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

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Original article

Abstract

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

Keywords: *acrobatic gymnasts, elite junior, role strain theory, transitions.*

INTRODUCTION

Sport talent development research spanning several decades and disciplines has revealed the complex, idiosyncratic and non-linear pathways travelled by international junior and senior athletes

(Coutinho, Mesquita & Fonseca, 2016; Huxley, O'Connor & Larkin, 2017). A comprehensive literature base, which retrospectively explored the sport participation histories of elite junior and

senior international athletes, showed that they accumulated extensive sport-specific practice over many years, but also engaged in different sports during childhood and adolescence (Rees et al., 2016). In addition, a recent systematic review of the limited literature available showed that early youth sport specialisation is not a prerequisite to achieve success at the elite level (Kliethermes et al., 2019). A position statement by the Australasian College of Sport and Exercise Physicians (2019) further supports this notion, but does however state that the only sport for which there might be an exception is rhythmic gymnastics. A number of recent studies have continued to extend this knowledge base by specifically exploring the 'dual-careers' phenomenon, defined by Geranosova and Ronkainen (2014, p.53) as 'the challenge of combining a sports career with education or work'.

Historically, this literature has been theoretically underpinned by the Holistic Athlete Career Model (HACM) (Wylleman, De Knop & Reints, 2011). Informed by research and applied work across multiple sports with athletes of varying age and abilities, this model summarised what physical, psychological, psychosocial, financial and academic transitions athletes are likely to encounter during their sports careers. The model is internationally acknowledged and well established in the literature. Previous research suggests sufficient time and resources should be made for junior athletes to balance sport training and competition demands with other life roles, including friendships, school, paid and voluntary work plus other sport and leisure interests, so they are less likely to experience high stress levels, burnout, social isolation, athletic identity foreclosure or dropout. Recent empirical research found that applying Role Strain Theory (RST) (Fenzel, 1989) to explore transitional experiences of elite adolescent Australian Rules Football (AFL), tennis and gymnastics performers directly explained how they combined and coped with the

competing role demands of sport and education arising from the different roles they fulfilled as developing elite adolescent athletes (Hayman, Polman, Taylor, Hemmings & Borkoles, 2019, Van Rens, Borkoles, Farrow, Curran & Polman, 2016; Van Rens, Borkoles, Farrow & Polman, 2018;). Role Strain, defined as a 'felt difficulty in fulfilling role obligations' (Goode, 1960, p.483), is a widely accepted psychological concept that in previous research has been applied across educational and organisational psychology settings to explain problems and barriers faced by individuals when fulfilling multiple role demands. Role strain is further defined by Goode (1960, p.483) as 'a consequence of role bargains and as a continuing process of selection among alternative role behaviours in which each individual seeks to reduce his role strain'.

RST focuses on four interrelated stressors: overload, conflict, underload and ambiguity arising from life role demands (Fenzel, 1989; Holt, 1982). Fenzel (1992; 2000) provided empirical evidence that role strain was frequently experienced by young adolescents when transitioning from primary to secondary school, with consequent reductions in self-esteem, self-worth and academic achievement. The study by Van Rens et al., (2016) was the first to apply RST within a sport context and investigated how elite adolescent Australian Rules Footballers (aged 13-17 years) simultaneously undertook multiple life roles as identified by the theory. A key finding was that all participants frequently encountered multiple instances of role ambiguity, role overload and role conflict as they pursued their ambition of transitioning to international senior sport performance levels. Van Rens, Borkoles, Farrow and Polman (2018) also found overload, conflict, underload and ambiguity were all negatively associated with total life satisfaction of 112 junior international Australian Rules Footballers. Hayman et al., (2019) investigated the experiences of elite adolescent golfers who all had

concurrently undertaken multiple sport, family, peer and educational roles during the pre-elite to elite junior transition period. Applying RST enabled for the nature, intensity and temporal aspects of role strain experienced to be identified. Chronic but low level and manageable role strain was reported during childhood, only increasing intermittently in severity and regularity during the early teenage years until the very final stages of the pre-elite transition period. This was particularly noticeable around the ages of 15-16 years, when for the first time, participants encountered difficulties in combining training, competition and other sports commitments with their basic educational requirements. The findings suggested a complex developmental transition, especially when the junior athletes were considered as 'talented' in several sports. It was soon after they made the decision to specialise in golf when role strain gradually subsided, combined with cessation of educational strain upon completion of formal secondary education. These research findings demonstrate the suitability of RST in explaining the temporal nature of role strain during key transitional periods and how junior athletes cope with multiple competing role demands throughout this particular developmental stage.

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

for schools teams (Hayman et al., 2019). The final concept with RST is ambiguity and refers to limited understanding or clarity of one's responsibilities such as the mixed messages presented to young athletes about the different priorities in their sport or life (Van Rens et al., 2018).

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

Surprisingly, limited talent development research specific to gymnastics, and especially AG, exists. The few studies to do so demonstrate many international talent programmes follow early specialised approaches to development, with young children annually completing significant hours of physically and mentally demanding deliberate practice training regimes (Arkaev & Suchilin, 2004;

Krane, Greenleaf & Snow, 1997; Nunomura, Okade & Carrara, 2012). Law, Côté and Ericsson (2007) compared participation histories of Canadian Olympic and international (non-Olympic) rhythmic gymnasts. They found Olympians accumulated three times the amount of gymnastic specific deliberate practice, as well as reduced enjoyment, poorer physical health and increased numbers of injuries by 16 years of age when compared with non-Olympians. Elite gymnasts have also reported difficulties in developing an identity outside their sport and having limited power and control within the coach-gymnast relationship (Kerr & Dacyshyn, 2000; Krane et al., 1997; Lavalley & Robinson, 2007).

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

METHODS

The sample comprised 5 (male = 3, female = 2) international junior acrobatic gymnasts (mean age = 16.2 years). All had specialised in acrobatics before the age of 7 and competed regularly across a range of standards (e.g., regional, national and international competition levels). Experts

have been defined within the extant literature as those who compete at international and/or national levels (e.g., Helsen, Starkes & Hodges, 1998). In this paper, the term 'elite junior acrobat' was used to categorise participants aged between 14 and 17 who had secured 4th place or higher for Great Britain (GB) Junior Acrobatic Gymnastic representative teams (under 12's - 19's category) in mixed pairs or quartet disciplines at either European or World Junior Championships over the past decade. Once institutional ethical clearance was granted, face-to-face debriefs addressing the study aims, objectives and procedures to follow were completed. All participants were aged under 18, so parental consent permitting their child's involvement was obtained in all instances.

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

To ensure participants felt relaxed, comfortable and at ease to share personalised and sensitive information,

each interview started with an informal discussion on how they first became involved in acrobatic gymnastics (Rapley, 2004). The proposed interview schedule was pilot tested by 2 regional level junior acrobatic gymnasts aged 15 and 16 years respectively. This confirmed duration of approximately 45 minutes and strengthened the lead authors interviewing techniques. The interview format was specifically designed to explore how demands arising from combining sport and other role commitments impacted the participants and whether RST was applicable to their specific experiences. The lead author undertook the role of 'active listener' to assist participants in telling their unique stories in their own particular way. Participants were encouraged to talk about all their life roles, including sports, school, friends, family and other hobbies (e.g., art or music). In the first instance, the interviewer explored the acrobatics involvement and experiences of participants throughout childhood and adolescence. Follow up questions probed how they fulfilled other sport, educational, extracurricular and family commitments during this time.

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

Each interview lasted approximately 40 minutes, was audio-taped, transcribed verbatim and subjected to similar thematic analysis guidelines published by Braun and Clarke (2006). Each transcript was read on several occasions by the first and fourth authors with notes placed within margins reflecting theme statements and their meanings. The same authors then independently annotated each interview transcript with their personalised thoughts and interpretations of the data. Initial thematic coding employed a deductive approach, which is recommended for qualitative analysis when existing theories are being tested (Elo & Kyngas, 2008). Once the deductive approach was complete, an inductive approach was undertaken to ensure any additional higher order themes were included and to allow for lower order themes to be derived. There were marginal differences between the two separate coding results, with discrepancies discussed and agreed. Primary associations and connections based on similarities and patterns between derived themes were made, resulting in the development of four main themes.

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

RESULTS

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

Pre-Elite Role Strain Experiences***Theme 1: Benefit of Early Internalised Acrobatic Identity***

All participants reported a commitment to their sport, resulting in development of early acrobatic identity. Participants of this study viewed themselves as having 'lived and breathed' the sport at their own free will and successfully combined educational and sport related commitments. For example, they found that the reduced sport organisational demands such as reduced personal sacrifices, less financial impact, more family and friend's time and fewer logistic problems of participating in multiple sports made their experiences far less complex. This simpler transition period allowed them to find acrobatics to be a more enjoyable, fulfilling and naturally rewarding experience, consequently reducing role strain overload, ambiguity, and conflict. Interviews revealed participants were normally successful in managing role strain during this early period of their life. As dedicated and highly ambitious young children, they reported a very single-minded focus and commitment to securing world class junior acrobat

status. Each participant (and their parents) invested significant time, money and resources to become an elite international acrobatic gymnast.

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

Table 1
Category and Theme Classification.

Category	Theme
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)

This training pattern and early specialisation in sports like gymnastics and/or acrobatics are common. Participants reported this helped reduce potential

sources of role strain, such as overload and conflict of training and competitions from other sports. Participants considered their improved consistency and quality of

acrobatic performance to be a direct consequence of this dedicated and systematic approach to achieving international junior status, impacting significantly on their intrinsic motivation, self-efficacy and perceived competence. For example, Participant 3 said *'the fact I was improving every year and getting better was so motivating'*. This quote indicated that they were able to monitor their physical and psychological readiness to make the next level transition, which is inherently a difficult and complex process in developing athletes. It appeared to be motivational for the junior athletes. Each sport has different physical, psychological, and social demands, which is difficult to monitor when competing at multiple sports simultaneously.

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

By late childhood, becoming an international level junior acrobat had become a primary life goal for all, causing an upsurge in strain from educational, friendships and family commitments. After entering the early teenage years, junior athletes in the study reported increased role strain frequency and intensity. At this stage of transition, physical and mental fatigue remained chronic but low-level and manageable, but it was at late childhood when participants reported to experience elevated role strain for the first time. They attributed the rise to when they simultaneously had to combine increased periods of training (frequency and volume) with competition and school work for the first time. They explained how the physically demanding and time intensive training regimes, particularly in the lead up to international competitions, left them feeling more mentally and physically fatigued than ever before. The development of role strain was clearly explained by Participant 2 who said:

'It can get stressful, especially leading up to an international competition when training is at its highest. It's just really nice to be able to have a break and I get so much

more social time so I am able to see my friends much more and sleep more and not have to worry about having to fit homework in and I just like being less physically tired from all the training' (RST: increased overload, ambiguity and conflict).

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

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

Minimising Role Strain throughout the Elite Adolescent Context

Theme 3: Sacrifices Made to Pursue Junior International Acrobatic Career

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

'I only see my non gymnastics friends in college and if there is the odd party I can attend which is not very often. Then there are my friends here at gymnastics but I never get to see them outside of being here and then also it is hard when you are making new friends because they don't understand the level of commitment or what I do really. I do sometimes think I miss out on a really fun social life' (P1) (RST: increased conflict).

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

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

'You have to basically look and be the best you possibly can, like the strongest you possibly can, and leanest you possibly can so you really have to watch the diet but at the same time push the weights and get stronger and more toned' (P4) (RST: increased overload and conflict).

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

Theme 4: Influential Teacher and Coach Support

All athletes in the study reported a positive relationship and receiving a significant social support from school teachers and acrobatic coaches, who fully understood the competing role demands placed on the day-to-day lives of their acrobats. Participants highly valued their teachers' and coaches' guidance during their early international careers, viewing them as significant sources of support, which helped them to attenuate role strain frequency and intensity encountered:

'I have a really good relationship with my coach especially as he has coached me ever since I was six years old and I can talk to him about literally anything and he helps

me plan my days so I get everything done' (P1) (RST: reduced overload and conflict).

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

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

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

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

School teachers were extremely considerate to all participants because of escalating sport and education commitments, regularly extending assignment deadlines and provided tangible support to complete school work. This was especially common during the lead up to formal secondary education examinations. This approach not only helped to reduce role strain severity and frequency, but also enabled more time to focus on their acrobatic development.

'School is so supportive because they know how demanding all my training is, so they are quite lenient with me and if homework was due in on a Tuesday and I did not manage to do it they would say ok

we know you are very busy so can you do it for Friday instead' (P2) (RST: reduced overload and conflict).

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

DISCUSSION

It is well recognised that international junior athletes encounter multiple stressors whilst fulfilling dual careers (Christensen & Sorensen, 2009; Godber, 2012; Pink, Saunders & Stynes, 2015; Van Rens et al., 2016). Examples include time management barriers and pressures (e.g., limited study time due to daily training commitments and ensuring homework and assessment deadlines are met), extended periods of school absence to attend overseas training camps and competitions, sport related injuries and illness and dealing with poor performance, de-selection and failure. Recent research has clearly demonstrated the effects of competing role demands can cause role strain and have a significant effect on aspiring junior elite athlete's sports performance, academic progress, life satisfaction and well-being (Hayman et al., 2019; Van Rens et al., 2016, 2018). This exploratory study extended the sport talent development literature by utilising RST to investigate how combining sport, education, family and social role demands impacted upon the experiences and development of 5 elite junior international acrobatic gymnasts.

Previous research found that RST further explained the challenges encountered by junior international athletes in undertaking multiple roles and how it impacted upon their psychological and physical development and the temporal nature of role strain experienced (Van Rens

et al., 2016). In this study, we were able to highlight how applying RST can yield further unique findings and explain some of the key factors that helped the participating 5 junior athletes to make the transition from pre-elite to elite. The key finding compared to other research (e.g. Van Rens et al., 2016; 2018) was that athletes in this study reported relatively low role strain at various transitional stages of their sport careers. To our knowledge, no other studies have reported positive influences of early specialisation in sport for successful transition from pre-elite to elite junior status. From a very early age, all 5 participants were committed to becoming an elite acrobat, shaping their athletic identity. In early childhood, these junior acrobats were identified by coaches as 'talented'. This helped them and their family to make acrobatics the focus of their athletic development, which led to them all striving to compete at international level in this sport. As their status and reputation as an emerging national acrobatic talent increased, their commitment became ever stronger and they decided to specialise early.

In general, there is limited support for early sport specialisation in most sports, and playing multiple sports at this stage of their talent path and movement skill development is now an accepted requirement for securing international status in junior sports (Exeter et al., 2018). Previous research by Brenner (2016) highlighted the association between early sport specialisation and its potentially detrimental impact upon an athlete's physical, psychological and social development (e.g., earlier cessation of sporting activity and possible burnout, less fun derived from playing sport and 'psychological needs' dissatisfaction). In this study we only interviewed athletes who successfully achieved elite junior status and recognise that because of their strong commitment expressed to their role as a gymnast, they may be also at risk of athletic identity foreclosure in the future if they do

not successfully transition to adult elite status. This is particularly relevant if there is no scope for additional exploratory behaviours (e.g., becoming a musician or artist) at this crucial developmental stage (Gray & Polman, 2004).

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

Following an early specialised pathway also reduced personal sacrifices from family and friends plus financial resources and travel time associated with other sports. The study also revealed no participant had ever reached a point where they felt unable to cope with living the life of an elite junior acrobat, whereas athletes in previous studies did (e.g., Van Rens et al., 2016). This finding warrants more quantitative and qualitative studies to

explore these effects on talent development in adolescence.

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

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

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

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

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

identity foreclosure) and physical health (e.g., more chance of injury and/or burnout).

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

CONCLUSION

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

influential parental, teacher and coach support.

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