



A Citation Network Analysis of Research on Parent–Child Interactions in Youth Sport

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Citation network analysis is a systematic technique that affords the synthesis of scholarship in a well-defined content area. In an effort to highlight the citation structure of research on parent–child interactions in youth sport, multiple databases were searched using all 12 combinations of the following keywords: (Level 1) “families,” “parents,” “fathers,” and “mothers”; (Level 2) “children,” “adolescents,” and “athletes”; and (Level 3) “sport.” A 3-step filtering approach (Jones, 2004; Meade & Richardson, 1997) driven by prespecified inclusion and exclusion criteria was used across 4 separate searches to consolidate the article population. This process yielded a final article population of 199 peer-reviewed publications across 77 peer-reviewed outlets since 1968. Descriptive analyses of the participants and publications highlighted a steady increase in publication frequency over the past 5 decades, with the vast majority of research having been conducted in the United States, the United Kingdom, Canada, and Australia. Athletes participating across 37 unique sports were represented across the articles, with most sampling athletes aged 11 to 15 and/or their parents. Nearly 60% of articles used quantitative methodologies, with an increase in qualitative work occurring over the past decade. UCINET software was used to identify the most prominent (i.e., widely cited) articles, as well as cohesive subgroups of closely linked articles in the literature. The use of citation network analysis in the present study proved useful in identifying knowledge gaps in the research on parent–child interactions in youth sport, thus highlighting potentially fruitful paths for future empirical efforts.

Keywords: citation network analysis, parent–child interactions, youth sport

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The review and synthesis of research is an essential step in situating a field of knowledge (Rayleigh, 1885). This systematic process is defined by the analysis, appraisal, and assimilation of the accumulated literature in a given field (Thomas, Nelson, & Silverman, 2005). Importantly, high-quality research syntheses go

beyond just a summary of research to offer concrete conclusions and future directions for study (Thomas et al., 2005). Historically, the two most common forms of research synthesis have been meta-analysis and qualitative review.

Meta-analysis (Glass, 1976) is a rigorous quantitative approach to the synthesis of a specified literature. Specifically, meta-analyses use detailed methods to guide a bracketed review of the relevant literature and offer an integrated analysis of results based on a standard metric (i.e., effect size; Thomas et al., 2005). At present, no meta-analyses have been conducted in the literature examining parent–child interactions in youth sport, in large part due to a lack of substantial quantitative research as well as the lack of a unifying phenomenon or construct (e.g., parent involvement, parent–child relationship, and child enjoyment).

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A second general methodology of research synthesis is qualitative review. The goal of a qualitative review is to make reliable and valid inferences from the written text, spoken word, or methodical observation in a systematic and unbiased way (Krippendorff, 2004). Multiple qualitative reviews have been conducted in youth sport (Gould, 1982; Weiss & Bredemeier, 1983; Weiss & Raedeke, 2004); however, three recent studies provide a summary and commentary on the growing literature in the area of youth sport parenting. In the family literature, Bremer (2012) described and critiqued what is known about relations between parents and children in sport. In the sport and exercise psychology literature, Harwood and Knight (2015) synthesized the extant body of work and forwarded a position on the concept of sport parenting expertise through the presentation of six key postulates. Knight, Berrow, and Harwood (2017) maintained a more contemporary focus, synthesizing the literature from the past 2–3 years in three related (and in some cases overlapping) areas: (a) the influence of parental involvement on children (Dorsch, Smith, & Dotterer, 2016; Elliott & Drummond, 2017b), (b) factors influencing parent involvement (Dunn, Dorsch, King, & Rothlisberger, 2016; Knight & Holt, 2013), and (c) the strategies developed by parents to facilitate their involvement in their children's sport (Dorsch, King, Dunn, Osai, & Tulane, 2017; Thrower, Harwood, & Spray, 2016).

Although Harwood and Knight's (2015) and Knight and colleagues' (2017) reviews highlight the foundational and contemporary understanding of youth sport parenting, research has yet to evaluate the prominence and interconnectedness of this literature area. In light of this, there remains a complementary need to highlight the citation structure of research on sport parenting. However, because the sport parenting literature is large, and in some respects fragmented, a more targeted area of inquiry was sought to achieve parsimony and coherence in the citation network. As such, the focus of the present study is on parent–child interactions in youth sport. In line with Bell (1968), parent–child interactions are conceptualized as the bi-directional influences of parents and children (e.g., the impact of parent involvement on children's experiences and/or the impact of children's experiences on parent involvement). Fur-

thermore, parent–child interactions can be conceptualized as strategies used to facilitate parent involvement.

In an attempt to highlight the citation structure of research in this area, it is important to appropriately match our synthesis approach with the research questions of interest. One such approach is citation network analysis. Citation network analysis is a systematic technique that affords the synthesis of scholarship. Although traditional approaches to synthesizing literature (e.g., meta-analysis and qualitative review) focus on integrating the results of studies in a particular area, citation network analyses primarily function to uncover the prominence and interconnectedness of studies in the field of study based on citation practices (Barabási & Bonabeau, 2003; Moore, Shiell, Hawe, & Haines, 2005). The results of a citation network analysis offer an objective evaluation of the visibility and interconnectedness of scholars, articles, participant groups, and methodological approaches (de Nooy, Mrvar, & Batagelj, 2005; Moore et al., 2005). Moreover, the analysis has the potential to identify subgroups and isolates within a single area of literature. Because scholars within a research area tend to cite each other (de Nooy et al., 2005), the identification of relevant subgroups may enhance the understanding of the interconnectedness of a literature area, and the identification of isolates can highlight particular studies that have otherwise been overlooked. This methodology, therefore, is an appropriate step toward the enhanced understanding of the corpus of research on parent–child interactions in youth sport.

Citation network analysis holds substantial potential to effectively synthesize the quickly growing body of research associated with parent–child interactions in youth sport. Because knowledge is socially constructed (Moore et al., 2005), documenting the citation practices utilized within this field has the potential to guide our understanding of the knowledge construction process. The methodology has been effectively applied to provide helpful typologies of various subdisciplines within the larger field of sport and exercise psychology (Bruner, Erickson, Wilson, & Côté, 2010; Bruner, Eys, Beauchamp, & Côté, 2013; Gustafsson, Hancock, & Côté, 2014), and adopting the citation network approach in the present study will improve the present understanding of the complexity of

parent–child interactions in varied youth sport settings. In building from past research utilizing this methodology, the purpose of the present investigation is to synthesize and evaluate the prominence, interconnectedness, and coverage of the research on parent–child interactions in youth sport using citation network analysis. The investigation was based on three primary research questions: (1) What are the most widely cited research articles within the literature on parent–child interactions in youth sport? (2) How are these articles linked across the cited literature in the field? and (3) Which participant and publication demographics are most and least understood across the body of research?

Method

Specification of the Article Population

The inclusion of relevant articles was accomplished by utilizing general (i.e., PubMed, Web of Science, Google Scholar) and specific (i.e., PsycINFO, SportDiscus) electronic databases in January, 2017. We chose to restrict our search to these databases because of their comprehensive reportage of the English-language sport research. In an effort to produce an inclusive population of articles, a date range was not set when initially searching the databases. In specifying the search parameters, we sought all academic literature targeting parent–child interactions in the context of youth sport. Identifying papers across a range of literatures afforded a broad documentation of the extant research on parent–child interactions in youth sport.

Inclusion Criteria

In an effort to guide the article retrieval process, two primary inclusion criteria were established. First, articles were required to highlight some form of parent–child interactions in youth sport. For the purposes of our search, parent–child interaction was operationalized based on the three domains of contemporary research established by Knight and colleagues (2017): (a) the influence of parental involvement on children, (b) factors influencing parent involvement, and (c) the strategies developed by parents to facilitate their involvement in their children’s sport. Although these domains do not represent the youth sport parenting literature

comprehensively, they each represent one aspect of parent–child interaction in youth sport. Specifically, the third domain is composed of work highlighting the role of researchers and practitioners in providing education and strategies for the parent–child interaction (e.g., involvement, communication, and support) in youth sport. In the present study, youth sport is operationalized as “adult-organized and controlled athletic programs for young people,” wherein “participants are formally organized [and] attend practices and scheduled competitions under the supervision of an adult leader” (Smoll & Smith, 2002, p. xi). This definition does not include physical activity, exercise, physical education, and free play settings, which comprise a substantial volume of research in sport and exercise psychology. A second inclusion criterion was that the research must have been published in a peer-reviewed, English-language, academic journal. Because research articles published in peer-reviewed academic journals represent the accumulated scholarship in a field of study (Silverman & Skonie, 1997), books, book chapters, encyclopedia entries, literature reviews, methodological, conceptual, and theoretical papers, conference proceedings, theses and dissertations, government reports, and organizational “white papers” that did not contain original data or had not been subjected to peer review are not included in the present analysis.

Exclusion Criteria

In an effort to further delimit the article population, four exclusion criteria were established to guide the article retrieval process. First, we excluded settings where sport participation was secondary to another programmatic goal, such as positive youth development (Hodge, Kanteris, Forneris, Bocarro, & Sayre-McCord, 2017) or sense of community (Legg, Wells, & Barile, 2015). However, publications were included where equal weight was given to parent–child interaction in multiple contexts, such as music (Simpkins, Vest, Dawes, & Neuman, 2010) and academics (Cassidy & Conroy, 2006). Second, we excluded research with a primary purpose of assessing the interaction between the coach and parent, the coach and athlete, or across the coach/parent/athlete triad (Amorose, Anderson-Butcher, Newman, Fraina, & Iachini, 2016;

Hayward, Knight, & Mellalieu, 2017; Jowett & Timson-Katchis, 2005). This criterion did not exclude articles that targeted two or more of these participant subgroups as participants, as long as the research focus was on parent-child interactions in youth sport (Appleton, Hall, & Hill, 2011; O'Rourke, Smith, Smoll, & Cumming, 2014). Third, although we acknowledge its importance as a growing area of interest, we also excluded research addressing sport participation in disability or clinical populations (Fitzgerald & Kirk, 2009). Fourth, because our aim was to synthesize research on parent-child interaction in sport, we excluded articles that simply *collected* data on parents or from parents but did not assess their interactions with their children in sport. For example, numerous articles in the youth sport literature rely on observations of parents at sporting events (Blom & Drane, 2008; Bowker et al., 2009) or parent reports to assess children's participation outcomes (Neely & Holt, 2014). Such articles were not included in the present synthesis. This delimited the article population greatly, as there is an extensive literature documenting parental behaviors in youth sport settings.

Article Retrieval

Databases were searched using 12 combinations of keywords at three levels. The first level ($n =$ four keywords) included "families," "parents," "fathers," and "mothers." The second level ($n =$ three keywords) included "children," "adolescents," and "athletes." The third level included the keyword "sport." During an initial search conducted in January 2017, 942 English-language articles were identified for review. Removal of duplicates resulted in 711 articles being retained for further consideration. A three-step filtering approach (Jones, 2004; Meade & Richardson, 1997) was then used to consolidate the article population. First, study *titles* were reviewed. Second, study *abstracts* were reviewed. Finally, full *article texts* were reviewed. Papers were excluded from the final article population when they did not meet the established inclusion criteria at one of these steps. The screening of study titles of yielded 296 articles that fit the inclusion criteria, each of which were retained for the abstract review. Electronic (PDF) copies of the 296 articles were obtained through various means (e.g., author repository, institutional library search engine, interlibrary

loan, Google Scholar web search, and *Research-Gate* author query). The screening of article abstracts yielded 194 articles that fit the inclusion criteria, each of which were retained for full-text review. During this step, the full text of each article was screened and discussed by the first and second authors in an effort to come to consensus on inclusion/exclusion. Following this discussion, 167 articles were retained for inclusion in the final article population (Figure 1).

A second search was conducted in July 2017 based on the annotation of references cited by the 167 publications in the article population. Thirty-one new articles were identified by titles for review. Filtering occurred by abstracts and then full text in an effort to consolidate the article population, and papers were excluded from the final article population when they did not meet established inclusion criteria at one of these steps. The screening of publication abstracts yielded 17 articles that fit the inclusion criteria, each of which were retained for full-text review. During this step, the full text of each article was screened and discussed by the first and second author in an effort to come to consensus on inclusion/exclusion. Following this discussion, 15 new articles were retained for inclusion in the final article population (Figure 1).

A third search was conducted in December 2017 to document all articles published in 2017 that fit the study's inclusion criteria. All articles were subjected to the same title, abstract, and full-text screening procedures, and papers were excluded from the final article population when they did not meet the established inclusion criteria at one of these steps. This search produced 10 new articles that were published in the 2017 calendar year. Each was retained for inclusion in the final article population (Figure 1).

A final search and validation was conducted in March, 2018, subsequent to the peer-review process. As a first step, the electronic databases were researched to ensure the most comprehensive coverage across the extant literature. Because many publications are not indexed on scientific databases until 3 to 6 months after publication (Gustafsson et al., 2014), we hoped this final search would uncover articles that were missed in the December 2017 search. The final search yielded 21 new articles, each of which were subjected to title, abstract, and full-text screening procedures. Papers were ex-

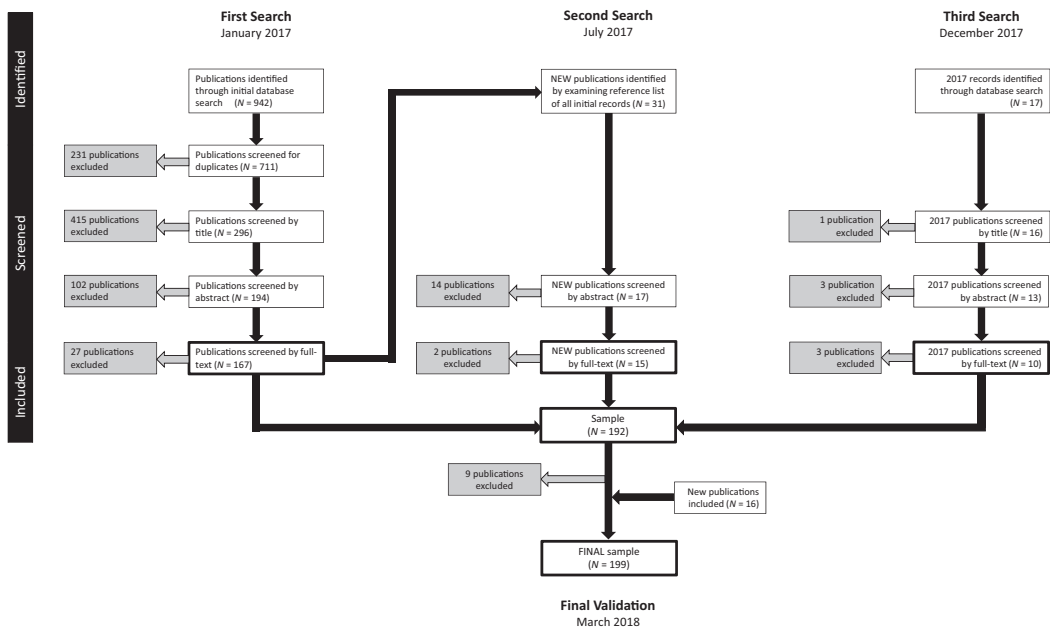


Figure 1. Citation network analysis of the final article population ($N = 199$).

cluded from the final article population when they did not meet the established inclusion criteria at one of these steps. Ultimately, 16 of the 21 new articles were retained for inclusion in the final article population ($N = 208$). As a final step, each of the 208 articles was reviewed based on the original inclusion and exclusion criteria. This validation process resulted in the removal of nine articles from the population (Figure 1). A comprehensive bibliography of the final article population ($N = 199$) is included in the online supplemental appendix.

Data Synthesis

Each publication in the final article population was assigned a number between 1 and 199, which was recorded in the first column and first row of an Excel spreadsheet to create a 199×199 citation matrix. The reference lists for each of the articles were thoroughly reviewed, and citation information was extracted for each instance where an individual article cited any of the others in the final article population. For instance, if Article 01 cited articles 50, 100, and 150, then an “x” would be inserted in the row associated with Article 01, and the columns associated with articles 50, 100, and 150

(Gustafsson et al., 2014). The final citation matrix was cross-referenced by two members of the research team, and verified by the lead author, to ensure accuracy. The resultant citation matrix was imported into UCINET software (Borgatti, Everett, & Freeman, 2002).

To address the first research question (what are the most widely cited research articles within the literature on parent–child interactions in youth sport?), we calculated the in-degree centrality (i.e., the number of times an article is cited by other articles in the final article population) of each individual article. To address the second research question (how are these articles linked across the cited literature in the field?), we explored subgroups within the citation network (i.e., clusters of articles that are more tightly connected to one another than they are to articles belonging to other clusters; Hanneman & Riddle, 2005). In essence, the algorithms used to uncover subgroups within a network are similar to a cluster analysis approach in that they aim to maximize similarity (i.e., citations) within each subgroup and dissimilarity between subgroups. To address the third research question (which participant and publication demographics are most and least understood across the body of research?), we used numerous factors to

classify each article: (a) year of publication, (b) journal of record, (c) countries from which participants were drawn, (d) ages of participants, (e) analytic methods used, (f) sports participated in, and (g) levels of sport participation.

Results

Citation Network Analysis

Figure 2 displays the citation network for all 199 articles in the final article population. Each article is represented by a node, the size of which corresponds to its in-degree centrality (i.e., how many times an article is cited by other articles in the final population). Arrows between nodes represent citations from one article to another. The average in-degree centrality score for the article population was 6.33 ($SD = 9.09$), with individual scores ranging from 0 to 53. The 11 most prominent articles in the population are presented in Table 1. The most widely cited article was a qualitative study on the role of the family in the development of talent in sport (Côté, 1999), with an in-degree centrality score of 53. Given that older articles are more likely to be widely cited, it is not surprising that several of the most prominent articles are earlier studies on

the role of sport parents (Leff & Hoyle, 1995; Scanlan & Lewthwaite, 1984; Scanlan & Lewthwaite, 1986). However, three articles identified in Table 1 were published within the last decade (Dorsch, Smith, & McDonough, 2009; Holt, Tamminen, Black, Mandigo, & Fox, 2009; Holt, Tamminen, Black, Sehn, & Wall, 2008). Because in-degree centrality, scores may be biased toward older articles, we calculated each of the 199 articles' citations per year as a second metric. Although the majority of articles represented in Table 1 also have high levels of citations per year, this process highlighted several more recent articles (Dorsch, Smith, & McDonough, 2015; Elliott & Drummond, 2017a; Knight & Holt, 2014; Knight, Neely, & Holt, 2011) that have been widely cited (2.71–5.00 citations per year), despite having relatively low in-degree centrality scores due to their more recent publication dates.

The citation network appeared to consist of three main subgroups, which are identified by node color in Figure 2. The first and largest subgroup ($n = 178$; gray nodes) consists of the majority of the article population and is predominantly situated at the center of the citation network. The second subgroup ($n = 13$; white nodes) represents “disconnects,” which are found

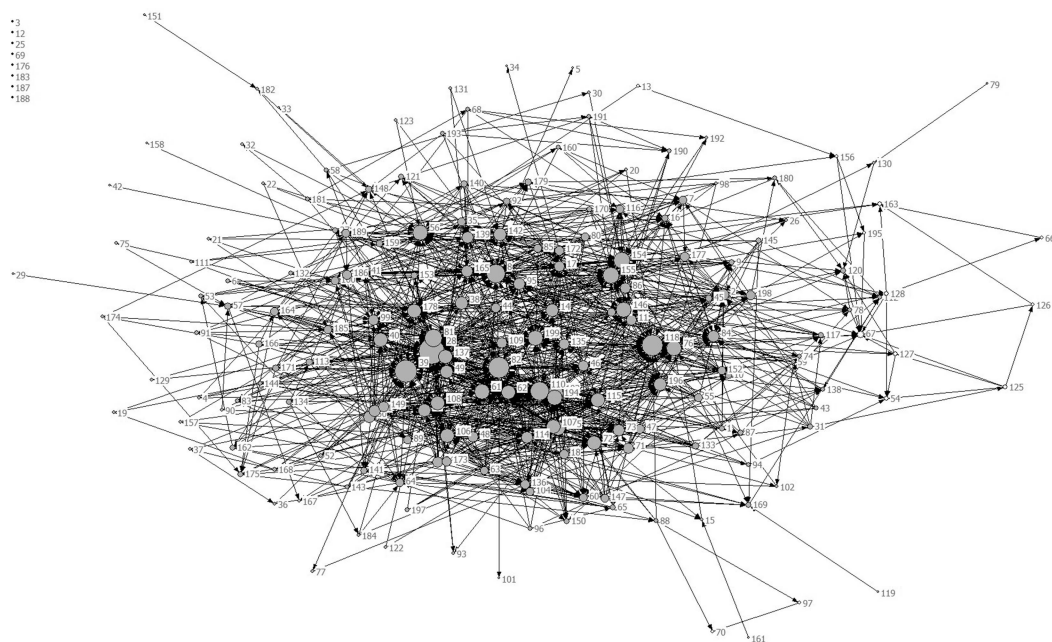


Figure 2. Citation network for the 199 studies in the final article population.

Table 1
Most Frequently Cited Studies in the Final Article Population

Rank	Title [text identification number in Figure 2]	In-degree centrality score	Citations per year
1	The influence of the family in the development of talent in sport (Côté, 1999) [28]	53	2.79
2	Parental involvement in competitive youth sport settings (Holt, Tamminen, Black, Sehn, & Wall, 2008) [82]	38	3.80
3	Parents' perceptions of child-to-parent socialization in organized youth sport (Dorsch, Smith, & McDonough, 2009) [39]	36	4.00
4	Young athlete's perceptions of parental support and pressure (Leff & Hoyle, 1995) [118]	36	1.57
5	Social psychological aspects of competition for male youth sport participants: Predictors of competitive stress (Scanlan & Lewthwaite, 1984) [154]	35	1.03
6	Social psychological aspects of competition for male youth sport participants: IV. Predictors of enjoyment (Scanlan & Lewthwaite, 1986) [155]	33	1.03
7	Parental involvement and athletes' career in youth sports (Wuerth, Lee, & Alfermann, 2004) [199]	31	2.21
8	Parental influence on children's cognitive and affective responses to competitive soccer participation (Babkes & Weiss, 1999) [8]	30	1.58
9	Family socialization, gender, and sport motivation and involvement (Fredricks & Eccles, 2005) [56]	27	2.08
T10	Understanding the role parents play in tennis success: A national survey of junior tennis coaches (Gould, Lauer, Rolo, Jannes, & Pennisi, 2006) [61]	27	2.25
T10	Youth parenting styles and practices (Holt, Tamminen, Black, Mandigo, & Fox, 2009) [81]	27	3.00

on the periphery of the network and consist largely of older articles (Felker, 1968; McElroy & Kirkendall, 1981). The third subgroup ($n = 8$; black nodes) represents “isolates,” which are articles that are completely disconnected from the rest of the population, both in terms of articles they cite and by whom they are cited. This subgroup consisted of articles published between 1980 and 2015 in a wide range of typically nonsport psychology-focused journals (e.g., *Journal of Human Stress*, *Journal of Pediatrics and Child Health*, *The Journal of Genetic Psychology*, *The Leadership Quarterly*). Further, only four of the isolates explicitly mention families or parents in the article title.

Population and Publication Demographics

Year of publication. Across the final population of articles, the years of publication ranged from 1968 through 2017. Articles published “online first” in 2017 are included in the analysis, even if they had not yet gone to print by the end of the calendar year. Ultimately, of note to the reader, these are likely to become

2018 publications. Figure 3 represents a histogram of articles, sorted chronologically, from 1968 through 2017. These data highlight a relatively strong trajectory of work being published on parent–child interaction in youth sport. Indeed, 120 of the 199 articles in the article population (60.3%) were published in the last decade (2008–2017). This is in contrast to the three articles published between 1968 and 1977, the 14 articles published between 1978 and 1987, the 24 articles published between 1988 and 1997, and the 38 articles published between 1998 and 2007.

Journal of record. Across the final population of articles, 77 peer-reviewed journals are represented. Of these, 24 outlets (31.2%) have published more than one article in the final population, whereas 53 outlets (68.8%) have published only one article. The most commonly represented journal (*Psychology of Sport & Exercise*) has published 20 articles (10.1% of the database). Figure 4 represents a histogram of the 77 journals, sorted alphabetically. Data reveal a relatively small group of journals in

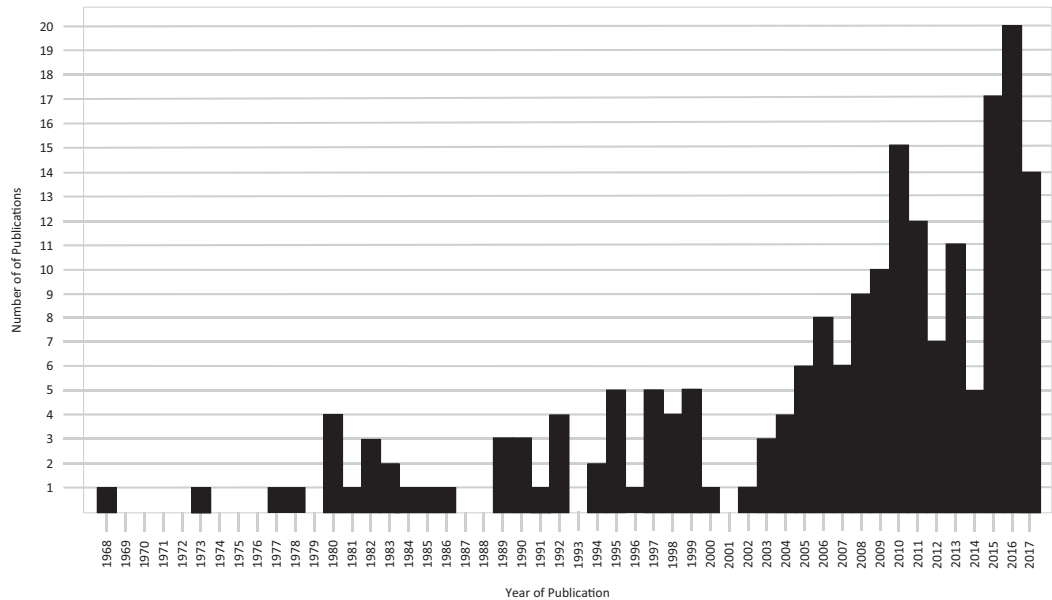


Figure 3. Number of publications by year in the final article population (1968–2017).

which the majority of the research in this area has been published. Indeed, the top five journals (6.5% of journals represented) account for more than one third of the total publications.

Countries from which participants were drawn. Across the final population of articles, 25 countries are represented. The least com-

monly represented countries are Belgium, China, Greece, Hungary, Israel, Italy, Korea, Lithuania, Poland, and Taiwan, which are each represented in a single study. The most commonly represented countries are the United States ($n = 99$), the United Kingdom ($n = 27$), Canada ($n = 23$), and Australia ($n = 15$). Al-

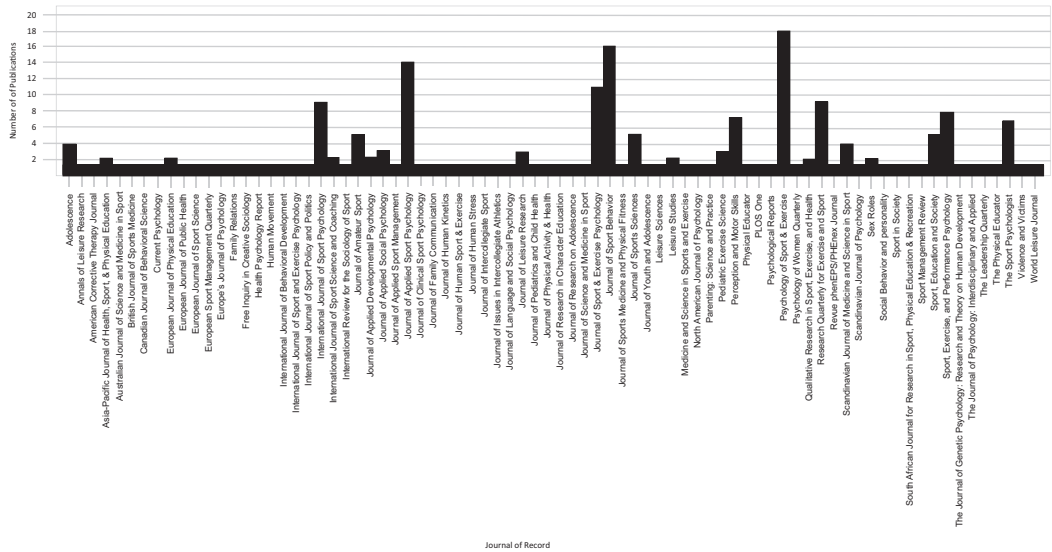


Figure 4. Number of publications by journal in the final article population.

though not surprising, this publication bias skews the field's present scope of understanding toward Western sociocultural contexts. Six of the 199 articles (3.0%) did not explicitly state the country or countries from which participants were recruited. Figure 5 represents a histogram of the countries from which participants were drawn, sorted alphabetically. The sum of the counts in the figure is greater than 199 because multiple articles drew participants from more than one country. These data suggest that almost half of the research in this area has been conducted on American families, and that the overwhelming majority of research has been conducted with participant samples drawn from four Western countries: the United States, Canada, the United Kingdom, and Australia.

Ages of participants. Across the population of final articles, the ages of children ranged from 1 to 18 years. Eleven articles categorized athletes from age "birth to 18"; however, in our review of the extant literature, the youngest explicitly reported athlete age was 4 years. We therefore have no reason to believe that any research has been conducted on 1-, 2-, or 3-year-old athletes and their parents. Despite this, we present the data as the ages or age ranges originally communicated in each article. Figure 6 represents a chronological histogram of youth participant ages, from 1 to 18 years. Across the 199 articles, the most common age of athlete sampled was 13-year-olds ($n = 130$ articles). The majority of articles in the final population were conducted with athletes aged

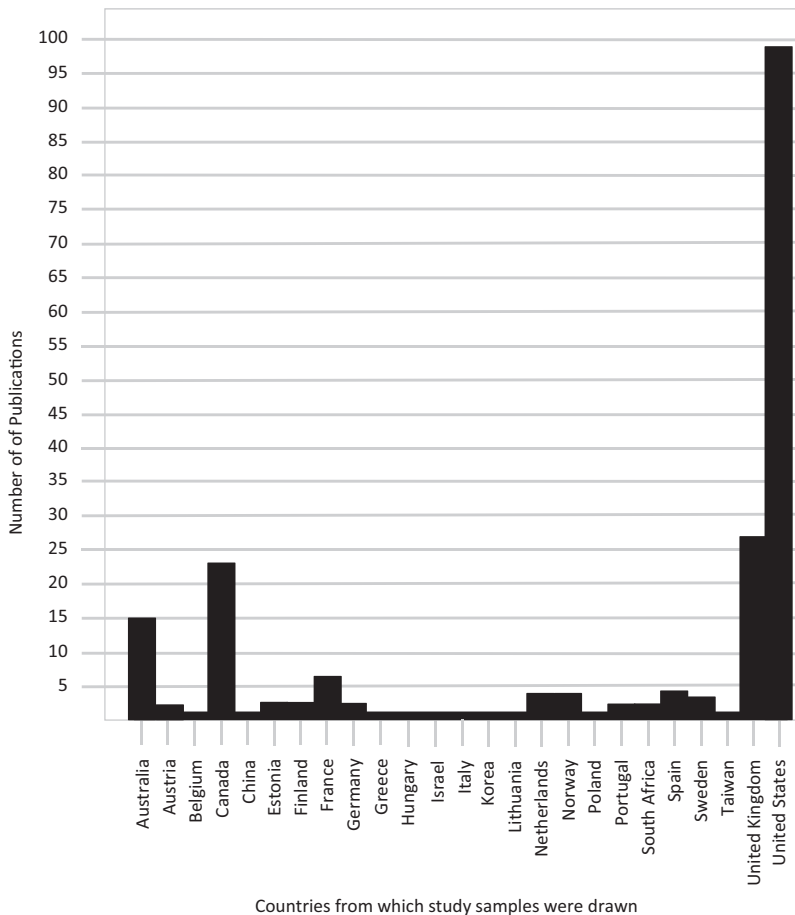


Figure 5. Number of publications by country from which the sample was drawn in the final article population.

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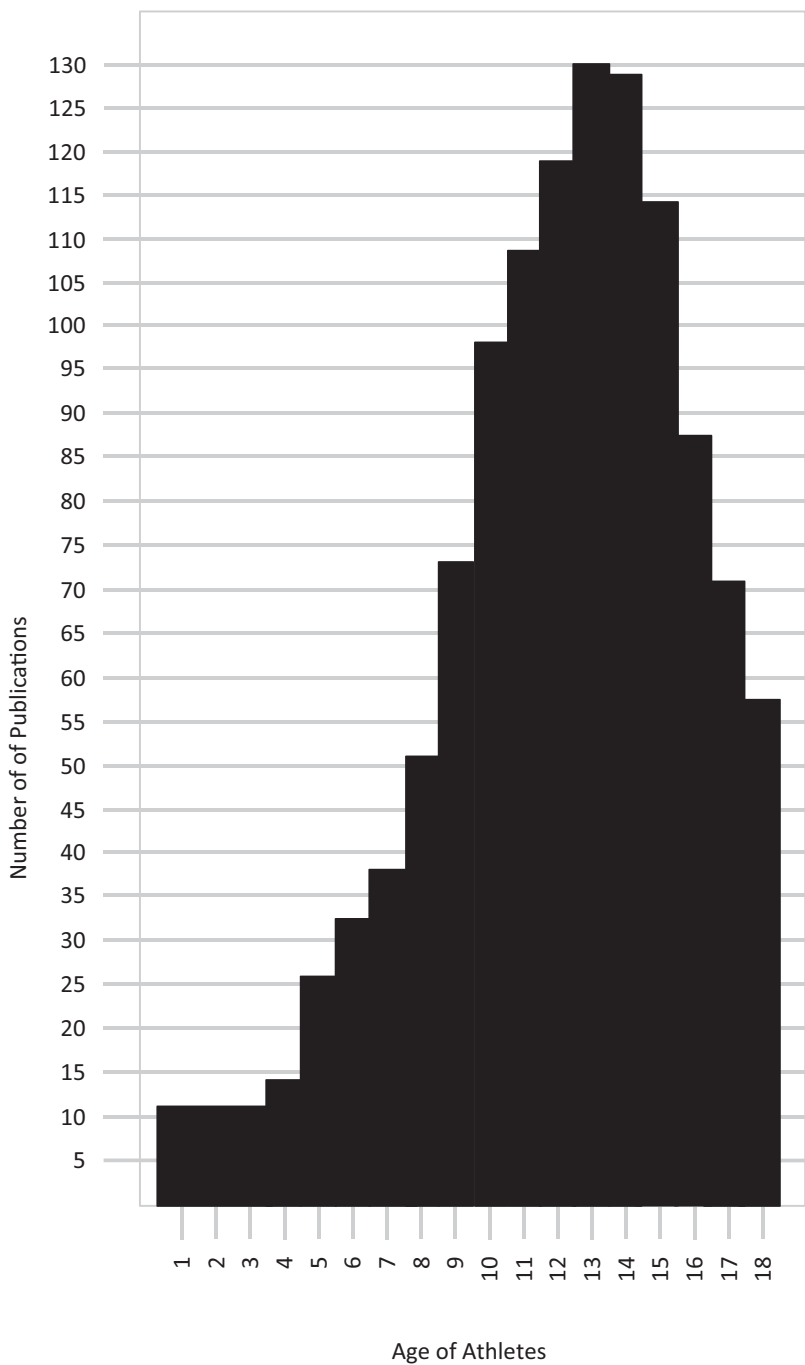


Figure 6. Number of publications by athlete age in the final article population.

9–17, with an especially high proportion of 11- to 15-year-olds. Fifteen of the 199 articles (7.5%) did not explicitly state the range of ages from which children were recruited. Surprisingly, only 38 of the 199 articles (19.1%) reported on parent age, ranging from 18 to 67 years.

Analytic methods used. Across the final population of articles, 114 (57.3%) used quantitative methods, 70 (35.2%) used qualitative methods, and 15 (7.5%) used mixed methods. Across these categories, eight articles reported using a longitudinal design. Figure 7 represents a histogram of these general methodological categories, as utilized by authorship teams across the article population.

Sports participated in. Across the final population of articles, 37 unique sports were represented. The least commonly represented sports were bowling, canoeing, climbing, cycling, diving, field hockey, motocross, ringette, and table tennis, which were each represented in a single article. The most commonly represented sports were European football (soccer), tennis, basketball, swimming, and ice hockey which were represented in 66, 37, 36, 32, and 29 articles, respectively. Across the article population, sports were consolidated conceptually to keep the list manageable. For example, reports of participation in rugby, rugby league, rugby union, and rugby sevens are all classified as “rugby,” and reports of participation in judo, taekwondo, and karate are all classified as “martial arts” in our analysis. The sum of the counts in the figure is greater than 199 because multiple articles drew participants from more than one sport. Forty-two of the 199 articles (21.1%) did not explicitly state the sport(s) from which participants were recruited. Figure 8 represents a histogram of sport participation across the article population.

Levels of sport participation. Across the final population of articles, athletes participating at the “local” level are represented in 72 articles (36.2%), athletes participating at the “regional” (or provincial) level are represented in 57 articles (28.6%), athletes participating at the “national” level are represented in 41 articles (20.6%), and athletes participating at the “international” level are represented in 29 articles (14.6%). Some assumptions were made in the classification of these levels. For example, “house league” hockey participants in Canada

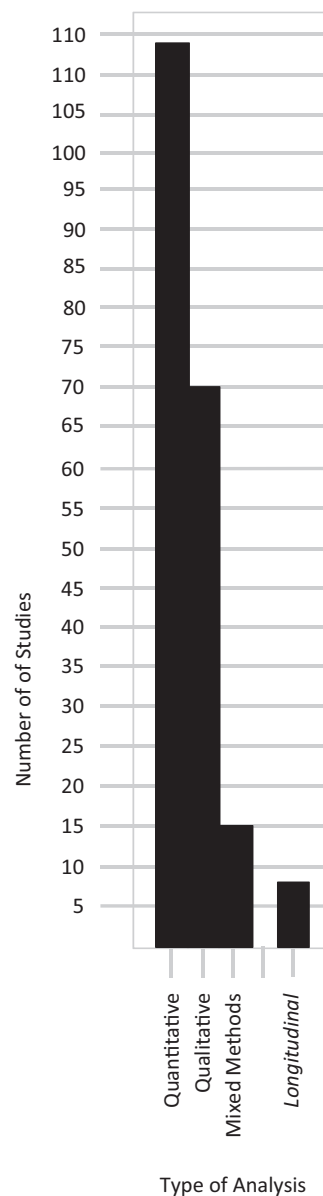


Figure 7. Number of publications by type of analysis in the final article population.

were classified as *local* participants, “travel” baseball participants in the United States were classified as *regional* participants, “competitive” Aussie rules footballers in Australia were classified as *national* participants, and “semi-professional” football (soccer) players in Europe were classified as *international* partici-

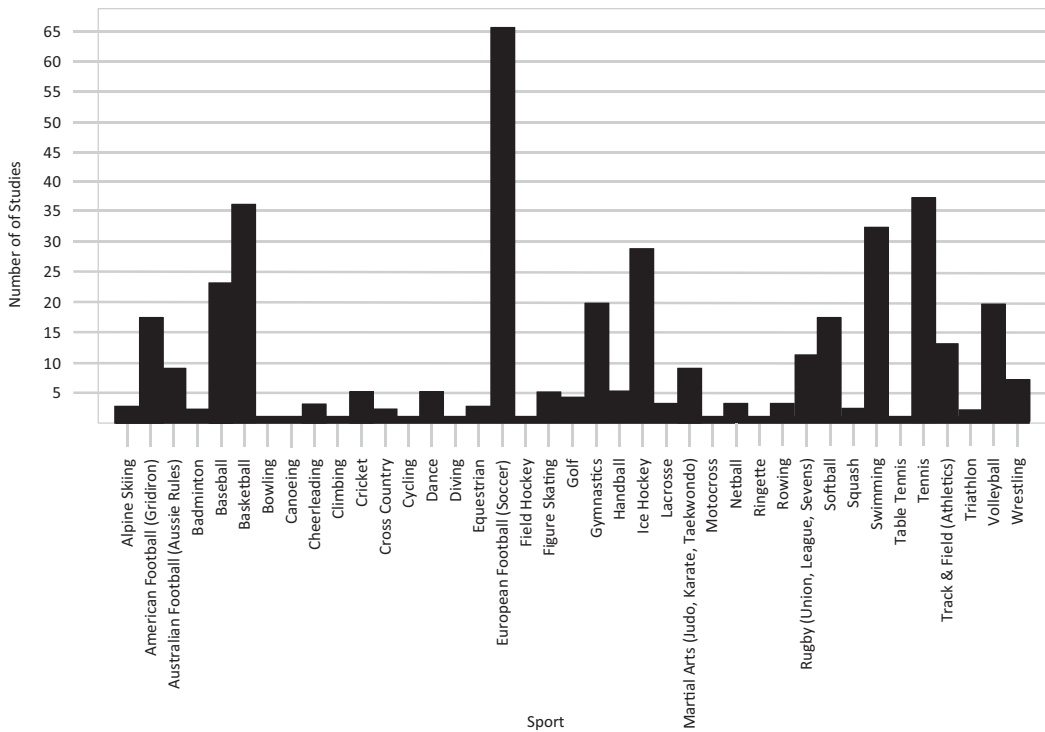


Figure 8. Number of publications by sport in the final article population.

pants. The sum of the counts in the figure is greater than 199 because multiple articles drew participants from more than one level of sport. Fifty-one of the 199 articles (25.6%) did not explicitly state the level of sport from which the participants were drawn. Figure 9 represents a histogram of participation-level representation across the article population.

Discussion

This citation network analysis was designed to answer three primary research questions: (a) What are the most widely cited research articles within the literature on parent–child interactions in youth sport? (b) How are these articles linked across the cited literature in the field? and (c) Which participant and publication demographic factors are most and least understood across the body of research?

In addressing our first research question, using citation network analysis allowed for the identification of the most prominent research articles within the extant literature on parent–

child interactions in youth sport. Moreover, it allowed us to examine these studies and provide a more critical discussion of their findings. Of the 11 most cited articles in the network (Table 1), eight targeted primarily the influence of parental involvement on children (Babkes & Weiss, 1999; Côté, 1999; Fredricks & Eccles, 2005; Gould, Lauer, Rolo, Jannes, & Pennisi, 2006; Leff & Hoyle, 1995; Scanlan & Lewthwaite, 1984, 1986; Wuerth, Lee, & Alfermann, 2004), three targeted primarily factors influencing parent involvement (Dorsch et al., 2009; Holt et al., 2008, 2009), and none explicitly targeted strategies developed by parents to facilitate their involvement in their children's sport. As most researchers in this space would acknowledge, overlap in these domains is common. Indeed, it is this very overlap that suggests that these domains represent complementary facets of parent–child interaction in sport. Although studies can address more than one area simultaneously, what is most noticeable in the aforementioned breakdown is the progression of the field's research focus from parents' im-

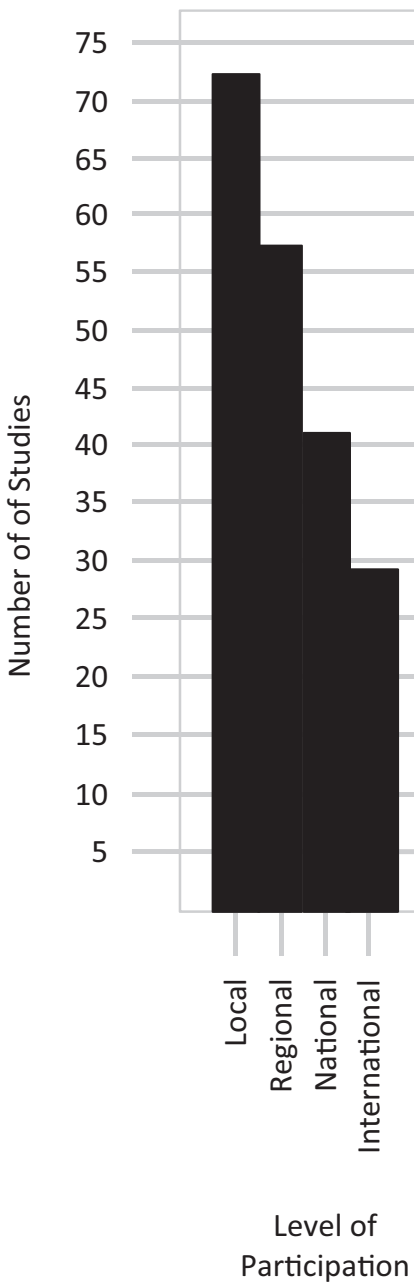


Figure 9. Number of publications by level of participation in the final article population.

pact on children on the 1980s, 1990s, and early 2000s to factors that influence parent involvement in the late 2000s through present. A focus on strategies to facilitate parent involvement

represents a more recent trajectory of research and has been spurred by contemporary studies in the United Kingdom (Thrower et al., 2016), Canada, (Knight & Holt, 2013), and the United States (Dorsch et al., 2017), as well as nonempirical contributions such as Harwood and Knight's (2015) position paper on parenting expertise. Given the state of the field, we expect this trajectory to continue in the short term, with special attention toward the integration of research and interactive technologies (i.e., websites and/or smartphone applications).

In examining the citation structure of the article population, it also became evident that qualitative research has become a widely accepted (using accumulated citations as a proxy indicator) methodology in the literature examining parent–child interaction in youth sport. Indeed, the top three in-degree centrality scores in the article population (Côté, 1999; Holt et al., 2008; Dorsch et al., 2009) employed focus groups, interviews, observations, and participant diaries with athletes, parents, and siblings in youth sport. Such findings should empower future researchers to critically examine the most appropriate ways to answer their chosen research questions. Given recent advances in qualitative and quantitative methodologies, as well as dyadic and group analyses, future researchers in this space need not be limited by conventional approaches.

In addressing our second research question, the present citation network analysis establishes how articles in the population are connected across the cited research in the field. Examination of the citation network revealed a relatively well-connected article population and identified the most prominent articles within the network, both in terms of in-degree centrality (i.e., number of citations), as well as citations per year. These highly cited articles represent key contributions to this literature and provide a foundation for scholars seeking to immerse themselves in this area of research. Exploration of subgroups within the citation network highlighted two small subgroups of articles (“disconnects” and “isolates”) that are poorly linked to the rest of the article population. Many of the articles that make up these subgroups were either published many years ago (e.g., 1960s–1980s), or were published in atypical journal outlets (e.g., *American Corrective Therapy Journal* and *Journal of Human Stress*), relative to the rest of

the network. As a result, they may not be easily accessible online or may not be indexed in the same sport-specific databases as the majority of this area of literature. Although the small number of disconnects and isolates indicates a relatively well-integrated network as a whole, consideration of these subgroups remains important because they represent a set of articles that may be useful in advancing the current understanding of parent–child interactions in youth sport, despite having been historically overlooked due to a lack of visibility and/or accessibility. As scholars become more interdisciplinary in their training and career trajectories, and subsequently seek to publish in a range of journal outlets, the corpus of knowledge of parent–child interactions in youth sport will continue to be fragmented. Future researchers working in this space may be able to learn from the characteristics (e.g., journals, keywords, and variables of interest) of these neglected articles to maximize the reach of their own publications in the area of parent–child interactions in youth sport.

In addressing our third research question, the present analysis highlights specific gaps that exist across the body of empirical knowledge. Such gaps limit the breadth of understanding of parent–child interaction in youth sport. Specifically, it creates a relatively ethnocentric collage of the parent–child relationship in youth sport. Researchers building from the present citation network analysis should attempt to purposefully design studies to address some of the heretofore neglected areas. As a first step, more research needs to be conducted in non-Western cultures. Just one of the 199 articles (Chan, Lonsdale, & Fung, 2012) targeted parents and children in China or India, two countries whose inhabitants constitute roughly one third of the world's population. In the same light, popular global sports such as badminton, field hockey, and cricket were underrepresented and should be more broadly investigated in the future. Indeed, largely as a matter of convenience (i.e., participants have been drawn from cities and regions where the researchers live), present understanding in this research area emanates largely from studies conducted with participants aged 11–15 years old who live in the United States, United Kingdom, Canada, or Australia, and participate in European football (soccer), tennis, basketball, swimming, or ice hockey. Lastly, we were

not able to report with certainty on potentially important sociodemographic factors (e.g., ethnicity, annual family income, and participation goals) because these data were not reported with sufficient consistency or clarity across the population of articles. Future researchers should not only draw attention to neglected research areas but should be purposeful in the demographic description of the participants and contexts under investigation. Doing so will afford a broader (and potentially deeper, in time) understanding of parent–child interactions in youth sport. One strategy to accomplish this aim would be for researchers to build interdisciplinary teams across countries and cultures. Indeed, the “gaps” identified above may be less pronounced if research being published in non-English-speaking outlets was considered. Incorporating findings from this literature base could do much to integrate our knowledge of parent–child interaction in youth sport.

The contributions of the present citation network analysis should be viewed in light of study limitations. First, the present study was limited to English-language articles. This constraint limited our scope of understanding to specific (i.e., “Western”) sociocultural contexts and left unaddressed the extent to which research in this space is being conducted in non-English-speaking cultures and/or with participants in non-Western-centric sports. Despite this limitation, the study design did afford an opportunity to examine participants' country of origin, as well as other demographic factors related to the participants and publications that may aid scholars in interpreting and extending the present corpus of knowledge.

A second study limitation is that a publication can be cited in the literature not only for its excellence but also for being poor (Gustafsson et al., 2014). Therefore, high in-degree centrality within our citation network is not necessarily an absolute marker of high-quality research. Results of this and all other citation networks should be interpreted with caution, and authors engaging in literature searches should make critical judgments regarding a specific article's contributions to the broader knowledge base.

A third limitation is that the scientific study of youth sport parenting has difficult-to-define boundaries, covering everything from parental stressors to child outcomes in youth sport. To bracket the present analysis, we used Knight

and colleagues' (2017) three domains of sport parenting. Although not a perfect, or comprehensive, classification system, it did allow us to delimit our inclusion criteria in a reproducible way. Although a three-step search of the literature was undertaken using these criteria, it is unlikely that every relevant study can be included or excluded within a specific field of interest (Cooper & Lindsay, 1998). Despite being confident in our process, we therefore acknowledge the potential for commissions and/or omissions in the final population of 199 articles.

A final limitation was the infrequency with which articles in the final population reported on parent and child gender. Surprisingly, given that contextualizing the youth sport setting is an important facet of research conducted in this space, only 142 of the 199 articles (71.4%) reported on gender(s) of the child(ren) in the studies. Of these, 85.9% sampled male and female children, 11.3% sampled only males, and 2.8% sampled only females. Worse yet is the rate at which parent gender has been reported in this literature. In the present study, this demographic factor was only explicated in 72 of the 199 articles (36.2%) included in the final population. Given the potential impact of gender dynamics on parent–child interaction (both in and out of sport), it is imperative that future researchers collect and report parent and child genders in future work.

Despite these limitations, the present work has the potential to enhance the interdisciplinary understanding of the citation structure of research on parent–child interactions in youth sport in two ways. First, because researchers are unlikely to be experts in each of the fields from which the 77 peer-reviewed outlets come, this citation network analysis has the potential to connect researchers, ideas, and theories from kinesiology, psychology, sociology, human development, family studies, and communication. Second, because these 199 articles have been explicated in a single citation network analysis, future researchers publishing in this area will be better equipped to cite findings from a range of disciplines in their own work, as well as to submit research to a wider range of journals with different missions and readership.

To complement Knight and colleagues' (2017) recent qualitative review, we felt this area of parent–child interaction in youth sport was ripe for a review of its citation structure. In

pursuit of this aim, the present study was successful in combining, integrating, and synthesizing qualitative and quantitative research in an effort to provide a foundation for future research examining parent–child interactions in youth sport. This represents a potentially important contribution, as combining knowledge from numerous types of reviews is the most effective means for evaluating a research field (Whitley, 2002). The results presented herein therefore provide a picture that supplements past reviews in the sport and exercise psychology and family literatures (Bremer, 2012; Harwood & Knight, 2015; Knight et al., 2017).

Thomas and colleagues (2005) suggested that research syntheses should move beyond a summary of research to offer important future directions for investigation. Given the results from this citation network analysis, it is clear that the literature investigating parent–child interaction in youth sport is largely atheoretical, or in the case of many qualitative studies, is designed to develop theory inductively. One strategy that may help sharpen a somewhat fragmented understanding of parent–child interaction is the use of theoretical frameworks to guide investigations. One framework that may help shape future inquiries is Bronfenbrenner's process-person-context-time, or PPCT, model (Bronfenbrenner, 2005; Bronfenbrenner & Morris, 1998). Specifically, addressing variables that relate to processes such as parent–child communication (measured or observed in 36 of the 199 articles) will continue to add depth and breadth to the current body of literature. Additionally, examining how specific person characteristics such as parent or child emotions (measured or observed in 29 of the 199 articles) might impact parents' engagement in their children's sport could be a fruitful research path. Understanding whether sport occurs in recreation, competitive, or elite contexts (a factor measured or observed in 148 of the 199 articles) is also important in understanding parent–child interactions in youth sport. Finally, as called for by Côté (1999) and Weiss and Raedeke (2004), scholars should attempt to understand the impact of time (i.e., development) on young athletes and their parents as they progress through youth sport.

Through the application of citation network analysis, the present study answered recent calls in the sport and exercise psychology literature to synthesize bodies of literature using a citation network approach (Bruner et al., 2010, 2013;

Gustafsson et al., 2014). Importantly, using this methodology enhances the understanding of how interdisciplinary scholars from areas related to kinesiology, psychology, sociology, human development, family studies, and communication are attempting to unravel the complexity of parent-child interactions in youth sport. By highlighting the prominence and connectedness of research articles in this area, we can better understand the implications of our citation practices moving forward. This is an important step for scholars entering a research area as they aim to take a more mindful approach to the knowledge creation process. Moreover, in line with Thomas and colleagues (2005), the present research synthesis goes beyond a summary of research to offer important future directions for investigation. Armed with information regarding the countries represented in past research, the ages of study participants, the sports and levels at which children have participated, and the analytic methods most commonly used by researchers, future scholars will be able to target the gaps that remain in this literature area.

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