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Creating and Nurturing a Youth Cycling Pipeline Part 2: Youth Development

Ralph Frazier and Kelli Rogan

Frazier Cycling's Atlanta-based Junior Development Program was developed by Ralph Frazier and Kelli Rogan. Ralph has over 35 years of cycling experience as an endurance and marathon racer and a coach. Kelli has 10 years experience of coaching juniors and masters as well as an impressive track and race racing career. Frazier Cycling has a mission to develop the next generation of cyclists with an appreciation for the sport, life-long physical fitness, sportsmanship, teamwork and commitment. As the southeast's largest junior development program, they have been recognized by USA Cycling News as "an excellent model for other junior development initiatives"...focusing on "character as much as athletic ability." The 2008 Frazier Cycling Juniors team holds 9 state championships and 9 national medals, including 2 national championship titles.

Ralph Frazier

BEGIN This is our second article in the series Creating and nurturing a Youth Cycling Pipeline. The topic is Youth Development. We share what we have learned about how young cyclists develop based on our experience with our youth cycling team over the past six years.

We formed our Frazier Cycling youth team in 2003. We had little experience with youth cyclists but we had a passion for cycling and our mission statement: "Grow the sport by developing the next generation of serious cyclists. The next is to groom junior cyclists with a focus on sound principles and values; good sportsmanship, attitude and teamwork. Promote a lifestyle of fitness and exercise to build a healthy environment for families." This mission is the driving force for creating and nurturing a youth cycling pipeline.

We wanted answers to questions that would help us accomplish our mission.

How do young cyclists develop based on skills acquisition?
How do young cyclists develop based physiological considerations?
How do young cyclists develop based psychological considerations?
How do young cyclists develop based social considerations?
How are young cyclists' skills acquisition related to growth and development?
How are young cyclists' skills acquisition related to gender?

After we had those answers, then specifically these sorts of questions follow…

Kelli Rogan

When a kid should be introduced to:
- A bike with drop handlebars?
- Gear shifting?
- Clip-less pedals?
- Drinking from a water bottle while riding?
- Riding with no hands?
- Riding in a group?
- Following a wheel in a pace-line?

Followed by many, many more questions...

We realized that even after all of those questions were answered, we would have to deal with another big question: "How do you teach these skills to kids with varied levels of development?"

We looked for comprehensive research on how cyclists are developed from very early ages. Our USA Cycling Level 3 Coach Manual provided a good summary about athlete development, but we were looking for more details about implementation. We investigated other cycling programs. We consulted other cycling coaches and coaches from other sports. We learned that there was not a single source that answered all of our questions. We discovered that there were a wide variety of opinions regarding youths' cycling development.

It became obvious to us that the only way we would get the answers to our questions would be through our own work with our kids. Through our experiences with our team, we could determine "what is myth and what is truth"

During our lengthy investigation process, we continued to work with our kids using our common sense and shared knowledge. New kids joined our team. We learned how to teach cycling skills to a variety of ages and competency levels. We learned how to assess ability. Our team taught us how to teach them. From this knowledge, our youth program developed along with the development of our youth cyclists. We became the experts on youth cyclist development.

Over the past six years, it has been a process of "learn-as-you-go" and "on-the-job-training". Along the way, we have found most of the answers to our questions. We have witnessed our youth cyclists become pre-adolescents, adolescents, and youth adults. Today, our program accommodates the varying developmental stages of youths – physiologi-

cal, psychological, and socially. We have been successful in retaining our members and increasing our membership by creating a practice and ride schedule based on age groups, gender, and competency.

Physiological Development

Skills Acquisition and Competency

The USA Cycling Level 3 (Club) Coach Manual lists a number of cycling skills. Several other cycling resources contained similar skills lists. We considered all of these resources and we created a competency assessment.

The concept of competency in USA Cycling's Level 3 Coach Manual was our best resource for listing skills and setting guidelines for development assessment. To summarize the Level 3 Coach Manual characterizes development as follows:

• Phase I, the early years, general introduction to the sport, "key elements are fun, peer associations, parental support, and the joy of becoming more proficient", between the ages of 10 and 13, the young cyclist and parents become more serious about the sport with regards to training and competitions.
• Phase II, middle years, commitment and skill improvement, ages 13-18.
• Phase III, maturity, devotion to the mastery of the sport.

Through our experience with our youth team, we subdivided the skills into three levels. These levels are based on our assessment of cyclists' competency capabilities.

Level 1 is the most fundamental set of skills and Level 3 is the most complex. Level 1 Skills are handled by kids at the lower end of the physical and psychological development; whereas Level 3 Skills are handled by the more advanced. As the young cyclist masters each skill, he/she progresses toward the next level. We have found that kids as young as six have the motor skills and awareness to comfortably master Level 1 Skills and many of the Level 2 Skills. Although we have seen a few six-year-olds who have the physical skills, we decided to set our program's entry age at seven years old for several reasons such as:

• Most seven year olds have the physical size and strength to ride 24' wheeled road bikes
• Most seven year olds have the attention span and awareness to operate a bicycle among others

Although we selected seven years old as our program's entry age, beware that children between the ages of six and eighteen can vary widely amongst their age group peers with regards to physical, psychological, and social development. Indeed some ten year olds will not be as big or strong as some six year olds. To determine a youngster's skill level, it is important to perform a skill assessment. This is especially true for new members. When a new kid signs up for our team, he/she is required to take private lessons. During these sessions, we assess and challenge the kid's cycling skills and abilities. At all levels of development, we have found that kids improve their cycling competency with repeated practices devoted to these skills.

Equally important is having the youth repeatedly practice skills they have mastered and introducing few new skills for the individual. Skill assessments and practices are important for every youth member, regardless of their level, continue their progress and improved cycling competency.

Level 1 Skills:
1. Mounting and Dismounting
2. Stopping and Starting
3. Braking
4. Riding Clip-less Pedals
5. Shifting Gears
6. Drinking from a Water Bottle
7. Riding a Straight Line
8. Following a Wheel
9. Cornering
10. Standing out of the Saddle

Level 2 Skills:
1. Riding in a Double Pace-line
2. Standing Start
3. Sprinting out of the Saddle
4. Bumping/Touching
5. Cornering 2 abreast at speed
6. Beginning Teamwork
7. Riding with no Hands
8. Passing/Receiving Water Bottles
9. Climbing out of the Saddle
10. Proper Gear Selection

Level 3 Skills:
1. Team Tactics
2. Cornering at Speed in a group
3. Bumping Wheels and Handlebars
4. Standing in a Pack
5. Sprinting out of a corner
6. Shifting while Standing
7. Putting on/Taking off a jacket on the bike
8. Sprinting out of a slipstream
9. Lead out
10. Blocking
11. Attacking from the front/back of the pack
12. Psychology of Racing

Private Lessons

When a kid wants to join our team, we require new members to attend basic training lessons, or private lessons, to assess the new member's competency and to satisfy our coaches that he/she has the cycling skills to ride safely in the group situation. The number of required private lessons to complete basic training is dependent upon the student's skill level progress.

Here is a list of skills that are assessed.

• Proper starting and stopping technique
• Safe drafting instruction
• 2x2 riding
• Proper hand signaling and communication
• Proper speed within a group
• Instruction for pace-line movement, position, and etiquette
• Understanding traffic, lanes, signs and signals, and traffic behavior
• Pedal stroke, cadence, gear shifting, and hand positioning skill instruction
• Proper use of brakes
• Use of water-bottle

Developing Competency

Throughout the year, during the off-season and the competitive season, we have weekly skill practices to instill and improved learned skills and to introduce new skills. The skills practices are sometimes arranged in groups by skills level, sometimes by ages, sometimes by genders, and sometimes by training years. Intermixing skills levels is beneficial to the inexperienced as well as the experienced. Repetition is key to progress and learning, to retaining capabilities, and to avoiding bad habits.

Annual Skills Assessment and Tracking Competency

Every year we measure and track each youth cyclist's competency by skills assessment. The Private Lessons were described earlier in this article. The annual skills assessment is similar to the Private Lesson but it is expanded to testing groups by their associated skills levels. Our annual skills assessment occurs over two practice sessions for the convenience of our members and parents. The annual skills assessment is mandatory for all members. We use the results from these assessments to build a

database for our own youth cycling program's developmental reference.

The Skills Assessment has an associated Competency Score. Each skill is assigned a value: Level 1 Skills are one point, Level 2 Skills are two points, and Level 3 Skills are three points. There are 32 skills that are tested and scored. To receive the point value for the skill, the individual must complete the skill to the satisfaction of the coaches. The Competency Score is the sum total of all completed skills.

Here is an example of Skills Assessment for an Individual:

NICK FRAZIER	Nov-2009	Nov-2008	Nov-2007	Nov-2006	Nov-2005	Nov-2004
RACE AGE	17	16	15	14	13	12
COMPETENCY SCORE	0	63	60	57	54	39
%	0%	95%	91%	86%	82%	59%
Riding Clip-less Pedals		1	1	1	1	1
Mounting and Dismounting		1	1	1	1	1
Stopping and Starting		1	1	1	1	1
Braking		1	1	1	1	1
Shifting Gears		1	1	1	1	1
Drinking from a Water Bottle		1	1	1	1	1
Riding a Straight Line		1	1	1	1	1
Following a Wheel		1	1	1	1	1
Cornering		1	1	1	1	1
Standing out of the Saddle		1	1	1	1	1
Riding in a Double Paceline		2	2	2	2	2
Standing Start		2	2	2	2	2
Sprinting out of the Saddle		2	2	2	2	2
Bumping/ Touching		2	2	2	2	2
Cornering 2 abreast at speed		2	2	2	2	2
Beginning Teamwork		2	2	2	2	2
Riding with no Hands		2	2	2	2	2
Passing/Receiving Water Bottles		2	2	2	2	2
Climbing out of the Saddle		2	2	2	2	2
Proper Gear Selection		2	2	2	2	2
Team Tactics		3	3	0	0	0
Cornering at Speed in a group		3	3	3	3	0
Bumping Wheels and Handlebars		3	3	3	0	0
Standing in a Pack		3	3	3	3	3
Sprinting out of a corner		3	3	3	3	3
Shifting while Standing		3	3	3	3	3
Putting on/Taking off a jacket on the bike		3	3	3	3	0
Sprinting out of a slipstream		3	3	3	3	0
Lead out		3	3	3	3	0
Blocking		3	0	0	0	0
Attacking from the front/back of the pack		3	3	3	3	0
Psychology of Racing		0	0	0	0	0

Featured Junior Athlete
Zoe Frazier
Birth date: May 1, 1995
Sport: Road cycling
Key accomplishment: 2008 USA Cycling's Junior Women's 13/14 National Time Trial Champion

Zoe is a member of the Frazier Cycling Junior Cycling Development Team. She has been involved in competitive cycling since she was nine years old. During her career, Zoe has won numerous local cycling races and she has won six medals in three USA Cycling Junior National Championships. Zoe does most of her training with the older Junior boys and men in the Frazier Cycling club. She competes in time trials, road races, circuit races, and criteriums for both Juniors' and Women's classifications. She often races two races per venue and up to six races per weekend. Zoe has ridden more than 6,000 miles in training and races during the 2008 season.

The data generated from the Skills Assessment is very valuable to our youth development program. By evaluating each individual, we can determine individual benchmarks and what skills need addressed to improve competency. Beyond the individual, the Skills Assessment helps identify the skills that need to be emphasized in team practices. It shows us how to divide the groups and how to blend them.

The Skills Assessment results have shown that youth cyclists (at all ages and levels) improve competency with continued skill practices throughout the year; otherwise, there is a significant competency plateau. The Skills Assessment results have shown that an improvement in an individual's Competency Score has a direct relationship to improved cycling abilities:

- Handling, balance, and control
- Hill-climbing
- Time trialing
- Stamina
- Descending
- Sprinting
- Cornering

In addition, the data is useful in determining competency norms for ages, gender, training years. From this data we can infer what is actually taking place developmentally with our youth cyclists. In other words, we are finding the answers to the important questions like "How do young cyclists develop based on skills acquisition?"

Age Group	Beginner	Score	Intermediate	Score	Advanced	Score
10-12	Level 1	7-10	Level 1 & 2	11-30	Level 2	31+
13-14	Level 1 & 2	10-29	Level 2	30-46	Level 2 & 3	47+
15-16	Level 1 & 2	10-29	Level 2 & 3	30-54	Level 2 & 3	55+
17-18	Level 1 & 2	10-39	Level 2 & 3	39-62	Level 3	63+

The typical number of training years for:
• Beginner is less than 2.
• Intermediate is 2 to 3 years.
• Advanced is more than 3 years.

Physiological abilities

Similar to our skills assessment for youths, we measure the physiological development of our youth cyclists with periodic time trials during the competitive season and an annual Power Test during the off-season. We use the physiological test results and measurements to monitor each member's physiological abilities throughout their involvement in our youth cycling program. Just like competency data, physiological testing results are useful to establish norms for ages, gender, and training years. From this data we can infer what is actually taking place developmentally with our youth cyclists. These results tests show progress that parallels the skills acquisition from pre-puberty to early puberty with boys and girls. Girls tend to plateau at earlier ages than boys. After boys reach puberty, they tend to rapidly advance in power and strength, appreciably surpassing the girls in the same age group.

The Power Test and time trial results indicate a direct relationship to improved cycling abilities:

Physiological abilities

• **Endurance –** the ability to continue despite the onset of fatigue.
• **Strength –** the ability to generate force against a resistance.
• **Speed –** the ability to pedal quickly and efficiently.
• **Speed endurance –** the ability to pedal quickly for a long period of time under a workload (combination of endurance and speed).
• **Muscular endurance –** the ability of a muscle or a muscle group to perform repeated contractions for a long period of time under a workload (combination of endurance and force).

Age Group	Girls Sprint Watts/KG	Girls LT Watts/KG	Boys Sprint Watts/KG	Boys LT Watts/KG
10-12	7 – 10	2.1 – 3.0	7 – 10	2.2 – 3.1
13-14	8 – 11	3.2 – 3.4	10 – 12	3.2 – 3.4
15-16	9 – 11	3.2 – 3.4	12 – 14	3.5 – 4.2
17-18	No data*	No data*	12 – 14	3.7 – 4.5+

*We do not have any 17 – 18 Women on our team

Annual Growth and Measurements are recorded in our database to evaluate physiological changes and progress of each youth cyclist.

Here is an example of our Measurement Form.

NAME	JANE DOE	
DATE	February 18, 2009	
AGE	13	
HEIGHT	5' 0"	Height measurement (bare feet, feet together, back straight)
WEIGHT	91.7 lb.	Weight measurement (without clothing)
NECK	12"	Neck measurement (tape measure, center - around the Adam's Apple)
WAIST	25"	Waist measurement (tape measure, approximately 1" above the belly button)
HIPS	27"	Hip measurement (tape measure, approximately 1" below the belly button)
Girls only		
FOREARM	7.5"	
WRIST	5.5"	

Psychological Development

The importance of "Individual and Team Identity" can not be underestimated for all of the youth age groups. This is especially true for teens who are striving to discover their identities. Also, the joy of becoming more proficient is as prominent in Phase II development as it is in Phase I. Self-esteem and confidence grow when progress is realized and recognized. Coaches should be aware that youth cyclists need encouragement, acknowledge, and recognition more than adults. This need diminishes with the older age groups, but it still exists.

Social Considerations

We have found that all team members share a connection and they thrive on peer associations – it is not limited to Phase I development. We have witnessed significant improvements by kids, across all of the age groups, who have come from teams/clubs where they were the only junior. Having a peer age group and having fun is crucial for most youth cyclists to progress in this sport.

The key elements are fun, peer associations, parental support, and", between the ages of 10 and 13, the young cyclist and parents become more serious about the sport with regards to training and competitions.

The Arc of Independence

Occasionally and especially during our off-season indoor practices, we gather the team members for a meeting, but we arrange the kids seated on the floor in an arc facing the coaches. The arc is made by placing the youngest member on the left facing the coaches with progressing old members on their left ending with the oldest Junior seated facing the coaches for the right. The parents are assembled behind their children and they face the coaches, too. We call this seating arrangement the "arc of independence". With is seating arrangement, we delver the message to the team how each individual grows and matures with our program: from the pre-race age youths, the 10 – 12 age group, 13 – 14 age group, 15 – 16 age group, and finally, the 17 – 18 ages group. We emphasize how the kids need to be aware that we expect more from them as they leave school age to adolescents to adulthood. We expect more independence from the kids and increased leniency from the parents as each individual grows older, advancing to the next age group, and eventually "graduating" from our junior program.

Children growing up: dependence ← independence, self-sufficient
Parents must balance: overly protective ←→ overly lenient

Examples of social progression:
• Sleep without a night light
• Sleep without a toy or special blanket
• Ride a bus to/from school
• Stay overnight trip without your parents
• Driver's license – driving without parents
• Going away to school, i.e. college
• Living on your own

The "arc of independence" is our method to convey our expectations for each individual's social progression. The team enjoys this seating arrangement and the discussion. In a fun way, it gives our kids a visual manner for understanding their roles and responsibilities as individuals and to each other.

Girls versus Boys

We have observed various differences between girls and boys

who are cyclists on our team.

Until about the age of 13, girls and boys are about equal in strength/power. We recommend that girls should race in separate fields beginning in the 13 – 14 age group and they should be definitely separated by the 15 – 16 age group. Beginning around the age of 15, boys rapidly develop increased power and strength. The increased strength and power of teenage boys compared to girls is the main factor – the girls need a level "playing" field for competition and their esteem. The separation is not necessary for training rides and practices. There is little disparity in strength and power of the younger age group (10 -12), so it is not necessary to have separate race them.

Recommended Juniors race fields based on developmental differences:
Junior Men and Women 10 – 12 years old
Junior Men 13 – 14
Junior Men 15 – 18
Junior Women 13 – 18

Here are some general behaviors:
• Girls (in particular, teenage girls) are more likely to quarrel among one another than boys.
• Boys tend to be more tolerant of the group.
• Girls tend to follow coaches' instructions better than boys.
• Boys tend to show off more than girls.
• Race sense – we have not noted in difference between the genders.
• Boys are more likely to join the team.
• Girls are more likely to quit the sport than boys.
• Boys are more likely to quit a race than girls
• Boys are more likely to whine and/or complain.
• Bicycle handling skills – boys tend to be better
• Enjoy team events – girls and boys are equal. O

More Information Please!
Contact the authors about their "Coaching Juniors - The Team Approach" clinic and manual. www.fraziercycling.com, 770-513-8640.