood et al., 2019) reducing the unpleasant emotions experienced. Such changes are  
5 important given unpleasant emotions (i.e., anger, anxiety) can lead to punitive parental  
6 behaviour as well as harsher or fewer interactions with children (Knight et al., 2009). However,  
7 the results show that the OCPW led to significant reductions in parents' levels of excitement. It  
8 may be that exposing parents to the theoretical tenets and behavioural ramifications of Self-  
9 Determination Theory (Deci & Ryan, 1985) and Achievement Goal Theory (Nicholls, 1989)  
10 constrains the excitement of junior tennis competitions for some parents (e.g., reducing the  
11 emphasis on winning matches, getting caught up in a focus on results). Furthermore,  
12 suggestions that parents should change their behaviour, or lessen their involvement in their  
13 child's tennis, may also diminish some parents' enthusiasm.

14 Building on the aforementioned findings, the current study also explored children's  
15 perceptions of parental behaviour before (i.e., baseline) and after (i.e., 1-month, 3-months)  
16 participating in the OCPW. Results showed significant changes in children's perceptions of  
17 both mother and father ego involving motivational climates but no perceived changes in task-  
18 orientated behaviour (possibly due to a 'ceiling effect' – see Table 1). Reductions in parent-  
19 initiated ego-involving motivational climates are encouraging given that young athletes'  
20 perceptions of such parent-initiated climates have been linked to lower levels of athlete  
21 engagement and perceived support (Harwood et al., 2019), higher extrinsic motivation and  
22 anxiety (O'Rourke et al., 2014), and more perfectionistic cognitions (Appleton et al., 2011).  
23 Despite this, within the current study perceptions of parent-initiated ego-involving climates  
24 were not significantly associated with players' ego orientation. These findings further highlight  
25 the complex interactions between children's dispositional goal orientations and the wider

1 motivational climate created by key social agents (e.g., coaches, parents, peers) and reiterates  
2 the need for similar field-based motivational climate interventions with coaches and peers,  
3 particularly during early adolescence (e.g., McLaren et al., 2015).

4       Beyond programme *effectiveness*, the current study also examined the wider *reach*,  
5 *adoption, implementation, and maintenance* of the OCPW. Although the current study recruited  
6 a far greater number of parents than previous studies (i.e., Thrower et al., 2017; 2019), the  
7 OCPW still reached a relatively small proportion of the available population during 2018 (i.e.,  
8 13.91%). The demographic data did illustrate the percentage uptake was higher from parents of  
9 younger children (i.e., under 11s) compared to early adolescents (i.e., under 12s, under 14s).  
10 These points highlight the need to go beyond *passive* recruitment strategies (i.e., emails,  
11 posters, social media posts) and target parents, particularly those with adolescents, through  
12 more *direct* approaches (e.g., via coaches and/or local voluntary tennis parent representatives).  
13 These conclusions led to the LTA making it an expectation that parents of county level players  
14 attend the workshop in 2021 and recruiting parent representatives to work closely with their  
15 local county association, to support the ongoing development and promotion of the OCPW in  
16 2022. However, these on-going concerns about programme *reach* also highlights the need to  
17 consider more innovative and creative ways of accessing, educating, and supporting tennis  
18 parents (e.g., podcasts, videos) during the initial stage of their involvement in tennis. For  
19 example, the successful uptake of live OCPW online webinars through COVID-19, and  
20 requests from parents to watch a recorded webinar having missed attendance, encourages  
21 consideration to archive recorded content for parents to access entirely at their convenience.  
22 Further attention can also be afforded to ways in which education and support can be better  
23 integrated as part of a joined-up youth sport system (e.g., peer mentoring, parent club  
24 representatives). Moreover, broader structural changes to the junior tennis system in Great  
25 Britain (e.g., reducing the emphasis on ratings and/or rankings from an early age; introducing a

1 task-involving rewards or recognition scheme) would also help optimise tennis parents'  
2 involvement, experiences, and enjoyment.

3         Alongside data on *reach*, the current study provides unique insights regarding the  
4 *adoption* and *implementation* of the OCPW across a 4-year period. The *adoption* of the OCPW  
5 was driven by a successful pilot phase in 2017, which secured both human (i.e., NGB staff) and  
6 financial resources from the LTA. Importantly, this led to the management and delivery of the  
7 OCPW to be included in RTCs annual objectives as well as the recruitment and training of  
8 tutors to deliver the OCPW. These steps were key to the wider scale out of workshops being  
9 delivered across Britain than originally outlined within the KPIs. As such, the steps taken in the  
10 current study provide a useful starting point for youth sport organisations planning to design  
11 and implement sport parent education programmes.

12         Changes to the delivery of the OCPW between 2018 and 2021 make it difficult to  
13 directly compare feedback data across the 4-year evaluation period. For example, a non-profit  
14 cost was implemented in 2018 to maintain programme sustainability. This led to a drop in the  
15 number of parents signing up to attend a workshop but, in contrast, fewer parental sign-ups not  
16 attending (i.e., fewer 'no-shows'). However, online delivering during the COVID-19 pandemic  
17 (during 2020 and 2021) increased the average number of parents attending each workshop and,  
18 most notably, led to no significant differences in terms of parents' satisfaction, enjoyment, tutor  
19 evaluation, and transfer intention. Although some attendances are likely to have been  
20 influenced by being in lockdown, these findings provide tentative support for the notion that  
21 online delivery addresses some of the provider (i.e., cost) and parent (i.e., travel, childcare  
22 responsibilities) barriers of face-to-face sport parent education programmes reported previously  
23 (Thrower et al., 2019). While advantageous for accessibility as noted earlier, it is perhaps  
24 important to caution that online delivery may limit interaction, experience sharing, and the

1 opportunity for parents to build-relationships with other tennis parents (see Thrower et al.,  
2 2017) compared with ‘in person’ workshops. However, the LTA remain committed to  
3 extending the parent education and support strategy and eight monthly free online workshops  
4 have been scheduled for 2022 with further educational resources also being developed.

5         The findings and practical implications of the current study should be considered in  
6 light of a number of limitations and observations that necessitate attention within further  
7 research. Firstly, our assessment of perceived father task climate using the MCISCQ-Parent  
8 was not in line with the initial development and validation research by Harwood et al. (2019).  
9 While support was found for the structure of the remaining subscales (i.e., the combining of  
10 values and behaviours within mother task/ego and father ego subscales), young and relatively  
11 inexperienced players did not perceive the distinction between the two father task components.  
12 This is likely due to developmental and tennis-specific characteristics; that is, participants in  
13 the present study, who on average were only 10 years of age, could not identify the subtle  
14 distinction between values and behaviours promoted by their fathers in terms of, for example,  
15 their body language, actions, reactions, and words before, during, and after competition. They  
16 most likely did not have sufficient exposure to their fathers’ parenting style around tennis  
17 competition and interpreted task promoting values through their father’s behavioural response  
18 toward them (e.g., my father is *happy with me* if I tried my best despite the result). In contrast,  
19 in Harwood et al.’s (2019) examination of the MCISCQ-Parent, participants were older  
20 adolescents with more matured sport experiences involving their parents. Our decision to  
21 combine components produced a reliable scale at all time points, and conceptually matched the  
22 other MCISCQ-Parent factors. However, findings should be treated with caution due to our ad  
23 hoc creation of this subscale. Further MCISCQ-Parent-based research addressing the on-going  
24 task of measurement validation is important given the findings for this younger sample of  
25 individual sports performers. While the reliability profiles of the composite task and ego

1 subscales across parents and time points were generally promising, there was evidence of  
2 instability (i.e., father ego subscale). Such findings necessitate research into age-related  
3 thresholds for applying the questionnaire and establishing the salience of developmental and  
4 contextual (sport) influences on children's and adolescents' perceived parental climates.

5 Secondly, whilst the current study attempted to collect data from a naturally occurring  
6 control group (i.e., parents who signed up for the workshop and agreed to participate in the  
7 evaluation but did not attend) the sample size ( $n = 4$ ) was not sufficient for inclusion within the  
8 analysis. Although such challenges are common in field-based studies, future studies are  
9 encouraged to use stronger experimental designs to evaluate intervention *effectiveness*.  
10 Research is also needed to directly compare the *reach* and *effectiveness* of the interventions  
11 using different delivery methods (i.e., face-to-face vs. online) and pricing strategies (i.e., free  
12 vs. non-profit costings). Thirdly, the current study was unable to directly compare the  
13 representativeness of parent / guardian participants in relation to the wider tennis parent  
14 population in Britain. Youth sport organisations are encouraged to collect such data to be able  
15 to identify if certain demographic groups are more or less likely to engage in education and  
16 support initiatives. Finally, unlike previous research (e.g., Thrower et al., 2019), the current  
17 study did not examine the *effectiveness* of the OCPW on general parenting outcomes. Future  
18 researchers are encouraged to further examine how sport parent interventions could prevent, or  
19 address, some of the challenges faced in mainstream parent education (see Breitenstein &  
20 Gross, 2013).

21 In conclusion, the current study used the RE-AIM framework (Glasgow et al., 1999) to  
22 examine the programme *reach*, *effectiveness*, *adoption*, *implementation*, and *maintenance* of  
23 the OCPW within the context of British Tennis. In doing so, this study answers calls for youth  
24 sport researchers to become more involved in translational-science, research-dissemination, and  
25 program evaluation efforts (Gould, 2019). Results support the notion that brief one-off sport

1 parent interventions can positively influence parents and children's experience and behaviour  
2 in youth sport. Furthermore, findings highlight the importance of applied researchers  
3 collaborating with national youth sport organisations to design and deliver evidence-based  
4 sport parent education initiatives (i.e., establishing KPIs, scale-out strategy, financial backing,  
5 and promotion of research evaluation). Overall, the OCPW represents a well-received,  
6 practical, and effective brief intervention for enhancing parental involvement in junior tennis.  
7 We hope the current findings will lead to further resources being allocated to evidence-based  
8 sport parent education programmes in the future.

### 9 **Acknowledgements**

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11 LTA competition team for collecting data on the *reach, adoption, implementation, and*  
12 *maintenance* of the OCPW as well as their support at various stages of this project.

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7 Table 1.

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9 *Means and Standard Deviations of all Study Variables at Each Timepoint*

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Variable	Mean(SD)		
	Time 1	Time 2	Time 3
1. Parent Knowledge	2.72(1.02)	3.32(1.01)	3.32(1.03)
2. Parent Task Goal	4.48(0.58)	4.55(0.51)	4.59(0.47)
3. Parent Ego Goal	2.14(0.81)	2.01(0.76)	1.96(0.71)
4. Pre-Match Parent Efficacy	6.26(1.82)	7.61(1.36)	7.69(1.52)
5. In-Match Parent Efficacy	6.87(1.82)	8.14(1.40)	8.16(1.42)
6. Post-Match Parent Efficacy	6.28(2.14)	7.93(1.49)	7.94(1.68)
7. Parent Anxiety	2.89(0.98)	2.34(0.82)	2.30(0.71)
8. Parent Dejection	1.71(0.64)	1.38(0.53)	1.43(0.50)
9. Parent Excitement	3.22(0.87)	3.07(0.93)	3.13(0.93)
10. Parent Anger	1.69(0.79)	1.43(0.60)	1.42(0.58)
11. Parent Happiness	3.54(0.84)	3.43(0.95)	3.46(0.90)
12. Father Task Climate	6.06(0.71)	6.19(0.75)	6.14(0.95)
13. Father Ego Climate	3.09(1.26)	2.61(1.48)	2.55(1.43)
14. Mother Task Climate	6.06(0.71)	6.11(0.77)	6.05(1.09)
15. Mother Ego Climate	2.55(1.26)	2.21(1.22)	2.37(1.19)
16. Child Task Goal	4.63(0.45)	4.66(0.41)	4.63(0.52)
17. Child Ego Goal	3.40(0.97)	3.19(1.07)	3.07(1.06)
18. Child Competence	5.41(1.09)	5.39(1.05)	5.38(0.95)

11 *Note.* Scales: parent knowledge (0-5); parent goals and emotions, child goals (1-5); parent  
 12 efficacy (0-10); perceived parental climate, child competence (1-7).

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Table 2

*Regression Coefficients Describing Change in Study Variables across the Workshop*

*Intervention*

Variable	Intercept (Time 1)	Workshop	$R_1^2$ (Intraindividual Variance)
1. Parent Task Goal	4.48	0.10*	.28
2. Parent Ego Goal	2.13	-0.15**	.27
3. Pre-Match Parent Efficacy	6.26	0.31**	.03
4. In-Match Parent Efficacy	8.14	-0.11	.01
5. Post-Match Parent Efficacy	7.69	0.35***	.09
4. Parent Anxiety	2.80	-0.57***	.47
5. Parent Dejection	1.64	-0.30***	.38
6. Parent Excitement	3.18	-0.12*	.17
7. Parent Anger	1.65	-0.26***	.38
8. Parent Happiness	3.52	-0.10	.06
9. Father Task Climate	6.10	0.11	.00
10. Father Ego Climate	3.01	-0.51**	.27
11. Mother Task Climate	5.94	0.18	.30
12. Mother Ego Climate	2.46	-0.27*	.18
13. Child Task Goal	4.64	0.02	.00
14. Child Ego Goal	3.38	-0.27***	.25
15. Child Competence	5.41	-0.02	.23

*Note.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

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1 Table 3

2 *Multilevel Models Exploring Predictors of Child Achievement Goals for Tennis – Influence of Fathers (left side) and Mothers (right side)*

Predictor Variable	Child Task Goal	Child Ego Goal	Predictor Variable	Child Task Goal	Child Ego Goal
Intercept	4.58***	3.32***	Intercept	4.69***	3.38***
Workshop	.05	-.29**	Workshop	-.06	-.17*
Perceived Father Task Climate (PFTC)	.32**		Perceived Mother Task Climate (PMTC)	.24***	
Perceived Father Ego Climate (PFEC)		.20	Perceived Mother Ego Climate (PMEC)		.14
PFTC × Workshop	-.05		PMTC x Workshop	.11	
PFEC × Workshop		-.08	PMEC x Workshop		.07
$R_1^2$	.10	.18		.40	.45

3 *Note.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

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1 Table 4.

2 *Post-workshop feedback average scores between 2018 and 2021*

Items	Scale	<i>Post-Workshop Feedback</i>	<i>Post-Workshop Feedback</i>	<i>Post-Workshop</i>	<i>Post-Workshop</i>	<i>Total</i>
		<i>2018</i> <i>(n = 294)</i>	<i>2019</i> <i>(n = 38)</i>	<i>Feedback 2020</i> <i>(n = 44)</i>	<i>Feedback 2021 (n =</i> <i>31)</i>	<i>(n =407)</i>
		Mean (SD)				
Satisfaction	1-7	6.33 (.90)	6.26 (1.00)	6.68 (.83)	6.37 (1.06)	6.36 (.92)
Enjoyment	1-7	5.79 (1.12)	5.79 (1.24)	6.25 (1.06)	5.79 (1.28)	5.84 (1.14)
Instructor Evaluation	1-7	6.59 (.76)	6.53 (.85)	6.73 (.85)	6.56 (.64)	6.59 (.77)
Transfer Intention	1-7	6.68 (.75)	6.55 (1.05)	6.75 (.81)	6.52 (1.23)	6.66 (.83)

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1 Supplementary Material 1

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3 *Cronbach's Alpha Coefficients, Variance Associated with Each Level of Analysis, and Intraclass Correlation Coefficients for All Study*  
 4 *Variables*

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Variable	Cronbach's Alpha			Variance		Intraclass Correlation Coefficient
	Time 1	Time 2	Time 3	Level 1 Within	Level 2 Between	
1. Parent Task Goal	.80	.75	.77	0.11	0.16	.59
2. Parent Ego Goal	.87	.87	.86	0.20	0.39	.66
3. Pre-Match Parent Efficacy	.75	.79	.87	1.30	2.48	.66
4. In-Match Parent Efficacy	.81	.83	.86	0.33	1.72	.84
5. Post-Match Parent Efficacy	.88	.88	.93	0.45	1.96	.81
6. Parent Anxiety	.86	.87	.84	0.45	0.34	.43
7. Parent Dejection	.76	.85	.87	0.21	0.13	.38
8. Parent Excitement	.81	.93	.88	0.27	0.56	.67
9. Parent Anger	.87	.86	.87	0.32	0.12	.27
10. Parent Happiness	.87	.93	.88	0.29	0.51	.64
11. Father Task Climate	.71	.74	.89	0.47	0.17	.27
12. Father Ego Climate	.64	.85	.90	1.08	0.87	.45
13. Mother Task Climate	.85	.79	.90	0.50	0.52	.51
14. Mother Ego Climate	.81	.86	.84	0.60	0.90	.60
15. Child Task Goal	.75	.75	.83	0.16	0.05	.24
16. Child Ego Goal	.84	.90	.92	0.36	0.72	.67
17. Child Competence	.80	.79	.73	0.40	0.66	.63

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1 Supplementary Material 2

2  
3 *Bivariate Correlations of all Study Variables at the Beginning of the Study (Pre-Workshop, Time 1)*

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Variable	Bivariate Correlations																
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1. Parent Task Goal	-																
2. Parent Ego Goal	.37**	-															
3. Pre-Match Parent Efficacy	.27**	.00	-														
4. In-Match Parent Efficacy	.21*	-.11	.64**	-													
5. Post-Match Parent Efficacy	.28**	-.01	.76**	.65**	-												
6. Parent Anxiety	-.19*	.06	-.31**	-.18*	-.24**	-											
7. Parent Dejection	-.12	.11	-.15	-.15	-.17*	.53**	-										
8. Parent Excitement	.18*	.08	.17	.08	.17	.19*	.15	-									
9. Parent Anger	-.06	.14	-.02	-.13	-.12	.32**	.65**	.13	-								
10. Parent Happiness	.20*	.04	.15	.13	.17	.10	.04	.80**	.08	-							
11. Father Task Climate	.19	.18	.30*	.22	.35*	-.05	.05	-.05	-.01	.12	-						
12. Father Ego Climate	.09	.31*	-.09	-.17	-.05	.44**	.35*	.28	.43**	.15	-.13	-					
13. Mother Task Climate	.27*	.12	.47**	.13	.28**	-.31**	-.16	.24*	-.04	.16	#	#	-				
14. Mother Ego Climate	.19	.39**	.29**	.16	.19	-.11	.04	.04	.03	-.14	#	#	.11	-			
15. Child Task Goal	.18*	.13	.12	.06	.10	-.23**	-.26**	.12	-.13	.13	.31*	-.08	.41**	.12	-		
16. Child Ego Goal	.10	.22*	.10	.14	.13	.14	.08	-.05	.13	-.08	.01	.51**	-.17	.48**	.01	-	
17. Child Competence	-.05	.04	-.01	-.00	-.07	-.00	-.09	.28**	-.03	.23**	-.02	.06	.06	-.09	.20*	.12	-

5 *Note.* \*  $p < .05$ , \*\*  $p < .01$ . # Coefficient could not be calculated as players reported on mother or father climate (n = 45 fathers, n = 85 mothers).

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