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**ROLE STRAIN THEORY: APPLICABILITY IN  
UNDERSTANDING DEVELOPMENTAL EXPERIENCES OF  
INTERNATIONAL JUNIOR ACROBATIC GYMNASTS**

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**Abstract**

1  
2 *It is well established that elite sports performers encounter multiple stressors during their*  
3 *careers. However, limited research has specifically investigated developmental,*  
4 *organisational, and competitive transitional experiences of international junior elite athletes.*  
5 *Through the application of of Role Strain Theory (RST), this study extended the sport talent*  
6 *development literature by providing key insights into the experiences of five highly successful*  
7 *Great Britain (GB) junior international acrobat gymnasts, aged 14-17. It explored how they*  
8 *simultaneously combined multiple sport, family and educational role demands during their*  
9 *pre-elite to elite transition and coped with these complex demands. Derived themes from*  
10 *semi-structured retrospective interviews identified a presence of chronic, but low level and*  
11 *manageable role strain during all transitional stages, which enabled positive acrobatic*  
12 *development, life satisfaction, physical and mental well-being and educational progress. All*  
13 *reported how severity and regularity of role strain, specifically overload and conflict, at*  
14 *times fluctuated intermittently during the early teenage years. It was at this point when*  
15 *increased role strain was reported to meet family commitments due to increased training and*  
16 *competition schedules. Challenges faced in maintaining healthy and compatible friendships,*  
17 *particularly with peers outside of acrobatics and school settings, were further sources of role*  
18 *strain during this time. Three key factors which regulated role strain were present in all*  
19 *participant narratives: early internalised acrobatic identity, acrobatic specialisation by very*  
20 *young age and social and tangible guidance from teachers and coaches in support of the*  
21 *athletes' holistic development. Potential further research and limitations are discussed.*

22  
23  
24 **Keywords:** *acrobatic gymnasts, elite junior; role strain theory; transitions.*  
25

## 1 INTRODUCTION

2 Sport talent development research spanning several decades and disciplines has  
3 revealed the complex, idiosyncratic and non-linear pathways travelled by international junior  
4 and senior athletes (Coutinho, Mesquita & Fonseca, 2016; Huxley, O'Connor & Larkin,  
5 2017). A comprehensive literature base, which retrospectively explored the sport  
6 participation histories of elite junior and senior international athletes, showed that they  
7 accumulated extensive sport-specific practice over many years, but also engaged in different  
8 sports during childhood and adolescence (Rees et al., 2016). In addition, a recent systematic  
9 review of the limited literature available showed that early youth sport specialisation is not a  
10 prerequisite to achieve success at the elite level (Kliethermes et al., 2019). A position  
11 statement by the Australasian College of Sport and Exercise Physicians (2019) further  
12 supports this notion, but does however state that the only sport for which there might be an  
13 exception is rhythmic gymnastics. A number of recent studies have continued to extend this  
14 knowledge base by specifically exploring the 'dual-careers' phenomenon, defined by  
15 Geraniosova and Ronkainen (2014, p.53) as 'the challenge of combining a sports career with  
16 education or work'.

17 Historically, this literature has been theoretically underpinned by the Holistic Athlete  
18 Career Model (HACM) (Wylleman, De Knop & Reints, 2011). Informed by research and  
19 applied work across multiple sports with athletes of varying age and abilities, this model  
20 summarised what physical, psychological, psychosocial, financial and academic transitions  
21 athletes are likely to encounter during their sports careers. The model is internationally  
22 acknowledged and well established in the literature. Previous research suggests sufficient  
23 time and resources should be made for junior athletes to balance sport training and  
24 competition demands with other life roles, including friendships, school, paid and voluntary  
25 work plus other sport and leisure interests, so they are less likely to experience high stress

1 levels, burnout, social isolation, athletic identity foreclosure or dropout. Recent empirical  
2 research found that applying Role Strain Theory (RST) (Fenzel, 1989) to explore transitional  
3 experiences of elite adolescent Australian Rules Football (AFL), tennis and gymnastics  
4 performers directly explained how they combined and coped with the competing role  
5 demands of sport and education arising from the different roles they fulfilled as developing  
6 elite adolescent athletes (Van Rens, Borkoles, Farrow, Curran & Polman, 2016; Van Rens,  
7 Borkoles, Farrow & Polman, 2018; Hayman, Polman, Taylor, Hemmings & Borkoles, 2109).  
8 Role Strain, defined as a ‘felt difficulty in fulfilling role obligations’ (Goode, 1960, p.483), is  
9 a widely accepted psychological concept that in previous research has been applied across  
10 educational and organisational psychology settings to explain problems and barriers faced by  
11 individuals when fulfilling multiple role demands. Role strain is further defined by Goode  
12 (1960, p.483) as ‘a consequence of role bargains and as a continuing process of selection  
13 among alternative role behaviours in which each individual seeks to reduce his role strain’.

14 RST focuses on four interrelated stressors: overload, conflict, underload and  
15 ambiguity arising from life role demands (Fenzel, 1989; Holt, 1982). Fenzel (1992; 2000)  
16 provided empirical evidence that role strain was frequently experienced by young adolescents  
17 when transitioning from primary to secondary school, with consequent reductions in self-  
18 esteem, self-worth and academic achievement. The study by Van Rens et al., (2016) was the  
19 first to apply RST within a sport context and investigated how elite adolescent Australian  
20 Rules Footballers (aged 13-17 years) simultaneously undertook multiple life roles as  
21 identified by the theory. A key finding was that all participants frequently encountered  
22 multiple instances of role ambiguity, role overload and role conflict as they pursued their  
23 ambition of transitioning to international senior sport performance levels. Van Rens,  
24 Borkoles, Farrow and Polman (2018) also found overload, conflict, underload and ambiguity  
25 were all negatively associated with total life satisfaction of 112 junior international Australian

1 Rules Footballers. Hayman et al., (2019) investigated the experiences of elite adolescent  
2 golfers who all had concurrently undertaken multiple sport, family, peer and educational roles  
3 during the pre-elite to elite junior transition period. Applying RST enabled for the nature,  
4 intensity and temporal aspects of role strain experienced to be identified. Chronic but low  
5 level and manageable role strain was reported during childhood, only increasing  
6 intermittently in severity and regularity during the early teenage years until the very final  
7 stages of the pre-elite transition period. This was particularly noticeable around the ages of  
8 15-16 years, when for the first time, participants encountered difficulties in combining  
9 training, competition and other sports commitments with their basic educational  
10 requirements. The findings suggested a complex developmental transition, especially when  
11 the junior athletes were considered as ‘talented’ in several sports. It was soon after they made  
12 the decision to specialise in golf when role strain gradually subsided, combined with  
13 cessation of educational strain upon completion of formal secondary education. These  
14 research findings demonstrate the suitability of RST in explaining the temporal nature of role  
15 strain during key transitional periods and how junior athletes cope with multiple competing  
16 role demands throughout this particular developmental stage.

17         When applying RST principles within a sport context, overload would occur when  
18 demands exceed personal resources, such as participating regularly in several sports all at  
19 once and/or leaving limited or insufficient time to see friends and/or complete school work  
20 (Van Rens et al., 2016). Conflict would transpire when disagreement occurred between what  
21 an individual wishes to do and the demands imposed by others. An example would be  
22 contrasting athlete and coach beliefs towards prescribed training load and frequency (Van  
23 Rens et al., 2016). The underload element of RST emphasises a perceived underutilisation of  
24 an individual’s capabilities and lack of challenge, including frequently competing for schools  
25 teams (Hayman et al., 2019). The final concept with RST is ambiguity and refers to limited

1 understanding or clarity of one's responsibilities such as the mixed messages presented to  
2 young athletes about the different priorities in their sport or life (Van Rens et al., 2018).

3 Acrobatic Gymnastics (AG) is an internationally recognised artistic discipline  
4 performed by both genders. Its global popularity had increased significantly over the past two  
5 decades with multiple countries now hosting regular international, national and regional  
6 competitions. GB is one of the leading nations in the sport and has a global reputation for  
7 excellence in the discipline, having amassed multiple successes at World and European levels  
8 across various age categories and disciplines. For example, GB was represented in every  
9 medal ceremony at the 2019 European Age Group Championships. This was followed by 13  
10 medals at the 2019 European Junior and Senior Championships. At developmental level, a  
11 world age group competition is held every two years and has the following age categories:  
12 11-16, 12-18 and 13-19. The 13-19 age range is also considered the Junior level. For the first  
13 time in 2018, AG formed part of the Youth Olympic Games in Argentina. Formal routines  
14 must last up to 150 seconds, contain a mixture of static, dynamic and combined elements, be  
15 choreographed to music and performed on a sprung floor surface. Five different partnership  
16 combinations are permitted in official competitions: male, female, mixed pairs, female groups  
17 (3 gymnasts) and male groups (4 gymnasts) (British Gymnastics, 2013).

18 Surprisingly, limited talent development research specific to gymnastics, and  
19 especially AG, exists. The few studies to do so demonstrate many international talent  
20 programmes follow early specialised approaches to development, with young children  
21 annually completing significant hours of physically and mentally demanding deliberate  
22 practice training regimes (Arkaev & Suchilin, 2004; Krane, Greenleaf & Snow, 1997;  
23 Nunomura, Okade & Carrara, 2012). Law, Côté and Ericsson (2007) compared participation  
24 histories of Canadian Olympic and international (non-Olympic) rhythmic gymnasts. They  
25 found Olympians accumulated three times the amount of gymnastic specific deliberate

1 practice, as well as reduced enjoyment, poorer physical health and increased numbers of  
2 injuries by 16 years of age when compared with non-Olympians. Elite gymnasts have also  
3 reported difficulties in developing an identity outside their sport and having limited power  
4 and control within the coach-gymnast relationship (Kerr & Dacyshyn, 2000; Krane et  
5 al.,1997; Lavallee & Robinson, 2007).

6 Extending upon the work of Van Rens et al., (2016; 2018) and Hayman et al., (2019),  
7 the primary aim of this unique qualitative study was to apply RST for the first time to explain  
8 transitional experiences and of 5 junior international acrobatic gymnasts, who each combined  
9 concurrent sport, education, family and peer role demands. The study is timely, because  
10 creating evidence informing how best to develop and retain the next generation of world class  
11 acrobats is a strategic priority for gymnastics governing bodies globally. Findings will  
12 provide coaches, parents, talent developers and policy makers with stronger evidence for how  
13 best to promote healthy development, whilst preserving physical (e.g., fewer injuries) and  
14 psychological welfare (e.g., reduced likelihood of burnout, dropout and identity foreclosure)  
15 of aspiring elite and elite junior international acrobatic gymnasts.

## 16 **METHOD**

### 17 **Participants**

18 The sample comprised 5 (male = 3, female = 2) international junior acrobatic  
19 gymnasts (mean age = 16.2 years). All had specialised in acrobatics before the age of 7 and  
20 competed regularly across a range of standards (e.g., regional, national and international  
21 competition levels). Experts have been defined within the extant literature as those who  
22 compete at international and/or national levels (e.g., Helsen, Starkes & Hodges, 1998). In this  
23 paper, the term ‘elite junior acrobat’ was used to categorise participants aged between 14 and  
24 17 who had secured 4<sup>th</sup> place or higher for Great Britain (GB) Junior Acrobatic Gymnastic  
25 representative teams (under 12’s - 19’s category) in mixed pairs or quartet disciplines at

1 either European or World Junior Championships over the past decade. Once institutional  
2 ethical clearance was granted, face-to-face debriefs addressing the study aims, objectives and  
3 procedures to follow were completed. All participants were aged under 18, so parental  
4 consent permitting their child's involvement was obtained in all instances.

## 5 **Procedure**

6 Participants were approached in person to participate in the study in by the third  
7 author who had established contacts within GB Junior Acrobatic Gymnastics representative  
8 teams. Participants were informed how they could withdraw from the study at any time  
9 without giving any reasons, provided written informed consent prior to any data collection  
10 commencing and assigned numerical pseudonyms to protect anonymity. For all consenting  
11 participants, interviews were recorded and undertaken at a convenient time, date and location  
12 for them. In all cases, this was within a safe, private and comfortable room within the  
13 grounds of a Gymnastics Academy based in Northern England. When undertaking qualitative  
14 research, it is important that the interviewer builds rapport and trust with the interviewee. The  
15 lead author was previously an elite junior athlete meaning he possessed contextual knowledge  
16 concerned with the demands and terminology used in such settings, which he used to aid the  
17 process of establishing a positive and empathetic bond with participants (Patton, 2002).

18 To ensure participants felt relaxed, comfortable and at ease to share personalised and  
19 sensitive information, each interview started with an informal discussion on how they first  
20 became involved in acrobatic gymnastics (Rapley, 2004). The proposed interview schedule  
21 was pilot tested by 2 regional level junior acrobatic gymnasts aged 15 and 16 years  
22 respectively. This confirmed duration of approximately 45 minutes and strengthened the lead  
23 authors interviewing techniques. The interview format was specifically designed to explore  
24 how demands arising from combining sport and other role commitments impacted the  
25 participants and whether RST was applicable to their specific experiences. The lead author

1 undertook the role of ‘active listener’ to assist participants in telling their unique stories in  
2 their own particular way. Participants were encouraged to talk about all their life roles,  
3 including sports, school, friends, family and other hobbies (e.g., art or music). In the first  
4 instance, the interviewer explored the acrobatics involvement and experiences of participants  
5 throughout childhood and adolescence. Follow up questions probed how they fulfilled other  
6 sport, educational, extracurricular and family commitments during this time.

7 In the second stage, specific challenges encountered in meeting role demands were  
8 explored. Example questions included ‘were there any difficulties you faced in carrying out  
9 the various roles in your life’ and ‘what did you do to manage this process’. To elicit richer  
10 data, supplementary probing was used, such as ‘why was this so important to you’, ‘why did  
11 you do these things’ and ‘how did this make you feel’. This flexible questioning approach  
12 ensured participant centeredness, making it possible to follow up conversations where  
13 appropriate (Lincoln & Gubba, 1985). Every attempt was made to follow participants’ stories  
14 and to understand their unique experiences and accounts of the pathways they travelled,  
15 rather than following a standardized list of questions.

## 16 **Data Analysis**

17 Each interview lasted approximately 40 minutes, was audio-taped, transcribed  
18 verbatim and subjected to similar thematic analysis guidelines published by Braun and Clarke  
19 (2006). Each transcript was read on several occasions by the first and fourth authors with  
20 notes placed within margins reflecting theme statements and their meanings. The same  
21 authors then independently annotated each interview transcript with their personalised  
22 thoughts and interpretations of the data. Initial thematic coding employed a deductive  
23 approach, which is recommended for qualitative analysis when existing theories are being  
24 tested (Elo & Kyngas, 2008). Once the deductive approach was complete, an inductive  
25 approach was undertaken to ensure any additional higher order themes were included and to

1 allow for lower order themes to be derived. There were marginal differences between the two  
 2 separate coding results, with discrepancies discussed and agreed. Primary associations and  
 3 connections based on similarities and patterns between derived themes were made, resulting  
 4 in the development of four main themes.

5 When finalised, interview extracts representing each theme were selected. The final  
 6 analysis stage involved developing written accounts from identified themes. These were  
 7 reviewed and redrafted several times. Five weeks post-interview, 3 of 5 participants  
 8 undertook a brief member-checking telephone conversation with the first author to establish  
 9 if they were satisfied that the findings were accurate reflections of their transitional  
 10 experiences (Lincoln & Gubba, 1985). All 3 participants corroborated their personal journey  
 11 within the wider context of the finalised data set. The remaining 2 declined to go through the  
 12 member checking process.

### 13 **RESULTS**

14 The data analysis yielded four themes that were subsequently grouped within two categories.

15 **Table 1: Category and Theme Classification**

<b>Category</b>	<b>Theme</b>
Pre-Elite Role Strain Experiences	(1) Benefit of Early Internalised Acrobatic Identity (reduced overload, conflict and ambiguity)  (2) Role Strain Fluctuation during Pre-Elite to Elite Junior Transition (increased overload, conflict and ambiguity)
Minimising Role Strain throughout the Elite Adolescent Context	(3) Sacrifices Made to Pursue Junior International Acrobatic Career (reducing overload by making adjustments & prioritising sport over family & friends)  (4) Influential Teacher and Coach Support (Social & Tangible)

## 1 **Pre-Elite Role Strain Experiences**

### 2 *Theme 1: Benefit of Early Internalised Acrobatic Identity*

3 All participants reported a commitment to their sport, resulting in development of  
4 early acrobatic identity. Participants of this study viewed themselves as having ‘lived and  
5 breathed’ the sport at their own free will and successfully combined educational and sport  
6 related commitments. For example, they found that the reduced sport organisational demands  
7 such as reduced personal sacrifices, less financial impact, more family and friend’s time and  
8 fewer logistic problems of participating in multiple sports made their experiences far less  
9 complex. This simpler transition period allowed them to find acrobatics to be a more  
10 enjoyable, fulfilling and naturally rewarding experience, consequently reducing role strain  
11 overload, ambiguity, and conflict. Interviews revealed participants were normally successful  
12 in managing role strain during this early period of their life. As dedicated and highly  
13 ambitious young children, they reported a very single-minded focus and commitment to  
14 securing world class junior acrobat status. Each participant (and their parents) invested  
15 significant time, money and resources to become an elite international acrobatic gymnast.

16 During their childhood, acrobatics had taken centre stage and they prepared for this  
17 life by specialising early, aged either 6 or 7 years. The decision to make a sole commitment  
18 to acrobatics early in their sporting careers freed up crucial organisational resources (e.g., less  
19 time spent training and competing in other sports and pursuing other identities plus reduced  
20 travel time and financial outlay). Other developmental stressors were also mitigated at this  
21 stage, such as not missing out as much on other developmental opportunities (e.g. playing in  
22 a band). To illustrate, Participant 1 said ‘*I may not have played many other sports when  
23 growing up but I was fine with this as it left me more time to get on with my gymnastics*’  
24 **(RST: reduced overload)** and Participant 5 stated ‘*doing gymnastics is all I have known and*

1 *it (specialising) made things easier as I could just focus on this one main sport in my life'*

2 **(RST: reduced overload, ambiguity and conflict).**

3 This training pattern and early specialisation in sports like gymnastics and/or  
4 acrobatics are common. Participants reported this helped reduce potential sources of role  
5 strain, such as overload and conflict of training and competitions from other sports.  
6 Participants considered their improved consistency and quality of acrobatic performance to  
7 be a direct consequence of this dedicated and systematic approach to achieving international  
8 junior status, impacting significantly on their intrinsic motivation, self-efficacy and perceived  
9 competence. For example, Participant 3 said '*the fact I was improving every year and getting*  
10 *better was so motivating*'. This quote indicated that they were able to monitor their physical  
11 and psychological readiness to make the next level transition, which is inherently a difficult  
12 and complex process in developing athletes. It appeared to be motivational for the junior  
13 athletes. Each sport has different physical, psychological, and social demands, which is  
14 difficult to monitor when competing at multiple sports simultaneously.

### 15 ***Theme 2: Role Strain Fluctuation during Pre-Elite to Elite Junior Transition***

16 By late childhood, becoming an international level junior acrobat had become a  
17 primary life goal for all, causing an upsurge in strain from educational, friendships and family  
18 commitments. After entering the early teenage years, junior athletes in the study reported  
19 increased role strain frequency and intensity. At this stage of transition, physical and mental  
20 fatigue remained chronic but low-level and manageable, but it was at late childhood when  
21 participants reported to experience elevated role strain for the first time. They attributed the  
22 rise to when they simultaneously had to combine increased periods of training (frequency and  
23 volume) with competition and school work for the first time. They explained how the  
24 physically demanding and time intensive training regimes, particularly in the lead up to

1 international competitions, left them feeling more mentally and physically fatigued than ever  
2 before. The development of role strain was clearly explained by Participant 2 who said:

3 *'It can get stressful, especially leading up to an international competition when*  
4 *training is at its highest. It's just really nice to be able to have a break and I get*  
5 *so much more social time so I am able to see my friends much more and sleep*  
6 *more and not have to worry about having to fit homework in and I just like being*  
7 *less physically tired from all the training'* (**RST: increased overload, ambiguity**  
8 **and conflict**).

9 These experiences indicate that had they been too involved in other sports, they may  
10 have experienced significantly more role strain. The rise of role strain was also well  
11 explained by Participant 4 during the immediate build up to international competition,  
12 who stated:

13 *'Training leaves me feeling absolutely exhausted both physically and mentally,*  
14 *especially in lead up to competitions. I absolutely love it, but sometimes when I*  
15 *am tired and sore it is intense and a bit too much'* (**RST: increased overload**).

## 16 **Minimising Role Strain throughout the Elite Adolescent Context**

### 17 ***Theme 3: Sacrifices Made to Pursue Junior International Acrobatic Career***

18 It was noticeable how living the life of an international junior acrobat had the  
19 potential to restrict participants' day-to-day social lives, especially during the early teenage  
20 years. All discussed challenges they faced in maintaining healthy and compatible social  
21 relationships, particularly outside of acrobatics and school settings. The following quotes  
22 capture the essence of such experiences:

23 *'I only see my non gymnastics friends in college and if there is the odd party I can*  
24 *attend which is not very often. Then there are my friends here at gymnastics but I*  
25 *never get to see them outside of being here and then also it is hard when you are*

1 *making new friends because they don't understand the level of commitment or*  
 2 *what I do really. I do sometimes think I miss out on a really fun social life' (P1)*

3 **(RST: increased conflict).**

4 *'I do not see my family that much apart from a bit at home and then with my*  
 5 *school friends I feel like I am missing out a lot of the time for the sake of my*  
 6 *training' (P5) (RST: increased overload and conflict).*

7 They reported difficulties in maintaining a particular body shape expected of world  
 8 class junior acrobats, with most opening up about having to comply with strict nutritional  
 9 guidelines and conditioning programmes from early childhood to preserve a hidden, but  
 10 required look (e.g., Douda, Toubekis, Avloniti & Tokmakikdis, 2008). During a transitional  
 11 period of physical growth and psychological maturity, it is difficult to judge whether the  
 12 athletes are able to cope with the demands of the sport, such as new routines based on their  
 13 previous body composition. The extract below illustrates a participant's specific experience:

14 *'You have to basically look and be the best you possibly can, like the strongest*  
 15 *you possibly can, and leanest you possibly can so you really have to watch the*  
 16 *diet but at the same time push the weights and get stronger and more toned' (P4)*

17 **(RST: increased overload and conflict).**

18 It is unknown how junior athletes monitor and manage these developments, but the  
 19 above quote indicates that they do, and those who make this transition successfully,  
 20 appear to become elite. It maybe that it is easier for adolescents to better understand  
 21 these encounters when they specialise early in a sport.

#### 22 ***Theme 4: Influential Teacher and Coach Support***

23 All athletes in the study reported a positive relationship and receiving a significant  
 24 social support from school teachers and acrobatic coaches, who fully understood the  
 25 competing role demands placed on the day-to-day lives of their acrobats. Participants highly

1 valued their teachers' and coaches' guidance during their early international careers, viewing  
2 them as significant sources of support, which helped them to attenuate role strain frequency  
3 and intensity encountered:

4 *'I have a really good relationship with my coach especially as he has coached me*  
5 *ever since I was six years old and I can talk to him about literally anything and*  
6 *he helps me plan my days so I get everything done'* (P1) (**RST: reduced**  
7 **overload and conflict**).

8 It appears that having a stable and continuous relationship with a coach reduced role strain  
9 arising from organisational, developmental, and competition stressors experienced.  
10 Furthermore, a participant specifically explained how the coach played a significant role in  
11 reducing their day to day stress levels. They said:

12 *'My coach is great and I have known him for years like and we have a mutual*  
13 *respect and he takes a lot of the stress off me like always having my routines*  
14 *planned out and tells me what my conditioning programmes are like and*  
15 *sometime takes me home when my mum has to get off early'* (P5) (**RST: reduced**  
16 **overload and conflict**).

17 Participants' school teachers had always shown keen interest towards their students'  
18 sports careers and were tremendously impressed and proud of all their national and  
19 international accomplishments. It appears that developmental stressors may be mitigated by  
20 the significant social support from the teachers of these junior athletes.

21 *'My teachers are interested in my progress and always asking what I am doing*  
22 *next in terms of competitions and just to ask if I need any extra time or help for*  
23 *things'* (P4) (**RST: reduced conflict**).

24 School teachers were extremely considerate to all participants because of escalating  
25 sport and education commitments, regularly extending assignment deadlines and provided

1 tangible support to complete school work. This was especially common during the lead up to  
2 formal secondary education examinations. This approach not only helped to reduce role strain  
3 severity and frequency, but also enabled more time to focus on their acrobatic development.

4 *'School is so supportive because they know how demanding all my training is, so*  
5 *they are quite lenient with me and if homework was due in on a Tuesday and I did*  
6 *not manage to do it they would say ok we know you are very busy so can you do it*  
7 *for Friday instead'* (P2) **(RST: reduced overload and conflict)**.

8 *'If I am going to miss a lesson due to training or competitions then the teachers*  
9 *all understand and we arrange to meet before I have to leave so I fully know the*  
10 *work that I have to do and they help me when I get back also by making sure I*  
11 *understand the work and they are just really supportive in everything'* (P3)  
12 **(RST: reduced overload and conflict)**.

### 13 **DISCUSSION**

14 It is well recognised that international junior athletes encounter multiple stressors whilst  
15 fulfilling dual careers (Christensen & Sorensen, 2009; Godber, 2012; Pink, Saunders &  
16 Stynes, 2015; Van Rens et al., 2016). Examples include time management barriers and  
17 pressures (e.g., limited study time due to daily training commitments and ensuring homework  
18 and assessment deadlines are met), extended periods of school absence to attend overseas  
19 training camps and competitions, sport related injuries and illness and dealing with poor  
20 performance, de-selection and failure. Recent research has clearly demonstrated the effects of  
21 competing role demands can cause role strain and have a significant effect on aspiring junior  
22 elite athlete's sports performance, academic progress, life satisfaction and well-being  
23 (Hayman et al., 2019; Van Rens et al., 2016, 2018). This exploratory study extended the sport  
24 talent development literature by utilising RST to investigate how combining sport, education,

1 family and social role demands impacted upon the experiences and development of 5 elite  
2 junior international acrobatic gymnasts.

3 Previous research found that RST further explained the challenges encountered by  
4 junior international athletes in undertaking multiple roles and how it impacted upon their  
5 psychological and physical development and the temporal nature of role strain experienced  
6 (Van Rens et al., 2016). In this study, we were able to highlight how applying RST can yield  
7 further unique findings and explain some of the key factors that helped the participating 5  
8 junior athletes to make the transition from pre-elite to elite. The key finding compared to  
9 other research (e.g. Van Rens et al., 2016; 2018) was that athletes in this study reported  
10 relatively low role strain at various transitional stages of their sport careers. To our  
11 knowledge, no other studies have reported positive influences of early specialisation in sport  
12 for successful transition from pre-elite to elite junior status. From a very early age, all 5  
13 participants were committed to becoming an elite acrobat, shaping their athletic identity. In  
14 early childhood, these junior acrobats were identified by coaches as ‘talented’. This helped  
15 them and their family to make acrobatics the focus of their athletic development, which led to  
16 them all striving to compete at international level in this sport. As their status and reputation  
17 as an emerging national acrobatic talent increased, their commitment became ever stronger  
18 and they decided to specialise early.

19 In general, there is limited support for early sport specialisation in most sports, and  
20 playing multiple sports at this stage of their talent path and movement skill development is  
21 now an accepted requirement for securing international status in junior sports (Exeter et al.,  
22 2018). Previous research by Brenner (2016) highlighted the association between early sport  
23 specialisation and its potentially detrimental impact upon an athlete’s physical, psychological  
24 and social development (e.g., earlier cessation of sporting activity and possible burnout, less  
25 fun derived from playing sport and ‘psychological needs’ dissatisfaction). In this study we

1 only interviewed athletes who successfully achieved elite junior status and recognise that  
2 because of their strong commitment expressed to their role as a gymnast, they may be also at  
3 risk of athletic identity foreclosure in the future if they do not successfully transition to adult  
4 elite status. This is particularly relevant if there is no scope for additional exploratory  
5 behaviours (e.g., becoming a musician or artist) at this crucial developmental stage (Gray &  
6 Polman, 2004).

7         However, we would argue that our study has significantly contributed to the  
8 adolescent talent development and management literature. By applying RST to explore the  
9 transitioning process and experiences from pre-elite to elite junior athlete, the study showed  
10 that early sport specialisation led to reduced role strain which is a significant finding and  
11 contribution to the literature. We hypothesise that having a less complex and a much simpler  
12 and less complicated pathway enabled the successful transition from pre-elite to elite junior  
13 status. In the case of these athletes, it appeared easier to meet the physical and psychological  
14 demands of high volumes of purposeful, deliberate and physically taxing acrobatic training,  
15 tailored specifically to improving overall sport performance. Competitive, organisational and  
16 developmental stressors (Harwood & Knight, 2009) were significantly reduced in the case of  
17 these participants. Further research needs to investigate for example, how the child's physical  
18 and psychological readiness (e.g., competitive stressor), and the child missing out on other  
19 opportunities, including the prolonged effect of uncertainty of which sport they will or not  
20 make a successful transition when participating in multiple sports, (e.g., developmental  
21 stressors) affect transitions in adolescence.

22         Following an early specialised pathway also reduced personal sacrifices from family  
23 and friends plus financial resources and travel time associated with other sports. The study  
24 also revealed no participant had ever reached a point where they felt unable to cope with  
25 living the life of an elite junior acrobat, whereas athletes in previous studies did (e.g., Van

1 Rens et al., 2016). This finding warrants more quantitative and qualitative studies to explore  
2 these effects on talent development in adolescence.

3         Nevertheless, there was evidence which showed how transitioning through this  
4 developmental stage was occasionally stressful and problematic for participants, with all  
5 experiencing levels of role strain, but not something they found overly detrimental to their  
6 performance or talent paths. For example, participants encountered intermittent role conflict  
7 and overload on an ad-hoc basis during the early teenage years. This was caused by feeling  
8 unable to spend as much time as they would have liked socialising with family and friends,  
9 because of competing role demands caused by training, competition, school, and social  
10 commitments.

11         Role conflict and overload was also present at this stage from having to comply with  
12 formal dietary guidelines to maintain the expected aesthetic look of international acrobats and  
13 the mental and physical demands associated with high volumes of training resulting in fatigue  
14 and tiredness. With regards to maintaining an aesthetic look, there is some evidence that  
15 anthropometric components explain the largest variance (45%) albeit in rhythmic gymnastics  
16 performance and include lean body mass, chest, biiliac, bitrochanteric, shoulder chest waist  
17 abdominal hip, calf, arm and midhigh circumference (Douda, Toubekis, Avloniti, &  
18 Tokmakidis, 2008). Research has also indicated that both artistic and rhythmic female  
19 gymnasts have broad shoulders, narrow hips, long and slim upper and lower limbs, very low  
20 body fat and show symmetrical values in sitting and standing height ratio (Douda,  
21 Tokmakidis, & Tsigilis, 2002; Russell, 1987). There is also some evidence that such a  
22 physique is more pleasing to judges (Hume, Hopkins, Robinson, Robinson, & Hollings,  
23 1993). Although this is mainly based on studies in rhythmic gymnasts, we would assume that  
24 findings would not be dissimilar in artistic gymnasts, although this requires further  
25 examination.

1           In this study, fully supportive coaches, teachers, parents and a close-knit community  
2 of fellow acrobats played a key part in moderating athletes' perceptions of role strain  
3 frequency and severity. Throughout all stages of their careers, participants reported how they  
4 had developed and maintained excellent working and personal relationships with all their  
5 coaches. This is a very unusual but important finding because it fails to support previous  
6 gymnastics talent development research, which revealed frequent power dynamics and issues  
7 of control between athletes and their coaches (Kerr & Dacyshyn, 2000; Lavalley & Robinson,  
8 2007). This needs to be explored further in relationship to role strain in future studies. In  
9 addition, the focus on a single sport from a young age is likely to make time management and  
10 planning easier, reducing role strain.

11           This study was not without limitations. Participant recollections were retrospective,  
12 thus liable to forgetfulness and bias. The sample was also sport specific, elite in nature, small,  
13 and homogeneous, thus limiting generalisability of findings to other disciplines and levels of  
14 performance. Validation of participants' retrospective accounts with those of coaches, peers  
15 and parents would have further strengthened the study.

16           To assist them, it would be useful for junior international acrobats to be taught  
17 appropriate self-regulatory skills and for national governing bodies to provide social and  
18 financial support at this crucial developmental stage. From a practically applied perspective,  
19 RST provides an essential framework to explore the psychological implications of roles and  
20 role demands in adolescence. It is therefore very important for coaches, parents, teachers and  
21 policy makers involved in AG to be educated on how to best safeguard the welfare of high  
22 performing athletes from excessive levels of role strain and the potentially negative impact  
23 upon their psychological (e.g., greater likelihood of identity foreclosure) and physical health  
24 (e.g., more chance of injury and/or burnout).

1           Although existing gymnastics talent development research is limited, the study  
2 findings provide a firm foundation on which future research may build. For example,  
3 longitudinal research combining semi-structured interviews, self-report diaries and the Role  
4 Strain Questionnaire for Junior Athletes (Van Rens et al., 2016) would enable day-to-day  
5 training loads, experiences, feelings and behaviours of aspiring and current male and female  
6 international junior acrobats fulfilling dual-careers to be established over time. This would  
7 enable identification of any key differences in role strain experienced by those who are  
8 successful and unsuccessful in transitioning from pre-elite to elite junior a status. Research  
9 monitoring role strain in acrobats who specialise early with those who diversify and  
10 undertake additional sports is also warranted.

## 11 **CONCLUSIONS**

12           This study applied RST to explore potential physical and psychological health risks  
13 encountered by elite international junior acrobats at key transition periods of their  
14 development. Essentially, the critical period of combining school, sport, and social  
15 commitments simultaneously posed the most threat to their well-being. During early  
16 childhood up to 11-12 years, they generally only experienced low level but chronic role  
17 strain. By the early teenage years, this had increased both in frequency and volume but  
18 remained manageable during all stages of their successful transition from pre-elite to elite  
19 status. Three key factors attenuated junior athletes' retrospective perceptions of role strain  
20 intensity and regularity (particularly overload and conflict). They were 1) early identification  
21 with wanting to become an elite acrobat; 2) early sport specialisation in acrobatics during  
22 young childhood; and 3) influential parental, teacher and coach support.

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