"She's a Natural": Identifying and Developing Athletic Talent

H. Joey Gray
Middle Tennessee State University

Jonathan A. Plucker
Indiana University

Similarities between the identification and development of athletic talent and that of gifted children are rarely compared. Interestingly, however, they share analogous processes. The purpose of this review is to investigate the progress of research regarding athletic talent identification and development, including current issues, and provide suggestions for future research. Key roadblocks to the identification of athletic talent include attempting to identify talent at an early age, use of flawed athletic talent identification models, and lack of education of coaches, parents, and teachers regarding how to properly identify athletic talent.

Proper identification of athletic talent has many benefits. From an economic standpoint, the success of the multi-billion-dollar professional sport industry relies heavily on successful identification and development of athletic talent. For the year of 2008–2009, the National Federation of State High School Associations (NFHS, 2009) reports that 7,536,753 high school students participated in high school sports. However, according to the National Collegiate Athletic Association (NCAA, 2009b), just more than 40,600 student-athletes participate in their competitions each year. These numbers suggest that less than 1% of all athletes participating in high school sports will continue their participation into collegiate sports. Even fewer student athletes will possess the ability to become professional athletes. Yet, millions of athletes experience a host of benefits in youth sports. For example,

H. Joey Gray is an assistant professor of recreation and leisure studies at Middle Tennessee State University. Her research interests include talent development, obesity, and pedagogy. Jonathan Plucker is a professor of educational psychology and cognitive science at Indiana University, where he also directs the Center for Evaluation and Education Policy.

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research provides evidence of the positive impact of athletic participation on development of kinesthetic skills, social development, and academic outcomes (Abbott & Collins, 2004; Green, 2005). Additionally, youth sport is one way to combat the sharp increase in student obesity. These benefits point to the importance of encouraging and maintaining youth and young adult involvement in sports. Athletic talent identification is of particular interest to coaches, researchers, parents, and educators alike. Coaches seek out athletic talent identification as an obvious means to succeed. As a result, coaches nurture and encourage talented athletes to continue sports participation. Research findings suggest that student athletes who perceive they have high ability levels are more likely to maintain participation in sports activities (Martin, 1997).

The literature on identification and development of athletic talent has been limited in the past decade. Persson (2002) particularly noted the absence of research on athletic talent identification in journals that focus on high ability and education. He further maintained that this lack of research is an essential component lacking in gifted education. High ability primarily focuses on the intellectual realm where ability level may be easily measured through standardized testing. However, talent research is beginning to take shape since Persson's 2002 call. Talent and talent development have been given attention in the 2007 editions of two journals (*International Journal of Sports Psychology* and *High Ability Studies*). The efforts of these two journals are a much-needed beginning for a thorough exploration of talent.

Identifying athletic talent is an added challenge that is difficult at any age and at various levels of play. Although we typically target talent identification efforts in youth and adolescence, athletic talent identification occurs at all ages and levels of athletic play. So, why are those involved in youth sport often obsessed with athletic talent and why do some people spend countless hours, dollars, and resources planning to identify athletic talent? The success of professional sport hinges upon proper identification of athletic talent. Given that billions of dollars are at stake, talent identification and development (TID) are major concerns for professional sports as well as for those who aspire to become a part of the professional ranks. Achieving notoriety also plays a role in talent identification and development. Many coaches, parents, schools, friends, and family members dream of the prestige

associated with becoming a renowned athlete or being associated with a "talented" athlete. Motivations for fostering and identifying athletic talent may be ego driven by the desire to be associated with an athlete who achieves widespread athletic notoriety.

Less extrinsically motivated reasons for talent identification and development also exist, such as the opportunity to develop self-esteem, social skills, and physical and mental abilities. Researchers recognize the importance of effective talent identification and development due to the psychological ramifications of dropout or failure to achieve among youth (Wall & Cote, 2007). Additionally, research highlights the importance of a child's potential to learn and develop as a part of recognizing potential for sporting performance. According to Green (2005), athletic development can play an important role in social environment and skill development. The purpose of the current review is to investigate what it means to be "talented," to explore the current issues surrounding identifying and developing athletic talent, and to provide suggestions for youth workers and researchers.

Athletic Talent Defined

Talent generally is considered an exceptional natural ability to attain goals (Moon, 2003), therefore, logically, athletic talent ought to be exceptional natural ability of an individual to perform a sports-related task or activity. Yet, how does one determine athletic ability and how should this concept be measured? We have yet to determine an exact science in discovering or developing athletic talent. This may be caused partly by disagreements about the definition of athletic talent, which continues to be a point of discussion among scholars (Abbott & Collins, 2004; Howe, Davidson, & Sloboda, 1998). One way to begin to define talent is to seek evidence of its existence. In their attempt to verify the reality of talent, Howe et al. (1998) referred to the existence of autistic savants and child prodigies as unique examples that singularly prove the veracity of innate talent. The authors do argue that even these persons practice a great deal. However, research indicates that autistic savants indeed exist and could play music or art with no instruction (Miller, 1989; Snyder et al., 2003). Through the use of brain technology, Snyder et al. (2003) produced evidence that innate

or natural talent may exist within autistic savants. Savant-like drawing and proofreading abilities were created by "normal" subjects when function was temporarily suppressed in part of the brain. The work of Snyder et al. provides solid evidence of talent. More interestingly, the researchers demonstrated that talent could be created.

Many readers of this article will agree that they personally know someone who they suspect is "athletically talented." But how do we know what athletic talent is and when it exists in a particular person or group of people? Studying the phenomenon is a complex and often difficult challenge.

Researchers argue that athletic talent identification and development must recognize the multidimensional and dynamic nature of sport talent (Bailey & Morley, 2006, Baxter-Jones, Helms, Baines-Preece, & Preece, 1994; Edwards, 1994; Helsen, Hodges, & Starkes, 2000; Nieuwenhuis, Spamer, & Van Rossum, 2002). Abbott and Collins (2004) maintained we should be examining physical (biometric), performance (motor), and psychological factors depending on whether we are trying to identify current performance ability or future performance. Howe et al. (1998) noted people are often vague when referring to talent and maintained that we should be more specific regarding what form talent takes and how it might affect athletes. In an effort to begin defining talent, Howe et al. provided five properties of talent: (a) genetic or innate factors exist, (b) advance indicators of talent can exist at an early stage, (c) evidence of talent potential can be used as a predictor of achievement, (d) talent is limited to a small part of the population, and (e) talents are reasonably domain-specific. These properties are helpful, but are not all inclusive of this complex concept. Helsen et al. (2000) applauded Howe et al.'s attempt to define talent, noting that the definition may assist researchers; however, these authors could only support three out of the five properties. Howe and his colleagues could not find evidence that talent could predict excellence nor that talent was domain-specific. Additionally, Helsen et al. noted the lack of evidence to support excellence predictability and domain specificity is particularly problematic because these factors are the main tools used to identify and select talented youth. Despite the flaws revealed by both Howe's and Helsen's research teams, their work examining the elements of athletic talent is crucial to moving toward a more fitting and universal definition.

Elements in Talent Identification and Development

The most common and obvious way to identify athletic talent is to examine physical ability, but current research cautions against a unidimensional approach. Simonton (2001) supported the idea that talent is a complex topic, stating that multiple components contribute to the development of talent in any domain. Abbott and Collins' (2004) study denoted the importance of psychological skills in talent identification and development. They stated that athletes should not be excluded or identified based solely upon one attribute, such as height. Abbott and Collins maintained that other factors like speed and agility may compensate for a weakness. Further, these researchers found that key psychological behaviors such as motivation and learning strategies are essential to the talent development process both in sport and other performance areas. Meta-cognitive strategies have been shown to enhance achievement among numerous disciplines including education and sport (Kreiner-Phillips & Orlick, 1992; Zha, 1993). Cognitive ability plays a significant role in athletic success. An essential key in identifying the talented athlete is recognizing athletes who can actively think and modify their actions while participating, utilizing strategy and cognitive abilities during play. Physical skill alone does not signify athletic talent.

Nieuwenhuis et al. (2002) sought to identify the specific kinanthropometric, physical-motor, and psychological variables as well as specific skills that influence field hockey performance. The study examines two top and two bottom field hockey teams in a 14–15-year-old league to determine any differences. The only meaningful difference they found in kinanthropometric characteristics was frontal thigh skinfold. However, the top group had significantly better endurance and demonstrated more advanced ball-handling skills. Nieuwenhuis et al. created a prediction function using discriminant analysis that successfully distinguished between successful and less successful hockey players 90% of the time. The specific variables distinguishing players include agility, speed, approach success in competition, ability to hit, humerus measurement, general approach success, flexibility, and femur measurement. This complex predictive function falls short of the linear relationship most coaches would like to imag-

ine. Nevertheless, Nieuwenhuis et al.'s 90% success rate indicates that talent may be distinguishable in the teen years.

An area that has received limited research is the role of adults during the development of athletic talent. Wolfenden and Holt (2005) examined the perceptions of elite junior tennis players, their coaches, and their parents regarding talent development. The authors found that intense commitment to tennis occurred earlier for participants than the time frame suggested by previous research. Wolfenden and Holt's findings support the concern of defining "stages" of athletic talent development given that maturity occurs at different times and cannot necessarily be predicted by chronological age. Additionally, this research illustrates the difficulty in identifying elite youth, because there are no guarantees these youth will become elite adult athletes. As a case in point, Venus and Serena Williams are often mentioned as examples of successful adult athletes whose talents were identified and developed beginning at an early age, but for every shining example probably dozens, if not hundreds, of children are identified as talented and achieve little, if any, success. For example, the NCAA (2009a) estimates that only 1% of women make it from collegiate to professional basketball and less than .003% make it from high school to professional basketball. The NCAA-projected similar estimated results were found for most major sports. Wolfenden and Holt also suggested six categories of factors that may influence the development of athletic talent. The categories included emotional support, tangible support, informational support, sacrifices, pressure, and relationship with coaches. A closer examination of these categories is needed to ascertain the impact on the development of athletic talent. Concomitantly, purely cognitive assessments also fail to differentiate levels of athletic talent.

Chess is considered a sport consisting solely of intellectual challenge. Doll and Mayr (1987) found that a measure of intelligence could not distinguish the best among chess players and asserted that additional factors are important in determining who will be the best chess players. Similarly, research demonstrates that athletic talent is a culmination of psychological, physiological, and support factors, and these elements should be examined to truly grasp the complexity of identifying athletic talent.

Conceptualizing athletic talent development becomes increasingly challenging when researchers make a distinction between talent identification and development. Some research seeks to examine immediate identification of athletic talent, while other research explores development of talent over a period of time. Abbott and Collins (2002) claimed their approach to athletic talent identification and development acknowledges the difference between performance and potential: (a) Main emphasis should be placed on potential to develop rather than immediate performance; (b) one's potential to develop rests on psycho-behavioral components; (c) in order to develop in a sport, essential fundamental movement skills must be present in their vocabulary (psychomotor); and (d) talent identification and talent development processes should be combined. Seemingly, it is difficult to include one aspect of the approach without addressing the others. This new approach may prove to be useful to those who are interested in talent identification and development.

Issues in the Identification of Athletic Talent

Predictability

One problem with talent identification and development is the predictive validity of talent identification strategies. Predictability of talent is in high demand. Although a few coaches and parents believe they possess the ability to predict talent, some researchers disagree (Abbott & Collins, 2002; Helsen et al., 2000). For example, Abbott and Collins (2002) discussed the lack of predictive ability of a traditional talent identification model, the Sport Interactive Model. The model utilizes a computer program that matches children to sports based on desirable sport-related characteristics. Abbott and Collins' study revealed that the model had poor test and retest correlation scores. As such, the model is unlikely to accurately identify potential athletic physical composition and performance ability in young children.

The professional sports arena also has difficulty predicting talent. Professional football, as well as other sports, utilizes several skills tests to "predict" future football stars, with millions of dollars at stake

in each draft day decision, yet many of the identification strategies have questionable validity. For example, the 40-yard dash is a ubiquitous assessment used to predict success at the professional level, yet it does not predict athletic success reliably due to the arbitrary distance. Moreover, a combination of physical and cognitive abilities is needed to be successful in professional athletics. Stories abound about successful professional athletes who were predicted to be mediocre due to specific physical measurements (e.g., height, weight). These athletes achieve success despite expected predictors of talent. For instance, Muggsy Bogues is 5 feet, 3 inches tall, the smallest National Basketball Association (NBA) player in history. His height is considered overwhelmingly small for even a high school team. Despite his height challenge, Muggsy is an elite athlete. Conversely, the annals of professional sport overflow with stories of highly touted prospects who achieved little success during their careers. Tim Couch, an All-American and the number one National Football League (NFL) draft pick in 1999, soured quickly as his professional play fell short of his previous talent predictions. Couch, a quarterback for the Cleveland Browns, received $48 million as the first round draft pick. Despite several attempts to be successful, his short 9-year football career is less than impressive for a highly touted NFL draft pick.

Those who study intelligence are also enthralled with their own form of talent identification. Intellectual aptitude tests are certainly not excluded from their share of poor instrumentation with little merit. An example of accepted but poorly representative testing is the Wonderlic Intelligence Quotient test created in 1937 (Wonderlic, 2008). The Wonderlic IQ test is used to assess learning and problem solving across a variety of domains. The test takes 12 minutes or less and is normed so that a score of 21 represents average performance. This exam is widely used in personnel screenings and by the NFL, yet this assessment may miss a wide variety of important intellectual abilities. Those interested in sport talent identification should be concerned about similar shortcomings regarding the methods used to scout athletic talent of youth. Although many coaches perceive that they are identifying children who will demonstrate athletic talent in the future, in reality they may be limiting their judgment to children who demonstrate current indications of talent, such as physical precocity. If gatekeepers to athletic development programs identify

children at an early age based primarily on physical maturity, "late bloomers" or even children of average maturity may be excluded permanently from these programs. The ability to predict talent is moot if we lack adequate knowledge of how to identify and, more importantly, how to nurture athletic potential.

Age

Strong evidence suggests that athletes whose birth dates fall early in the year are more likely to be identified as "talented" (Baxter-Jones et al., 1994; Dudink, 1994; Edwards, 1994; Helsen et al., 2000). Helsen et al. (2000) tested the idea that physical development and an age advantage may be equated by some coaches as talent. The researchers examined studies of international, national, and provincial soccer players. The findings revealed that players born in the first quarter of the selection year were considered "more talented" by their coaches than those born later in the selection year. These effects were maintained over time, as professional players were more likely to have been identified as talented as youngsters and provided with additional coaching. Interestingly, during the study period, Federation of International Football Association (FIFA) changed the selection year guidelines from August through July to January through December. After the guidelines changed, different youngsters were considered talented by their coaches and the changes directly correlated with the date of birth. Children born in the months of January to March were most likely to be considered talented after the FIFA change, whereas the desirable months before the FIFA guideline changes had been August to October. Similar results were not noted in the 16 and older age group, presumably because players born in less desirable times of the year were likely to have dropped out prior to that age. Helsen et al. concluded their findings by suggesting that coaches' talent identification is explained by physical ability relative to an advantage in age. Other researchers argue that one of the reasons talent goes unidentified is because talent does not emerge until later ages (Green, 2005; Helsen et al., 2000). When compounded with the earlier observation that physical maturity alone does not predict future talent, the tendency to mistake early physical maturation for physical talent is even more troublesome. While important attributes regarding athletic

talent are being overlooked by coaches and researchers, the narrow range of abilities that are the focus of identification efforts may be contaminated by irrelevant factors. We can conclude that numerous children will be missed or inaccurately ruled out as talented. Helsen et al. affirmed an additional psychological component may affect the performance of younger children when competing against more mature children within the same age group.

Date of birth may play a significant role in both identifying and developing athletic talent. Research supports the well-known relationship regarding achievement in education and date of birth (Dudink, 1990, 1994). Dudink (1990) found that children in the younger group, regardless of school year, are at a disadvantage compared to older children. However, this study is not the first harbinger of the existence of a problem. Dudink (1994) pointed out that *Nature* published an article more than 20 years ago that indicated a concern regarding the relationship between season of birth and cognitive development. Nonetheless, researchers continue to note the problem and unfortunately our flawed systems have yet to change.

Edwards (1994) criticized Dudink's findings because Dudink does not identify whether the disadvantages of birth date are physiological or psychological in nature. Edwards investigated this notion by collecting the birth dates and heights from cricket players in the United Kingdom during the 1991 season. The researcher found the birth-date effect is true for goalkeepers, defenders, midfielders, and forwards but height was significant for goalkeepers and defenders (Edwards, 1994). Those familiar with soccer are aware that, unlike in other sports such as basketball, height has little impact on ability in soccer, with the exception of the goalkeeper position. The findings indicate that the birth-date effect may cause a psychological disadvantage. Edwards further maintained birth-date effect is not based solely on physiological or psychological advantages or disadvantages; rather, he noted the combination may vary among sports. However, the author's suggestion to simply guide youth into appropriate sports is somewhat archaic. The author does not provide data nor the method regarding how to discover one's appropriate sport, which is almost certainly easier said than done. Moreover, discovering one's appropriate sport is the major goal of identifying athletic talent. The birth-date

effect does reveal a genuine concern for those who are responsible for identifying athletic talent and should be investigated further.

Talent Versus Practice

Some researchers have attempted to justify or refute the very existence of athletic talent, arguing that practice is the key element that fosters excellence in sport. Studying the "talented non-practicers" is a difficult task as we currently have few examples of those who are talented and do not practice, yet continue to excel. Although experts in a given field such as sport, music, and math appear to be doing their skill or performance effortlessly, research evidence reveals these persons intentionally practice for many hours to attain advanced levels of ability. For example, Ericsson, Krampe, and Tesch-Römer (1993) noted that within the realm of accomplished musicians, the best experts log about 10,000 hours of solitary practice during their music development, whereas less accomplished and serious amateur pianists log only 5,000 and 2,000 hours respectively. The authors refer to the phenomenon of excellent performance only after intense and intentional practice as the theory of deliberate practice. Devotion to practice among those who excel in their craft is often referred to as the "10-year rule," a phrase coined by Simon and Chase (1973), which maintains that one must practice his or her skill for at least 10 years to master any field. The 10-year rule is commonly used in the areas of mathematics, music, swimming, middle- and long-distance running, figure skating, field hockey, wrestling, and tennis. To be succinct, practice during the course of skills acquisition essentially makes perfect (Ericsson et al., 1993). However, the theory of deliberate practice still falls under scrutiny by researchers today (Abernethy, Farrow, & Berry, 2003; Bullock, Gulbin, Martin, Ross, Holland, & Marino, 2009). Research demonstrates practice plays at least some role in athletic success, but how much of a role likely varies based upon individual and sport specific characteristics.

Bloom's (1985) model of talent development, although not intended to be sport-specific, is frequently applied to athletic contexts. In Bloom's original research, he interviewed 120 participants, roughly a third of whom were elite swimmers and tennis players, and developed a three-stage model of talent development. The three-stages

consist of the early years, middle years, and late years. Bloom describes how the intensity of the activity and athlete focus changes over these three time periods. Specifically, practice time increases significantly during the middle years.

Building on the work of Bloom (1985), Cote (1999) created the model of sport participation, proposing three alternate stages of sport participation, which he referred to as the sampling years (ages 6–12), specializing (ages 13–15), and investment (ages 16+). The major difference between the Bloom and the Cote models is that Cote's model is grounded in the concepts of deliberate play and deliberate practice. Deliberate practice is defined by Cote as performance with the specific intention of improvement. The model of sport participation hinges on the concept of active participation rather than innate talent, whereas many other models of talent identification and development rely more on identifying innate ability. This research is particularly noteworthy to those interested in talent development, as Cote's work adds to the understanding of an athlete's motivation and evolution of participation in sport.

Helsen et al. (2000) tested the model of deliberate practice in an attempt to understand if practice alone could be responsible for talent development in sport. The research provides evidence of a positive linear relationship between individual practice, team practice, and skill in soccer. One must be motivated to practice and, furthermore, this level of motivation plays an essential role in high achievement (Ziegler & Raul, 2000). Nieuwenhuis et al. (2002) also noted the psychological factors in athletic talent and suggested that successful teams tend to present higher motivation scores. Notably, high levels of success often do not exist without intense motivation.

Researchers and coaches alike argue that practice plays a large role in talent development. For example, Howe et al. (1998) noted that genetic differences in ability may become less important with large quantities of practice and training. Hidden within the complicated argument of talent versus practice are the roles of psychological factors, personality traits, motivation, and both the biological and environmental influences of these factors. Indeed, children born with natural athletic ability may be more apt to practice, because practicing may provide a greater internal reinforcement than it does for those children who are less talented. Motivation to practice is an important

point, as the existing research supports the significant role of practice in athletic development. Without proper intrinsic motivation, athletes are less like to commit to sport and continue participation (Anshel, 2003; Gould & Carson, 2004). Based upon the importance of practice, the implication for athletic talent identification is that we should provide numerous opportunities to all children at various developmental stages to build skills, rather than isolate the few children we merely suspect are talented based on uneducated and misguided procedures. The next Tiger Woods, Mia Hamm, or Bret Favre may be what many refer to as a "late bloomer," with a desire to succeed and opportunities for intense practice overcoming the lack of precocious athletic talent.

Recommendations for Youth Workers

School districts can play an important role in talent identification among youth. The primary need is to educate coaches, teachers, and parents on how to properly identify athletic ability without prematurely excluding children because of delayed or nonprecocious development in cognitive and physical skills. However, not all coaches are properly trained to identify and develop talent. A paramount concern for all involved with youth sport should be to educate coaches and teach them to utilize the same measures and means of identifying and developing talent. Creating educational opportunities and standardized practices should ensure equal opportunity for discovery of talent. Until then, coaches will continue to use their instincts and personal desire to educate themselves.

Helsen et al. (2000) suggested that coaches should provide equal opportunities to all children regardless of perceived talent. These recommendations include practice and playing time as well as a variety of sports pursuits. Scholars support the idea of varied sports for youth, maintaining that an alternate use of the deliberate practice theory may be to focus on diligent practice time across a multitude of sports (Baker, 2007; Coleman, 2007). Children should not be ruled out as having no athletic potential because of age or physical size. Thus, we recommend that all children are monitored throughout their development for talent potential while encouraging students to try a variety

of sports. The various manifestations of the Schoolwide Enrichment Model (Renzulli, 2000), which facilitate children being exposed to numerous activities, appear to be appropriate for use in this context. For example, although a student may not be considered talented at soccer, she may excel at swimming. Coaches and children simply will not know where talent potential could be hiding until the child tries new activities. The findings of Fraser-Thomas, Cote, and Deakin (2008), Magill (2007), and Wall and Cote (2007) strongly encourage the diversification of sport pursuits. In addition, research suggests that participation in a variety of sports may assist in skill development rather than hinder development (Magill, 2007; Wall & Cote, 2007), debunking a common myth. The existing research on athletic talent development provides evidence that some children may not reveal talent until young adulthood and/or after considerable practice. Helsen et al. suggested that coaches should be aware of the importance of the optimal content and amount of practice as related to long-term sports success.

In addition, schools and coaches should be aware of the talent development stages presented by Bloom (1985) and Cote (1999). Knowledge of the athletic developmental stages may assist with the level of attention and practice time given to individual children. However, coaches must be mindful that children mature both physically and mentally at different rates. Taking this into account could lead to additional nurturing of skills and ultimately more talented athletes. Further, schools, programmers, and coaches should have policies on recruitment and retention. Green's (2005) exploration of the Pyramid Model of Sport Development noted three necessary tasks for an effective pyramid model and sport policy development: athlete recruitment that relates to how athletes become involved in a sport, athlete retention that focuses on how to keep athletes involved and enhance their commitment, and athlete transitions that strive to ensure their advancement, particularly those who show potential to excel. Additionally, Green emphasized the importance of motivation, socialization, and commitment in athletic success as essential elements in sport development. These findings suggest that sports programmers must attend to a variety of social and emotional needs and connections of the children they work with, in addition to coaching the sport. However, youth sport workers should maintain caution

regarding pyramid-based development systems, as sequential levels do not assure athlete progression. Athlete progression requires effective linkages between levels and solid communication within the pyramid. Programs must have an efficient means to identify when athletes are ready for transition and to facilitate adjustment to programs at advanced levels (Green, 2005). Although we have touted the importance of practice on talent development, Wall and Cote's (2007) study on elite ice-hockey players revealed that dropout rates were higher for youth who began off-ice training regimens at a younger age and who participated in more off-ice training between the ages of 12 and 13. Overexposure and dropout do have a connection and must be considered by youth sport workers. Wiersma (2000) suggested that the need to restrict training hours based upon age is fast approaching. Youth workers must learn to understand and manage this delicate balance of practice intensity, natural talent, and burnout. A child's intrinsic motivation may help guide these decisions.

Abbott and Collins (2002) highlighted the need to ensure that all children are provided with opportunities to develop the psychomotor and psychobehavioral factors proposed as precursors to successful development in sport. The researchers further maintained that development opportunities should be provided, and children's progress monitored, prior to any selection into or elimination from a talent development program (Abbott & Collins, 2002). Practice, nurturance, and psychological influences of sport have been presented throughout the literature as significant factors in talent development. School districts and community sports organizations can provide all of these elements to children in an effort to assist with identification and development of talent. Perhaps our focus with youth sports should be on development rather than solely upon identification.

One cannot underestimate the importance of school districts and community sports organizations utilizing all available community resources. Sports committees including members who are well-educated in the elements of talent identification will be invaluable, especially if they will oversee athletic programs. Given the current budget constraints of school systems, committee positions could be voluntary. Committees could consist of members from the school board, current coaches, and parents. A committee would benefit from opportunities to attend workshops on talent identification and development. When

assessing talent, coaches and educators should pay particular attention to dates of birth and maturity to avoid the problem of underidentification based upon age. When identifying athletic talent, concerted efforts should be made to look specifically for the potential of physical skill, cognitive skill, motivation, and attitude. Parental education is also a matter of concern for school districts (Wolfenden & Holt, 2005), given that parents provide significant emotional and logistical support to young athletes. Schools must consider the impact of parents and utilize every opportunity to educate parents as well as coaches and teachers regarding talent identification and development.

Conclusion

Research suggests that athletic talent is rarely identified with much accuracy, especially early in a child's development. Sadly, talent selection methods are often sporadic, lack criterion, and those selecting are uneducated regarding identification of athletic talent. The average citizen involved in sports can identify a coach who truly believes that he can spot athletic talent simply by watching young players briefly. The recent bestseller, *Moneyball* by Michael Lewis (2004), provided several colorful examples of conflict between athletic talent scouts who "know talent when they see it" and statisticians who rely on prior performance. Those who rely on prior performance are much more statistically relevant. Clear evidence exists that age and physical ability can identify or rule out youth regarding potential to excel in a sport (Baxter-Jones et al., 1994; Dudink, 1994; Edwards, 1994; Helsen et al., 2000), yet identification of athletic talent frequently confounds athletic skill and potential with physical maturity. This problem increases as the age of the children being considered decreases.

Talent identification models are still being used despite notable flaws in the design and inability to predict future performance ability (Abbott & Collins, 2002). Furthermore, the authors note the key question in designing and developing talent identification models is, "Which characteristics indicate that an individual has the *potential to develop* in sport and become a *successful senior athlete*?" (Abbott & Collins, 2002, p. 157). Several models have been proposed and examined in order to identify talent, but their usefulness is often

questionable. The importance of identifying and developing talent is evident by the tremendous attention it receives at all levels, from organized sports programs for very young children to professional league scouting, yet researchers continue to struggle to create reliable and valid strategies for identifying athletic talent.

We understand the desire many feel to identify the next sport prodigy such as Tiger Woods, Michelle Wie, or Freddy Adu. But children who develop physically and mentally at the lower end of the normative developmental spectrum have been discounted as nontalented when they might actually present as talented later in their childhood. Sadly, these children are likely to be ignored because they did not show evidence of talent to the right people at the right time. As a result, these late bloomers are likely to lose interest in a sport due to lack of encouragement or even explicit discouragement. Coaches, educators, and parents should find ways to nurture athletic interests in children, especially given the multiple potential contributors to athletic talent, some of which may not emerge at a young age, and the variation in children's physical development. We simply cannot allow children to lose the positive benefits sports offer simply because we wrongly believe that they do not have enough talent to excel.

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