Psychological Indices of Animal Judging Team Participants: Predictors for Development of Optimal Performance

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Abstract

It is generally accepted that a competitive mindset is essential to successfully compete in collegiate sports. Unlike sports, where both mental and physical skills are required, agricultural students compete in judging contests, solely on mental skills. Therefore, quantifying the mindset of judging competitors, and determining the efficacy of psychological inventories may prove useful in identifying and developing student judging performance. Following informed consent, multidimensional psychometric inventories were completed by 265 collegiate judging participants (161 males, 104 females) from 13 universities. Coaches ranked team participants by judging proficiency/skill level (high, moderate, low). Data were analyzed by skill level, gender and judging event. MANOVA indicates significant main effects across skill level (P = 0.007) and judging event (P = 0.003), but not gender (P = 0.19). Highly-ranked competitors exhibit significantly less tension, depression, anger, fatigue, and confusion, and significantly greater skills in controlling anxiety and maintaining concentration, confidence, and motivation than lower-ranked competitors. Top performers are more power-oriented, more repressive-focused and internalistic than lower-ranked peers. Discriminant function analysis revealed 88% of judging competitors were correctly classified by skill level using psychological variables. In conclusion, psychometric inventories can assist judging coaches in identifying a student's capacity and potential development to successfully compete in a judging environment.

Introduction

A competitive mindset is advantageous to successfully compete in sports. Areas of investigation included mood states, psychological skills, motivation, competitive anxiety, training adaptation, and locus of control (Bresciani et al., 2011; Feher et al., 1998; Geukes et al., 2013; LeUnes and Burger, 1998; Meyers et al., 1994; Stewart and Meyers, 2004). From these and other studies, compelling evidence indicates a strong association between an individual's psychological/emotional status and actual performance, as well as the usefulness of psychometric instruments in quantifying and monitoring the psychological profile deemed necessary for optimal performance (Bresciani et al., 2011; Raglin et al., 1996; Sheldon and Eccles, 2005; Smith et al., 2002; Terry, 1995). Others also note that present mindset and psychological skill set are significant predictors of performance development and competitive potential (Chamberlain and Hale, 2007; Geukes et al., 2013; Mahoney, 1989; Sheldon and Eccles, 2005; Psychountaki and Zervas, 2000).

At academic institutions, agricultural students also participate in competitive programs in the form of animal judging team contests to test their ability to evaluate and select animals, while providing an avenue for competitors to continue to enhance their knowledge and communication skills. Ultimately, the student gains substantial knowledge of the animal industry's standards and accepted criteria of quality.

Unlike sports, where both mental and physical abilities are required, animal judging is dependent solely on mental skills. A judging contest often lasts several hours depending on the species and level of competition and, oftentimes, under challenging conditions. Judging team members are required to evaluate several classes of animals during a morning session, ultimately ranking or "placing" each animal from first to last based on conformation and/or performance potential (i.e., marketability, athleticism, genetic/reproductive). During the afternoon session, students explain their decisions

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by orally presenting their placings, referred to as "reasons," to a qualified animal judge. Each competitor is scored on both their placements and rationale on those placements relative to how the officials judged the various classes. Scores are tabulated to determine both individual and team awards.

The mental skills involved in successful animal evaluation and selection include the ability to manage anxiety and mental fatigue while consistently maintaining a high level of concentration, composure, self-discipline, confidence and motivation (McCann and McCann, 1992; Moore, 1991; Nash and Sant, 2005). Team members must also be skilled in making acute, objective decisions and possess the ability to organize and succinctly verbalize these decisions (Boyd et al., 1992; McCann et al., 1991). To achieve optimal potential, extensive efforts in the identification, development and monitoring of sound mental strategies are key ingredients throughout the competitive season, involving decision-making skills developed through long hours of intense training.

Although limited in scope, research on agricultural judging dates back to the turn of the century. Early studies primarily addressed the efficacy of grain judges in the evaluation of corn yields (Hughes, 1917; Wallace, 1923), and winter wheat (Trumbo et al., 1962). Later research on horse and livestock judging focused on psychological skills development and assessment (Phelps and Shanteau, 1978; Shanteau and Phelps, 1977), personality typing (McCann et al., 1988, 1991), coaching influence (Shanteau, 1978), and development of life-skills (Boyd et al., 1992; Nash and Sant, 2005).

In the evaluation and selection of judging students, coaches may perceive that certain attributes exert an influence on the ability to effectively compete. These include prior experience and level of success, degree of intellect as reflected in a student's academic progress in course work or degree plan, age or maturity, motivation, or gender (McCann et al., 1988, 1991; Moore, 1991). Shanteau (1978) indicates a significant increase in judging proficiency in trained versus untrained students. With the extensive amount of information processing and strategy required in animal judging, selecting students with a high degree of intelligence and prior experience would make sense. There is no general consensus, however, on how to adequately define or independently assess these attributes. Experience and maturity may be difficult to quantify, obtaining information on academic status is typically deemed obtrusive and in violation of a student's right to privacy, and attributes such as age and prior performance have not been proven to guarantee future success.

In regards to gender differences, with the extensive participation of females in collegiate judging programs, it is critical that psychological response on female competitors be investigated for comparison and development. Research conducted on other livestock-related contests, such as rodeo, reveals that males possess significantly greater psychological skills in anxiety management, confidence, and motivation than female com-

petitors (Meyers et al., 1996). Male competitors involved in numerous sports also exhibit significantly greater coping, self-confidence, and cognitive skills, and lower precompetitive anxiety and catastrophizing response when confronted by competitive challenges (Feher et al., 1998; Meyers et al., 1999; Trafton et al., 1997).

Interestingly, the intense competitive nature of animal judging at the national level has only led to limited investigation addressing the relationship between psychological competitiveness and judging performance (McCann et al., 1988, 1992). When former judging team members were requested to list positive attributes gained by participating in a judging team program, competitiveness was listed among other traits such as communication skills, confidence, animal evaluation skills, motivation, and self-discipline (McCann et al., 1992). Since actual competitive performance is typically the standard to evaluate a student's skill set (Smith et al., 2002), no research efforts have focused on a comprehensive, multidimensional approach utilizing a battery of competitive-specific psychometric inventories modified to the competitive judging environment. Therefore, the purpose of this study was to quantify the competitive mindset of judging competitors by skill level, gender, and judging event, and to determine the efficacy of psychological inventories in identifying and developing competitive performance in a judging environment for future student development. Consequently, it is believed that higher skilled judging participants exhibit a more optimal competitive mindset than less-skilled peers, and that males demonstrate a profile deemed more conducive for successful performance than females.

Methods

Subjects and Procedures

Following Institutional Review Board approval and prior to the study, judging coaches from 13 colleges and universities were randomly contacted by phone to discuss the purpose, procedures, and benefits of the research, and subsequently agreed to participate in this study. During their respective team meetings, student participants were fully informed of the nature of the study and provided written informed consent. This resulted in a total of 265 collegiate animal science judging team members (161 males, 104 females; 21.3 ± 2.2 yrs) representing seasonal team rankings ranging from one to 25 in their respective events.

Based on the theory that psychological indices of successful performance are multidimensional involving several domains (Gould et al., 2002; Sheldon and Eccles, 2005), a psychometric battery of inventories consisting of the Profile of Mood States (POMS; McNair et al., 1971), the Sports Attitude Inventory (SAI; Willis, 1982), the Sport Competition Anxiety Test (SCAT; Martens, 1977), the Controlled Repression-Sensitization Scale (CR-S; Handel, 1973), Levenson's IPC Scale (IPC; Levenson, 1981), and the Psychological Skills Inventory for Sport (PSIS; Mahoney et al., 1987) were mailed to

the judging coaches. The battery was then administered to each participant by his/her respective coach and completed during a single team meeting. Participants were encouraged to answer all questions to the best of their ability according to written directions. Coaches were also requested to submit in writing the ranking of team members into three groups according to judging proficiency: high, i.e., individuals that consistently perform well at judging practice and contests; moderate, individuals that often have inconsistent performances during judging practice and contests; or low, individuals struggling to successfully compete at the collegiate judging team level. Compiled inventories and ranking sheets were then mailed to the principal investigator for scoring and statistical analyses. No incomplete inventories were returned and all returned inventories were completed within a 14-day period of time.

Instrumentation

Profile of Mood States (POMS). The POMS is a 65-item inventory used extensively to assess six dimensions of mood state: tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, confusion-bewilderment, and a composite score, i.e., total mood disturbance [TMD = (tension + depression + anger + fatigue + confusion) - vigor] (McNair et al., 1971). Answers range from strongly agree to strongly disagree, with reliability and internal validity (r = 0.65 - 0.93; Cronbach % = 0.87 - 0.95) of the POMS supported in over 250 publications (LeUnes and Burger, 1998). Successful competitors typically exhibit the "iceberg profile," a phrase coined by Morgan (1984) indicating a satisfactory mood state that is high in vigor while low in the other performance-compromising states.

Sports Attitude Inventory (SAI). The SAI was developed to evaluate three forms of competition-specific motivation: power, motivated to achieve success, and motivated to avoid failure (Willis, 1982). The inventory consists of 40 statements with a 5-point Likert-type format, ranging from strongly agree to strongly disagree. Higher scores denote higher perceived competence. Construct and concurrent validity has been established (r = 0.69 - 0.95; %= 0.76 - 0.78) and normatives developed across numerous sport populations and gender (Feher et al., 1998; Trafton et al., 1997; Willis and Layne, 1988).

Sport Competition Anxiety Test (SCAT). Originally developed to determine the level of anxiety typically felt prior to competition (Martens, 1977), the SCAT is comprised of 15 statements with a 3-point Likert-type scoring format ranging from hardly ever to often. Scores range from 10 to 30, demonstrating low to high competitive anxiety, respectively. Test-retest reliability (r = 0.91 - 0.97) and validity (% = 0.72 - 0.90) have been firmly established (Feher et al., 1998; Martens, 1977; Trafton et al., 1997). Stress, anxiety and tension have been determined to both negatively and positively affect competitive response dependent on the type of competition and level of ability (Chamberlain and Hale, 2007; Geukes et al., 2013).

Controlled Repression-Sensitization Scale (CR-S). The CR-S is comprised of 30 true-false statements used to measure one's ability to concentrate or focus during competition (Handel, 1973). A low score indicates the ability to repress or block out external distractions and focus on performance, whereas a high response indicates sensitivity to distractions during competition. Successful competitors will usually exhibit a low CR-S score. The reliability and validity of the CR-S have been extensively documented in the literature (r = 0.82 - 0.94; %= 0.62 - 0.91; Feher et al., 1998; Handel, 1973; Trafton et al., 1997).

Levenson's IPC Scale. Originally conceived to quantify the influence of reinforcement on behavior, the IPC scale indicates three dimensions of locus of control over one's life: internal, powerful other, and chance (Levenson, 1981). Subjects respond to 24 statements via a 6-point Likert format. Scores range from 0 to 48 on each dimension, with higher scores preferred for the internal construct, and low scores desirable for the powerful other and chance-oriented dimensions. An extensive amount of research has been conducted on locus of control substantiating both validity (%= 0.60 - 0.91) and reliability (r = 0.71 - 0.96) across numerous competitive populations, with Levenson's scale continuing to be viewed as psychometrically sound (Daiss et al., 1986; Feher et al., 1998; Levenson, 1981).

Psychological Skills Inventory for Sport (PSIS). The PSIS is a 45-item instrument which indicates six psychological skills relevant to competition: anxiety management, concentration, confidence, motivation, mental preparation, and team emphasis (Mahoney et al., 1987; Mahoney, 1989). Higher scores indicate greater perceived ability derived from a 5-point Likert scoring format. Research with the PSIS has established internal consistency, convergent validity, test-retest reliability, and scale construct effectiveness (r = 0.47 - 0.87; %= 0.64 - 0.72; Mahoney, 1988, 1989; Meyers et al., 1994).

Statistical Analyses

Data were grouped for analyses by skill level (high, moderate, low), gender and animal judging event (horse, livestock). As previously mentioned, the amount and quality of prior experience has always been difficult to define or control for in any study dealing with a competitive population. For instance, although the Aexperience factor@ is typically emphasized, any successful attempt at comparing the number of years of competition, the number of contests per year, or the level of contest experience from one student to another is improbable. In other words, a student with less years of participation may have obtained a higher quality of coaching or experiences. Subsequently, the authors decided that rankings derived from collegiate competition would best define the quality of experience, and was the preferred choice among the participating coaches. Multivariate analyses of variance (MANOVA) were performed utilizing General Linear Model procedures on a Statistical Analysis System (SAS) platform to

determine significant main effects. Least squares means procedures were employed due to unequal number of observations upon which to compare differences between variables. Post hoc analyses using analysis of variance (ANOVA) and Tukey's HSD procedures were performed on each dependent variable when significant main effects were observed. Statistical significance was determined a priori at the 0.05 level. Discriminant function analysis was performed using all psychological test scores from the inventories as predictors of skill level of subjects as predetermined by coaches rankings. The three groups were high, moderate and low-skilled competitors.

Results and Discussion

Skill Level

Comparison of psychological responses between high, moderate and low-ranked competitors is shown in Table 1. Wilks' Lambda criterion indicates a significant skill level effect ($F_{42,396}$ = 1.66; P = 0.007) across mood states, motivation, repression-sensitivity, locus of control and psychological skills. High-ranked competitors exhibit significantly less tension, depression, anger, fatigue, and confusion and possess significantly higher skills in controlling anxiety, and maintaining concentration, confidence, and motivation (P < 0.05 to 0.0001) than lower-ranked judging participants. The high-ranked individuals are more power-oriented, more repressive/focused and internalistic than their less-skilled peers.

These findings are consistent with prior personality research conducted on animal judging team members (McCann et al., 1988, 1992), and other traditional agriculturally-related competitors (Meyers et al., 1996, 1999). With regard to the POMS, not only do scores of high-ranked competitors reveal the Aiceberg profile@ across all independent variables in this study (Morgan, 1984), the relationship observed between positive psychological traits and high-skill level is consistent with other sport studies (Chamberlain and Hale, 2007; LeUnes and Burger, 1998; Meyers et al., 1994).

In regards to the utility of the psychometric subscales to predict a participant's skill level, discriminant function analysis indicates a significant association between skill level groups and psychological variables, with 88% of judging competitors correctly classified according to high, moderate or low skill levels. This suggests that psychometric inventories, typically used in sport, do have application within the highly competitive, judging team environment.

Gender

Mean psychological response of judging students by gender is shown in Table 2. Although no significant main effects is observed between gender ($F_{25,196}$ = 1.27; P = 0.19), there is a tendency for males to exhibit lower levels of tension, depression, confusion and total mood disturbance than female students. Males also demonstrate a tendency to respond higher in anxiety management, concentration, confidence and motivation, as well as more driven to attain power, more influenced

Table 1. Mean Psychological Construct Scores Between High, Moderate, and Low-Ranked Competitors			
		Skill Level	
Variables	High	Moderate	Low
Participants	78	104	61
POMS			
Tension-Anxiety	12.5 A 0.8[d]	12.4 A 0.7[d]	15.7 A 0.9[e]
Depression-Dejection	7.4 A 1.1[d]	9.1 A 0.9[b]	12.5 A 1.2[e,c]
Anger-Hostility	8.8 A 1.9[f]	10.2 A 0.7[d]	13.4 A 1.0[g,e]
Vigor-Activity	17.7 A 0.6	17.4 A 0.5	17.1 A 0.7
Fatigue-Inertia	9.0 A 0.7[b]	9.3 A 0.6[b]	11.4 A 0.8[c]
Confusion-Bewilderment	7.6 A 0.6[b]	7.8 A 0.5[b]	9.4 A 0.6[c]
Total Mood Disturbance	27.7 A 3.4[f]	31.4 A 2.8[d]	45.3 A 3.8[g,e]
SAI			
Motivated by Power	46.3 A 0.8[f,h]	42.9 A 1.6[g]	41.4 A 0.8[i]
Motivated to Achieve Success	71.7 A 0.8	69.5 A 0.7	69.8 A 0.9
Motivated to Avoid Failure	37.5 A 0.8	36.3 A 0.7	37.2 A 0.9
SCAT	17.3 A 0.3	17.4 A 0.2	17.1 A 0.3
CR-S	11.3 A 0.5[b]	12.3 A 0.4	13.1 A 0.6[c]
IPC			
Internal	37.3 A 0.6[b]	37.2 A 0.5[b]	35.4 A 0.7[c]
Powerful Other	16.9 A 0.9	16.8 A 0.7	16.8 A 1.0
Chance	17.1 A 1.0	17.8 A 0.8	18.4 A 1.1
PSIS			
Anxiety Management	66.9 A 1.4[d]	64.1 A 1.2	60.8 A 1.6[e]
Concentration	71.1 a 1.4[d,h]	66.0 A 1.2[e]	62.7 A 1.6[i]
Confidence	75.3 A 1.8[f,d]	69.3 A 1.5[e]	65.2 A 2.0[g]
Mental Preparation	61.3 A 1.1	60.1 A 0.9	59.0 A 1.2
Motivation	75.0 A 1.4[d,h]	69.8 A 1.2[e]	66.7 A 1.5[i]
Team Emphasis	77.5 A 1.0	75.6 A 0.8	75.3 A 1.1

[a]Mean A SEM; POMS, Profile of Mood States; SAI, Sports Attitude Inventory; SCAT, Sport Competition Anxiety Test; CR-S, Controlled Repression-Sensitization Scale; IPC, Levenson's IPC Scale; PSIS, Psychological Skills Inventory for Sport. [bc] P <.05, [de] P <.01, [fg] P <.001, [hi] P <.0001

Table 2. Mean Psychological Response of Competitors by Gender		
		Gender
Variables	Male	Female
Participants	161	104
POMS		
Tension-Anxiety	12.8 A 0.5	13.9 A 0.7
Depression-Dejection	9.4 A 0.7	10.2 A 1.0
Anger-Hostility	11.3 A 0.6	10.6 A 0.8
Vigor-Activity	17.5 A 0.4	14.1 A 0.5
Fatigue-Inertia	9.6 A 0.5	9.8 A 0.6
Confusion-Bewilderment	7.5 A 0.4	8.9 A 0.5
Total Mood Disturbance	33.1 A 2.2	36.4 A 3.0
SAI		
Motivated by Power	44.9 A 0.5	42.3 A 0.7
Motivated to Achieve Success	70.4 A 0.6	69.8 A 0.7
Motivated to Avoid Failure	36.2 A 0.6	37.0 A 0.7
SCAT	17.5 A 0.2	16.9 A 0.2
CR-S	12.1 A 0.3	12.3 A 0.4
IPC		
Internal	37.6 A 0.4	35.9 A 0.5
Powerful Other	18.2 A 0.6	15.6 A 0.6
Chance	18.4 A 0.6	17.1 A 0.8
PSIS		
Anxiety Management	65.8 A 0.1	63.2 A 0.1
Concentration	69.2 A 0.1	65.2 A 0.1
Confidence	73.7 A 0.1	67.1 A 0.1
Mental Preparation	60.0 A 0.1	60.8 A 0.1
Motivation	71.2 A 0.1	69.6 A 0.1
Team Emphasis	75.3 A 0.1	76.6 A 0.1

[a]Mean A SEM; POMS, Profile of Mood States; SAI, Sports Attitude Inventory; SCAT, Sport Competition Anxiety Test; CR-S, Controlled Repression-Sensitization Scale; IPC, Levenson's IPC Scale; PSIS, Psychological Skills Inventory for Sport.

to seek behavior reinforcement from others and believe that chance played a role in judging outcome when compared to female competitors.

The nonsignificant differences observed between gender and event by gender, however, are not surprising based on equivocal findings in other studies. While some competitive populations exhibit significant differences between males and females in anxiety management, confidence and cognitive awareness (Encarnacion et al., 2000; Meyers et al., 1988, 1992, 1996), others competitors reported in the literature reflect similarity in psychological response (Feher et al., 1998; Meyers et al., 1990). Findings may be indicative of the similarity of daily preparation and expectations, regardless of gender, that is required in this extremely competitive environment, or simply attributed to the greater psychological uniformity of individuals drawn to this type of activity (Encarnacion et al., 2000).

Judging Event

Wilks' Lambda criterion indicates a significant main effect ($F_{25,196} = 2.07$; $P = 0.003$) by judging event, with mean psychological responses of competitors shown in Table 3. Horse judging competitors exhibit significantly higher tension, depression, fatigue, confusion, and significantly lower concentration, confidence and motivation response ($P = 0.05$ to 0.001) than livestock judging participants. Horse judging students are also less power-motivated ($P = 0.02$), and express less precompetitive anxiety ($P = 0.03$) than livestock judging competitors.

Table 3. Mean Psychological Response of Competitors by Judging Event			
		Judging Event	
Variables	Horse	Livestock	*P*
Participants	106	159	
POMS			
Tension-Anxiety	14.4 A 0.7	12.2 A 0.7	.03
Depression-Dejection	10.9 A 0.9	8.2 A 1.0	.05
Anger-Hostility	10.5 A 0.7	10.3 A 0.8	NS
Vigor-Activity	16.8 A 0.5	17.8 A 0.5	NS
Fatigue-Inertia	11.3 A 0.6	8.5 A 0.6	.001
Confusion-Bewilderment	9.3 A 0.5	7.2 A 0.5	.002
Total Mood Disturbance	39.6 A 2.9	28.5 A 3.0	.009
SAI			
Motivated by Power	42.3 A 0.7	44.6 A 0.7	.02
Motivated to Achieve Success	69.8 A 0.7	71.0 A 0.8	NS
Motivated to Avoid Failure	36.9 A 0.7	36.9 A 0.7	NS
SCAT	16.8 A 0.2	17.6 A 0.3	.03
CR-S	12.1 A 0.4	12.5 A 0.4	NS
IPC			
Internal	36.7 A 0.5	36.6 A 0.6	NS
Powerful Other	17.0 A 0.7	16.6 A 0.8	NS
Chance	18.2 A 0.8	17.7 A 0.9	NS
PSIS			
Anxiety Management	63.1 A 1.2	65.3 A 1.3	NS
Concentration	64.6 A 1.2	68.7 A 1.3	.03
Confidence	67.1 A 1.5	73.0 A 1.6	.007
Mental Preparation	60.1 A 0.9	60.8 A 1.0	NS
Motivation	68.0 A 1.2	73.6 A 1.2	.002
Team Emphasis	75.7 A 0.8	76.7 A 0.9	NS

[a]Mean A SEM; POMS, Profile of Mood States; SAI, Sports Attitude Inventory; SCAT, Sport Competition Anxiety Test; CR-S, Controlled Repression-Sensitization Scale; IPC, Levenson's IPC Scale; PSIS, Psychological Skills Inventory for Sport.

The significant differences in mood states, precompetitive anxiety and psychological skills between horse and livestock judging competitors has not been reported elsewhere in the literature. Event differences are noted, however, in such sports as equestrian, rodeo, and football (LeUnes and Burger, 1998; Meyers et al., 1988, 1999). Findings, again, reiterate both the variability and similarities commonly perceived by individuals between and within a specific competitive environment (Sheldon and Eccles, 2005).

Limitations

Although this study reflects an initial attempt in addressing this unique population of competitors, possible limitations to the study are the extensive, but not all-inclusive number of indices that were quantified. Although the psychological aspects of competition are clearly multidimensional, and that other psychological indices may be pertinent to successful performance (Gould et al., 2002; Sheldon and Eccles, 2005), the authors feel that the array of inventories and the time required to address the extensive number of questions and subsequent subscales provide substantial insight into a competitive population not recently investigated. Prior discussions with coaches, judging team members, and prior author experience as they relate to optimal performance, also substantiate our selection and use of the inventories provided. In summary, findings clearly indicate that the incorporation of psychometric assessment reveals potential predictors of competitive performance as confirmed in prior studies and paradigms (Meyers et al., 1994; Psychountaki and Zervas, 2000; Sheldon and Eccles, 2005, Smith et al., 2002).

Conclusion and Implications

The purpose of psychometric assessment in almost any arena is multifaceted. Of prime consideration is the identification of psychological constructs of exemplary individuals who habitually perform at high levels. The assessment of the status of poorly performing individuals on these same constructs is of parallel importance. The results at this time indicate that the multidimensional use of psychometric inventories that address competitive variables, deemed essential for optimal sport performance, has the potential for use in identifying and delineating a student's capacity and potential development to compete in an animal judging team environment. The brief format of these self-report instruments, effective in obtaining information where limitations on time are a factor during the judging season, provides a quantitative yardstick prior to the season to supplement a coach's overall assessment, while also revealing critical cues on subtle nuances that may go unnoticed leading to maladaptive behavior (Meyers et al., 1992; Smith et al., 2002). During the judging season, scores may aid coaches in differentiating those students that effectively address the competitive environment from those competitors that may require additional attention to insure optimal performance (Bresciani et al.,

2011; Raglin et al., 1996; Smith et al., 2002). Subsequent readministration of psychometric inventories may provide information concerning changes in attitudes and strategies of students following cognitive interventions, or identify impending psychological dysfunction preventing optimal return to top performance.

At this point, initial research concerning the utility of psychometric instruments in assessing animal judging team performance is encouraging, as judging students appear to parallel the psychological profile of both team and individual sport athletes. The unique nature of this competitive non-sport activity reveals an individual who faces new challenges on a daily basis, prompting similarity in psychological mindset. Further research establishing precompetitive preparation in judging competitors with performance outcome and physiological response, as confirmed in other sports, may provide additional insight into the judging student's perception of imminent competition (Meyers et al., 1990; Psychountaki and Zervas, 2000; Silva and Hardy, 1986). Research exploring additional indices of exemplary performance specific to the judging environment, and at other levels of judging competition, also warrant further attention. Such knowledge would enable coaches to optimize the training environment through more developmentally structured programs that emphasize the optimal preparation of the competitive mindset, for scholastic achievement both in and outside of the classroom.

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