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A Personal Construct Psychology Perspective on Sport and Exercise Psychology Research: The Example of Mental Toughness

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Personal Construct Psychology (PCP) (Kelly, 1955) is a theory that, rather than telling us *what to think*, tells us *how* we can go about understanding what we think. It presents a framework within which we, as researchers, practitioners, and people, can understand and appreciate how other people theorize about their worlds; it is a theory about theories. Over the years, PCP has been applied extensively to a range of areas subject

to psychological inquiry, including clinical settings (Winter, 1992), nursing (Costigan, Ellis, & Watkinson, 2003), education (Pope & Denicolo, 2001), forensics (Horley, 2003) and politics (Stojnov, 2003). However, with the exception of investigations involving Butler's (1991) performance profiling technique, researchers in sport and exercise psychology have largely ignored PCP. The main purpose of this chapter, therefore, is to provide a PCP framework

for studying psychological variables in sport and exercise settings. In doing so, we hope to illustrate the usefulness of PCP as a framework for the design of empirical research in sport and exercise settings, and provide a PCP theoretical base for interpreting the data from such research. The example of mental toughness was chosen as the illustrative example for this paper because the research to date on this topic has not been linked to any theoretical framework. While Jones, Hanton, and Connaughton (2002) mentioned that their research was based on a general framework of PCP, no clear link was presented to specifically demonstrate how the theory guided their research.

Following a brief overview of mental toughness research in sport, both the repertory grid and performance profiling techniques are discussed, and a model of the PCP experience cycle is described. The chapter concludes with an illustration of how PCP can be employed for understanding and developing any psychological phenomenon in sport and exercise settings. The essential components of PCP, presented in Table 1, are discussed throughout the paper, highlighting their relevance to the research agenda.

Mental Toughness in Sport

Within scientific and coaching communities, mental toughness is acknowledged as being one of the most important psychological attributes in achieving performance excellence (Bull, Shambrook, James, & Brooks, 2005; Fourie & Potgieter, 2001; Goldberg, 1998; Gould, 2002; Jones et al., 2002; Middleton, Marsh, Martin, Richards, & Perry, 2004a). Most individuals use the term implicitly, and accordingly scientific literature contains a plethora of widely differing definitions of mental toughness; without a general consensus as to its meaning, the term serves to complicate rather than clarify discussion (Jones et al., 2002). Moreover, until several recent qualitative investigations (Bull et al., 2005; Fourie & Potgieter, 2001; Gould, Dieffenbach, & Moffett, 2002; Jones et al., 2002; Middleton et al., 2004a; Thelwell, Weston, & Greenlees, 2005), much of what was known about mental toughness was based on anecdotal reports.

Studies by Jones et al. (2002) and Middleton et al. (2004a) were specific attempts to elucidate an understanding of mental toughness within their

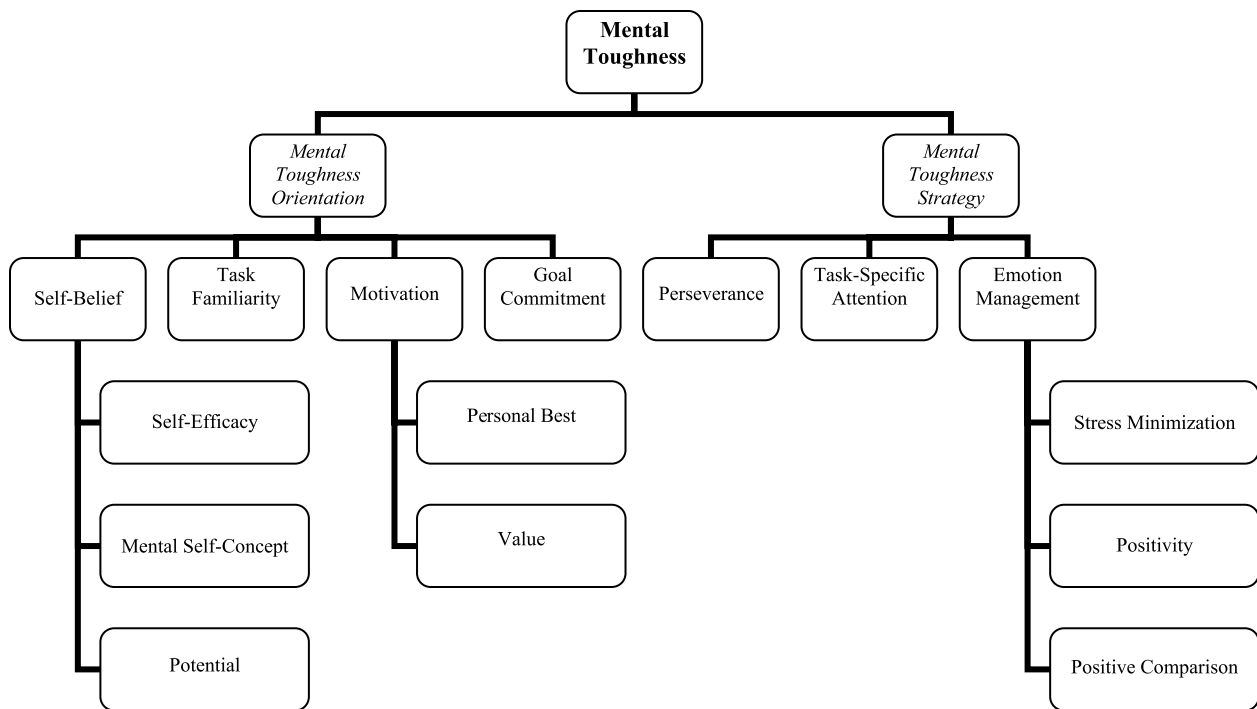
given cohorts. These investigations with athletes and coaches provided some insight into the complexity of the concept and provided definitions of, and characteristics essential to, mental toughness. Jones et al. (2002) provided this definition:

Mental toughness is having the natural or developed psychological edge that enables you to: Generally, cope better than your opponents with the many demands (competition, training, life style) that sport places on the performer. Specifically, be more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure (p. 209).

They also identified 12 attributes as keys to mental toughness: an unshakeable self-belief to achieve competition goals; an unshakeable self-belief in their unique qualities that make them better than the rest; an insatiable desire to succeed; the ability to bounce back from set-backs; to thrive on pressure; to accept anxiety as inevitable; to not be affected by performances of others; to remain focused despite personal issues; to switch sport focus on and off as required; to remain focused despite competition issues; to push physical and emotional pain boundaries while maintaining technique and effort; and to regain psychological control following unexpected or uncontrollable competitive events (Jones et al., 2002).

Middleton et al. (2004a), however, asserted that the Jones et al. (2002) definition was inadequate as it only described the outcomes of being mentally tough and did not define mental toughness itself. Based on their qualitative research, these authors concluded that mental toughness is “an unshakeable perseverance and conviction towards some goal despite pressure or adversity” (p. 6). They also identified 12 key mental toughness characteristics, which included *self-efficacy* in your ability to achieve in a chosen sport; a strong and positive *mental self-concept* with regards to dealing with adversity; believing in your own *potential* and capacity for growth and development; *task-specific attention* whilst being able to block out distracting or negative thoughts; *perseverance* in the face of adversity; *task familiarity* and understanding adversity; intrinsically motivated

Figure 1. Adapted with permission from Middleton et al.'s (2004a) proposed Model of Mental Toughness.



to achieve personal bests; *task value* in the quality and success of performance; intellectual and emotional goal commitment; *positivity* when faced with adversity; *stress minimisation* when under pressure or adversity; and *positive comparisons* with your opponents in coping better with adversity. Middleton et al. went one step further and proposed a model of mental toughness (Figure 1) that is both multidimensional and hierarchical, attempting to capture the complexity of this concept with greater specificity. This model separates mental toughness into *orientation* and *strategy*, with further distinctions emphasizing factors that are actions (coping strategies, focusing of attention) and personal characteristics (self-beliefs, motivations). The authors argued that their definition and model illustrate not only what mental toughness is, but also what the actions of mental toughness are (e.g., emotion management, perseverance, and task focus), together with the role of some of the factors that orient individuals to be mentally tough (e.g., self-belief, determination, commitment, attitude, and task familiarity).

Middleton and colleagues have also developed a Mental Toughness Inventory (MTI) based on their definition and model, which encompasses 13 factors in total. These include the 12 components of mental toughness mentioned previously, plus a global mental toughness measure (Middleton, Marsh, Martin, Richards, & Perry, 2004b). The inventory was piloted at a specialist sports school in Sydney, Australia, with 279 male and 200 female athletes between 12 and 19 years old. The MTI showed good reliability and the measurement model was supported in a confirmatory factor analysis.

Research by Bull et al. (2005) focused specifically on mental toughness in elite cricket. They sought to gain a better understanding of how mental toughness is conceptualized in that sport, and to determine how players developed the qualities of mental toughness. Twelve English cricketers identified by 101 coaches as being among the mentally toughest during the previous 20 years were interviewed. Analysis of their 1:1 interview transcripts identified four themes, which were subsequently

used to disseminate findings among England's cricket coaching and playing population. The first theme, *environmental influence*, provides the foundation for the development of mental toughness. In the formative years, parental influence and childhood background were identified as the primary contributors together with secondary factors such as needing to "earn" success, having opportunities to survive early setbacks, and being exposed to foreign cricket. Having a *tough character* was the first of three themes focusing on the individual player, and included common personality characteristics such as resilient confidence, independence, self-reflection, and competitiveness with oneself as well as others. The third theme of *tough attitudes* was considered an important component for the successful exploitation of tough character. These attitudes include a never-say-die mindset, a go-the-extra-mile mindset, thirst for competition, a belief in making a difference, exploiting learning opportunities, a willingness to take risks, a belief in quality preparation, the determination to make the most of ability, and the tendency to self-set challenging targets. The final theme of *tough thinking* relates to cognitions most desirable in and around competitive events, such as clear thinking (e.g., good decision-making, keeping perspective, honest self-appraisal) and robust self-confidence (e.g., overcoming self-doubts, feeding off physical conditioning, maintaining self-focus).

The most recently published research into mental toughness was conducted by Thelwell et al. (2005), who focused on professional soccer and aimed to confirm the definition of, and attributions for, mental toughness identified by Jones et al. (2002). In Study 1, interviews with six international soccer players suggested general consensus with the Jones et al. definition. The sole variation was that mentally tough soccer players should always cope better than their opponents with the demands of soccer rather than generally cope better. The attributes of the mentally tough soccer player, identified in Study 1, also closely resembled those provided by Jones et al. In Study 2, 43 male professional players with first team playing experience ranked the 10 attributes associated with mental toughness in descending order: Having total self-belief at all times that you will achieve success; wanting the ball at all times (when playing well and not so well); having the ability to react to situations

positively; having the ability to hang on and be calm under pressure; knowing what it takes to grind yourself out of trouble; having the ability to ignore distractions and remain focused; controlling emotions throughout performance; having a presence that affects opponents; having everything outside of the game in control; and enjoying the pressure associated with performance.

As the first published sport-specific research on mental toughness, the previous two studies represent significant contributions toward achieving a context-rich understanding of the phenomenon. At a practical level they also provide some useful insights into how to develop mental toughness among young cricketers and soccer players. Clearly, however, the conceptual ambiguities acknowledged by all previously mentioned researchers still exist. In other words, mental toughness in sport remains an intuitively attractive yet poorly understood concept that requires considerably more research attention.

Personal Construct Psychology (PCP): The Experience Cycle

The root metaphor that Kelly (1955) employed for his theory of personal constructs was "man-the-scientist" (p. 4). He saw human beings as "forms of motion" (p. 48) constantly engaged in actively describing and evaluating the phenomena they experience by developing and maintaining internal representations (called *personal constructs*) so that they may anticipate and predict what will happen in the future. *Construing* is the term Kelly coined to represent this interpretive process and Kelly refers to the dual process where we abstract recurring themes and their contrasts from the succession of events we experience throughout our lives. The PCP emphasis on the role in behavior of viewing the future distinguishes the Kellyan approach in psychology. Kelly, in fact, saw anticipatory processes or personal construing as the source of all psychological phenomena. The theory of PCP is comprised of a fundamental postulate and 11 subsequent corollaries, presented in Table 1, which elaborate on the fundamental postulate and provide greater specificity by describing the nature of construing.

The fundamental postulate epitomizes what Kelly (1955) envisioned human behavior to entail

PCP Component	Kelly's (1955) Words	Our Words
Fundamental Postulate	A person's processes are psychologically channelized by the ways in which he anticipates events (p. 46).	Interactions with our external environment lead us to operate (psychologically) by developing, maintaining, and modifying descriptive and evaluative internal representations of the phenomena we experience in an attempt to actively anticipate and predict what will happen in the future.
Construction Corollary	A person anticipates events by construing their replications (p. 50).	People develop personal meaning by recognizing regularities and recurring patterns in their experiences.
Individuality Corollary	Persons differ from each other in their construction of events (p. 55).	People develop their individuality through a unique and different approach to construing similar events.
Organization Corollary	Each person characteristically evolves, for his convenience in anticipating events, a construction system embracing ordinal relationships between constructs (p. 56).	Each person develops a unique hierarchical system where some constructs are more important (superordinate) than others (subordinate) to reduce the chaos of the external world so that consistent predictions can be made.
Dichotomy Corollary	A person's construct system is composed of a finite number of dichotomous constructs (p. 59).	Constructs are reference axes, with one personally relevant pole describing the similarities between two events and a contrasting pole implying the distinction between two similar events and another event.
Choice Corollary	A person chooses for himself that alternative in a dichotomised construct through which he anticipates the greatest possibility for elaboration of his system (p. 64).	By expressing preference for one pole of a construct, people aim to increase the accuracy of their predictions and anticipations, thus allowing extension and definition of their system of processes.
Range Corollary	A construct is convenient for the anticipation of a finite range of events only (p. 68).	A personal construct does not apply to everything it encompasses like a concept, and will only account for the anticipations known to that individual.
Experience Corollary	A person's construction system varies as he successively construes the replication of events (p. 72).	People are consistently engaging in experiments (events of their lives) with their hypotheses (constructs) and the result of these experiments (confirm/disconfirm) leave their constructs open to amendment in light of those events.
Modulation Corollary	The variation in a person's construction system is limited by the permeability of the constructs within whose ranges of convenience the variants lie (p. 77).	Some personal constructs are more accommodating (permeable) of new or novel events within their range of convenience.
Fragmentation Corollary	A person may successively employ a variety of constructions subsystems that are inferentially incompatible with each other (p. 83).	The meaning generated through the elaboration of a person's system can be inferentially incompatible with an existing subsystem of constructs.
Commonality Corollary	The extent that one person employs a construction of experience which is similar to that employed by another, his processes are psychologically similar to those of the other person (p. 90).	People are not similar because they encounter similar events or behave similarly, but rather because they construe events similarly.
Sociality Corollary	To the extent that one person construes the construction process of another he may play a role in a social process involving the other person (p. 95).	Any attempt to construe what another person is also construing of the situation influences our own construction of that event.

Table 1. The Essential Components of PCP and Their Meaning.

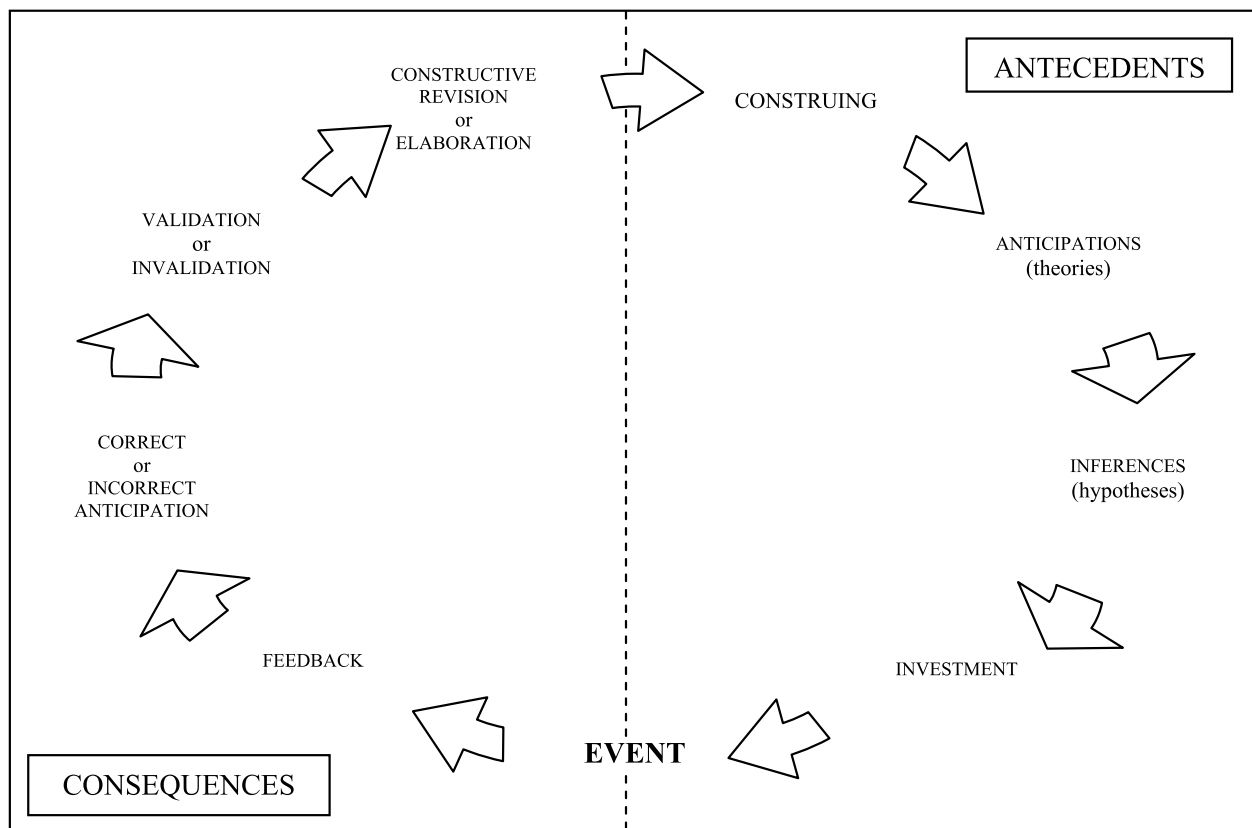
and states: “A person’s processes are psychologically channelized by the ways in which he anticipates events” (p. 46). Interactions with our external environment lead us to operate (psychologically) by developing, maintaining, and modifying descriptive and evaluative internal representations (*personal constructs*) of the phenomena we experience. This whole process operates through a structured network of pathways (i.e., the construct system) and the fundamental postulate highlights that people are not reactive, but rather, proactive, in trying to make sense of what may seem an otherwise chaotic world of events.

The experience cycle, illustrated in Figure 2, is based on the experience corollary, and explains how the assertions of PCP are integrated into a cyclical process. *Anticipation* initiates this cycle—without it, individuals would have no knowledge of their experiences and no understanding of their future (Landfield & Leitner, 1980). *Inferences* are the assumptions we abstract from the investment process and represent

an individual’s hypotheses or predictions formulated from each construct within their system regarding the likelihood of future events (Kelly, 2003). Once a choice has been made about which alternative in a construct best permits elaboration of their system, the individual can hypothesize possible outcomes of events incorporating similar elements. The *event* (encounter) marks the stage in the experience cycle where individuals test the anticipations and predictions they have ascribed to the chosen construct. In Kelly’s (1955) words, “The constructions one places upon events are working hypotheses, which are about to be put to the test of experience” (p. 72). In keeping with Kelly’s “man-the-scientist” metaphor, the encounter would be considered as analogous to the running of an experiment for the scientist. Subjective and objective feedback (or data) from the encounter allows people to determine if they correctly anticipated the event.

According to Kelly (1955), *validation* “represents the compatibility (subjectively construed)

Figure 2. Experience Cycle. Adapted with permission from Middleton et al.’s (2004a) proposed Model of Mental Toughness.



between one's predictions and the outcome he observes. Invalidation represents incompatibility (subjectively construed) between one's predictions and the outcome he observes [sic]" (p. 158). In other words, both subjective and objective feedback may either confirm or disconfirm an individual's hypotheses about a particular event, which will either lead to retainment of that construct or constructive revision. Thus, the validation stage of the experience cycle is where individuals subjectively assess their commitment made during the encounter, the feedback received from the encounter, and whether the resulting evidence confirmed or disconfirmed their anticipations. Both the validation and invalidation of a construct can lead individuals to revise their construct in the final phase of the cycle. Generally, we retain a belief when a construct has been validated by the feedback from the encounter.

One personal construct that an individual may consider useful for mental toughness, for example, is that of *team-focused* versus *individual-focused*. Let us consider John, who, involved in a team sport, employs the personally relevant team-focused pole to anticipate (theorize about) certain future events for which he considers this construct useful (e.g., competition). Based on these anticipations, John will make inferences (hypotheses) about what he believes will eventuate from an event when employing this construct (e.g., fluent passing of the ball, more blocks for team-mates). John invests himself in the event and receives feedback from what happens. This feedback is used as data to determine if he correctly anticipated the event. In the event that the data validate the usefulness of the construct (e.g., fluent passing, more blocks), John may simply retain that belief or revise that construct to include other elements previously not considered as part of that construct. On the other hand, the data may disconfirm the usefulness of the construct (e.g., scrappy passing, no blocks), which may encourage John to search for more information to revise the construct.

PCP Repertory Grids and Performance Profiling

Probably the most frequently used technique to explore personal construing is the *repertory grid*, which has flourished to the point where it has almost become synonymous with PCP. There are other PCP techniques such as laddering, pyramiding, self-characterization sketches, bow-ties, illuminative incident analysis, snakes and rivers, and the lying game, but these are much less prominent techniques than repertory grids. (For a more in-depth discussion of both these techniques and the repertory grid technique, the reader is referred to Fransella, Bell, & Bannister, 2004). Whereas traditional methods (i.e., tests and questionnaires) measure an individual on *a priori* constructs, the repertory grid enables the researcher or practitioner to elicit what is important to the individual by identifying the structure and content of meaning (Fransella et al., 2004). This gives the individual freedom to personally pursue meaningful constructs, as opposed to forcing responses to predetermined measures.

There are a number of techniques that can be employed for construct elicitation and the most commonly used include triadic or dyadic comparisons of a concept in 1:1 interviews, during which participants elicit their own set of constructs to describe the similarities and differences associated with the object of study. After the constructs have been elicited a grid is drawn up, with elements listed horizontally and constructs listed vertically.

There are several studies within sport (Clarke, 1994, 1995; Cripps, 1999; Feixas, Marti, & Villegas, 1989; Russell & Salmela, 1992) and exercise (Furnham, Titman, & Sleeman, 1994; Jones & Harris, 1996; Jones, Harris, & Walter, 1998) settings that have employed grid methodology. Feixas et al. (1989) employed the repertory grid to understand various perspectives of the manager, individual team members, and the whole team among a Spanish football team. Two grids were administered, one elicited by individual team members and a second containing common constructs elicited from interviews. They identified two clusters of constructs relating to professional characteristics (e.g., hard-working, responsible) and personal characteristics (e.g., introverted, talkative). Additionally, a discrepancy was revealed

in one element (the player “Andres”) that helped the manager explore reasons for this discrepancy (i.e., his public criticisms of this player). The authors concluded that the information gained through grid methodology provided insight into the manager’s and players’ construction patterns, which could expand the manager’s understanding of the players’ construals, thus allowing meaningful role relationships between them, as asserted by the *sociality corollary*.

Nearly a decade later, Jones et al. (1998) demonstrated the usefulness of grid methodology for eliciting the expectations of people with regard to an exercise program. Participants were interviewed prior to the commencement of a 10-week exercise program during which they completed repertory grids designed to elicit constructs about exercise-related change. Three individual case studies illustrated the diversity and often over-optimistic expectations of change with regard to the program. Results indicated that those participants who held modest expectations were more likely to complete the program. Moreover, those who completed the program demonstrated less discrepancy between current views of themselves and views of how they would like to be. It was concluded that having realistic aims and an understanding of the outcomes of a brief exercise program are important predictors of success.

The most prominent use of a PCP-based technique in sport is *performance profiling*, which is “a natural application of Kelly’s 1955 Personal Construct Theory to sport psychology” (Butler & Hardy, 1992, p. 254). Using this technique, the researcher or practitioner elicits constructs or qualities that an individual perceives as essential to achieving personal performance excellence. After these constructs have been elicited, the athlete self-rates his or her own achievement or current status for each of the constructs, which are presented as a visual profile. Subsequently, the performer’s coach adds his or her rating of the individual on this profile, which enables the performer to learn more about how the coach construes the performer (Butler, Smith, & Irwin, 1993). Consistent with PCP’s *sociality corollary*, this proposes to lead to the development of more effective and more meaningful coach-athlete relationships and, in turn, this partnership also enhances the athlete’s ability to extend his or her personal construct system.

From a team perspective, performance profiling may be employed to create an open, non-judgmental atmosphere for athlete/teammate/coach communication, in turn facilitating team goals and cohesion. Dale and Wrisberg (1996) presented a case study illustrating the effectiveness of performance profiling with a Division I women’s volleyball team. Performance profiles were conducted pre-season, mid-competitive season, and at the end of the competitive season. It was revealed that both athletes and coach agreed that the profiling process resulted in a more open communication medium, through which athletes expressed appreciation for their role in the decision-making process regarding training programs and goal setting. These qualitative results were paralleled with significant improvements by each athlete, the coach, and the team on one or more characteristics of the performance profile.

PCP Retrospective Interview

Despite the currency of repertory grids in PCP research and limited use of performance profiling research in sport research, we believe that much more attention should be given to examining the effectiveness of a PCP interview methodology as a research tool. To both identify and understand the phenomena associated with mental toughness in sport, we propose an adaptation of Kelly’s (1955) psychotherapy retrospective interview, which is illustrated in Table 2. Interestingly, in talent development research among elite performers, Côté, Ericsson, and Law (2005) have also recommended the retrospective interview as an important research tool:

As long as we are not able to predict accurately which young athlete will eventually reach the highest level, these outstanding athletes can only be distinguished after the fact. Consequently, retrospective interviews with such outstanding athletic performers will remain one of the primary sources of information on the acquisition of the highest levels of performance for the foreseeable future (p. 15).

Prior to considering each question in Table 2, there are two tenets of PCP that bear the stamp of

Kellyan thinking and guide the interview methodology. First, the *credulous approach* means the interviewer must not disregard anything recorded at any time. Second, interviewers need to establish each interviewee's constructions in terms of *bipolar* or *dichotomous constructs*. In PCP, understanding the meaning of anything becomes possible only by understanding a sense of its opposite.

<p>Q1. Please describe what you consider mental toughness to be for your sport. Can you offer a definition, phrase, or quote to describe it? (individuality corollary)</p> <p>Q2. In your sport, what do you think are the situations that require an individual to be mentally tough and those situations that do not? (events)</p> <p>Q3. Having identified situations that require mental toughness, what do you think are the characteristics that distinguish mentally tough individuals from mentally weak individuals? What attitudes and/or beliefs do you consider to be the contrast of each of these characteristics? (dichotomy corollary)</p> <p>Q4. In your opinion, what do you consider to be the role(s) or purpose(s) of each of these characteristics? (behaviors)</p> <p>Q5. Of all of the characteristics that you have mentioned, please rank these characteristics in order of importance for mental toughness. (organization corollary)</p> <p>Q6. Now that you have identified these characteristics, please list all the situations to which these characteristics apply. (range corollary)</p> <p>Q7. Please put yourself in your coach's shoes and describe what he or she would consider mental toughness to be. Again, what would he or she contend to be characteristics of a mentally tough individual and what is the role of each characteristic? (sociality corollary)</p> <p>Q8. Are there any significant others (e.g., coach, team-mates, parents, etc.) who you feel have played a crucial role in the development of your mental toughness? What have these individuals done to help? What have they not done? Are there any techniques or methods that you have experienced that you feel have influenced the development of mental toughness? (sociality corollary)</p> <p>Q9. Please think of someone you know whom you would characterize as being mentally tough. How do you think they have developed their mental toughness? (sociality corollary)</p>

Table 2. Proposed Personal Construct Psychology Interview Protocol for Understanding Sport-Specific Mental Toughness.

The following series of questions is based on an interview protocol that the second author is currently using for his doctoral research, in an effort to identify and understand mental toughness and how it can be developed among Australian Rules footballers. In presenting this retrospective interview schedule, we hope to illustrate how several simple ideas derived from the fundamental postulate and its associated corollaries can inform researchers wishing to explore the personal construing process.

Q1. Please describe what you consider mental toughness to be for your sport. Can you offer a definition, phrase or quote to describe it? (individuality corollary)

The *individuality corollary* emphasises that we always have our own individual anticipations of certain events and even identical events can be construed differently from person to person. So, the *credulous approach* (Kelly, 1955), which encourages the interviewer to see the interviewee's world through the interviewee's eyes, starts here and is maintained throughout the interview in an attempt to arrive at a value-free understanding of another's construal and behaviour.

Q2. In your sport, what do you think are the situations that require an individual to be mentally tough and those situations that do not? (situations)

Situations and *people* are the most frequently employed elements in PCP research. Initially, we ask the interviewee about those situations that do and do not require mental toughness to encourage the interviewee to place himself or herself in these situations and identify salient features of these personal experiences. Moreover, by identifying situations that do and do not require an individual to be mentally tough, it is possible to gain an insight into possible event simulations that are useful when designing interventions for developing mental toughness.

Q3. Having identified situations that require mental toughness, what do you think are the characteristics that distinguish mentally tough individuals from mentally weak individuals? What attitudes and/or beliefs do you consider to be the contrast of each of these characteristics? (dichotomy corollary)

There will always be people regarded as mentally tough and those who are not, and interviewees

will import characteristics of these people from their encounters with them. So, elaborating on Q2, we ask about the characteristics that distinguish mentally tough people from mentally weak people in the situations identified previously. In the *construction corollary*, the regularities and inconsistencies of situations and people come to represent the characteristics or constructs of those phenomena that they experience. The *dichotomy corollary* extends this notion to the extent that wherever there is a personally-relevant consistency pole there will also be a contrasting pole that implies some distinction or inconsistency.

Q4. In your opinion, what do you consider to be the role(s) or purpose(s) of each of these characteristics? (behaviors)

Having identified constructs ascribed to mentally tough individuals, we now try to identify what the interviewee considers to be the roles or behaviors of these constructs. By identifying which behaviors are inferred from the constructs, we not only learn how a mentally tough individual behaves but also get insights into possible techniques for facilitating the development of mental toughness (e.g., coping and/or stress reduction strategies).

Q5. Of all the characteristics that you have mentioned, please rank these characteristics in order of importance for mental toughness. (organization corollary)

According to the *organization corollary*, personal constructs are arranged into a hierarchical system with some constructs being more personally important than others. PCP suggests that the purpose of this organization is to reduce the chaos of the external world for people and provide them with clearer avenues to infer understanding from experiences. We ask the interviewee to rate the constructs in order of importance in an attempt to identify and understand the organization of personal superordinate and subordinate constructs.

Q6. Now that you have identified these characteristics, please list all the situations to which these characteristics apply. (range corollary)

Elaborating on Q5, and further strengthening our understanding of the organizational properties of an individual's personal construct system, we ask the interviewee to list all the situations to which each superordinate and subordinate construct applies.

When a construct has a higher range of perceived utility, more inferences can be made regarding its significance across a variety of situations. A construct with a higher range of utility would be considered more superordinate than a construct that has a lower range of utility.

Q7. Please put yourself in your coach's shoes and describe what he or she would consider mental toughness to be. Again, what would he or she contend to be characteristics of a mentally tough individual and what is the role of each characteristic? (sociality corollary)

When a psychological phenomenon like mental toughness involves more than one individual's construing (called the *commonality corollary*) and it seems necessary to understand the construing of others (e. g., in team sport settings), the sociality corollary is required. Using the *sociality corollary*, we simply ask the interviewee to consider another individual and to describe the characteristics this individual might believe represents mental toughness. By taking the perspective of another individual, interviewees are being encouraged to go beyond their own idiosyncrasies and further explore how others conceptualize mental toughness. The purpose is to gain more explicit and in-depth information about mental toughness from the interviewee.

Q8. Are there any significant others (e.g., coach, team-mates, parents, etc.) who you feel have played a crucial role in the development of your mental toughness? What have these individuals done to help? What have they not done? Are there any techniques or methods that you feel have influenced your mental toughness? (sociality corollary)

Researchers have yet to investigate formally how mental toughness can be developed. So the final two questions, which are also influenced by the sociality corollary, examine development ideas and avenues that might be explored. The sociality corollary extends the interviewee's personal construct system by obliging an understanding of how others give meaning to the interviewee's world.

Q9. Please think of someone you know whom you would characterize as being mentally tough. How do you think they have developed their mental toughness? (sociality corollary)

Finally, we ask the interviewee to construe how others might develop mental toughness.

In a sport-specific sample of interviewees, we are likely to find commonality in the meanings ascribed to different events. These meanings represent a certain similarity in the psychological processes in those individuals. However, it is important to remember that people are not similar because they experience similar events—they are similar because of the commonalities in their construing of events.

PCP Research Template

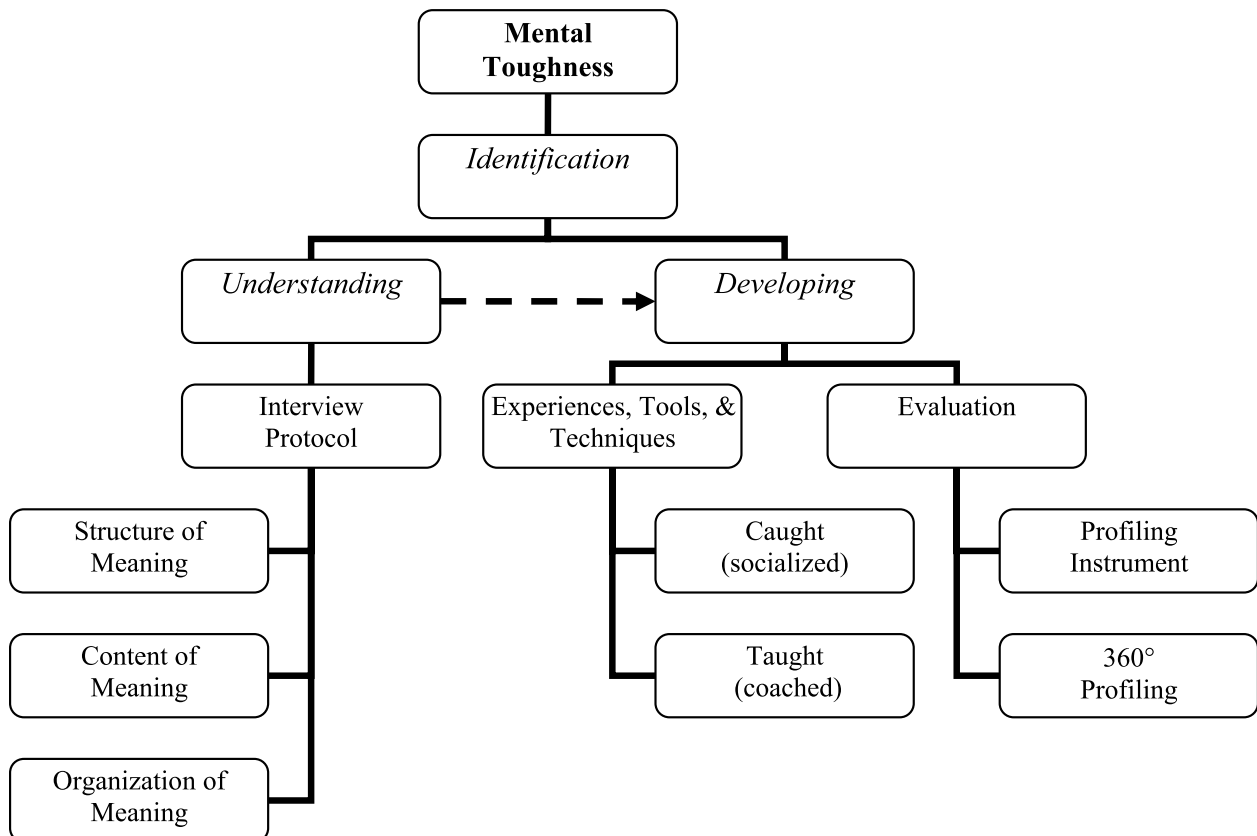
In the previous section we explained how the components of PCP can be employed to design an interview protocol for understanding mental toughness. The PCP research template illustrated in Figure 3 separates the research agenda into an *understanding* and a *developing* phase, with further distinctions identifying the essential characteristics of each phase.

PCP emphasizes that if we are to gain an accurate understanding of any psychological phenomenon we

need to identify the content, structure, and organization of meaning among our research cohorts. At this early stage in the research process, we can also probe individuals about certain methods for changing or developing specific psychological attributes among people. More importantly, we can design an interview protocol that addresses each of these categories and adheres to the essential proponents of PCP.

Regarding the development of mental toughness, PCP also presents researchers with the repertory grid that has been extended to sport and exercise settings in the form of the performance profile (Butler, 1989). Subsequently, a profile instrument that incorporates the key characteristics of mental toughness could be employed to assess and monitor changes in its development, which is a necessity for evaluating any intervention program designed to enhance a psychological attribute. In addition, based on an understanding of mental toughness and in conjunction with the assertions postulated by PCP, intervention programs

Figure 3. Personal Construct Psychology template for identifying, understanding, and developing a psychological attribute.



that might include exposure to certain experiences as well as mental skills training could be designed specifically to develop mental toughness.

Using a PCP framework, we can envisage athletes as in a continual cycle of construing that enables them to generate an elaborate theory of their physical and psychological condition as to direct their behavior (see Figure 2). Applying the PCP approach in sport and exercise, therefore, involves trying to understand how an individual's unique interpretation of the world contributes to the development and maintenance of his/her behavior. So, if we want to identify and understand mental toughness among athletes, the first phase in the experimental project would entail qualitative research methodologies, such as retrospective interviewing, to enable researchers to examine different levels of meaning. This research would be aimed at gaining an understanding of the meanings athletes and coaches ascribe to the concept of *mental toughness*. Such an approach appropriately places the individual at the center of knowledge. We are aiming to elicit information about individual construct systems by encouraging interviewees to explore and explicitly communicate what comes implicitly to them, which usually occurs at a low level of awareness (Ravanette, 1977).

Summary

The main objective of this chapter was to introduce a PCP research framework for researchers engaged in trying to identify, understand, and develop any psychological attribute associated with sport and exercise performance. The template provides sport and exercise psychology researchers with an understanding of the pertinent theoretical assertions of PCP that can guide the design of both qualitative and quantitative research methods. The theoretical framework proposes qualitative techniques, such as retrospective interviewing, as an essential starting point for investigating any psychological attribute that is not clearly understood. This foundational knowledge can be extended to develop valid and reliable performance profiling measures associated with a particular psychological attribute. Subsequently, these profiles can be employed to evaluate intervention programs designed to enhance and develop the psychological attribute.

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