Sport-Confidence and Competitive Orientation:  
An Addendum on Scoring Procedures  
and Gender Differences

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In an earlier study, an approach to the study of self-confidence was introduced in which the constructs sport-confidence and competitive orientation were conceptualized (Vealey, 1986). Sport-confidence was defined as the belief or degree of certainty individuals possess about their ability to be successful in sport. Competitive orientation was conceptualized to account for differences in how individuals define success and may be defined as a tendency for them to base their satisfaction and feelings of competence either on winning (outcome orientation) or performing well (performance orientation).

Based on the distinction between personality traits and states, sport-confidence was separated into two constructs: a dispositional construct termed trait sport-confidence (SC-trait) and a state construct termed state sport-confidence (SC-state). To operationalize the constructs in this model, three instruments were developed: the Trait Sport-Confidence Inventory (TSCI), the State Sport-Confidence Inventory (SSCI), and the Competitive Orientation Inventory (COI). Through five phases of data collection, evidence of internal consistency, item discrimination, test–retest reliability (trait scales only), concurrent validity, and construct validity was accumulated for these instruments as valid operationalizations of the constructs within the conceptual model (Vealey, 1986).

As an addendum to the original article (Vealey, 1986), this paper has two purposes. First, the intricate scoring procedures for the COI are clarified, a new procedure for computing a composite competitive orientation score is outlined, and norms for the new composite score are presented. Second, the analyses from the original study are extended to examine gender differences in the personality dispositions of SC-trait and competitive orientation based on the level of sport structure.

Computing the COI Score

Since the COI was introduced (Vealey, 1986), questions have been raised about the procedures involved in scoring the inventory. The original scoring
method yielded two scores—a performance orientation score (COI-performance) and an outcome orientation score (COI-outcome). Initially, both scores were included in instrument validation and hypotheses testing based on the model of sport-confidence, but that has proven to be unwieldy and even unnecessary based on their strong interrelationship ($r = -0.82$ to $-0.88$ in various samples collected by the author). Also, the distinguishing feature of the COI is that it requires subjects to weigh both performance and outcome simultaneously so that the scoring format is based on a continuum with performance orientation on one end and outcome orientation on the other. This format is different from Gill’s (1986) Competitiveness Inventory in which goal and win orientations are separate constructs. For these reasons, the scoring procedures are clarified and computation procedures for the COI composite score are outlined.

The COI uses a matrix format that contains 16 cells representing different situations in sport (see Vealey, 1986). Each cell represents a situation that combines a certain level of performance with a certain outcome. This matrix format forces subjects to weigh the value of both goals simultaneously. Subjects complete the inventory by assigning a number from 0 to 10 for each cell that represents how satisfied they would feel in that situation. Scoring the COI involves computing the proportion of variance that is based on different outcomes (outcome score) and the proportion of variance that is based on differences in performance (performance score). Thus, the outcome score represents how much athletes’ feelings of satisfaction vary based on whether they win or lose, and the performance score represents how much athletes’ feelings of satisfaction vary based on whether they perform well or poorly.

To aid researchers, the scoring procedures for the COI are outlined in the Appendix. These procedures may be easily formatted into data transformation statements in computer statistical packages (SPSS-X, SAS, etc.). In Step 1 the format for setting up the data is explained. In Step 2 the substeps involved in computing the performance score are explained. This requires (a) summing the values for each row, (b) plugging each athlete’s COI responses into the basic sum of squares formula found in any statistics text, and (c) and (d) dividing the performance sum of squares by the total sum of squares so the performance score represents a proportion of the total variance. In Step 3 the substeps involved in computing the outcome score are explained. These substeps include the same procedures as in Step 2 except that the values are summed for each column.

In Step 4, substeps for computing the composite competitive orientation score are explained. As discussed previously, this step has been included to simplify data analyses and interpretation based on a performance-outcome orientation continuum. That is, two scores are unnecessary when one score adequately operationalizes the competitive orientation construct. Because of the nature of the COI format in which subjects weigh performance and outcomes simultaneously, the performance score can also be thought of as the inverse of the outcome score (Substep 4a). Thus, the performance score and the inverse of the outcome score are averaged (Substep 4b) to provide a composite competitive orientation score that represents performance orientation. Because the composite score represents variance, it will range from 0 to 1.0.

This composite score reflects a more accurate measure of competitive orientation as it accounts for performance score in relation to outcome score for each
subject. For example, a subject with a performance score of .80 and an outcome score of .02 would have a composite competitive orientation score of .89. However, a subject with a performance score of .80 and an outcome score of .16 would have a composite competitive orientation score of .82. Thus, even though both subjects have identical performance scores, differences in their outcome scores create differences in their final composite scores.

Thus, the COI now yields one competitive orientation score that represents performance orientation. The normative data distributions computed from several data sets using the COI (N=692) are listed in Table 1. COI scores for elite athletes should be interpreted with caution, as only one sample representing one sport (gymnastics) is included. As indicated by Gill and Dzewaltowski (1988), the nature of different types of sports may influence athletes’ orientations toward performance and outcome. Clearly, additional data from elite athletes in various sports is needed.

<table>
<thead>
<tr>
<th>Percentile</th>
<th>12-14 yrs (n = 156)</th>
<th>High school (n = 262)</th>
<th>College (n = 226)</th>
<th>Elite (n = 48)</th>
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The data from the original validation of the COI (Vealey, 1986) were reanalyzed using the new competitive orientation score and yielded similar findings, with a slight increase in some correlations. These findings emphasize that computing the composite competitive orientation score does not change the nature of the competitive orientation construct from its original conceptualization, but rather reduces the complexity of interpreting two separate scores and including both in statistical analyses and interpretation. Although scoring the COI may still appear complex and unwieldy, the steps listed in the Appendix can simply be written into the statistical computer program being used by the researcher. Hopefully, the clarification of these procedures and the creation of one composite score will simplify the scoring and interpretation of the COI.
Gender Differences in Sport-Confidence and Competitive Orientation

The second objective of this paper is to extend the analyses using the original validation study sample to examine gender differences in sport-confidence and competitive orientation. The rationale behind using the same data set for an additional analysis is based on the uniqueness of the sample, which included 48 international caliber athletes competing in a national competition that served as the Olympic trials for their sport. Gender differences on various personality constructs are usually examined using high school, college, or even recreational athletes. Although research in sport psychology indicates that females are lower in self-confidence than males with regard to motor performance (Corbin, 1981; Corbin, Landers, Feltz, & Senior, 1983; Corbin & Nix, 1979; Duquin, 1986; Martens, Burton, Vealey, Bump, & Smith, 1982; Ryan & Pryor, 1976), it seems that this may largely be the result of gender-role socialization. That is, because sport is largely perceived as a male activity and most sport behaviors are regarded as masculine behaviors, females may feel less competent, perceive they have less social support, and receive fewer awards for sport participation and success. However, it may be that elite female athletes differ from the norm with regard to how they perceive their sport experiences.

Findings in gender role research indicate that females in competitive sport possess more "masculine" (instrumental) personality characteristics than do female nonparticipants (Colker & Widom, 1980; Del Rey & Sheppard, 1981; Harris & Jennings, 1977; Helmreich & Spence, 1977). We could extend this to predict that females who have entered the elite phase of competition are less influenced by traditional gender roles and possess as much confidence as males. Thus, the inclusion of an elite sample of athletes along with college and high school samples permits the examination of how sport-confidence (SC-trait) and competitive orientation are manifested differently based on gender and the structural level of sport competition.

Method

Subjects for this study included 103 (53 female, 50 male) high school, 96 (71 female, 25 male) college, and 48 (20 female, 28 male) elite athletes (n=247). The high school and college athletes participated in tennis, track and field, baseball/softball, and basketball, and the elite athletes were gymnasts participating in the United States Gymnastics Federation National Meet. These are the same samples that were used in the original validation studies (Vealey, 1986). In a non-competitive situation (practice or team meeting), subjects were administered the TSCI and the COI. Inventories were administered by the investigator, and coaches were not present.

Results

Although the relationship between SC-trait and competitive orientation ($r=.19$) was statistically significant, this low correlation indicated a lack of shared variance between the variables. Also, these variables were found to be orthogonal in three other samples collected by the author. Finally, from a theoretical perspective, SC-trait and competitive orientation are conceptualized as unrelated dis-
positional constructs that interact to predict SC-state. Thus, univariate analyses for each variable based on gender and participation level (high school, college, elite) were deemed appropriate.

As discussed previously, recent research indicates that the nature of specific sport types may influence the cognitive orientations of athletes (Gill & Dzewaltowski, 1988). Thus, preliminary one-way analyses of variance were conducted to determine if there were differences in SC-trait and competitive orientation based on sport type (individual vs. team). The results indicated that team sport athletes ($M=82.84$) were higher in SC-trait than were individual sport athletes ($M=77.24$), $F(1, 182)=8.67$, but no significant differences emerged for competitive orientation based on sport type.

Because the previous analysis indicated that SC-trait is influenced by sport type, the gender-by-participation-level analysis was conducted using athletes from only individual sports including gymnastics, track and field, and tennis. The TSCI scores of 46 high school and collegiate subjects from the original test-retest sample (Vealey, 1986) were added to the sample to fill all cells in the factorial design with individual sport athletes. A $2 \times 3$ (Gender $\times$ Participation Level) factorial analysis of variance for SC-trait indicated a significant interaction, $F(1, 167)=5.78$, $p<.01$ (see Figure 1). Student-Newman-Keuls post hoc analyses revealed that elite male athletes were higher in SC-trait than all other groups with the exception of elite female athletes. That is, no differences in SC-trait emerged between elite male and female athletes. Elite female athletes were higher in SC-trait than both high school groups and college female athletes. Finally, college male athletes were higher in SC-trait than college female athletes and both high school groups.

![Figure 1](Figure 1 — SC-trait as a function of gender and participation level.)
References

And level of participation. Performance consistency of girls' and competitive orientation based gender

performance consistency hypotheses have demonstrated some important differences in the

study. Although the findings of this study are
dists that are personally consistent. Although the findings of this study are

Descriptive in nature, these findings suggest that athletes who are more performance-oriented than col-
gender. In the field of sport, these findings suggest that athletes who are more performance-oriented than col-

Discussion

These findings suggest that the participation level of athletes should be taken

Because no differences in competitive orientation were indicated on the

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### Appendix

1. Each COI cell is a separate variable and in your data list can be written as COI1 to COI16 (see matrix below for cell numbers).

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</table>

2. Compute the performance score.
   a. Sum the values for the cells in each row.
      
      \[
      \begin{align*}
      R1 &= COI1 + COI2 + COI3 + COI4 \\
      R2 &= COI5 + COI6 + COI7 + COI8 \\
      R3 &= COI9 + COI10 + COI11 + COI12 \\
      R4 &= COI13 + COI14 + COI15 + COI16
      \end{align*}
      \]

   b. Plug the computed row variables into the sum of squares equation.
      \[
      \text{PERSS} = \frac{((R1 \times R1)/4 + (R2 \times R2)/4 + (R3 \times R3)/4 + (R4 \times R4)/4 - ((R1 + R2 + R3 + R4)/4)^2)}{16}
      \]

   c. Compute the total sum of squares.
      \[
      \text{TOTSS} = ((COI1 \times COI1) + (COI2 \times COI2) + (COI3 \times COI3) + (COI4 \times COI4) + (COI5 \times COI5) + (COI6 \times COI6) + (COI7 \times COI7) + (COI8 \times COI8) + (COI9 \times COI9) + (COI10 \times COI10) + (COI11 \times COI11) + (COI12 \times COI12) + (COI13 \times COI13) + (COI14 \times COI14) + (COI15 \times COI15) + (COI16 \times COI16) - ((R1 + R2 + R3 + R4)/4)^2}{16}
      \]

   d. Divide the performance sum of squares by the total sum of squares to get the performance score.
      \[
      \text{COI-PERFORMANCE} = \frac{\text{PERSS}}{\text{TOTSS}}
      \]

(cont.)
Appendix (cont.)

3. Compute the outcome score.
   a. Sum the values for the cells in each column.
      \[ C_1 = COI_1 + COI_5 + COI_9 + COI_{13} \]
      \[ C_2 = COI_2 + COI_6 + COI_{10} + COI_{14} \]
      \[ C_3 = COI_3 + COI_7 + COI_{11} + COI_{15} \]
      \[ C_4 = COI_4 + COI_8 + COI_{12} + COI_{16} \]
   b. Plug the computed column variables into the sum of squares equation.
      \[ OUTSS = \frac{(C_1 \cdot C_1) + (C_2 \cdot C_2) + (C_3 \cdot C_3) + (C_4 \cdot C_4)}{4} - \frac{(C_1 + C_2 + C_3 + C_4)^2}{16} \]
   c. You have already computed the total sum of squares (see above).
   d. Divide the outcome sum of squares by the total sum of squares to get the outcome score.
      \[ COI_{OUTCOME} = \frac{OUTSS}{TOTSS} \]

4. Compute the composite competitive orientation score.
   a. Compute the inverse of the outcome score.
      \[ INVERSE = 1 - COI_{OUTCOME} \]
   b. Compute the competitive orientation score as the average of the performance score and the inverse of the outcome score.
      \[ COI = \frac{(COI_{PERFORMANCE} + INVERSE)}{2} \]

Manuscript submitted: March 3, 1988
Revision received: May 19, 1988