Towards the Development of a Conceptual Model of Expertise in Cricket Batting: A Grounded Theory Approach

JUANITA WEISSENSTEINER
Australian Sports Commission

BRUCE ABERNETHY
Institute of Human Performance, The University of Hong Kong & School of Human Movement Studies, The University of Queensland

DAMIAN FARROW
Sports Science and Sports Medicine, Australian Institute of Sport

Data from semi-structured interviews with 14 male expert cricket batsmen, coaches, and administrators were used to generate a conceptual model of expertise in this sport. In the model, a favorable socio-developmental environment (support, vast investment in creative and challenging play, sibling rivalry) provides the essential foundation for the development of positive psychological attributes (mental toughness, self-belief and confidence, ability to cope with adversity, adoption of individualized routines/rituals), technical skill mastery (optimal balance, speed of downswing, versatility of shot execution) and superior visual-perceptual skill. Intrinsic motivators (fun, enjoyment, challenge and achievement, desire to be the best, “love of the game”, camaraderie) are regarded as essential to continuation and progression along developmental pathways. Facets of contemporary society and its constraints on free play emerged as one of the major limitations to the future development of expertise. The model has immediate implications for coaching practice, developmental policy, and future research approaches to identifying and nurturing sports talent.

Understanding the factors and skill components that both facilitate and constrain the development of sporting expertise is of practical importance for guiding coaching practice and refining development policies specific to the identification and nurturance of sporting talent.
Theoretically, such knowledge is central to understanding the limits to human performance. In this paper we use a grounded theory approach to identify key factors facilitating and impeding the development of batting in the sport of cricket, as a step toward formulating a conceptual model of expertise in this sport. Cricket batting provides a useful model for examining the development of sporting expertise because batting itself is an extremely difficult and complex time-constrained interceptive skill (Müller & Abernethy, 2006) (Figure 1), the limiting factors to skilled performance are many and diverse (Stretch, Bartlett, & Davids, 2000), and the pathway to the elite level of competition, as in many activities, is a long one (Ericsson, 1996). Existing studies have identified differences between expert and non-expert batsmen in terms of their movement production (e.g., Elliott, Baker, & Foster, 1993), their capacity to anticipate the opposing bowler’s action (e.g., Müller, Abernethy, & Farrow, 2006), and aspects of their mental skills (e.g., Gordon, 1990), but little is known about how these key components of expertise develop, nor about other contributing factors and their developmental characteristics.

It is now well-established from research on a number of other sports that the emergence of expertise depends on both the successful interaction of biological, psychological, and socio-developmental factors and the attainment of sophisticated psychological and physiological adaptations arising as a consequence of extended periods of practice (Baker, Horton, Robertson-Wilson & Wall, 2003; Ericsson, Krampe, & Tesch-Römer, 1993). Successfully capturing the essence of expertise therefore requires multi-disciplinary rather than uni-disciplinary approaches (e.g., Helsen & Starkes, 1999). Some multi-factorial models of talent prediction have been proposed for sports such as soccer (e.g., Williams & Reilly, 2000), although these
existing models are frequently limited in two ways. First, the factors within the existing models are generally derived from, and restricted to, existing research and do not tap into the rich sources of information and insight available from experts themselves. Second, many of the skill-based approaches used to measure expertise are not truly holistic and frequently pay scant attention to socio-developmental variables that are increasingly known to be influential on the emergence (or not) of expertise. A growing body of evidence suggests that athletes’ transitions and progressions along the continuum from novices to experts are heavily influenced by their social environments, by the developmental experiences created for participation in play and practice, and by the support provided to assist athletes through key developmental periods.

Côté and colleagues (Côté, 1999; Côté, Baker, & Abernethy, 2007; Côté & Hay, 2002), following investigations of the development of elite Canadian and Australian athletes, proposed a pathway toward elite performance that consists of three distinct developmental stages: the sampling years (childhood; 5–12 years), the specializing years (early-adolescence; 13–15 years) and the investment years (late adolescence; 16+ years). During the sampling years, athletes typically participate in a wide range of sports with the focus being primarily on deliberate play activities (i.e., activities, such as informal neighborhood games like backyard cricket, that have as their principal driver enjoyment and immediate gratification rather than performance improvement and long-term skill acquisition). The specializing years involve engaging in one or two competitive sporting activities, with a focus upon refining sport-specific skills. Finally, the investment years demonstrate a complete commitment to an elite level of performance in the chosen sport. Recent research suggests that the development of expertise through these stages may be facilitated by such things as early unstructured play and practice experiences, participation in a wide array of sports before specialization, and early exposure to playing with and against adults (Baker, Côté, & Abernethy, 2003; Côté, Baker, & Abernethy, 2003, 2007). Being relatively older than one’s sporting peers (e.g., Thompson, Barnsley, & Stebelsky, 1991) and growing up in regions of relatively low population density (e.g., Côté, MacDonald, Baker, & Abernethy, 2006) may also be advantageous.

This study, in working toward the development of a conceptual model of expertise in cricket batting, sought to redress the two main limitations identified in the existing research. Information from batting experts (highly skilled batsmen and elite coaches and administrators), including information in relation to socio-developmental factors, was sourced through semi-structured open-ended interviews. Grounded theory (Glaser & Strauss, 1967) was then used to identify emergent factors conceptualized as critical to the development of expertise. A grounded theory approach was chosen because the study, being largely exploratory in nature, required a methodology that was highly generative, had an inherent freedom to explore situation dynamics and the interrelationships of critical components, and was sufficiently flexible to permit continual redirection of the focus of inquiry to areas of emerging importance. Grounded theory has been used increasingly frequently to study sports development phenomena (e.g., Holt & Dunn, 2004; Morgan & Giacobbi, 2006; Rees & Hardy, 2000) because it meets these requirements.

**METHOD**

**Participants**

Fourteen male participants were recruited through purposive sampling—three adult elite cricketers (EB1-EB3), two adult sub-elite cricketers (SEB1-SEB2), five elite cricket coaches (EC1-EC5), and four experienced cricket administrators (EA1-EA4). The elite batsmen were all either past or current Australian Test and One-day (international) players and had a
cumulative experience of more than 230 (international) test matches and had collectively scored more than 26,000 runs between them. Both the sub-elite batsmen had represented their state at junior level as players and were, at the time of the study, state level junior coaches. The elite cricket coaches all had formal coaching qualifications to at least Level 3 accreditation and were active coaches at the state level in either senior or junior competition, and the experienced cricket administrators were serving on state and/or national cricketing administrative boards in Australia. All the participants provided informed consent and partook in the study voluntarily.

Procedures

A one-on-one, semi-structured, in-depth interview was conducted with each participant either face-to-face (five interviews) or via telephone (nine interviews). All interviews were conducted by the first-named researcher and tape recorded. Interviews were based on open-ended questions developed in advance by the research team and commenced with a simple reminder of the purpose of the study. Elite and sub-elite batsmen were then asked questions relating to their own developmental experiences and what factors either facilitated or constrained their attainment of expertise. Coaches and administrators were asked questions relating to which skill components they believed contributed the most to exceptional batting performance across the ages from under 13 to adult and what factors they believed facilitated or constrained progression to expertise. General questions asked at the beginning of the interview served to initiate and guide the conversation and give the participants an opportunity to acquaint themselves with the interview process. Probe questions were used to elaborate on relevant points serving to enhance “... the interviewer’s understanding of an issue” (Côté, 1999, p. 400) and to promote and encourage the articulation of the interviewee. Follow-up questions were employed to explore new lines of inquiry that emerged from the interview process. In accordance with constant comparative analyses (Strauss & Corbin, 1998), interviews were scheduled so that each interview could be transcribed and preliminary analysis could be completed before commencement of the next interview. This process permitted new issues to be raised, checked, and compared with the next interviewee and provided the researcher with opportunities for developing and revising concepts, categories, and the framework of the emergent theory. A pilot test was conducted to refine the interviewing skills of the researcher and the semantics and order of questions.

Data Analysis

All interviews were transcribed verbatim and grammatical changes were made, where necessary, to improve the flow of the text. Sentence-by-sentence open coding was then performed by the main researcher to draw out raw data themes in the form of quotations from each participant (Strauss & Corbin, 1998). Next, categories and sub-categories that captured the essence of the ideas or concepts being discussed by the participants were created using axial coding with each quotation being placed in the category (or sub-category) that it was deemed to best fit. Coding continued until theoretical saturation occurred, a point where no further properties, components, or relationships emerged from data collection and analysis (Strauss & Corbin, 1998). Following the completion of coding, conceptual models depicting the “hierarchical synthesis” of the emergent higher order categories (representing each major factor/skill component) and lower order categories (representing relevant sub-components), and the inter-relationships between them, were developed in the form of computer-generated mind maps. Finally, a global, multifactorial model incorporating each of these critical factors and skill components, and depicting the inter-relationships between them in the form of a
Two methods were employed to ensure the trustworthiness of the output from the data analysis process. First, throughout the research process, the main researcher used a journal to record observations, ideas, questions, and decisions provoked by the data. Second, research group meetings were held periodically, where the main researcher presented interview results. Extensive quotations from participants highlighting emergent themes and a summary of the main researcher’s conclusions were presented and reviewed by the group to confirm that the themes and quotations were representative and accurate.

RESULTS

A grounded theory that encapsulated skill components and factors critical to the development of expertise emerged from the data and is presented in Figure 2. This figure highlights key factors that contribute to the development of expertise in cricket batting and influence the transition from “cricket scholar” (the aspiring player eager to further his cricket education) to “expert” (the established international player). Successful progression along the pathway to expertise was seen to depend on the co-existence of five key factors, the developments that are inter-related and inter-dependent. These key factors, each necessary but individually not sufficient to ensure the emergence of expertise, are:

1. The presence of a stimulating and supportive socio-developmental background providing a strong base of support from family and peers, easy access to resources for play and
practice, and conditions conducive to a vast investment in observational learning, creative and competitive deliberate play;

2. Favorable psychological attributes including a strong self-belief and confidence, mental toughness and resilience, intense work ethic, preparation, and a high level of self-regulation (including the use of performance routines and rituals);

3. Well-developed visual-perceptual/anticipatory skills (i.e., the ability to use early, pre-release cues from the bowler’s delivery action to accurately predict, in advance, the type and length of delivery about to be bowled);

4. Proficiency of technical skill characterized by optimal balance, excellent manipulative skill with the bat, proficiency of front and back foot shot execution, and speed of foot movement and bat downswing; and

5. The presence of strong intrinsic motivators in the form of fun and enjoyment, self-challenge, desire to be the best, love and passion for the game, and camaraderie, ensuring a strong, ongoing commitment to practice, competition, self-challenge, and self-improvement.

Within the model, a favorable socio-developmental background provides grounding for the development of cognitive, perceptual, and technical skills and a strong and unwavering intrinsic motivation underpins progression along the developmental pathway to expertise. Biological immaturity, sub-optimal junior sport experiences, and limits on free play during the developing years are identified as factors that can constrain development and prevent the emergence of adult batting expertise. In the sections that follow we elaborate on each of the factors within the grounded theory, using illustrative quotes from the participants.

Socio-Developmental (Contextual) Factors

The presence of a stimulating and supportive socio-developmental environment was considered by the participants to be critical to the development of interest and subsequent commitment to the sport.

Parental Support and Encouragement

Parents, in particular, were considered to play a critical role in socializing their children into sport and in presenting an environment that engagement in sport was not only possible but also valued. EB1 offered the following quote:

My dad was a very good sportsman, he played state baseball and he played Australian rules football, played A grade cricket . . . they [parents] were always brought up around sport, they loved sport themselves . . . so maybe it was just that they could see the benefits or they could see it was making me happy and my brothers happy.

Parental valuing of sport also facilitates early play and participation. As EB2 remembered: “As long as I can remember dad always encouraged us to be playing with a bat and a ball and probably was throwing balls to us as soon as we were capable of handling them.” Parents assist with provision of not only emotional support for early engagement with sport but also provide many of the resources essential for both play and practice. EB1 recalled: “In the first house we lived in dad actually built a cricket net . . . for us . . . it was a full sized cricket pitch that was made of concrete and had steel netting around it.”
**Access to Resources for Practice & Competition**

The sampling years of the expert batsmen were characterized by adequate time and easy access to resources for practice and play and the presence of a favorable learning environment in the form of competition from siblings and friends that helped foster the development of important psychological attributes such as competitiveness, strategizing, coping, and mental toughness. EB2 recounted, “Most of our spare time we’d just meet up at the park or all the kids would come around to our place because they knew we’d be playing cricket.” EB2 further suggested that:

I think the most important thing really in the whole development process was the backyard test matches [test = label for an international match], the test matches in the street or in the park or down the beach with our mates, that’s where we learned to compete . . . Having an older brother, I had to learn to compete with him . . . I had to struggle to keep up there and those coping skills that I learned at that stage were absolutely critical for what happened later on. [EB2]

**Investment in Creative, Competitive Play**

The participants indicated that they believed a vast investment in unorganized play in the sampling years was important for fostering the creativity, problem-solving ability, and adaptability fundamental to later sporting success.

We didn’t play a lot of organized cricket, we organized our own cricket . . . we knew there’d be guys down at the park. It wasn’t like mum or dad had to get us to the ground by nine o’clock in the morning otherwise we couldn’t play and you had to be part of a team and you had to have a coach and you had to do as you were told. We (just) wanted to . . . be allowed to do our own thing, make up our own rules. [EB2]

A vast investment in deliberate play is also thought to foster self-discovery and self-discipline—finding solutions to problems and working on mistakes. The experts typically reported creating their own challenges to test their skills and physical capacities. As EB2 recalled:

We had a slat fence with upright posts and beam supports . . . if I hit it between the beams it was runs but if I hit under the beams or over the top beam it was out, or if I hit the uprights it was out, so they were my fielders. The challenge was to see how much of a risk I could take, the most runs were scored in the hardest areas.

Deliberate play in the formative years was characterized by innovation and experimentation. Experts typically challenged themselves by using bats with smaller surface areas, balls with variable bounce characteristics, and tasks that required creative shot execution. As EB2 explained:

You’d be playing with a hard ball in the backyard and around the park but on the road when you’re playing with tennis balls or other sorts of composite balls or down at the beach we’d often shave one side so it’d swing. If we were down the beach we’d dunk it in the water so that made it a bit heavier and . . . that’d make it fly a bit differently.

It was considered by the participants that these innovations help with the development of the exquisite hand-eye coordination and interceptive skills needed for batting.

A prime concern for most of the interviewees was the societal changes that have resulted in reduced access for current generation children to safe and stimulating play environments.
and leisure time. Societal constraints such as these were perceived as a real threat to the
development of future, talented cricketers. EB3 talked about the rise of litigious thinking and
how free play in parks was being progressively and unnecessarily reduced by safety concerns:

I think back to my youth, we were able to go down to the park and once it got dark we had to
come home. . . Now, I would never let my kids do that now because you’re always worried
about [their safety]. . . [Now] parents supervise their children and this may impact on a child’s
freedom to play, explore, and problem solve.

Reduced access to resources of play equates to more reliance on parents to set up play
opportunities, yet contemporary lifestyle equates to more distracters, less spare time, and
more structure.

Well, society’s changed . . . the spare time is less, the commitment to other things is greater . . .
the kids are doing extra work, going to private colleges [schools] to be tutored so that they get
better results so they can go to university. That sort of pressure wasn’t around in my day. [EB2]

Some of the participants suggested that excessive reliance on others to provide feedback
may affect learning of skills such as problem-solving, adaptability, and self- monitoring that
typically emanate from free play experiences. As SEB2 observed:

Children in sport are relying fairly heavily on coaches’ feedback and not learning—because
they’re getting coached from a young age they’re getting the coaches’ feedback all the time
and then they get into a competitive situation, the coach isn’t there and they haven’t got that
feedback source.

Too much early structure in sports participation can also affect fun as EB2 lamented:

We’re putting kids off . . . we’re boring them to death, and I saw it with my boys. . . They
were in the classroom all day and then they’d come out and go to sports training . . . and it
was like the classroom all over again, someone was telling them how to do it, when to do it,
why to do it, what to do, making decisions for them. . . We’ve got to stop trying to structure
and do an assembly line production, we’ve got to get kids out there stimulated and having fun,
encouraging them to learn to compete and learn to enjoy the contest. If they don’t enjoy the
contest they’re going nowhere.

**Participation in Other Sports Before Specialization**

It was noted that expert batsmen generally had participated in a variety of other sports
before opting to devote their efforts exclusively to cricket. The expert coaches were of the
view that an early investment in other sports, particularly interceptive sports, before cricket
specialization helps foster the development of the hand-eye coordination, spatial awareness,
and movement adaptability needed in batting. EC1 opined: “I think at the under-13 level, it’s
really important that they play as many sports as they can . . . It multi-skills them and develops
a lot of different senses and a lot of different aspects to their skill work.” EC5 explained:

In the terms of hand-eye coordination, speed, agility, knowledge of game . . . of skills required,
. . . of opposition, you learn that in every sport . . . Where you may not be picking it up in one
sport you may actually pick it up in another.

EB2 attributed a portion of his batting skill to concurrent experience in baseball. He said of
baseball:
It was still a hand-eye coordination game, bat and a ball, slightly different but they were similar enough to be worthwhile, training similar skills. If anyone would bowl me a full toss in cricket [a full-pitched delivery that does not bounce] it was never a problem because I faced full tosses all through the winter with baseball.

**Role Models & Observational Learning**

The batting experts were characterized by their vast investment in observational learning, spending hours diligently observing the game of cricket either by watching a game live or on television and then attempting to imitate the technique and mannerisms of their batting heroes. EB1 revealed that modelling of other expert players is a strategy he continued to use even when he himself was an elite player:

> When you watch guys like Brian Lara [former West Indian batsman] or Sachin Tendulkar [current Indian batsman], Ricky Ponting [current Australian batsman and captain], you just pick up little things. I remember clearly I scored a test [international] hundred … and I think it was at that stage the third fastest ever hundred by an Australian test batsmen … and I was actually [imagining] I was Brian Lara.

**Demographic Effects**

Consistent with emerging empirical evidence from other sports (e.g., Côté et al., 2006), the participants in this study also identified developmental advantages for players who grew up outside of major metropolitan areas. EA1 observed:

> It’s fair to say that players from regional areas, or from the bush [rural areas], are less likely to be structured players. They’re likely to have had an opportunity to practice and learn a whole range of things and are uninhibited in the way they play … they’ve probably had a spare street to play in or an uninterrupted backyard; they’re not living, as a certain number of kids are, in home units or in a residential block or townhouse.

EA3 concurred, noting that:

> A lot more of the better sportsmen will come from the country because they’re still able to play after hours in a fun environment. Everything has to be very constructed in the city … Over the last 10 years, we’ve probably had two-thirds to three-quarters of players all up that have actually come from the country originally.

**Timely Exposure to Competition with Adults**

The development of batting expertise may also be facilitated by early exposure to playing against adults. EA3 noted that:

> … in the country you’ll have 11s and 13s playing together, you’ll have 13s and 15s playing together, because … of the lack of numbers … You wouldn’t find too many 15 year olds in the country that aren’t playing senior cricket, whereas that’s not the case in [the city where], those 15-year-olds would still be playing within their peer group.

EA1 concurred:

> I believe the reason why someone like Steven Waugh [former Australian test captain] progressed, matured, hardened, and tempered was because he played men early … By the time
someone turns 17 they need to be playing adults and beginning to learn tactics and tricks. . . .
That early adult exposure is a competitive advantage . . .

Many believe that school-based structures that use strict aged-based competitions and restrict the competitive experiences against adults hamper the successful transition of talented juniors into adult competition.

Schools are not releasing talented juniors to play grade cricket . . . they're not getting challenged and they're learning to play in their comfort zone . . . I just see lads that come back [to club cricket], their mental skills are ordinary and they find it very hard to get out of that comfort zone, they start failing and then they start to lose enjoyment that means they then start to question whether they want to play the game, or pursue the game to a high level. [SEB2]

The whole time [my older brother] was in the first XI [top team] at [school] they played B-grade cricket, most of the time I played there we played B-grade cricket . . . [My younger brother] went to the same school but they played in the student’s grade so he didn’t have that extra challenge at that vital stage of his development . . . He was an outstanding cricketer in the students’ grade, but what he needed at that stage [was] to be forced to do more. [EB2]

**Biological (Im)Maturity**

Different rates of biological maturation were thought to pose different problems for the developmental pathway to expertise. For “early maturers” the concern was that early success could be attained almost exclusively on the basis of the physical advantages accruing from early maturation without the incentive for concurrent development of the many other components of batting skill necessary for success in the sport as an adult. Conversely “late maturers” may struggle to gain early success in the sport because of being physically disadvantaged compared to their peers and this could seriously erode self-confidence and the likelihood of persisting in the sport. As EC3 explained:

Cricket’s all about opportunity, it’s a pretty tough road for kids coming through. It’s very result-driven and if you’re not scoring runs then you don’t get looked at and it doesn’t matter what age you are. So I think it’s a bit of a trap that coaches in particular fall into. They just choose the kids purely on what they see now.

Similarly EC5 offered the view that “. . . there’s . . . a honeymoon period where early on your physical size can actually help you. When you get older and everyone else catches up [physically] . . . then if you haven’t learned those skills that they have then they’re going to go past you . . .”

**Psychological (Cognitive) Factors**

It was strongly acknowledged by the interviewees that becoming an expert in batting requires a favorable mix of psychological characteristics although uncertainty was expressed as to whether or not some of these essential attributes were trainable or not.

You can teach the perfect backlift, the perfect follow through, the perfect footwork, the perfect technique, but that won’t necessarily guarantee final results. Why do some blokes [guys] with less than perfect techniques produce the statistics at the end? I think the mental approach is really important, but how you teach that, that’s a toughie, because sometimes you’ve either got it or you haven’t got it. [EB3]


**Self-Confidence and Dominance**

One psychological component considered to be particularly important to expert batting is a strong self-belief and self-confidence and the influence this can have not only on the player’s own performance but also that of opponents.

I remember playing against [a great international batsman] in a club game once and he walked out to bat and you just felt, ‘What am I doing here?’ The body language is just so confident that he creates pressure on the fielders, and there’s uncertainty . . . their body [is] presenting their thinking, and that’s they’re not going out there to fail, they’re going out there to succeed, to dominate, to be aggressive. [SEB2]

The essential mix of psychological skills necessary for success as adult batsmen is undoubtedly shaped by players’ developmental experiences and the socio-cultural contexts in which they grow up. Early success fosters early development of self-confidence.

It’s important for juniors growing up to be successful within their own age groups, it teaches them success, how to be good . . . I’m not necessarily all for fast tracking [because] the player’s going to go into a situation where he’s only mediocre . . . that can teach mediocrity . . . they forget how to be successful. [EC1]

Positive reinforcement and encouragement from peers greatly affects self-confidence and, for developing players, can have a major effect on how successfully the transition from youth to adult cricket is achieved. EB1 remembered:

One of the huge things for me back then was just the fact that I got selected at a young age, and . . . the fact that people had encouraged me and shown some faith in me . . . there were some amazing blokes [guys] playing, so for them to . . . select me in their side [team], that was a huge confidence booster.

Conversely, not being technically, psychologically, and emotionally prepared and confident for the transition from junior cricket to first grade and beyond was identified by many of the interviewees as a major developmental constraint. As EC2 explained:

[Young players] need to have that self-confidence in themselves that they know that they are capable of going out to play at this level. . . . They may be champion players at under age level and they enter the adult team too quick and they can’t cope . . . they’re under pressure all the time.

Lack of self-belief, confidence, and “single-mindedness” were thought to be particularly limiting factors and again, in significant part, a product of inappropriate junior developmental experiences. SEB1, one of the sub-elite batsmen, said, on reflection:

What I don’t think I did enough, was talk to the opposition or talk to senior players . . . I felt inferior. I couldn’t go up to [an experienced test player] and talk about cricket. If I’d known then what I know now I’d just go up and ask ‘Can I talk to you about cricket?’ . . . I felt they were unapproachable, they were legends of the game and I didn’t know how to do it and I should have done it.
Mental Toughness and Resilience
A second attribute considered by many of the participants as essential was mental toughness or resilience, developed through accumulated experience. EA1 noted:

Mental toughness is by my assessment clearly the distinguishing feature of those who ultimately play at the elite level. . . . I think mental toughness is something that actually comes as a result of experience, so to be mentally tough at 13 is not appropriate because it’s experiential.

Being resilient in the face of adversity and setbacks is thought to either stem from, or is built by, mental toughness. EC2 said:

To me they’re your better players, the ones who get there, have a crack, miss out, come back excited going, ‘I know what I’ve got to do’, prepare themselves, work out their game and they have a lot of success . . . they’ll stay there for a long period of time for you, whereas sometimes you’ll get the real talented player and he’ll get there, have a flip around and you don’t see them again.

Work Ethic and Preparation
The willingness to make sacrifices and to view positively the sheer amount of practice needed for success were also noted by a number of the interviewees. In reference to a particular elite batsman, SEB2 observed:

He doesn’t see hurdles, he sees those things differently. A lot of people look at sacrifices and they focus on what they’re missing out on instead of what they’re going to gain . . . the more you want to achieve the bigger the sacrifice.

EB1 suggested that “I just think it comes down to hunger, simple as that, and with hunger comes the willingness to make sacrifices, the willingness to work harder on your technique, physically getting stronger and fitter”. Participants also noted that many skilled batsmen also are well-organized and adept at compartmentalizing, and time managing different facets of their lives. One of the experienced administrators in the sample (EA3) noted that “We’ve got players that are duxes of the school [high academic achievers] that have been able to actually balance their life to do both because they are driven, dedicated people, they’ve been able to compartmentalize each part of it.”

Concentration and Attentional Control
The development of regulatory and preparatory routines and rituals to help self-regulate and achieve optimal concentration and attentional control also appears to be a psychological attribute common to successful batsmen. Having a successful routine that included pre- and post-ball rituals, self-talk using cue words, visualization, relaxation, and breathing techniques was of prime importance for all of the elite batsmen included in this study. All three expert batsmen confided that they relied on their pre-ball routines to optimize their physical relaxation and heighten their focus/attention. EB1 said “. . . my routines are crucial. . . . Whether I’m playing test [international] cricket or state cricket or club cricket, charity cricket, I tend to do the same thing all the time . . . ultimately my routines are about making me feel as relaxed as possible physically”.

EB1 verbalized his full routine:
Well, in the lead-up, I mark my crease, I turn towards the stumps, I mark my crease, I tap my right foot about three or four times on the toe, then I turn around and I tell myself to have my arms either as loose as possible or whatever I’ve actually been working on at the time. . . . I get that right to start off, then I tell myself ‘play straight, play straight’ or the other one I might use is ‘be sharp, be sharp’. I do this until it gets to the point of delivery where all my intention, all my focus goes on him [bowler] letting go of the ball.

Regular preparatory routines may assist concentration on critical cues and, equally important, avoid the distractions of irrelevant cues. As EB1 explained, “That’s the whole key to try to master concentration, to be able to cut out all the distractions and to see the ball out of the bowler’s hand”. EC2 observed in relation to expert batsmen:

I think they’re so good at being at their peak of concentration at release [when the ball is bowled]. . . . The important thing to me is that the batter at the ball release is thinking about absolutely nothing and responds to the bowler’s ball trajectory, the line of the ball, just the red dot that you see that makes a line as it comes to you.

**Visual Perceptual (Anticipation) Skill**

The participants regarded the ability to anticipate the bowler’s delivery as a key factor in exceptional batting. As EA3 said, “In cricket we talk about people having a lot of time, and that’s what I reckon it comes back to, that they’ve actually identified, . . . they’ve actually anticipated, which gives them the time.” There was some variance in opinion as to what cues are best used to help anticipate the bowler’s intention. EB2 offered the following:

I focussed on the bowler’s face as he ran up and as he got into the delivery stride the focus would then go to the area where the ball was going to come from. It was a fierce focus in the sense that it was narrow but it wasn’t fierce in the sense that it was forced, it was a relaxed focus. Most of the information I picked up from peripheral vision, just seeing the bowler’s body language and the way he loaded the body up to bowl gave you clues as to what was likely to come, and then that was confirmed by being focused on the ball as it left the hand. The way it came out of the hand, the angle . . . then gave you the final information that allowed you to launch into the area that you wanted to intercept the ball.

Other participants also noted that much of the anticipatory skill of experts occurs largely below the level of consciousness. For example, EB1 indicated “I’m not really sure what I watch, to be honest, but my main cue is to see the ball out of the bowler’s hand.”

Importantly, it was acknowledged that anticipation is an accumulated skill, developed and enhanced with exposure, experience, and familiarity with particular bowlers. As EB2 noted, “Most bowlers were fairly predictable and the more you played the more information you had to work with. EB3 said:

You’re always looking for little triggers . . . as much information as you can gather before he actually lets the ball go either through previous observation, watching tapes or whatever . . . does he do certain things in his run-up that’s going to give away whether he’s going to try and bowl an outswing or inswing, a short ball etc.

**Technical (Motor) Skill**

Amongst the participants there was a general consensus that an expert batsman requires superior technical skill and that this includes optimal balance and stability through shot
execution, supreme hand-eye coordination and manipulative skill of the bat, versatility and creativity in shot execution (typified by proficiency in playing shots on both the front and back foot and on both sides of the body and the ability to execute a shot to enforce a change in tactics and field placement), the capability to generate high bat velocity in the downswing, and the possession of fast footwork. EB1 noted that “... while everyone talks about how [cricket] is such a mental game ... you can never under-estimate how important it is to have a good technique and to work hard at it.”

**Intrinsic Motivators**

The progression from being interested in cricket as a youngster to being an elite, world-class batsman is clearly dependent upon preservation of high levels of motivation over an extended period of time. Although some external motivators are present, the emerging view amongst those interviewed was that it was intrinsic motivators that were essential for continued progression of players along the developmental pathways to expertise. EC2 noted, “I’m sure it’s not the money that actually drives them ... It’s this personal pride of the player to perform at the top level and for him to achieve.” Fun and enjoyment from playing the game, ongoing pursuit of the sense of achievement, a passion for national [Australian] representation, and camaraderie were all identified as key intrinsic motivators by those interviewed.

All three elite batsmen were adamant that what kept them in the game was their abiding love and enjoyment of the game. EC3 observed, “I think there’s something inside them that just finds that, to go out and play and practice and hit balls around, [is] more fun to do than anything else, or more challenging and that drives them ...” EB3 said, “You just did it because you enjoyed playing the game, enjoyed the competition, enjoy trying to get better, enjoyed all the process.” EB2 agreed:

> What kept me out there from 7:00 in the morning until dark wasn’t anything else other than absolute love of what I was doing. I was emotionally involved. I’d been captivated and captured by the challenge of the sport ... I didn’t realize I was working that hard, I just thought I was having fun ... but if I hadn’t been captivated by it I wouldn’t have been there.

The goal of playing for their country and wearing the national colors (the coveted ‘baggy green’ cap) was also a strong motivator for many of the players, although arguably not an intrinsic one. EB1 said “I remember clearly, Dennis Lillee [former Australian fast bowler] bowling that last ball at Viv Richards [former West Indian batsman] and thinking how great it’d be to play test [international] cricket, and wear the baggy green cap.” A number of those interviewed also noted that one of the things that kept them involved in the game for an extended period was that the sport was a vehicle for forging relationships with like-minded people and sharing common goals. As EC2 explained “… games are built around the social fabric of the team ... that’s why we play ... I’m sure the camaraderie and the fun and the enjoyment they get out of achievement is very important.”

The participants also identified motivational issues as being central contributors to the non-advancement of many promising junior batsmen. The interviewees noted that ‘talent’ is no guarantee of adult success or longevity in cricket; sustained success requires the presence of strong intrinsic motivators such as a genuine sense of enjoyment from committed participation in the sport. As EB3 put it, “I was pretty good, but my mate ... he might have been just as talented but not as driven.” Competing interests (e.g., study, travel, employment, family responsibilities) taking precedence over cricket is one of the major reasons promising players opt not to continue high level commitment to practice and the pursuit of expertise.
DISCUSSION

The purpose of the current study was to use multiple perspectives from credible sources to explore the development of expertise in cricket batting. The findings of this study support the contemporary notion that expertise is inherently multi-factorial (Bailey & Morley, 2006) and accordingly is most appropriately analyzed using a multi-disciplinary approach. Participants felt that batting expertise is the end product of the successful interaction of a complex array of dynamic and inter-related socio-developmental, psychological, perceptual, and technical factors. Intrinsic motivators, such as fun and enjoyment, were identified as critical at each and every stage of the developmental pathway in ensuring the players’ persistence in the sport as well as their progression to expertise.

From the participant interviews a grounded theory was formulated to promote further inquiry and guide the review and modification of current coaching practices and policy relating to player development. Consistent with emerging evidence from expertise in other team sports (e.g., see Côté et al., 2007), this theory highlighted how critical socio-developmental context is to laying the foundations for the development of cognitive, perceptual, and technical skills and future expertise, with the importance of familial support (Kay, 2000), encouragement, and access to resources to foster creative play and problem solving emphasized by those interviewed. Consistent with existing experimental evidence from cricket (Müller et al., 2006; Stretch et al., 2000), skills related to movement technique and anticipation were also regarded by the participants as being crucial for batting excellence. Psychological attributes, in particular mental toughness, commitment, and the ability to cope with progression around the critical transition from junior to adult competition, were also accorded high importance. Mental toughness or resilience has also been previously reported as a critical psychological competency for success in other team sports (Holt & Dunn, 2004) as has unwavering commitment (e.g., Scanlan, Russell, Beals, & Scanlan, 2003).

A collection of factors, again multi-disciplinary in origin, that account for the non-advancement of many promising junior batsmen to adult expertise were also identified. In addition to the loss of suitable intrinsic motivators to preserve player commitment to the pursuit of expertise, antecedent conditions in the socio-developmental backgrounds of players were also considered significant. Knowledge of these constraining factors is obviously important in guiding modification of existing practices and current policies in cricket relating to optimizing the developmental pathways of future batsmen. Of particular interest, was the negative effect that contemporary society was perceived to place on developmental play and the ramifications such constraints may have on the development of future talent. Reduced access for children to safe and stimulating, play environments and leisure time may act to constrain creativity, adaptability, and problem-solving ability and ultimately deleteriously affect perceptual, cognitive, and motor development. The potential for early talent to be confused with early maturation, lack of appropriate progression with restriction to under-age competition, lack of self-belief and confidence leading to a poor transition to adult competition and competing interests and distractions were also considered to constrain progression toward expertise.

The grounded theory suggests a number of immediate practical considerations for the sport itself. The theory suggests, inter alia, that there is a need to: (i) nurture young players by
maximizing their opportunities for creative play and observational learning; (ii) encourage participation in fun, early, unstructured play to facilitate problem solving ability and hand eye coordination; (iii) encourage early participation in “compatible” sports (i.e., open, interceptive sports such as baseball and softball) for transference of technical and anticipatory skill to cricket; (iv) allow freedom for emerging players to observe, problem solve, and develop their own batting styles without undue intervention and convention; (v) recognize that different rates of biological maturation create the potential for talent to be confused with early maturation; (vi) make possible play and practice opportunities against adults and not simply peers of comparable age, and; (vii) explicitly recognize the importance of accessibility to positive, encouraging mentors. Having effective social networks of support appears just as important in supporting cricket success as it is in promoting success in other sports (e.g., Holt & Dunn, 2004; Rees & Hardy, 2000). The importance of intrinsic motivation in the form of enjoyment and mastery for sustaining the level of practice necessary for expertise to develop was highlighted in this study. Clearly, ensuring these aspects are to the forefront in the design of junior sports systems is paramount for these systems to be successful.

In relation to psychological skills, the findings highlight the importance of self-regulation, preparation, concentration, and attentional control to elite performance and suggest that coaches, with the assistance of sport psychologists, should encourage batsmen to adopt effective regulatory and preparatory routines (e.g., pre- and post-ball rituals). It appears that a favorable mix of socio-developmental factors coupled with accumulated sport experience may augment the development of mental toughness and ultimately expertise. Further research is required to ascertain whether mental toughness can be fostered at an early age through psychological training. The transition from junior to adult competition was shown to be a critical step to expertise. To foster successful transition into adult competition, it is imperative that batsmen are technically, psychologically, and emotionally prepared, because a negative experience will have enduring effects on their confidence and belief.

As Morgan and Giacobbi (2006, p. 311) observed, “Grounded theories serve as starting points for future research and provide a working framework for researchers to add, modify and examine.” A key outcome of this study is the derivation of structured information, in the form of a grounded theory, that can help guide future multi-factorial investigations of expertise in this and related sports. Although a number of the factors considered as critical for expert performance in batting are ones that also emerge in models of talent identification from other sports (e.g., see Williams & Reilly, 2000), it is noteworthy that the physiological and anthropometrical factors that frequently dominate models of “talent” in other sports were not considered of great importance for cricket batting. Rather than making assumptions as to what components and sub-components should be included, exploratory, inductive analyses of the type employed in the present study allow conceptual models of expertise to be developed that identify only those skill components and sub-components, from among the myriad of such components, that are of high probability of being important. It is these components that can then be justifiably subjected to more detailed, traditional types of experimental analysis. Having identified those components considered critical for expert performance, our next steps are to experimentally confirm the importance of the identified components and to then ascertain their relative contribution to skilled batting performance at different developmental stages.

REFERENCES


