



# The role of critical life events in the talent development pathways of athletes and musicians: A systematic review

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## ABSTRACT

**Objectives:** The experience of critical life events may be crucial for talent development. Critical life events can shape individual biographies and are landmarks in defining narrative identities. However, there is a lack of systematic research on life events in the context of talent development. With this systematic review, we synthesize the literature on the role of critical life events in the biopsychosocial developmental pathways of athletes and musicians.

**Method:** The systematic review was informed by the PRISMA guidelines. The identified literature was appraised with the Mixed Methods Appraisal Tool. Additionally, we conducted a thematic network analysis.

**Results:** Thirty-six studies met the inclusion criteria. Three thematic networks emerged from the findings: Types of life events; coping strategies; and impact of life events on the developmental pathway. The findings suggest that critical life events are not necessarily traumatic or hinder the biopsychosocial development of athletes and musicians. Performers can benefit from various life events with regard to their development - dependent on the coping strategies employed.

**Conclusions:** Against the background of our findings, practitioners should consider to systematically use the benefits of challenges. These should be explicitly career-related, manageable, and focused on the refinement of skills.

By thematically synthesizing findings from qualitative and quantitative studies, we provide a practical understanding about the impact of life events on developmental pathways of elite athletes and musicians. Our findings support a broad conceptualization of giftedness, underscoring the idea that critical life events have an impact on the dynamic pathway to excellence in different achievement domains.

## 1. Introduction

Why do some people fulfill their potential and perform at high levels whereas others seem to never peak and remain at much lower levels? For nearly two centuries, this question has been heavily debated as part of the nature-vs.-nurture controversy in research on giftedness. While some researchers focus on the importance of innate abilities for the achievement of excellence, others insist on the importance of environmental factors (Gobet, 2013). The most prominent researcher in the field of expertise research is probably Anders Ericsson. He and his colleagues initiated an ongoing debate when they published the theory of deliberate practice (Ericsson, Krampe, & Tesch-Römer, 1993; Ericsson & Smith, 1991), which emphasizes the essential role of highly structured, domain-specific practice over several years in order to develop expertise. Because deliberate practice is the main predictor for

why some individuals achieve excellence and others do not, Ericsson's approach can be seen as an extreme environmental (nurture) position (Starkes, 2000).

Yet, the relationship between practice and performance is rarely linear (Baker, Côté, & Deakin, 2005) and practice is not the only factor to explain excellence. Several reviews have identified a range of environmental factors (e.g., birthplace, family dynamics) that all influence talent development (Baker & Horton, 2004; Li, Wang, & Pyun, 2014). In addition, retrospective studies with Olympic and World champions revealed a variety of non-linear pathways to expert status (Durand-Bush & Salmela, 2002; Phillips, Davids, Renshaw, & Portus, 2010a). Therefore, researchers increasingly agree that excellence emerges through dynamic interactions between multiple components or systems across the lifespan (Bailey & Collins, 2013; Collins, MacNamara, & McCarthy, 2015). In evolving dynamic human systems,

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critical life events are significant developmental components (Den Hartigh, Van Yperen, & Van Geert, 2017). Hence, the development of excellence might, to a relevant extent, be shaped by specific critical life events underscoring the idiosyncratic nature of pathways to excellence (Den Hartigh, Van Dijk, Steenbeek, & Van Geert, 2016).

Whereas many quantitative studies focused on predictors of exceptional performance, little is known about the different kinds of critical life events expert performers in music and sport have encountered on their winding path to the top, and how these may have influenced their development (Peterson, Canady, & Duncan, 2011). Still, knowledge about life events and their impact on the development of gifted individuals can be crucial for researchers and practitioners in order to revise and refine their talent development programs. For this review, we specifically chose music and sport because these high-performance environments share certain commonalities such as the pressure of competition and the high uncertainty of careers. With this review, we systematically synthesize the literature on the role of critical life events in the developmental pathways of elite performers in sports and music. In this regard, we employed a broad search strategy and included studies of various designs and different theoretical and methodological backgrounds. Therefore, our results can help educators and practitioners to systematically refine and individualize talent development programs.

### 1.1. Theoretical background

**Important concepts and terms.** Research on talent, giftedness, and the impact of critical life events on talent development suffers from a lack of conceptual clarity. Hence, in the following section, we define the terms and concepts that are relevant for this systematic review.

**Giftedness.** For the purpose of this review, we adopted a broad definition of giftedness, which proved to be useful across all domains of human endeavor. Subotnik, Olszewski-Kubilius, and Worrell (2011) construed giftedness as the manifestation of a performance that is at the upper end of the range in a certain talent domain. Giftedness is not limited to academic achievements only, but also encompasses other domains such as sports, music, arts etc. While in childhood, giftedness can actually only be evaluated by potential, the measure of giftedness in later stages of a career is achievement (Olszewski-Kubilius & Thomson, 2015). Informed by this broad definition of giftedness, we argue that gifted individuals who attained extremely high levels of success in their careers are thereby not only experts in their respective domain, but also experts in persisting through adversity, maintaining motivation in challenging times, and dealing with obstacles that inevitably arise during a career.

**Life experience, lived experience, and critical life event.** Every life story is characterized by a unique sequence of experiences, by drawbacks and progress, insights and outlooks, demands and overloads, wins and losses, daily hassles and big events, and transitions (Hinske, 1986). Life events and life experiences are part of the human life course (Runyan, 1982), and have been interpreted in multiple ways. The terms life experience and lived experience encompass a broad spectrum of positive and negative experiences relevant for individual development (Coleman, Robins, Micko, & Cross, 2015; Guptill, 2011). In phenomenological research, it is preferred to refer to the term lived experience, as opposed to life experience, in order to emphasize subjectivity and the embeddedness of experiences in the individual's life world (Finley, 2009). Critical life events differ from the wide spectrum of life experiences as they exceed the common horizon of expectations and experiences, are not part of everyday life, and are accompanied by extreme emotions (Filipp & Aymanns, 2010). By disrupting the balance between the individual and its environment, critical life events derange our everyday patterns of behavior and cognitions. They put us off our paths, thwart our plans, and lead us to question our most fundamental beliefs (Filipp & Aymanns, 2010).

Critical life events can be both conceptualized from a stress-

theoretical or a developmental viewpoint. From a stress-theoretical perspective, critical life events are stressors that trigger or solidify psychological disorders and illnesses. In contrast, the lifespan developmental perspective construes critical life events as disruptions in the life course. The main interest of this second theoretical perspective lies in studying adaptive dynamics following events; hence, processes of change are the variable of interest. From a developmental perspective, life events affect the whole person and eventually result in change of the whole person (Filipp & Aymanns, 2010). Whether an event is significant, depends on the individual – who is situated in a specific life context – and his or her specific vulnerabilities and resources. Thus, the meaning attached to an event is largely influenced by the individual's appraisal of the event and not by the event itself. This subjectivity inherent to critical life events, however, impedes their investigation.

**Transition.** Wippert (2011) noted that in North-American research, the term life event implies a dramatic change in life circumstances with sometimes traumatic consequences, whereas in the European research tradition, it is more common to use the term transition instead of life event. The implicit difference between these understandings is not only the graveness of an event, but also the event-related construction of time.

Events have to be differentiated according to their timing and time-course, depending on whether they are construed as abrupt disruptions, as end points of processes of change, or as transitions without a specific start and end point. In her seminal paper, Schlossberg (1981) argued that viewing life events only as markers in life histories underestimates the context of these events. In her opinion, the term transition is more suitable for events or non-events that result in a change of assumptions and social networks, and result in either growth or deterioration. Not the transition itself is of primary importance, but rather how that transition fits with an individual's life situation at the time of transition (Schlossberg, 1981); hence, transitions are not so much a matter of 'real' change as of the individual's perception of change. Conceptualizing important events as transitions places a greater emphasis on the process character of an event instead of depicting an event as an on-or-off phenomenon.

**Adversity.** All previous concepts (critical life event, life experience, lived experience, and transition) denote the relational nature of an individual's appraisal of events or experiences in his or her life. Events and experiences have to be of personal significance to be considered life events or life experiences.

Adversity is a state of hardship or suffering associated with trauma, distress, difficulty, or negative events or experiences (Tugade & Fredrickson, 2004). Adversity is located at the more severe end of the life experience continuum, evokes strong discomfort, and leads individuals to question deep-rooted beliefs. The emphasis is shifted to the relational state between an individual and its environment, as opposed to stressors which are simply defined as environmental demands encountered by an individual (Fletcher, Hanton, & Mellalieu, 2006).

**The relevance of critical life events for talent development.** To fully understand and support the development of gifted individuals in the performance domains of sports and music, it is important to examine both their developmental pathways and the range of factors that may positively or negatively impact development (Collins et al., 2015). Without doubt, critical life events are important parts of an individual's life, and therefore need to be conceptualized as essential components of the talent development process (Subotnik et al., 2011). This assumption is in congruence with dynamical systems theory, a contextual and dynamic framework, which attaches importance to the timing of experiences and exposure to certain events as crucial factors for developmental trajectories and pathways (Dai & Renzulli, 2008; Davids & Baker, 2007; Phillips, Davids, Renshaw, & Portus, 2010b).

The review aims to examine the role of critical life events in the developmental pathways of athletes and musicians. In many respects, music and sports seem to be quite disparate, but athletes and musicians may encounter similar critical life events on their respective paths to

the top. From a psychological perspective, music and sport performance also share commonalities (MacNamara, Holmes, & Collins, 2006). Performers in both domains need to exhibit full-time commitment in order to develop high-level skills and transform their potential into achievement. They are both subjected to challenges of competition and uncertainty of their careers and need to cope with setbacks they encounter along their way (MacNamara et al., 2006; Martin, 2008). Over the last two decades, interest in the effective development of talent has grown in many countries (Baker, Cobley, Schorer, & Wattie, 2017). Yet, every talent development program can only be as successful as it is related to the real life circumstances of those identified as talented. Against this background, we argue that the study of critical life events and their impact on talent development is of a very high practical relevance. Critical life events can shape individual biographies, are often landmarks in defining narrative identity, and affect mental and physical health to a large extent (Schwarzer & Luszczynska, 2012).

To the knowledge of the authors, no other systematic review on the impact of critical life events on the development of gifted individuals in sports, music, or other performance domains has been conducted so far. Based on the high practical relevance and the importance of critical life events for development, we conclude that there is a need for a more systematic understanding of the role of critical life events for the development of expert performers in sports and music.

In our review, we aim to (a) critically appraise existing research on the impact of critical life events on the development of expert performers; (b) compare different talent development domains (sports and music) in this regard; and (c) identify desiderata in the research on talent development. More specifically, we aim to address the following, overall research question: To what extent do critical life events have an impact on the developmental pathways of gifted individuals in the performance domains of sports and music? To answer this question, we analyze which life events are currently referred to in the literature on talent development and examine associated coping mechanisms of athletes and musicians. In our review, we do not only assess performance-related development but employ a holistic approach by focusing on the biopsychosocial development of expert performers.

## 2. Approach

The method for this systematic review was informed by the preferred reporting items for systematic review and meta-analysis (PRISMA) guidelines (Moher et al., 2015; Moher, Liberati, Tetzlaff, Altman, & Prisma Group, 2009). However, it needs to be stressed that the PRISMA statement was primarily developed for the reporting on quantitative health care evidence targeting study designs such as randomized control trials. Due to the exploratory nature of our review, which can be classified as a systematic mixed studies review (Pluye & Hong, 2014) entailing the synthesis of data and results from studies with diverse designs, not all items of the PRISMA checklist are applicable. We aimed to use the PRISMA statement as a guideline to increase the methodological rigor and quality of our review and tried to follow the guideline's suggestions as much as we felt was possible for the kind of review we conducted.

### 2.1. Search strategy

We identified relevant work through the following process: (1) searching e-journal databases (SportDiscus, Web of Science, Pubmed, PsycInfo, PsycArticles, RILM Abstracts of Music Literature, SpoLit, ERIC); (2) screening of reference sections of eligible studies; and (3) applying further searches using GoogleScholar to ensure that no key papers were omitted.

Table 1 shows the search terms, with set #3 yielding the initial search results from which studies were then selected. Search terms were agreed to a priori, and were intentionally broad to reduce the risk of removing relevant studies and to do justice to the wide range of

theoretical concepts that address critical life events. To capture all relevant previous research, no publication date limitation was set. The search was conducted on January 31, 2018.

### 2.2. Inclusion and exclusion of studies

Inclusion criteria for each stage were specified in advance. We deployed the following inclusion criteria: (a) papers were published in English or German; (b) papers were original, peer-reviewed articles; (c) full-text was available; (d) papers were either of qualitative, retrospective design or of quantitative, prospective design; and (e) papers must present data on life events, and on the impact of these events on the developmental pathways, or on other events that potentially influence biopsychosocial development.

Studies with adolescent elite athletes or musicians were only included if the performers were competing at an international level, were members of the age-relevant national team, or studied at sports or music schools to which admission is based on athletic or musical success. Since the measure of giftedness at later stages of a career is achievement (Subotnik et al., 2011), the adult athletes in original studies had to compete at least at the national level or in the NCAA division I. The reasoning behind the latter is that the collegiate sport system in the United States is very competitive and the top sport universities competing in the division I of the NCAA have a tradition of excelling in sports and could be argued to be relatively elite (see Swann, Moran, & Piggott, 2015). For adult musicians, it is even more difficult to set specific performance criteria for elite status. Here, we only included studies that examined professional instrumentalists or singers since it can be reasonably assumed that their level of performance is at the upper end in their respective talent domain.

We excluded studies if they (a) were not related to musicians or athletes; (b) did not examine the talent development process; (c) solely examined the singular coping with a life event without considering the impact of the event on development; (d) examined career termination; (e) included only subjects that were not the gifted individuals themselves but other individuals such as parents, teachers, coaches, siblings, or friends etc.; and (e) had a cross-sectional study design.

### 2.3. Sifting articles and study eligibility

The sifting process consisted of three stages (see Fig. 1); we first screened papers by title, then by abstract, and finally by full-text.

At each stage, articles that did not meet the inclusion criteria were excluded (reasons for full-text rejection are available from the first author). A peer-review team was established to increase methodological rigor. Peer-debriefings determined the eligibility of inclusion of the final studies. When there were disagreements about the eligibility of particular articles, agreement was reached through a process of constructive debate.

### 2.4. Data extraction and synthesis of study results

The first step of the data analysis was reading each study several times to become deeply familiar with the research context, findings, and inferences. The extracted data included sample characteristics, data collection tools, research methodology, main findings, and the country in which the study was conducted (see supplementary Table 1).

In accordance with the PRISMA protocol, given the heterogeneity of the included study designs, two researchers independently assessed the risk of bias of all included studies using the Mixed Methods Appraisal Tool (MMAT; Pluye et al., 2011). The MMAT demonstrates excellent inter-rater reliability (Pluye & Hong, 2014) and has been recognized as the most reliable tool for appraising mixed methods research (Crowe & Sheppard, 2011). The updated version of the MMAT (Pluye et al., 2011) consists of four criteria for the evaluation of qualitative studies (such as the extent of reflexivity; see supplementary Table 2) and four criteria

**Table 1**  
Search terms for the literature search.

Set	Search Terms
#1	“life event” OR “life events” OR “life experience” OR “life experiences” OR “lived experience” OR “lived experiences” OR adversity OR transition* OR “biographical disruption” OR “biographical disruptions” OR “disruptive experience” OR “disruptive experiences” OR “empowering experience” OR “empowering experiences” OR “disruptive event” OR “disruptive events” OR “empowering event” OR “empowering events” OR “positive experience” OR “positive experiences” OR “positive event” OR “positive events” OR “negative experience” OR “negative experiences” OR “negative event” OR “negative events” OR “childhood experience” OR “childhood experiences”
#2	athlete OR musician
#3	#1 AND #2

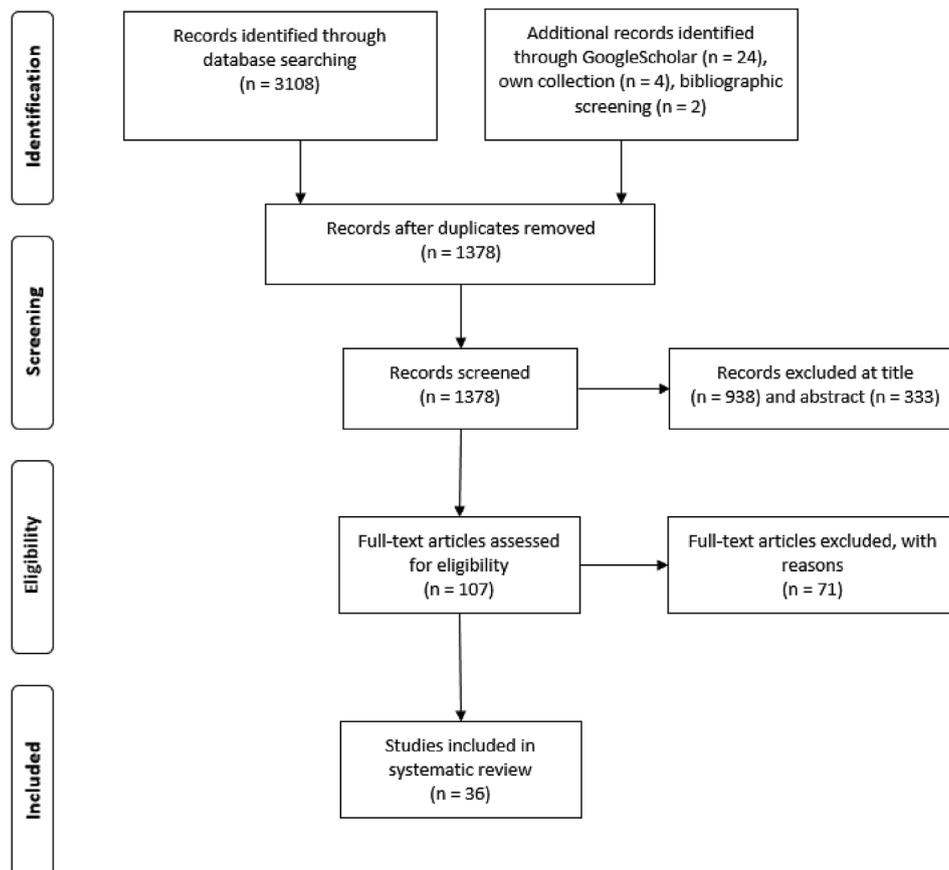
for different types of quantitative studies (e.g., sampling strategy; see [supplementary Table 2](#)). Three criteria are applied to mixed-methods studies. The final outcome of the MMAT is a star (\*) rating ranging from zero to four stars depending on the number of criteria achieved. The outcome of the quality appraisal can also be reported as a percentage value ranging from 0 to 100 with 25% increments ([Pace et al., 2012](#)). The higher the number of stars or the higher the percentage value, the higher the methodological quality of the study and the lower the risk of bias. In accordance with recent systematic mixed studies reviews in the field of sport psychology (see [Forsdyke, Smith, Jones, & Gledhill, 2016](#); [Gledhill, Harwood, & Forsdyke, 2017](#)), the research team agreed on the following thresholds for risk of bias in reporting: 0–24% = high risk of bias; 25–49% = high to moderate risk of bias; 50–74% = moderate to low risk of bias; and 75–100% = low risk of bias.

As [Melterud \(2001\)](#) and [Tracy \(2010\)](#) have pointed out, there is some debate over the concept of risk of bias and the use of criterion-based approaches to assess the methodological quality of qualitative research. However, lack of reporting on philosophical assumptions, existing preconceptions, and lack of discussing elements of reflexivity are all examples of increasing risk of bias in qualitative studies ([Gledhill et al., 2017](#); [Melterud, 2001](#)) and are assessed with the MMAT.

Nevertheless, it is important to keep in mind that the MMAT is solely used to assess methodological quality against a set of pre-determined criteria. It does not infer the overall quality of a research paper.

We used convergent thematic analysis (CTA) to synthesize data ([Hong, Pluye, Bujold, & Wassef, 2017](#)). A CTA includes the identification of the main or recurring themes from a body of research and is usually used to detect, group, and summarize findings from studies ([Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005](#); [Pluye & Hong, 2014](#)). Due to its narrative approach, CTA can handle qualitative and quantitative findings, and allows to organize and summarize findings from a large and diverse body of evidence. In line with [Butler, Hall, and Copnell \(2016\)](#), we defined qualitative data as first order constructs (quotes of participants) and second order constructs (researcher interpretation, statements, ideas). By extracting both types of data, it was ensured that the review findings were thoroughly grounded in the participants’ original experiences.

To circumvent the limitations of thematic analyses in systematic reviews, such as the lack of clarity about what thematic analysis involves and the processes by which it can be achieved ([Dixon-Woods et al., 2005](#)), we conducted a thematic network analysis based on the work by [Attride-Stirling \(2001\)](#). Thematic network analysis was



**Fig. 1.** PRISMA flow diagram.

originally developed for analyzing qualitative research, but it can be applied to systematic mixed studies reviews in order to thematically synthesize findings from a diverse body of evidence. Based on constant comparative analysis, the data from the included studies were organized by identifying recurrent *basic themes* and patterns. Basic themes were summarized by more abstract *organizing themes*. The research team reached consensus on the main thematic clusters within the data. These main themes were used as so called *global themes*, which summarize all organizing and basic themes. Eventually, three global themes were defined to give an idea of the patterns in the data with regard to the possible impacts of life events on the developmental pathways of gifted individuals.

### 3. Findings

#### 3.1. Literature identification

Database searching produced a total of 3108 results. Additional records were identified through GoogleScholar ( $n = 24$ ), searching in own collections ( $n = 4$ ), and bibliographic screening of reference sections ( $n = 2$ ). Following the application of inclusion criteria and the methodological quality assessment, 36 studies were deemed eligible for inclusion (see Fig. 1), 31 of which focused on sports, four on music, and one on both, sports and music. Amongst these, 25 articles were of qualitative design, 10 were quantitative, and one was of a multiple methods design.

#### 3.2. MMAT appraisal

For quantitative studies, methodological quality ranged from 50% to 100% ( $M = 75.0\%$ ). For qualitative studies, methodological quality ranged from 50% to 100% ( $M = 68.0\%$ ). The multiple methods study obtained a methodological quality score of 75% for both parts – the qualitative and quantitative part respectively (see supplementary Table 2).

Applying the MMAT quality criteria indicated that quantitative studies reported their samples and sampling strategies with clarity, but the response rates less so. Additionally, most quantitative studies did not explain their use of measurements. Retrospective interview designs were prominent in the qualitative studies. Utilizing the MMAT quality criteria, we noticed that only a few studies critically explained how findings related to the perspective, role, and interactions of the researchers with the participants. The researchers' role during all stages of the study process (formulating research questions, data collection, data analysis, and interpretation of findings) was often not clearly articulated. Furthermore, most qualitative studies did not explain the study context (i.e., location where interviews were conducted) and how findings might relate to the context.

#### 3.3. Demographic characteristics

Participants were 1700 athletes and 76 musicians. Table 2 contains a detailed demographic breakdown. We did not report results related to other social agents if they were included in the studies because the review aimed to focus on the impact of critical life events on the biopsychosocial development as perceived by athletes or musicians themselves. The reviewed studies ( $N = 36$ ) gleaned data of participants in: Australia ( $n = 3$ ); Canada ( $n = 3$ ); Finland ( $n = 2$ ); Germany ( $n = 2$ ); Great Britain ( $n = 10$ ); Ireland ( $n = 2$ ); New Zealand ( $n = 2$ ); South Africa ( $n = 1$ ); Spain ( $n = 1$ ); United States ( $n = 13$ ); and country not reported ( $n = 3$ ).<sup>1</sup> Of the 36 studies, 14% ( $n = 5$ ) reported ethnicity of the participants, 14% ( $n = 5$ ) reported ethnicity only of

certain subgroups, and 72% ( $n = 26$ ) did not report ethnicity.

#### 3.4. Convergent thematic analysis

Three key themes emerged from synthesizing the findings of included studies: (1) Types of life events; (2) Coping strategies; (3) Impact of life events on the developmental pathway. Whereas the global theme types of life events summarizes the variety of critical life events the original studies reported, the theme coping strategies describes the ways in which performers attempted to deal with those events. The third thematic network presents the impact of critical life events on the developmental pathway – mainly from the subjective, retrospective, and reflective perspective of the performers by linking life events and subsequent coping responses to development. In this regard, our thematic networks present a thematic analysis of the main themes of the included studies, and also the chronological pattern occurring from the onset of a life event-related experience to the perceived impact of those events on the developmental pathway. The thematic networks are presented in Figs. 2, 3, and 4. In the following paragraphs, we report on the specific findings of the included studies.

**Theme one: Types of life events.** In our analysis, we identified a variety of critical life events that potentially influence the developmental pathways of musicians and athletes. We classified these events into (a) events outside the performance domain, (b) health problems, and (c) events inside the performance domain (see Fig. 2).

- a) 'Events outside the performance domain' included life events related to *family dysfunction*, such as the divorce of parents (Aarresola, Itkonen, & Laine, 2017; L.; Hardy et al., 2017; Richardson, Littlewood, Nesti, & Benstead, 2012), witnessing abuse in the family (L. Hardy et al., 2017), having an absent (Howells & Fletcher, 2015), or alcoholism of one parent (L. Hardy et al., 2017). While family dysfunction encompassed events during childhood, *relational issues* usually occurred later. Examples were maternity (Martinez-Pascual, Alvarez-Harris, Fernandez-De-Las-Penas, & Palacios-Cena, 2014), partner becoming pregnant (Wadey, Evans, Hanton, & Neil, 2012), partner having an abortion (Wadey et al., 2012), and the breakup of a romantic relationship (L. Hardy et al., 2017; Wadey et al., 2012). Studies conducted with athletes also reported experiences of bullying (L. Hardy et al., 2017; Tamminen, Holt, & Neely, 2013) and sexual, physical, and verbal abuse (L. Hardy et al., 2017; Tamminen et al., 2013) by either coaches or parents (basic theme *abuse*). *Personal tragedies* ranged from serious illness of a family member (Aarresola et al., 2017; L.; Hardy et al., 2017; Howells & Fletcher, 2015; Wadey et al., 2012) to death of a family member (Aarresola et al., 2017; L.; Hardy et al., 2017; Howells & Fletcher, 2015; Morgan & Giacobbi, 2006; Sarkar, Fletcher, & Brown, 2015; Wadey et al., 2012), or death of a close friend (Wadey et al., 2012). In one study (Sarkar et al., 2015), political unrest (basic theme *global tragedies*) was identified as a significant life event with an impact on the developmental pathway.
- b) 'Health problems' encompassed psychological states, embodied states, and developmental disorders. Performers perceived various psychological states as critical life events such as eating disorders (Howells & Fletcher, 2015; Tamminen et al., 2013), disordered eating (Howells & Fletcher, 2015), burnout (Fraser-Thomas & Cote, 2009), depression (Howells & Fletcher, 2015; May, Veach, Reed, & Griffey, 1985), suicidal thoughts (Howells & Fletcher, 2015), and self-harm (Howells & Fletcher, 2015). Embodied states were particularly characteristic of careers in sports and music. Performers reported general health issues (Daykin, 2005), growth problems (Schubring & Thiel, 2014a; Schubring & Thiel, 2014b), injuries (Aarresola et al., 2017; Beltman & Voet, 2007; Brown, Lafferty, & Triggs, 2015; Burton, Van Heest, Rallis, & Reis, 2006; Collins et al., 2015; Cresswell & Eklund, 2006; Fraser-Thomas & Cote, 2009; Galli & Reel, 2012; Guptill, 2012; L.; Hardy et al., 2017; Howells &

<sup>1</sup> Some studies were multi-nation studies, hence the disparity between total number of studies and countries represented.

**Table 2**  
Demographic analysis.

Participants	n	% of total participants (N = 1776)	Level
Male athletes	946	53.3	Club level to Olympic champions
Female athletes	676	38.1	Club level to Olympic champions
Gender not specified athletes	78	4.4	National youth squad members to senior international level
Male musicians	46	2.6	Precocious boys from a prestigious Choir school to professional musicians
Female musicians	20	1.1	Amateurs in top level community ensembles to professional musicians
Gender not specified musicians	10	0.6	Professional musicians

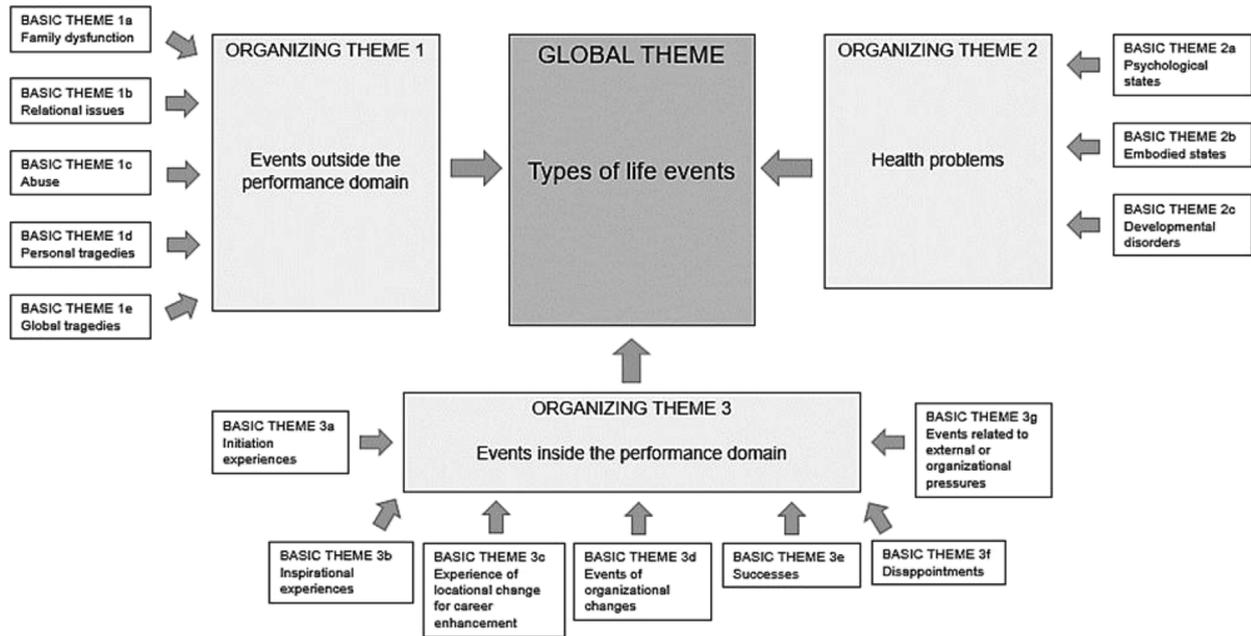


Fig. 2. Thematic network one: Types of life events.

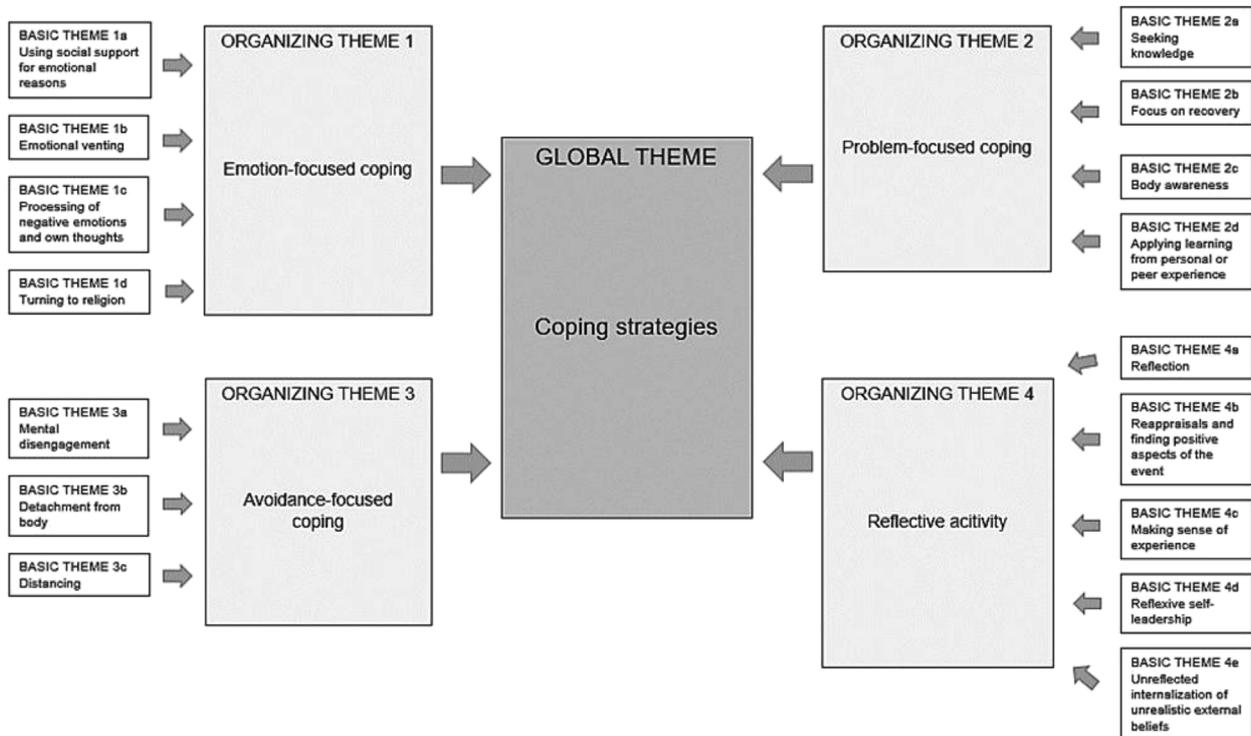


Fig. 3. Thematic network two: Coping strategies.

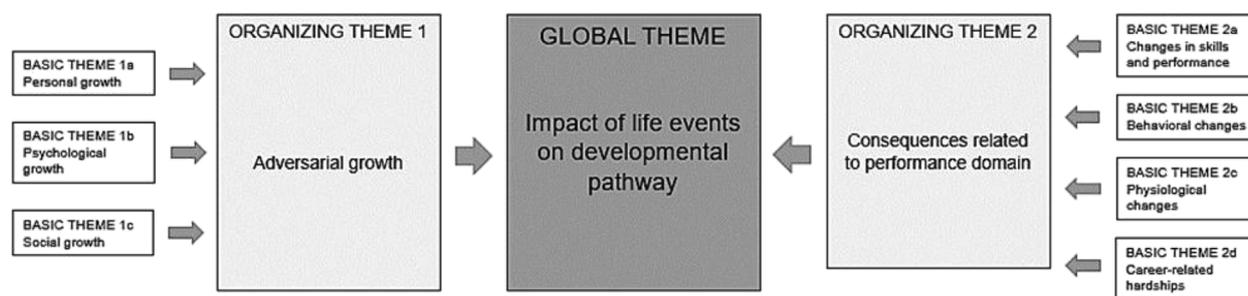


Fig. 4. Thematic network three: Impact of life events on developmental pathway.

Fletcher, 2015; Morgan & Giacobbi, 2006; Richardson et al., 2012; Roy-Davis, Wadey, & Evans, 2017; Ryba, Ronkainen, & Selanne, 2015; Sarkar et al., 2015; Savage, Collins, & Cruickshank, 2016; Tamminen et al., 2013; Udry, Gould, Bridges, & Beck, 1997; Wadey, Evans, Evans, & Mitchell, 2011; Wadey et al., 2012), surgeries (Burton et al., 2006; Collins et al., 2015; Morgan & Giacobbi, 2006), and illnesses (Aarresola et al., 2017; Collins et al., 2015; Fraser-Thomas & Cote, 2009; Howells & Fletcher, 2015; Savage et al., 2016; Wadey et al., 2012) as critical life events that influenced their career. Developmental disorders comprised dyslexia (Howells & Fletcher, 2015), attention deficit hyperactivity disorder (Howells & Fletcher, 2015), and obsessive compulsive disorder (Howells & Fletcher, 2015).

- c) Regarding ‘events inside the performance domain’, *initiation experiences* that got participants started in the respective domain were constitutive of the developmental pathway. Such events were discovering one’s talent (Freeman, 1999), being identified as talented (Coulson, 2010; Ryba et al., 2015), initiation to organized sport (Aarresola et al., 2017), finding sport (L. Hardy et al., 2017), selecting one’s primary sport (Aarresola et al., 2017), and finding one’s coach, teacher, or mentor (Coulson, 2010; L.; Hardy et al., 2017). Well-remembered *inspirational experiences* involved meeting a role model (L. Hardy et al., 2017), watching an inspirational performance (L. Hardy et al., 2017), or listening to a specific piece of music (Freeman, 1999). *Locational changes for career enhancement* were remembered as critical events in their lives by performers in both sports and music, which all went to great lengths to enhance their careers. Examples were migratory transitions (Brown et al., 2015; Richardson et al., 2012; Ryba et al., 2015), travelling abroad for tuition (Coulson, 2010), moving away from home at a young age (Burton et al., 2006; L.; Hardy et al., 2017), or applying and subsequently moving to a sports school (Aarresola et al., 2017). *Events of organizational changes* included the change to another sport or instrument (Beltman & Voet, 2007), transitions between competitions in different leagues (Cresswell & Eklund, 2006), and switching to a new coach or training group (L. Hardy et al., 2017). *Success* was identified as a critical life event by the performers in a variety of manifestations. Athletes mentioned early success (Aarresola et al., 2017; Burton et al., 2006; Morgan & Giacobbi, 2006), progress in ability-based groups (Aarresola et al., 2017), making their first team debut (Richardson et al., 2012), receiving a personal recognition (Aarresola et al., 2017), being selected for a team (Aarresola et al., 2017), and recruitment for the national team (Burton et al., 2006). *Disappointments* were also mentioned in manifold forms; these included performance setbacks (Aarresola et al., 2017; Brown et al., 2015; Tamminen et al., 2013; Wadey et al., 2012), failure in important music exams or competitions (Beltman & Voet, 2007; Burton et al., 2006; L.; Hardy et al., 2017; Sarkar et al., 2015), major mistakes in competitions (Wadey et al., 2012), not attaining goals (Wadey et al., 2012), nonselection (Collins et al., 2015; L.; Hardy et al., 2017; Sarkar et al., 2015), and deselection (Collins et al., 2015; Wadey et al., 2012). Not least, performers perceived *events*

*related to external or organizational pressures* as critical events in their lives. Examples were: events in which they felt pressured from media (Cresswell & Eklund, 2006); conflicts with coaches (Morgan & Giacobbi, 2006; Tamminen et al., 2013); events in which pressure on unrealistic, unhealthy body ideals was placed on them (Burton et al., 2006); inadequate breaks between seasons (Cresswell & Eklund, 2006); events of excessive stress from parents (Morgan & Giacobbi, 2006); and funding issues (Burton et al., 2006).

**Theme two: Coping strategies.** Our systematic review revealed that certain forms of coping with critical life events can have a significant impact on the subsequent career-related development. In our thematic analysis of reviewed papers, we identified four, clearly distinguishable coping strategies, namely (a) emotion-focused coping, (b) problem-focused coping, (c) avoidance-focused coping, and (d) reflective activity (see Fig. 3).

- a) ‘Emotion-focused coping’ was particularly characterized by strategies related to *social support*. Participants reported that they realized the importance of social support (Morgan & Giacobbi, 2006; Savage et al., 2016; Tamminen et al., 2013; Wadey et al., 2012), sought support for emotional reasons (Howells & Fletcher, 2015; Roy-Davis et al., 2017), and mobilized their social support system (Brown et al., 2015; Savage et al., 2016; Wadey et al., 2011; Wadey et al., 2012). Another emotion-focused coping strategy was *emotional venting* (Roy-Davis et al., 2017; Udry et al., 1997), which specifically included self-disclosure (Wadey et al., 2011), and confiding in others (Wadey et al., 2012). Two other strategies in the emotional domain involved the *processing of negative emotions and own thoughts* (Howells & Fletcher, 2015; Roy-Davis et al., 2017; Sarkar et al., 2015), and *turning to religion* (Roy-Davis et al., 2017).
- b) Apart from strategies aimed at handling emotions in the aftermath of critical life events, we identified ‘problem-focused coping’ strategies. Performers actively *sought knowledge* (Roy-Davis et al., 2017) by searching books (Wadey et al., 2011), adopting a lifelong learning mindset (Coulson, 2010), and attempting to deal with injuries from a medical perspective (Schubring & Thiel, 2014a; Wadey et al., 2012). Especially when sidelined with injuries, problem-focused coping was directed towards the *recovery process*, and characterized by actively planning recovery (Roy-Davis et al., 2017), adhering to the rehabilitation program (Brown et al., 2015; Wadey et al., 2011; Wadey et al., 2012), seeking support for instrumental reasons (Roy-Davis et al., 2017), and attending training sessions as a spectator (Wadey et al., 2011). Increased *body awareness* was also mentioned as a strategy to deal with the consequences of injuries. Athletes and musicians adopted an internal focus on their own personal performance (Brown et al., 2015), and decided to accept and care for their body’s needs (Daykin, 2005; Guptill, 2012; Schubring & Thiel, 2014a). By *applying learning from personal or peer experience* (Morgan & Giacobbi, 2006; Savage et al., 2016), expert performers were able to deal with the consequences of critical life events in a problem-focused manner.

- c) Whereas the previous strategies were related more or less to a positive impact on the developmental pathway, 'avoidance-focused coping' frequently led to unfavorable consequences, such as injuries, re-injuries, or performance decrements. *Mental disengagement* involved going out (Wadey et al., 2012), watching TV (Wadey et al., 2012), or self-imposed additional training sessions (Morgan & Giacobbi, 2006; Schubring & Thiel, 2014a; Schubring & Thiel, 2014b; Wadey et al., 2012). When injured, some performers attempted to ignore or conceal their pain (Schubring & Thiel, 2014b) (basic theme *detachment from body*). The basic theme *distancing* comprised findings showing that performers tried to distance themselves from problematic experiences in an attempt to maintain normality (Howells & Fletcher, 2015; Schubring & Thiel, 2014a; Wadey et al., 2012), or transferred all responsibility to medical professionals (Schubring & Thiel, 2014a).
- d) Finally, 'reflective activity' emerged from the findings of the original studies as a relevant coping strategy. *Reflection* was mentioned as an integral cognitive process mediating between the experience of critical life events and the perceived influence on development. In some studies, reflection was reported very broadly (Sarkar et al., 2015; Savage et al., 2016; Tamminen et al., 2013; Wadey et al., 2011), whereas in other studies, it was specified whether participants reflected on past experiences with adversity (Brown et al., 2015; Roy-Davis et al., 2017), reflected on previous successful transitions (Richardson et al., 2012), recalled their hopes and aspirations (Roy-Davis et al., 2017; Wadey et al., 2012), or thought through reasons for participating in sports or music (L. Hardy et al., 2017; Martinez-Pascual et al., 2014; Tamminen et al., 2013). Another important component of reflective activity were *reappraisals*, especially after negatively perceived life events. Examples were reappraising or reframing the significance of the event (Savage et al., 2016; Wadey et al., 2012), searching for and identifying positive aspects of the event (Roy-Davis et al., 2017; Wadey et al., 2012), developing a positive perspective on the encountered challenges (Beltman & Voet, 2007; Collins et al., 2015), and questioning the performance narrative (Howells & Fletcher, 2015). Closely related to this strategy were searching for meaning (Collins et al., 2015; Howells & Fletcher, 2015; Roy-Davis et al., 2017; Sarkar et al., 2015; Tamminen et al., 2013), and finding meaning (Collins et al., 2015; Schubring & Thiel, 2014b) – examples of the basic theme *making sense of experience*. We also identified a variety of *reflexive self-leadership* strategies in the data, such as self-discipline (Schubring & Thiel, 2014a), self-criticism (Collins et al., 2015), self-observation (Daykin, 2005), self-awareness (Burton et al., 2006), and self-evaluation (Burton et al., 2006; Daykin, 2005; Savage et al., 2016). In one study, participants reported that they *unreflectively internalized unrealistic external beliefs* (Cresswell & Eklund, 2006), which negatively impacted development.

### Theme three: Impact of life events on developmental pathway.

Performers identified several potential consequences of critical life events for their developmental pathways. These are depicted in the global theme impact of life events on developmental pathway (see Fig. 4). We identified two organizing themes, namely (a) adversarial growth and (b) consequences related to the performance domain.

- a) Some studies explicitly investigated 'adversarial growth', whereas others did not explicitly focus on this topic, but it implicitly emerged from the data. *Personal growth* was evident in the data when performers described personality changes as a result of being confronted and dealing with critical life events. Examples were changes related to maturity (Udry et al., 1997; Wadey et al., 2012), confidence (Coulson, 2010; Freeman, 1999; Udry et al., 1997; Wadey et al., 2011), patience (Udry et al., 1997), independence (Aarresola et al., 2017; L.; Hardy et al., 2017; Udry et al., 1997), optimism (Udry et al., 1997), time management (Martinez-Pascual et al.,

2014; Udry et al., 1997), self-understanding (Burton et al., 2006; Schubring & Thiel, 2014b), responsibility (Aarresola et al., 2017; Morgan & Giacobbi, 2006; Richardson et al., 2012), and competitiveness (Brown et al., 2015; Burton et al., 2006; Morgan & Giacobbi, 2006). Additionally, performers frequently reported that they gained perspective (Udry et al., 1997; Wadey et al., 2011) after experiencing negatively perceived life events. Gaining perspective was manifested in statements such as appreciating sports and the role of sports in their lives after suffering from injuries (Martinez-Pascual et al., 2014; Tamminen et al., 2013), having a new perspective on problems in the wider scope of life (Morgan & Giacobbi, 2006; Tamminen et al., 2013), acquiring a different perspective on what is important in life (Beltman & Voet, 2007; Burton et al., 2006; Howells & Fletcher, 2015; Morgan & Giacobbi, 2006), having a renewed appreciation for life (Burton et al., 2006; Galli & Reel, 2012; Roy-Davis et al., 2017), feeling uncertain about the future (Brown et al., 2015), recognizing the need for a more balanced life (Beltman & Voet, 2007), accepting injuries or challenges as a normal part of a career (Beltman & Voet, 2007; Richardson et al., 2012; Roy-Davis et al., 2017; Wadey et al., 2012), and viewing future difficult situations as positive and challenging learning experiences (Beltman & Voet, 2007; Brown et al., 2015; Tamminen et al., 2013). We also identified spiritual changes such as finding a deeper meaning in life (Wadey et al., 2012), or increased spirituality (Galli & Reel, 2012; Howells & Fletcher, 2015; Morgan & Giacobbi, 2006) as indicators of personal growth.

A wide array of findings was subsumed under the basic theme *psychological growth*. Here, performers reported increased motivation (Aarresola et al., 2017; Beltman & Voet, 2007; L.; Hardy et al., 2017; Martinez-Pascual et al., 2014; Morgan & Giacobbi, 2006; Sarkar et al., 2015; Savage et al., 2016), increased determination (Collins et al., 2015; L.; Hardy et al., 2017), increased passion (Brown et al., 2015; Burton et al., 2006), greater effort and desire (Sarkar et al., 2015; Wadey et al., 2012), increased commitment to excellence (Aarresola et al., 2017; Freeman, 1999; L.; Hardy et al., 2017; Howells & Fletcher, 2015; Savage et al., 2016), and an increased focus (L. Hardy et al., 2017; Savage et al., 2016; Tamminen et al., 2013) as a result of dealing with adversity during their development. Furthermore, they described psychological strength (Collins et al., 2015; Martinez-Pascual et al., 2014; Tamminen et al., 2013), resilience (Brown et al., 2015; L.; Hardy et al., 2017; Roy-Davis et al., 2017; Wadey et al., 2011), mental toughness (Brown et al., 2015; Richardson et al., 2012; Roy-Davis et al., 2017; Wadey et al., 2011), and a higher capacity for concentrating (Martinez-Pascual et al., 2014). Another component of psychological growth that we identified in the data was related to the self-concept of performers. Exemplary findings were increased self-belief (Brown et al., 2015; Freeman, 1999; Morgan & Giacobbi, 2006; Savage et al., 2016; Wadey et al., 2012), self-awareness (Savage et al., 2016), an improved body-self relationship (Roy-Davis et al., 2017), self-acceptance (Burton et al., 2006; Roy-Davis et al., 2017), development of an athletic identity (Martinez-Pascual et al., 2014; Ryba et al., 2015), improved body-awareness (Guptill, 2012; Udry et al., 1997), and development of more realistic expectations (Udry et al., 1997). Apart from these two growth components that mainly focus on aspects of the self, the theme *social growth* also emerged from the original data. Performers described changes in relationships as a consequence of life events, such as extended social networks (Wadey et al., 2011; Wadey et al., 2012), more positive or stronger relationships with friends, family, and coaches (Howells & Fletcher, 2015; Roy-Davis et al., 2017; Wadey et al., 2011; Wadey et al., 2012), and a detachment from negative relationships (Roy-Davis et al., 2017). Additionally, athletes reported increased empathy (Galli & Reel, 2012; Udry et al., 1997; Wadey et al., 2011; Wadey et al., 2012), and changes in pro-social behaviors (Howells & Fletcher, 2015; Roy-Davis et al., 2017) as a result of critical life

events. They described how they gained a desire to help others in similar circumstances (Tamminen et al., 2013), and how they developed into a more caring (Howells & Fletcher, 2015; Wadey et al., 2011) and unselfish (Wadey et al., 2011) person. Another indicator of social growth was an increased sense of belonging to a team or community (Fraser-Thomas & Cote, 2009; Richardson et al., 2012).

- b) We identified ‘consequences related to the performance domain’ as a second impact on the developmental pathway. In a few studies, performers directly related the experience of critical life events to *changes in skills and performance*. They described superior performances after being confronted with certain life events (Howells & Fletcher, 2015; Martinez-Pascual et al., 2014; Sarkar et al., 2015; Savage et al., 2016; Wadey et al., 2012), creative achievements as a result of changes in practice routines due to injuries (Daykin, 2005), but also inferior performances (May et al., 1985; Schubring & Thiel, 2014a; Wadey et al., 2012). Athletes furthermore reported improved technical and tactical awareness (Richardson et al., 2012; Udry et al., 1997; Wadey et al., 2011), and learning new training methods and techniques (Wadey et al., 2012).

We also identified some *behavioral changes* with a possible impact on the developmental pathway. Performers outlined general changes in practice routines (Brown et al., 2015; Guptill, 2012; Schubring & Thiel, 2014a), increased training loads (Collins et al., 2015; Udry et al., 1997), or more intensive training sessions (Aarresola et al., 2017; L.; Hardy et al., 2017; Udry et al., 1997), or changes in health behaviors (Roy-Davis et al., 2017). Musicians sometimes even changed their instruments after playing-related overload injuries (Daykin, 2005). Beside behavioral changes, athletes also mentioned *physiological changes* as a result of a successful rehabilitation process after injury. In this regard, they reported improved strength, flexibility, body control, fitness, speed, and conditioning (Roy-Davis et al., 2017; Tamminen et al., 2013; Wadey et al., 2011), and a decreased risk of re-injury (Wadey et al., 2011).

Apart from these positive consequences related to the performance domain, the findings of the original studies identified *career-related hardships*. Some performers described that they retired as a result of experiencing negatively perceived life events (Beltman & Voet, 2007; Burton et al., 2006; Howells & Fletcher, 2015), but subsequently came back to sports with a renewed perspective. After experiencing high negative life stress, others suffered from mental health problems which were regarded as significant life events in their own regard. Examples are depression (Beltman & Voet, 2007; Gouttebauge, Tol, & Kerkhoffs, 2016; May et al., 1985; Tamminen et al., 2013; Udry et al., 1997; Wadey et al., 2011; Wadey et al., 2012), feelings of isolation (Tamminen et al., 2013; Udry et al., 1997; Wadey et al., 2012), distress (Gouttebauge et al., 2016), anxiety (Gouttebauge et al., 2016), sleeping disturbances (May et al., 1985), or burnout (Cresswell & Eklund, 2006). Particularly prospective, quantitative studies showed a relationship between high negative life stress and subsequent injuries (Ford, Eklund, & Gordon, 2000; Hanson, McCullagh, & Tonymon, 1992; C. J.; Hardy, Richman, & Rosenfeld, 1991; C. J.; Hardy & Riehl, 1988; May et al., 1985; Petrie, 1992; Petrie, 1993; Petrie, Deiters, & Harmison, 2014), as did some qualitative studies from a more subjective perspective of the athletes (Schubring & Thiel, 2014b; Wadey et al., 2012).

#### 4. Discussion

The process of expert development implies changes at different levels that are not only related to performance but also to psychological, social, and physical aspects of the individual's life. The aim of this systematic review was therefore to comprehensively assess the impact of critical life events on the biopsychosocial development of expert performers by taking a holistic perspective. This aim was underpinned by the following overall research question: To what extent do critical

life events have an impact on the developmental pathways of gifted individuals in the performance domains of sports and music? The review was informed by a broad perspective on giftedness considering high-achieving individuals not only as experts in their respective domain, but also as experts in coping with challenges that inevitably arise during development. Furthermore, a dynamic perspective on talent development, which considers critical life events as important factors for development, guided our investigation.

Overall the findings of the review suggest that critical life events impact the biopsychosocial, developmental pathways of athletes and musicians on multiple levels. The reviewed quantitative evidence provides associations between stress, caused by recent life events, and injuries or mental health problems over a competitive season. From a stress-theoretical perspective, both, physical injuries and mental health problems, can be considered as an impact of life events on the biopsychosocial, developmental pathway. From a developmental perspective, injuries are perceived as life events that may impact performance or other levels of biopsychosocial development. The reviewed qualitative evidence elucidates coping strategies used by athletes and musicians in response to the occurrence of critical life events, and how different types of life events impact the biopsychosocial development of expert performers on multiple levels.

The findings of the analyzed, qualitative studies show that critical life events are not necessarily traumatic and/or hinder the developmental pathways of athletes and musicians. Performers, under appropriate circumstances, can certainly benefit from a wide variety of critical life events with regard to their development – often dependent on the coping strategies employed. Emotion-focused coping, problem-focused coping, and reflective activity often led to a favorable impact of life events on biopsychosocial development such as improved social relationships with significant others, superior performances, positive physiological and behavioral changes, and a wide range of psychological changes mainly related to adversarial growth. In contrast, when performers employed avoidance-focused coping strategies in response to life events, they often reported negative consequences for their subsequent physical and performance development such as inferior performances or injuries.

Our review also adds to recent domain-related reviews on talent development in sport psychology (e.g., Gledhill et al., 2017; Howells, Sarkar, & Fletcher, 2017). By employing a biopsychosocial perspective, we were able to draw a holistic picture of the role of life events in the developmental pathways of athletes and musicians. Additionally, by focusing on the concept of critical life events, which by definition includes both positive and negative events, we were able to identify a broad range of life events that had an impact on developmental pathways. This supplements the adversity-related experiences that Howells et al. (2017) identified in their review on adversarial growth in elite athletes.

In the following, we will discuss the thematic networks, offer applied implications, highlight key limitations of existing research, and provide a critical appraisal of our review.

##### 4.1. Thematic networks: discussion of findings

Our three thematic networks present a thematic analysis of the main themes of the included studies with regard to our research question. Additionally, they also illustrate the chronological pattern from the onset of a life event-related experience, over the employed coping strategies, to the perceived impact of events on the biopsychosocial, developmental pathway.

Athletes and musicians encounter a wide variety of critical life events during their lives which all potentially influence their development on a biopsychosocial level. Health problems and events inside the performance domain were investigated most frequently in the included studies; events outside the performance domain were described less often. This unequal report of life events inside and outside the

performance domain could be related to the research context of most studies. When performers were approached as successful musicians or athletes in a performance-oriented environment, they may be less apt to talk about critical life events outside their respective field such as events in their private lives. However, when events outside the performance domain were reported (e.g. Aarresola et al., 2017; L.; Hardy et al., 2017; Howells & Fletcher, 2015; Morgan & Giacobbi, 2006; Sarkar et al., 2015; Tamminen et al., 2013) they were often traumatic such as experiencing abuse, the death of a family member or a close friend, or the divorce of parents. Consequently, performers perceived that these events had a major impact on their subsequent development and often resulted in adversarial growth on a psychological and personal level.

It is remarkable that we identified only five studies that examined the impact of critical life events on the developmental pathways of musicians; even though musicians are likely to experience life events that are similar to those of athletes and that potentially influence their performance development. Accordingly, the reviewed studies investigated far more athletes than musicians. However, the included studies consistently reported for both performance domains that being recognized as a talent ignited a desire to excel, which was considered essential for the future career. Both, musicians and athletes also identified health problems – mainly injuries – as critical life events. Often, expert performers attributed health problems to the high demands in high performance contexts. Although the concept of a *culture of risk* has only been used to describe the dominant culture of normalizing pain and injuries in elite sports (Nixon, 1993), the culture in music appears to be similar in this regard. When being faced with injuries, musicians and athletes attempted to conceal or ignore their pain. This avoidance-focused coping strategy also exemplifies this very culture of risk (Mayer et al., 2018; Nixon, 1993). Despite the cultural similarities of both performance domains, there are barely any studies that investigate both domains simultaneously. We could only find one study (Beltman et al., 2007) that examined critical life events in the careers of both athletes and musicians. Nevertheless, studies by the work group around Dave Collins and Áine MacNamara on relevant psychological skills in successful careers of top-level athletes and musicians show that the challenges of excellence development in the two areas are by all means comparable (MacNamara, Button, & Collins, 2010).

As critical life events differ in their nature and impact, so do people in their responses to an event (Schwarzer & Luszczynska, 2012). However, only one of the included studies attempted to investigate which psychosocial factors or personality traits may influence which coping strategies were adopted. When comparing adolescent and adult elite athletes with regard to the impact of critical life events on development, both groups reported very similar life events and consequences for the developmental pathway. When analyzing the described coping strategies in the original studies, reflective activity was only reported by adult elite athletes. However, due to the heterogeneous study designs and different methodological approaches, these findings should be considered with caution. Additionally, even though we depicted coping styles in four, thematically different categories, it is important to bear in mind that performers may employ more than one coping strategy simultaneously, or first use one strategy followed by another.

The idea of adversarial growth on a personal, psychological, and social level as a result of being confronted with negatively perceived life events was predominant in the data. Adversarial growth emerges through a process of struggling with adverse events. Individuals who experience adversarial growth typically report a higher level of functioning than prior to the event (Joseph & Linley, 2005; Linley & Joseph, 2004). According to a recent systematic review by Howells et al. (2017), the study of growth following adversity increasingly receives attention in athletic talent development research.

It is important, however, to take into account that most researchers rely on self-reports of adversarial growth, which could be illusory

(Howells & Fletcher, 2016). In order to cope with traumatic events, individuals may actively search for benefits from the event as well as actively remind themselves of these perceived benefits (Tennen & Affleck, 2002). Adversarial growth may be illusory in cases where individuals construct hypothetical benefits or ignore a clear predominance of losses compared to benefits gained from traumatic events. In professional sports and music specifically, illusory growth experiences may arise from the above-mentioned pervasive culture of risk. This culture is characterized by the notion that pain, injury, and serious distress constitute a natural part of a career (Nixon, 1993) and that overcoming adversity characterizes highly successful performers. In other words, the culture of risk is clearly based on the assumption of “What does not kill you makes you stronger”, and, as such, explicitly depicts adversity as a catalyst for positive change. Consequently, expert performers in music and sports may be especially prone to provide illusory growth reports.

#### 4.2. Applied perspective

From an applied perspective, our findings stress that coping strategies for dealing with critical life events play a central role in successful developmental pathways. For practitioners, coaches, teachers, and mentors it might be relevant to teach performers effective coping strategies early to prepare them for critical life events that are likely to occur. In this regard, social support could be an essential strategy. In the analyzed quantitative studies, social support seemed to moderate the relationship between life-event-related stress and injuries or mental health problems. Similar findings emerged from the analyzed qualitative studies: Here, performers emphasized the importance of social support in the process of coping with negative life events. Seeking support for emotional and instrumental reasons was identified as a frequently employed coping strategy, which often had a positive impact on the developmental pathway. This finding stresses the importance of professional emotional support (i.e., counselling); a field that is to some extent established in professional sports, but is still in its infancy in professional music, despite its large potential. From an applied perspective, we recommend that coaches, music teachers, and mentors encourage their athletes or music students to enlarge and deepen their social networks, to use these networks when challenges arise, or to ask for professional emotional support.

Our analysis also suggests that overcoming critical challenges in a career might be essential for the perfection of skills. We do not want to imply that negative life events are a prerequisite for achieving excellence. However, against the background of our findings, practitioners should consider to systematically use the benefits of challenges. Such challenges should be explicitly career-related, manageable, and focused on the refinement of skills. Challenges such as playing on a different position, moving up to the next age group etc. can be systematically employed to create appropriate conditions for deliberate practice, develop coping strategies, and foster durability.

#### 4.3. Limitations of current research

**Clarity of definitions.** In sum, most studies did not offer clear definitions of the terms critical life event, life experience, or related terminology. Hence, we tried to offer clear definitions in our theoretical background based on theoretical and empirical work on critical life events in other fields. In addition to definitional and terminological issues, it was apparent that authors rarely referred to specific developmental theories when examining life experiences or critical life events.

**Theoretical approaches and research designs.** Overall, we identified theoretical shortcomings in the reviewed studies. Most studies were not thoroughly grounded in a specific theoretical framework, which evidently influenced the methodology and lowered the quality of the results. Even though the included studies were not explicitly based

on specific developmental theories, they can be implicitly attributed to the two common theoretical perspectives on life events that we described in our theoretical background.

Ten of the reviewed studies implicitly employed a stress-theoretical perspective on life events, nine of which being of prospective, quantitative design, and one qualitative. These studies examined the influence of life-event-related stress on pathological phenomena, such as injuries, CMD (depression, anxiety, sleep disturbances) and burnout in athletes. Methodologically, reviewed stress-theoretical studies applied a variety of different life-event scales. Most of these scales use subjective severity-ratings for each event to assess the subjective significance that might differ from person to person. These severity-ratings of the checked items are then summed up to yield a total score that indicates how much life-event-related stress individuals experienced. The same score can then refer to completely different life events. Consequently, it is questionable whether different life events should be regarded as psychologically equally demanding and be subsumed in the same analysis.

The remaining studies ( $n = 26$ ) can be implicitly associated with a developmental perspective on life events, which construes critical life events as natural interventions in the life course (Filipp, 1995). The respective studies were interview-based, with a focus on the subjective nature of experiences. Further, we observed that researchers either pre-determined one specific life event and investigated the appraisal of the event and the coping process or examined psychosocial factors that performers subjectively considered relevant for their career trajectories. Regarding our central question, the limitation of the first approach is that it does not take into account whether performers perceived the event as significant for their development. The second approach, on the other hand, describes a wide range of psychosocial factors as important for their career development, with life events just being one among many factors. This makes it very difficult to exactly assess the impact of critical life events on the developmental pathways of gifted individuals.

## 5. Conclusion

To conclude, some important limitations of our review need to be considered. A first limitation of this review lies in the categorization of the reviewed studies into three thematic networks. This categorization may possibly mask the complexities inherent in experiences. For example, the grouping of findings into one category, such as adversarial growth, might obscure the interactional and multilayered complexities that are characteristic of the impact of life events on the developmental pathways of athletes and musicians. However, the analyzed studies were, if at all, based on theoretical frameworks that do not allow an in-depth understanding of such complexities within a developmental pathway. Secondly, when making applied recommendations, we do caution that these are based on predominantly retrospective evidence with a moderate risk of bias. Another limitation is the limited number of analyzed studies conducted with musicians, even though the findings of music-related studies (all being of qualitative design) align closely with the sports-related studies. Additionally, data may be incomplete because some studies might have been published in another language or published in journals that are not indexed in the databases used. However, through cross-referencing and additional searches in GoogleScholar, we aimed to lower the risk of bias across studies.

In summary, it proved to be extremely difficult to conduct a systematic review on the impact of critical life events on the developmental pathways of expert performers. Overall, the topic is not researched systematically, which becomes evident in the wide range of methodological concepts, methods, and focus points of studies. Even though encountered life events, coping responses, and subsequent consequences may differ by gender (Costello, Bieuzen, & Bleakley, 2014; Ristolainen et al., 2012) and developmental stage, it was not possible to conduct subgroup analyses for gender and developmental stage due to heterogeneous study designs, sample characteristics, and

methodological approaches. Additionally, the included studies did not report their findings separately for men and women or athletes and musicians at different developmental stages. There might be gender differences especially when considering that career-related research in other performance domains reports about these, especially in relation to career advancement and career patterns (Biemann, Zacher, & Feldman, 2012; Timberlake, 2005). Therefore, for future research in the area of talent development in sports and music, it would be important to analyze gender differences and report them in particular.

Notwithstanding the above, our systematic review provides original contributions to the body of research by highlighting research trends and providing a detailed methodological appraisal of included studies. By thematically synthesizing findings from qualitative and quantitative studies, we offered a rich and practical understanding of the impact of critical life events on the biopsychosocial development of athletes and musicians. Our findings also support a broad conceptualization of giftedness, underscoring the idea that critical life events impact the dynamic pathway to excellence in different achievement domains. Taken together, we hope that this review and synthesis will further improve talent development practices.

## Declarations of interest

None.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.psychsport.2019.101565>.

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