

A Cross Cultural Examination of the Concentration Skills of Elite Level Athletes

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Introduction

Concentration is a critical determinant of performance and there is no place where errors due to an inappropriate focus of concentration become more immediately apparent than in sport. Particularly at elite levels of performance, the difference between winning and losing is often measured in inches and/or in fractions of a second. For this reason, elite level training centers around the world are using The Attentional and Interpersonal Style (TAIS) inventory to measure athlete's concentration skills, and to develop individualized training programs to improve those skills.

Technological developments have made it much easier for Enhanced Performance Systems (EPS) to gain access to the TAIS data that is being collected on elite level performers around the world. Sport psychologists from another of settings have expressed a willingness to share information in order to gain greater understanding of the role that concentration plays in performance. We have been fortunate enough to get data on elite level performers from various universities and training centers throughout the US and Canada, from Brazil, South Africa, France, The Australian Institute for Sport (AIS), the Scuola dello Sport in Italy, and the centre d'Alt Rediment in Barcelona, Spain.

This is the second in a series of exploratory papers taking a close look at the concentration skills of elite level performers from around the world. In the first paper, we examined the stability of athlete's scores over time, and the extent to which concentration skills seemed to change as the athlete's level of performance improved (Nideffer & Bond, 1998). All of the athletes in that study were elite level performers at the Australian Institute for Sport. In that paper, we concluded that:

- Test-re-test reliability coefficients averaged about .64 over a one year interval, indicating scores were reliable.
- The repeated testing of athletes indicated that on average, there was a positive change of 2.5 percentage points per year, for several years, on TAIS scales measuring external awareness (BET), analytical skill (BIT), and focus and follow through (NAR).
- On average, there were decreases of 3 percentage points per year, for several years, on TAIS scales measuring external distractibility (OET), internal distractibility (OIT), and the failure to shift attention from an external to an internal focus (RED).

In this paper want to report on some preliminary examinations of the cross cultural stability of differences between males and females in terms of their scores on TAIS concentration skills, and in terms of their dominant concentration style.

Subjects

The elite level athletes who's scores are presented in Table 1 are only a small, but representative sample of the thousands of subject's who's data we examined. The consistency of the data is quite remarkable as the patterns of the results shown are almost identical across cultures and across individual sports.

Table 1 provides a summary of the scores obtained from male and female athletes performing at elite levels in a wide variety of sports. Closed skill sports would include sports like diving, gymnastics, golf, bowling, archery, and shooting. Individual open skill sports include, cycling, canoeing, tennis, squash, athletics, swimming, karate, boxing, judo, etc. Team sports include basketball, baseball, field hockey, soccer, rugby, rowing, etc.

Table 1

TABLE 1
Percentile Comparisons Between Males and Females
On TAIS Concentration Scales

<u>TAIS Scale</u>	<u>Male vs. Female</u> <u>Closed Skill Sports</u> <u>N=112</u>	<u>Male vs. Female</u> <u>Individual Open</u> <u>Skill Sports</u> <u>N=207</u>	<u>Male vs. Female</u> <u>Team Sports</u> <u>N=258</u>
External Awareness (BET)	58% vs. 52%	51% vs. 51%	59% vs. 54%
Analytical Skill (BIT)	55% vs. 38%	58% vs. 49%	61% vs. 56%
Focus/Follow Through (NAR)	67% vs. 67%	67% vs. 62%	69% vs. 64%
External Distractibility (OET)	53% vs. 64%	45% vs. 59%	45% vs. 55%
Internal Distractibility (OIT)	57% vs. 59%	47% vs. 59%	47% vs. 56%
Failure to Shift Attentional Focus (RED)	68% vs. 75%	58% vs. 65%	57% vs. 55%

Results and Discussion: Dominant Concentration Style For Elite Athletes

Earlier work, has shown that different individuals have different concentration strengths and weaknesses (Nideffer, 1993). Research has also shown that these differences, at least for high level performers, are consistent with the primary performance demands of the individuals. Thus, the dominant concentration skill for upper level managers, both male and female, is their analytical ability (BIT). In contrast, the dominant concentration skill for world record holders in sport, and for highly technically skilled individual

contributors in the business sector is the ability to focus concentration (NAR). In a very real sense, high level performers are high level performers because they are smart enough, or lucky enough, to work and/or compete in situations that play to their dominant concentration skills.

Results of the analyses shown in Table 1 further emphasize the fact that the ability to focus concentration is strongly associated with the achievement of elite level performance in sport. The numbers in bold indicate the dominate attentional style of each group. As may be seen, the dominate style for both male and female athletes, independent of the type of sport, is narrowing (NAR).

Obviously, the ability to develop a broad-external focus of concentration (BET), to be able to read and quickly react to changing conditions in fast moving team sports is important. Indeed, high level performers in these sports score high on the TAIS scale measuring this ability. In spite of that fact, however, unless athletes also have the ability to focus and follow through, which is associated with high scores on the NAR scale on TAIS, they don't fully develop their talents.

The ability to focus concentration combined with the willingness to attend to details and follow through on task (all measured by NAR) almost seems to be a pre-requisite to elite level performance. An obvious question that gets raised by this data, is which came first? As individual's mature, do they develop the concentration skills required for elite level performance, or do they have them to begin with? Answering that question is where the data we reported from the first study in this series comes in.

As mentioned at the beginning of this paper, an analysis of the changes which occur in subjects scores on TAIS concentration scales indicates that concentration skills are improving with age (at least between the ages of 13 and 26). These changes, however are relatively small. On average, an individual's score will increase by about 2.5 percentage points per year. Since these changes are small and consistent over time, and since elite level performers highest scores tend to be on the NAR scale, that suggests that NAR was their highest score from the beginning. Thus, we would conclude that the ability to focus concentration is one important predictor of an individual's ultimate level of performance. There are a great many individual's in sport, business, and the military who have enough natural talent to perform at reasonably high levels, without being dominated by a narrow focus of concentration. It is unlikely, however, that these individuals will achieve elite level, or "world class" status in their particular performance arena.

Concentration Differences Between Male and Female Athletes

We have underlined all those scores in Table 1, where males scored higher than females. As you can see, there are some very consistent findings. The most striking finding with respect to the three effective concentration skills is the fact that on average, male's scores are 10 percentage points higher than females on the TAIS scale measuring analytical skill (BIT). This difference is statistically significant, and is consistent with the male-female cognitive style differences found in the research literature. On average, males were also

slightly, higher on the scales measuring external awareness (3.3%) and focus and follow through (3.3%). These differences were not statistically significant.

Distractibility

On those scales measuring distractibility, there are also consistent differences as a function of the sex of the athlete. Females are 11.7% more likely to be distracted by external stimuli than males. Females are 7.7% more likely to become distracted by their own thoughts and feelings than males. Finally, females are 4% more likely than males to experience a breakdown in shifting from an external to an internal focus or vice versa. The sex differences in terms of external and internal distractibility are statistically significant, the difference in terms of a break down in shifting of attention is not.

What is important about these findings is that they too are consistent across sport, and across cultures. The differences shown in these results are consistent with the behavioral observations and anecdotal reports of coaches who work with both male and female athletes. It is important to note, however, that we are talking about group differences here. There are female athletes who's scores are very similar to their male counterparts and vice versa.

Many coaches will tell you it is much more difficult for them to predict how well female athletes will perform than it is for them to predict how male athletes will perform. Although both males and females can have their performance fall apart, for males, the conditions leading to the deterioration of performance seem to many coaches to be more obvious. In addition, many coaches will tell you that as problems do occur, males seem to be more capable of problem solving in the situation, than females.

Hormonal differences between the sexes, and the hormonal changes that occur with menstruation, may help us understand these results. There have been reports suggesting that for some women pre-menstrual changes have associated with them, increases in distractibility and emotionality. Although these changes may need to be fairly dramatic before they affect the performance of individuals who are competing at sub-elite levels, that isn't true for elite level performers. At elite levels, individuals are performing very close to the limits of their potential. At this level even minor changes in hormonal balances can have a dramatic effect on competitive outcomes.

Implications for Training

Distractibility scores for male athletes suggest that the pattern of their concentration errors is fairly consistent. More often than not, their mistakes occur because they think too much, become distracted by their own thoughts. Females on the other hand, are just as likely to become distracted by external events (e.g., what their opponent is doing), as they are by their own thoughts.

Basic training for males should include learning how to shut off some of their analytical thought processes. As pressure increases, many males need to learn to let go of their own

thoughts and to redirect their focus to the events going on around them. They need to pay more attention to their opponent. Females, because of their increased sensitivity and reactivity to, environmental cues need to learn to let go of the external distractions, to find appropriate times to shut them out so they can more effectively problem solve.

Both male and female athletes share a highly competitive nature. Their competitiveness combined with their need to be in control causes them to become angry when they make mistakes and/or when things aren't going the way they planned or hoped they would. Because of the attentional differences, that anger often gets directed in different ways.

Females have a greater tendency to become angry with and/or irritated by opponents. Males, tend to focus the anger internally. They become angry with themselves. In either case, unless the anger is kept within reasonable bounds, performance deteriorates. Both males and females need to learn to "take the top off their anger." By that I mean they need to be able to reduce to the point that the arousal can help them focus, but not be so high as to interfere with their ability to make appropriate shifts from an external to an internal focus and vice versa. Females need to be able to shift internally, and use the anger and the focus associated with it, to help the problem solve. Males need to learn to use the anger to help them focus on the external environment.

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