

Comprehensive Analysis of Factors Impacting Australian and Canadian Paralympic Sport Athletes' Development



**This report has been developed from athletes' responses to the
Developmental History of Athletes Questionnaire (DHAQ)**

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1. General Characteristics



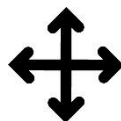
A total of 143 male and 70 female athletes from Australia (n=149) and Canada (n=63) completed the survey. The sample's average age was 33.5.



On average, athletes have competed in their sport for 12.2 years, with the lowest experienced player reporting 1 years of experience and 61 years for the most experienced athlete.



The majority of the sample (n=152) competed at the international level, with the remaining athletes reporting experiences at national (n=38) and provincial/state (n=8) or local (n=5) levels.



During their career, 30 athletes moved due to disability-related reasons (i.e., access to rehab/accessible housing) while 39 athletes moved due sport-related reasons (i.e., availability of coaches/sport-specific programs).



78 athletes were enrolled or completed secondary school, and 130 either enrolled or completed post-secondary schooling.

2. Impairment-Related Information

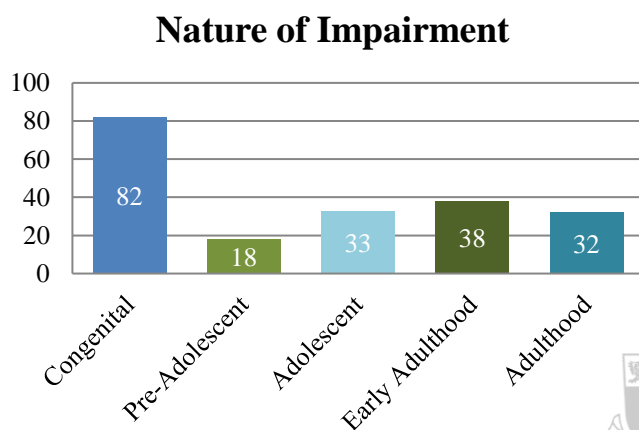
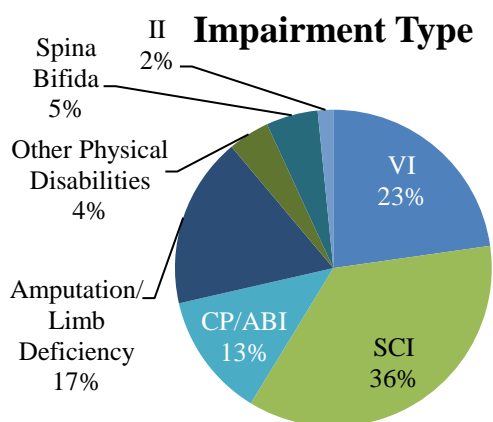


121 athletes acquired their impairment and the average onset of injury was 20.2 years old with the earliest injury occurring at 7 months old and oldest athlete obtained their injury at 57 years of age.



Athletes were divided into groups based on the onset of their impairment. The groups were aligned with biological development categories.

These groups were: congenital, pre-adolescence (0.1 months to 11.9 years old), adolescence (12.0-17.9 years old), early adulthood (18.0-24.9 years old), and adulthood (25+ years old).



3. Barriers & Facilitators

Most Common Methods of Introduction to Para Sport

Through friends, relatives, and family members (n=51)

Rehabilitation Centers (n=44)

Talent Search Programs (n=16)

Schools/Teachers/Councilors (n=15)

For enjoyment/fun (n=135)

To be competitive (n=115)

For overall health benefits (n=115)

To socialize and meet new people (n=102)

Encouragement from family and friends (n=98)

Reasons for Starting Participation in Para Sport

Most Common Initial Barriers

High expenses associated with sport (i.e., equipment, registration, etc.)

Dependence on others (i.e., transportation, preparation, etc.) (n=74)

Disability related complications (n=72)

Lack of other athletes with disabilities (n=67)

The competitive environment (n=135)

Sense of accomplishment (n=133)

Continuous support from family, friends, and coaches (n=128)

Desire to maintain a healthy lifestyle (n=116)

Most Common Persisting Facilitators

Most Common Persisting Barriers

High expenses associated with sport (i.e., equipment, registration, etc.) (n=89)

High demands associated with the sport (i.e., training, competition, travel, etc.) (n=60)

Lack of advanced programs nearby (n=50)

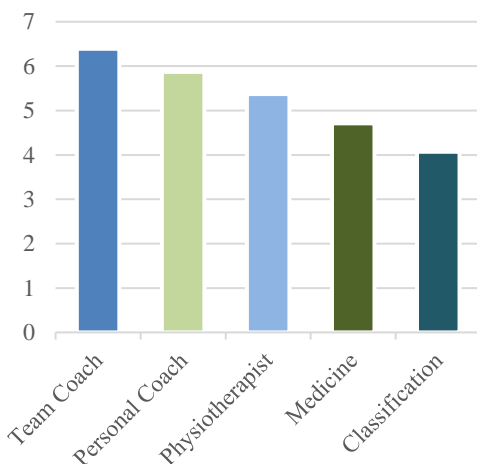


4. Resources

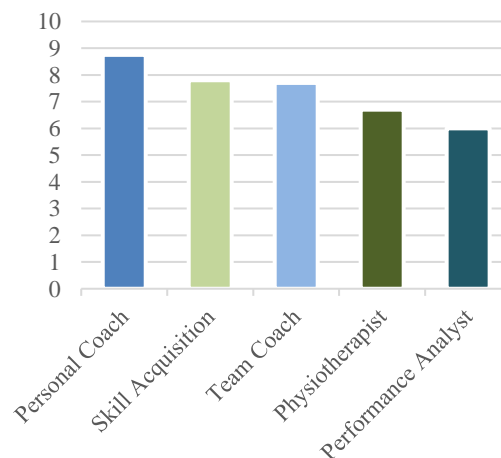
<i>Personal Coach (n=92)</i>	Average years athletes had access to the service	5.87
	Average years athletes utilized the service	5.77
	Perceived impact on development & performance	8.75
<i>Team Coach (n=139)</i>	Access	6.39
	Utilized	6.35
	Perceived Impact	7.70
<i>Psychologist (n=90)</i>	Access	3.93
	Utilized	3.08
	Perceived Impact	5.65
<i>Physiotherapist (n=108)</i>	Access	5.37
	Utilized	4.71
	Perceived Impact	6.70
<i>Skill Acquisition (n=55)</i>	Access	3.67
	Utilized	3.62
	Perceived Impact	7.80
<i>Performance Analyst (n=65)</i>	Access	3.29
	Utilized	3.00
	Perceived Impact	6.00
<i>Classification (n=74)</i>	Access	4.07
	Utilized	2.57
	Perceived Impact	5.80
<i>Biomechanics (n=55)</i>	Access	2.66
	Utilized	2.24
	Perceived Impact	5.34
<i>Medicine (n=61)</i>	Access	4.71
	Utilized	4.13
	Perceived Impact	4.20

*Numbers highlighted in red indicate resources scoring highest on impact scale.

Most Accessible Resources

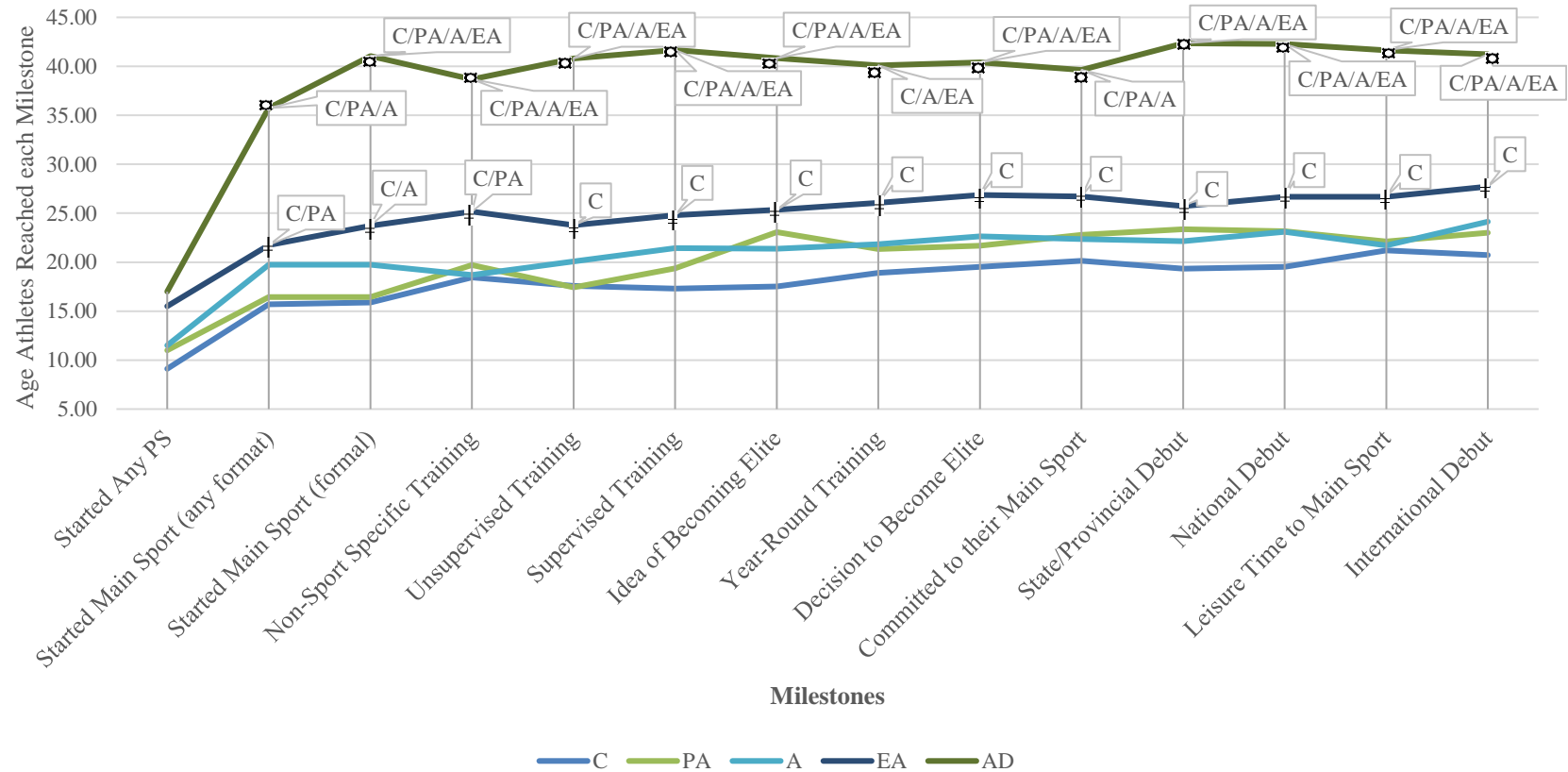


Most Important to Performance & Development



5. Milestone Trajectories

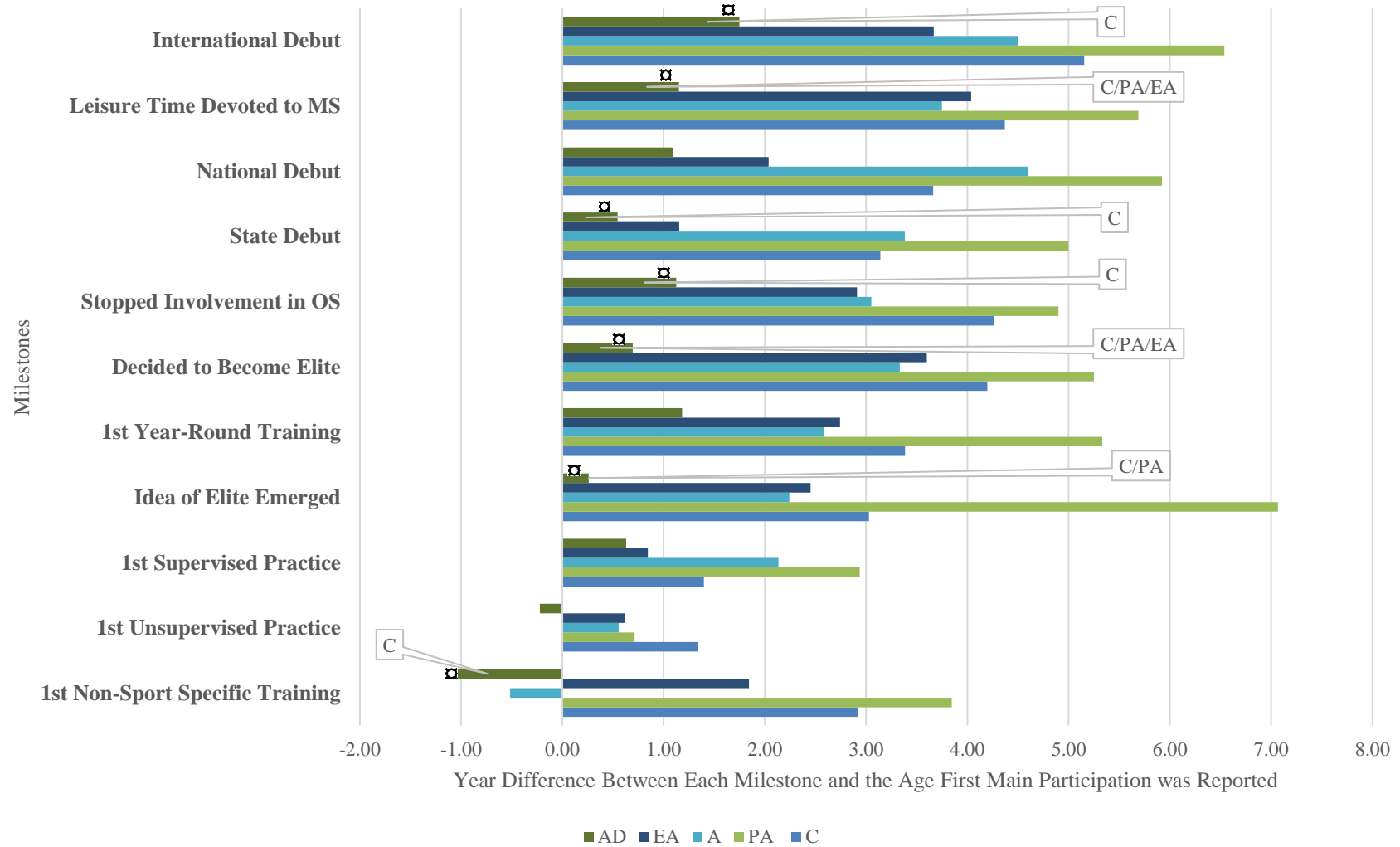
The graph below indicates the age each respective nature of impairment group reached sporting milestones.



Note. ¤ = indicates AD group reached milestone at an older age in comparison to one or more group(s). † = similarly, but for EA group, $p < .05$. The comment box lists the groups that these milestones were significantly different to. C=Congenital, PA=Pre-Adolescence, A= Adolescence, EA=Early Adulthood, AD=Adulthood



Years until Each Milestone was Attained from the Point of Main Sport Entry for each Impairment Group.



Note. □ = indicates AD group attained milestone at a faster pace in comparison to one or more group(s). The comment box lists the groups that these milestones were significantly different to.



6. Other Organized Sports

Para Sports



80 out of 213 (36%) of athletes participated in other Para sports than their current primary Para sport at some point in their careers.



On average, athletes' careers lasted 8 years and experiences here also ranged from recreational to international level of competition.

Most common reported other sports were:

Soccer (n=32)

Basketball (n=28)

Athletics (n=23)



Able-Bodied Sports



99 out of 121 (82%) of athletes with acquired impairment had experience in able-bodied sports prior to acquiring their impairments.



On average, athletes' careers lasted 9.5- years, and experiences ranged from recreational all the way to international level of competition.

Most common reported other sports were:

Wheelchair Basketball (n=28)

Para Athletics (n=17)

Para Swimming (n=17)

We then examined the similarity between athletes' current sport to the previous sports they had experiences in. The majority of athletes had experiences in sports (both able-bodied and Para) that were similar to their current sports.

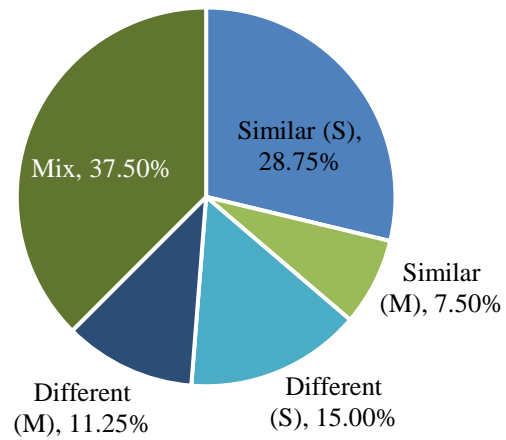
Sports were organized into two different categories for analysis.

1st level analysis (simple): Individual vs. Team

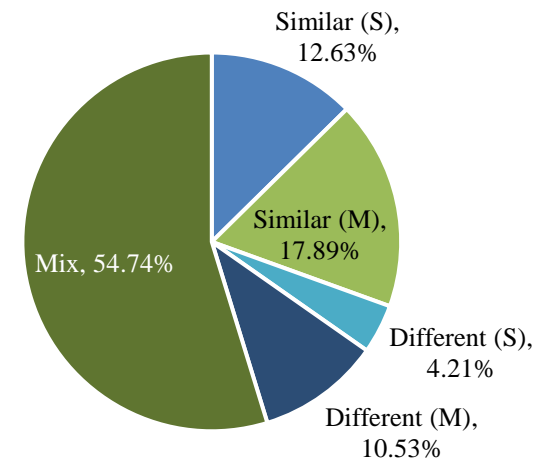
2nd level analysis (expanded): Invasion, CGS, Target, Net/Wall

Next page contains graphs that display distribution of the similarity between athletes experiences in other sports (both Paralympic and able-bodied) in comparison to their current primary sport, both in the simple and expanded similarity type analyses.

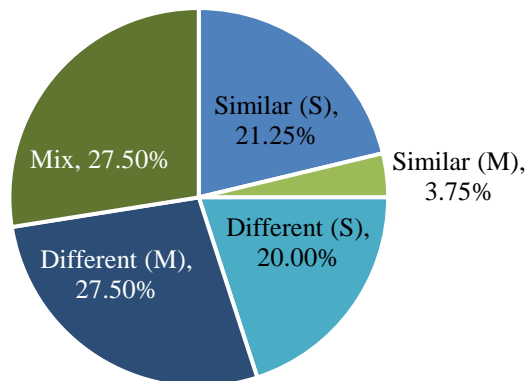
Simple Sport Types (Paralympic)



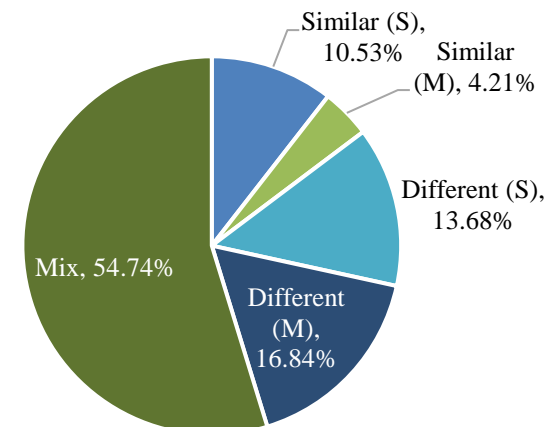
Simple Sport Types (Able-bodied)



Expanded Sport Types (Paralympic)



Expanded Sport Types (Able-Bodied)



7. Training History & Accolades



On average, athletes devoted 6,406 hours to training during their career

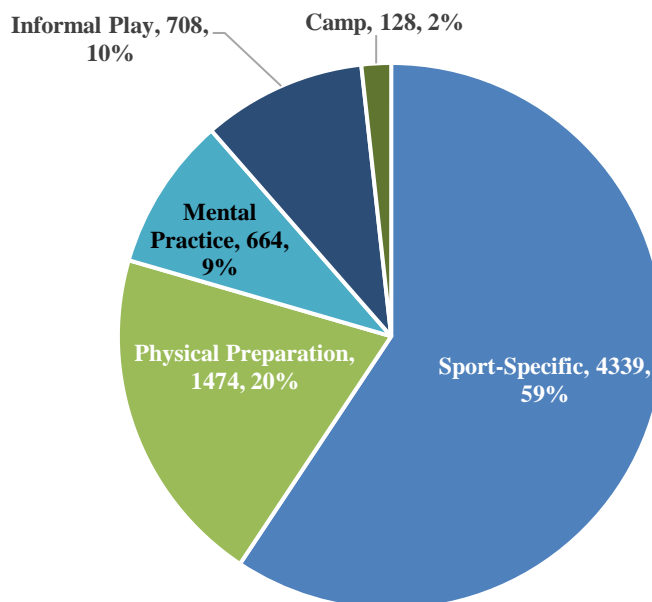
This total was generated from a combination of 5 types of training:

- ❖ Sport-Specific Training (SS)
- ❖ Physical Preparation (PP)
- ❖ Mental Preparation (MP)
- ❖ Informal Play (P)
- ❖ Training Camps (TC)

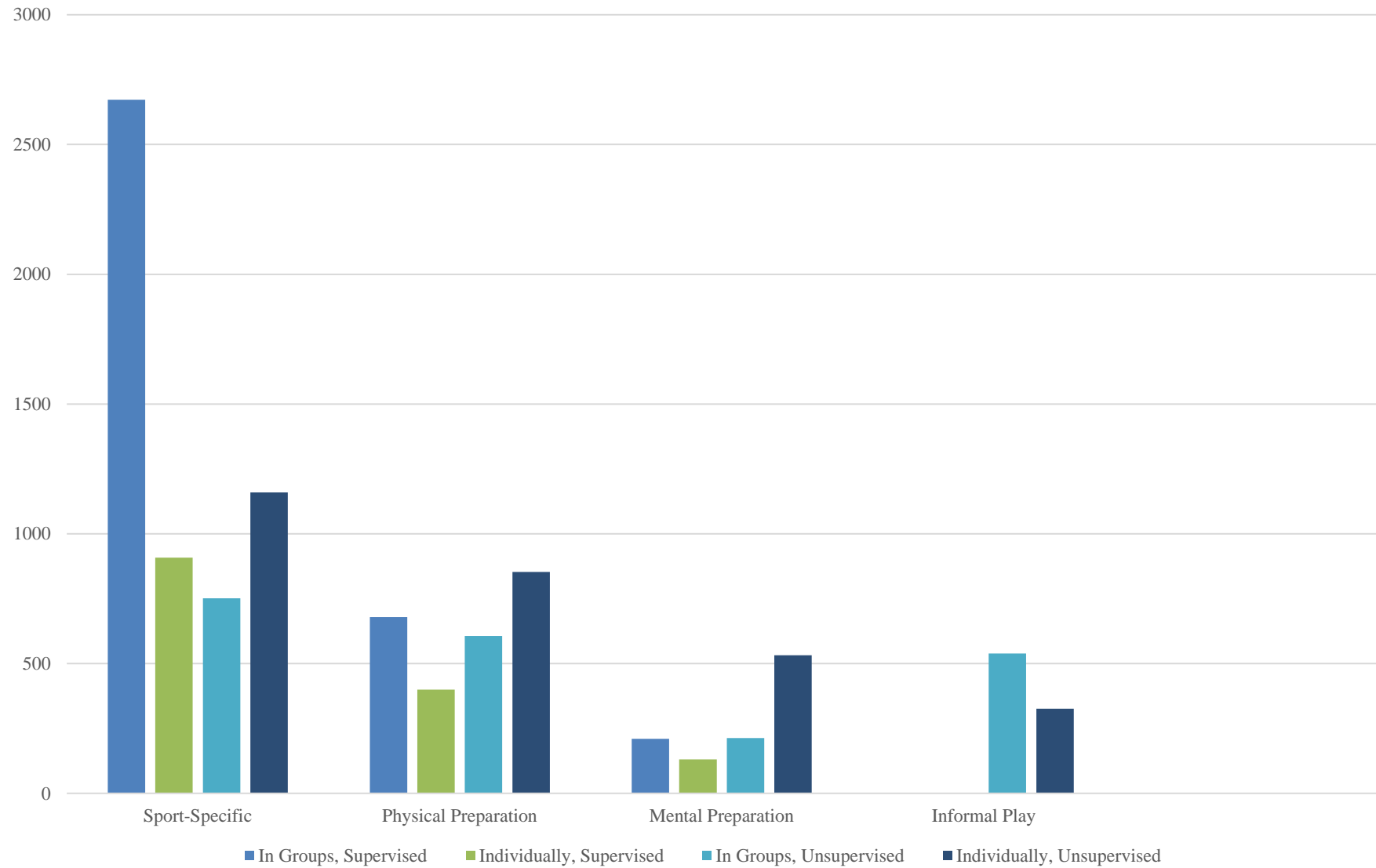
Within each training type, athletes were also asked to differentiate between the training settings. The four settings consisted of:

- ❖ Train in groups, supervised (GS)
- ❖ Train in groups, unsupervised (GU)
- ❖ Train individually, supervised (IS)
- ❖ Train individually, unsupervised (IU)

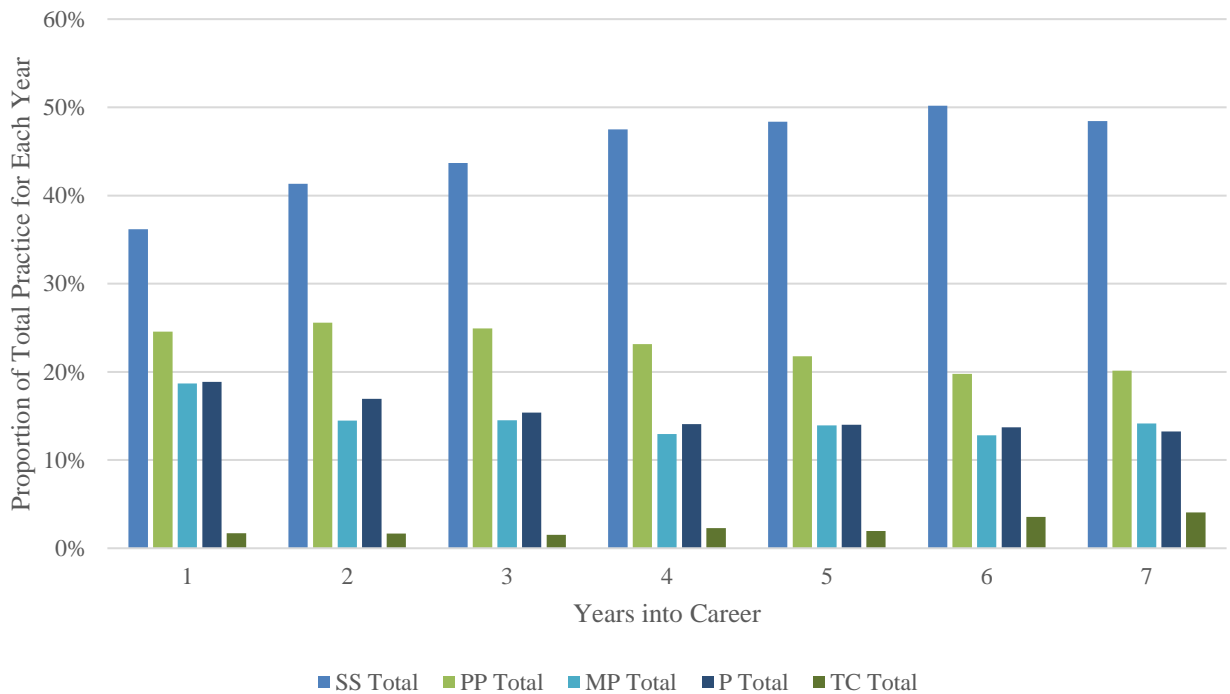
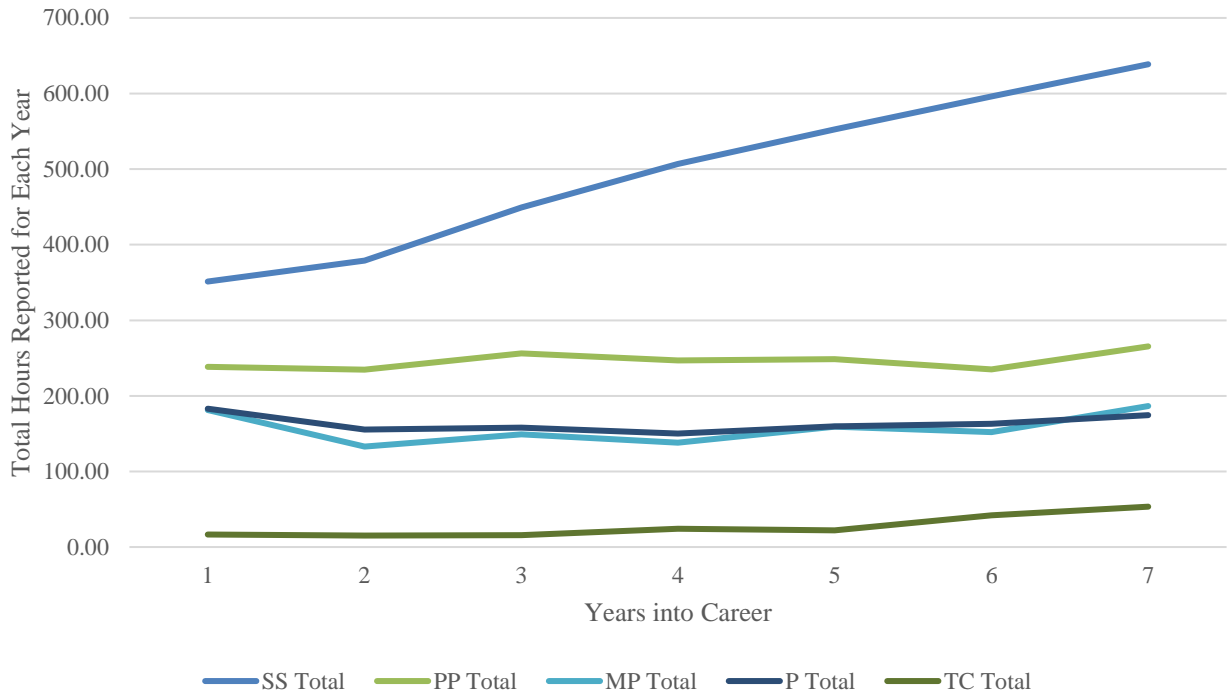
Distribution of Hours per Training Type



Distribution of Training Hours per Training Type in each Condition



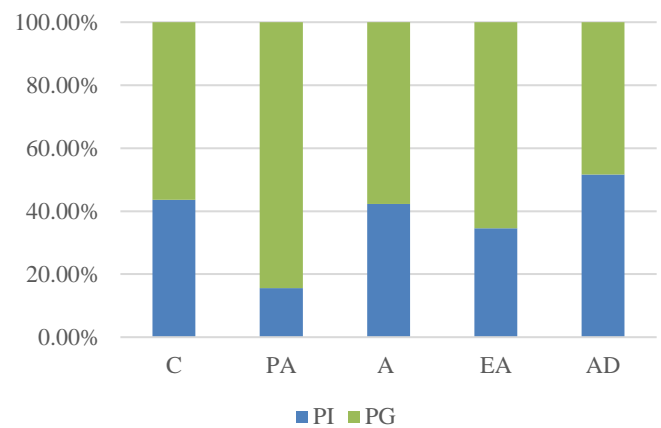
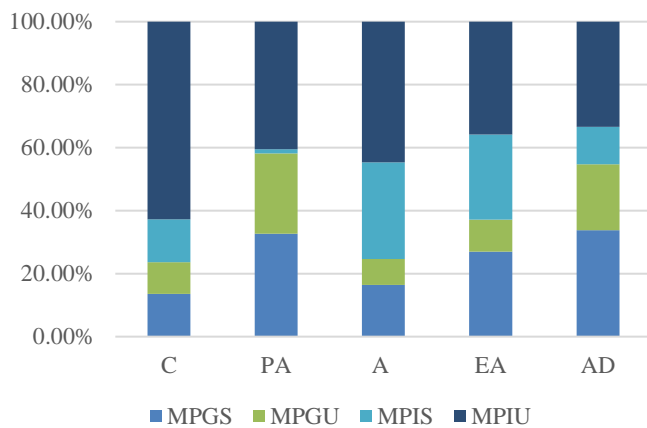
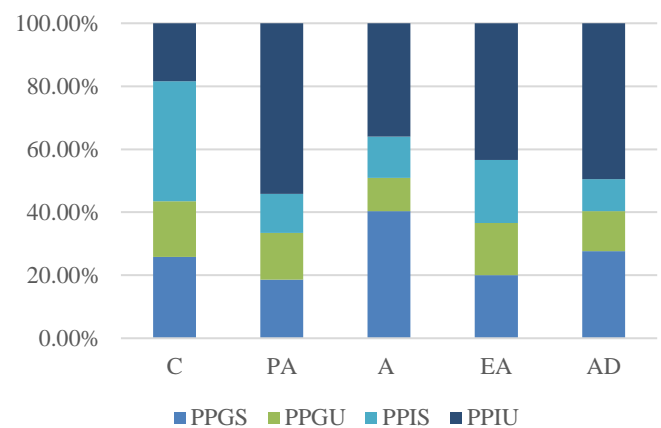
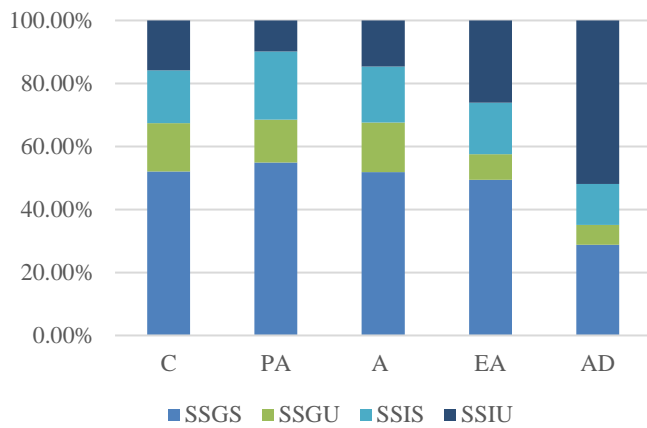
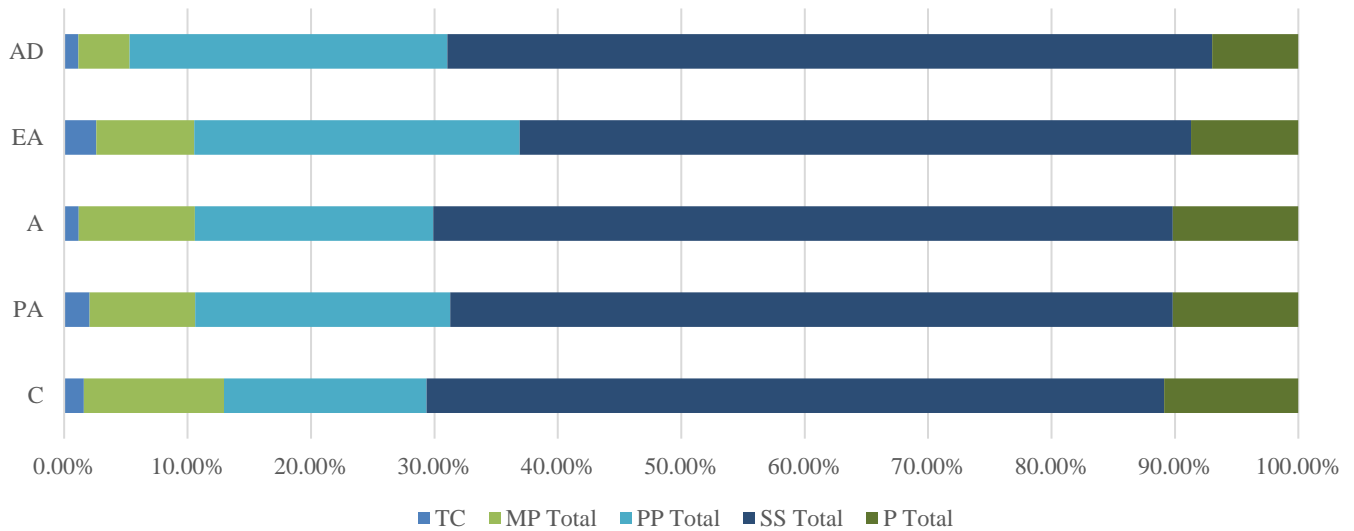
The total hours devoted to each training type across the first seven years of athletes' careers (above) and the proportion of hours devoted to each training type for each year (below).



SS=Sport-specific, PP=Physical preparation, MP=Mental preparation, P=Play, TC=Training camp



The proportion of total accumulated hours devoted to each training type (above) and each condition within the training types.



C=Congenital, PA=Pre-Adolescence, A=Adolescence, EA=Early Adulthood, AD=Adulthood
 SS=Sport-specific, PP=Physical Preparation, MP=Mental Preparation, P=Play
 GS=In groups, supervised, GU=In groups, unsupervised, IS=Individually, supervised, IU=Individually, unsupervised





Summary of the Training Elements

- 1 Evidently, the majority of athletes' training was devoted to *sport-specific training* and more specifically, with *coaches and other athletes*.
- 2 However, there were group differences (based on impairment-onset). Each groups demonstrated a unique preference to a set of conditions for each training type.
- 3 Mental preparation and to a degree physical preparation mostly were reported taking place in unsupervised, alone settings.



Athletes within this sample reported 31 international and 11 Paralympics/World Championship gold medals.

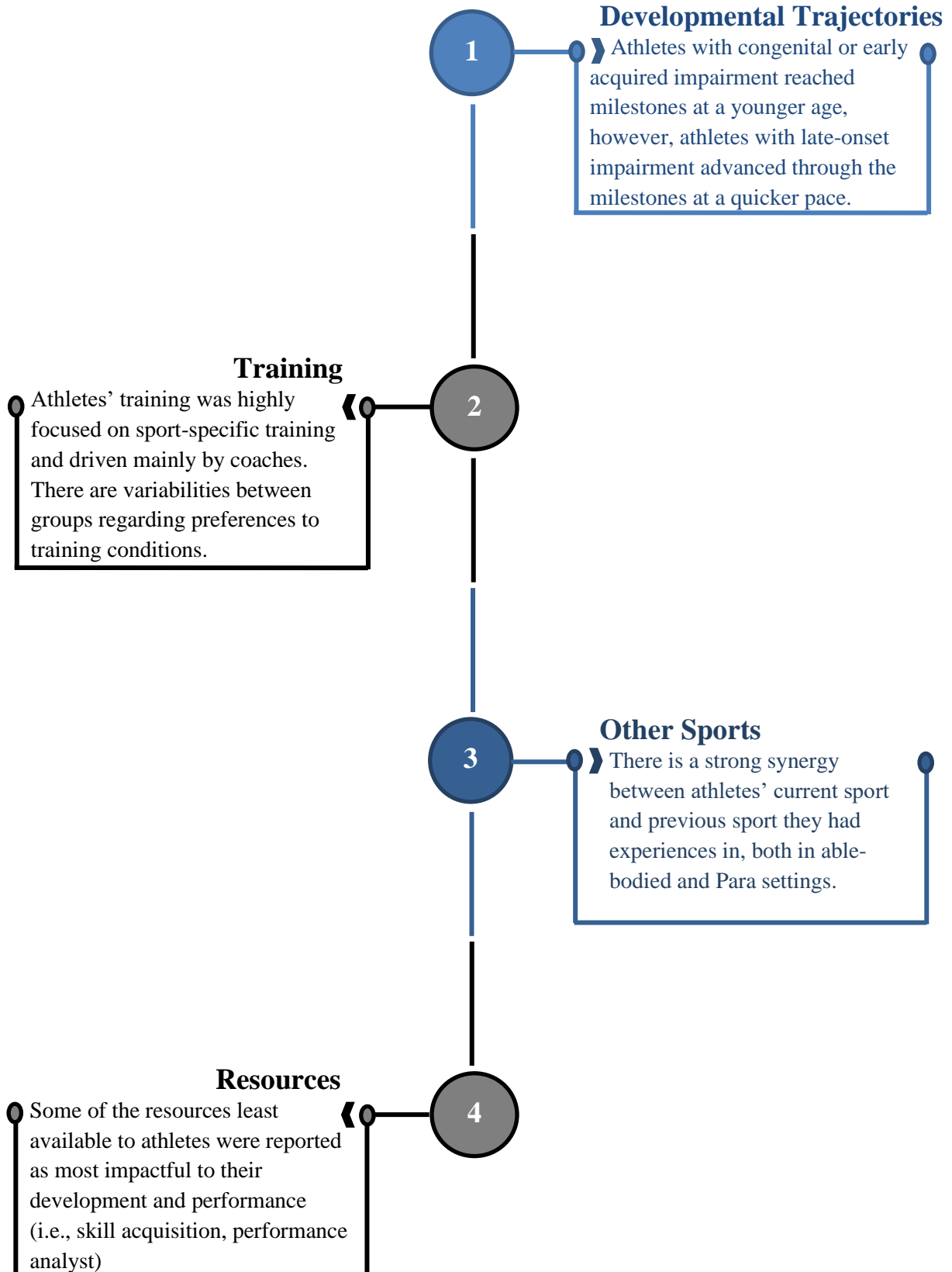


27 international and 5 Paralympics/World Championship silver medals.



26 international and 7 Paralympics/World Championship bronze medals.

8. Final Summary



9. Questions, comments and future analyses



Athletes with impairments acquired at different stages of their careers demonstrated different sporting trajectories (milestones, training profiles, etc.). Athlete differences need to be considered during recruitment and development stages as athletes' resource and support needs will vary.



How can we increase resources for athletes in areas such as performance analysis and skill acquisition?



Takeaways from sport synergy:

- ❖ Are there sports that could consider a cross-training program?
- ❖ What are elements that athletes utilize from previous 'similar' sports that helps them with their current sport development?
- ❖ Opportunities for multi-sport programs to support athletes' development early in their careers.

Your thoughts, comments and questions

1. What areas within the report do you consider important to explore with respect to your sport?

2. What other elements outside of this report would you consider important to explore more in depth (i.e., sibling and parental interactions, funding, etc.)?

If you have any questions or would like more information, feel free to contact the research team at Nima.Deoghansai@paralympic.org.au.

A manuscript containing in-depth analysis of the data presented here is currently in-print and will be available online soon. At this time, please check with the research team for a copy of the manuscript.

In Phase II of this project, interviews with directors, coaches, and athletes were completed in order to complement the quantitative measures taken in this questionnaire and provide a narrative to the data. Summary of findings from Phase II can be found [here](#).

We would like to take a moment to send our deepest appreciation and thank you to the sports, coaches, and athletes who participated in this research project. Without their commitment and contribution, this project would not have happened.

We look forward to continuing our great working relationship with you.

Thank you for your interest in this research project.



10. Appendix

Types of Training

Sport specific physical practice: Sport specific physical practice includes those **activities that directly resemble the technical and/or tactical demands associated with your main sport**. These activities require *physical effort* as well as *concentration* and are *aimed directly at improving performance*.

Physical preparation: Physical preparation includes all activities aimed at **improving physiological and muscular capacities** such as strength, power, endurance, and flexibility. Examples of physical preparation activities include, but are not limited to, strength and conditioning, weights, fitness, pilates, yoga, and flexibility training.

Mental preparation: Mental preparation includes all activities aimed at **improving your knowledge** of your sport, your team, and/or your opponents. Examples of mental preparation activities include, but are not limited to, working with a psychologist, video analysis / review, watching your sport live or on television, reading about your sport, surfing the internet for websites and articles about your sport, or talking about your sport with others.

Informal play: Informal play includes activities that **resemble the skills and goals of your main sport** but involve **modified rules and/or equipment**, with very little to **no formal instruction, coaching, or supervision**. The main emphasis of these activities is on fun and enjoyment rather than performance improvement (*e.g. pick-up basketball, swimming in the backyard pool*). **Only training conditions #3 and #4 are applicable for informal play.*

Training Conditions

There are four conditions in which training can take place:

1. **In groups, supervised:** A **coach is present** at the training venue providing supervision to **you and 1 or more other athletes**.
2. **Individually, supervised:** A **coach is present** at the training venue providing **one-on-one** supervision to you and only you in an individual practice session.
3. **In groups, unsupervised:** **No coach** is present to provide supervision but **you and 1 or more other athletes** are practicing together.
4. **Individually, unsupervised:** **No coach** is present to provide supervision, no-one else is practicing with you, but you are practicing **on your own**.

