

Psychometric Evaluation of Goal Orientation Measures in Sport

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Abstract

The concept of achievement goals has received increasing attention in recent years among researchers in sport psychology. The two types of goal orientation conceived in academic settings, namely “task” and “ego”, have been the focus of much research and form the basis of several instruments designed to measure achievement goals in sport. The unmodified use of these constructs has been criticized, however, and some caution needs to be exercised in employing the existing scales. The current paper reviews recent arguments relating to the concepts termed goal orientation and goal involvement. It also provides an empirical examination of these critiques through close scrutiny of data collected from 201 athletes who completed four different instruments purporting to measure goal orientation. Confirmatory factor analysis and “latent-trait” Rasch analyses were performed on scores obtained from these measures. Results confirmed that the concept of goal orientation should be further operationalized and the concepts better defined. Furthermore, the establishment of specific measurement tools for goal involvement and orientation has to be preceded by a clear conceptual distinction between the two concepts, and a clear definition of the components and structure of a transitory state of goal involvement.

Introduction

For the last few years the goal perspective approach to achievement behaviors has gained much popularity in the sport and exercise domain. Though this approach has been derived from educational and academic settings (see Duda & Hall, 2001 and Murphy & Alexander, 2000 for a review), the two derivations of this perspective, namely “task” and “ego” orientations (or “performance/mastery” and “outcome/win,” as termed by others) were found to affect motivation and subsequent behaviors such as satisfaction, adherence, effort, exertion, skill improvement, mastery of tasks, working habits,

competence perceptions, persistence, interaction with others, and social and moral beliefs. Both ego and task orientations were found to be associated with competitive as well as with voluntary/recreational types of activities (Duda & Hall, 2001).

Recently, several prominent voices in the field of achievement goal research have presented convincing yet contrasting views regarding the appropriateness of employing the task and ego orientation framework (and the corresponding states of task and ego involvement) in athletic settings (Harwood & Hardy, 2001; Harwood, Hardy, & Swain, 2000; Treasure, Duda, Hall, Roberts, Ames, & Maehr, 2001). Harwood, Hardy, and Swain summarized their overall message by stating, “We cannot afford to simply assume that task and ego involvement mean exactly the same thing in the sport domain as they do in the education domain” (p. 245). Based upon this premise, they provided a critique of the achievement goal framework, as it has been applied in sport, and expressed a number of conceptual and measurement concerns. In the ensuing response by Treasure et al. and rebuttal by Harwood and Hardy, it is clear that the authors disagree on several issues, the chief one being the measurement of achievement goal orientation.

These authors restricted their discussion of measurement issues to two instruments specifically designed to measure achievement goal orientation, namely the Task and Ego Orientation in Sport Questionnaire (TEOSQ: Duda & Nicholls, 1992) and the Perception of Success Questionnaire (POSQ: Roberts, Treasure, & Balague, 1998). It was noted that these two apparently similar scales do not necessarily behave as alternative measures of the same constructs. However, the discussion need not have stopped there. Additional instruments currently in use such as the Sport Orientation Questionnaire (SOQ: Gill & Deeter, 1988) and Will to Win (WW: Pezer & Brown, 1980) also appear to cover the same

psychological domains. There is a need to investigate issues relating to convergent and discriminant validity with these instruments as well.

Marsh (1994) attempted to elicit the “jingle” (scales with the same label and operational construct) and “jangle” (scales with different labels and operational constructs) inherent in the POSQ and the SOQ, both of which were designed to measure ego/competitiveness and task/mastery orientations. The POSQ consists of two subscales, ego and task (then termed mastery and competitiveness), while the SOQ consists of three subscales, competitiveness, win, and goal. Marsh fitted various CFA models including a model with two factors that corresponded to Task and Ego, but concluded that none of the models fitted the data better than a 5-factor solution that captured each of the original instrument-specific dimensions.

Marsh advised researchers to examine the “wording” of items before administration of the scales to participants. One might assume that task or ego orientations are measured, while this may not be the case. Along similar lines, Murphy and Alexander (2000) argued that “Researchers in motivation may determine that similar terminology is being used to mark varied constructs, or that the same constructs are being referenced by different languages” (p. 5). It should be noted, however, that Marsh’s failure to justify two latent variables of ego and task did not incorporate the TEOSQ, a questionnaire that was one of the focal points of the debate between Harwood et al. (2000), and Treasure et al. (2001). Furthermore, Marsh chose representative items from the SOQ and POSQ, thus avoiding potential problems due to misfitting items.

The present analysis extended Marsh’s (1994) analysis and elaborated on Harwood et al.’s (2000) conceptual concerns. The scales included were the SOQ, the TEOSQ, the POSQ, and the Will to Win. It was hypothesized that the WW will to win scale, the win and competitiveness scales from the SOQ, the POSQ ego scale, and the TEOSQ ego scale would reflect ego orientation, whereas the SOQ goal, the POSQ task, and TEOSQ task scales would reflect task orientation. Furthermore, the current study incorporated Rasch analysis to permit a more detailed inspection of item characteristics. The analyses we applied to the goal-orientation questionnaires were similar to those employed by Banjeri, Smith, and Dedrick (1997) in which confirmatory factor analysis (CFA) and Rasch analysis (RA) were used to infer multi-dimensionality within a given measurement construct.

Thus, the questions we examined were: (1) whether two-dimensional goal orientations are measured by the instruments in their present form, and (2) whether

the two dimensions would emerge if misfit items identified by Rasch analysis were deleted from their respective scales and “linear” measures used.

Method

Participants

Two hundred and one undergraduate sport participants took part in this study. Mean age was 20.78 (SD = 4.59). Of the total sample, 144 were males and 57 females. Of these, 153 were soccer and 48 were touch football players. Participation in the study was voluntary and no incentives were offered.

Instruments

Will to Win (WW; Pezer & Brown, 1980). The WW reflects the athlete’s desire to reach some standard of excellence or to defeat an opponent. Winning is extremely important for those who are characterized by this trait. The objective outcome (i.e., score, time, distance, etc.) is less important than the win itself. The measurement concept was derived from the need to develop a sport specific tool that relies on the “person by situation” approach in psychology. To operationally define the desire to win, items consist of emotions associated with winning and losing.

The WW scale consists of 14 true-false items that represent one dimension. Scores close to zero indicate a strong win orientation. The authors reported a KR20 internal consistency coefficient of .66 and a temporal stability coefficient of .87 across a four-month interval.

Sport Orientation Questionnaire (SOQ; Gill & Deeter, 1988). The SOQ was aimed at an aspect of sport achievement orientation appropriate for both athletes and non-athletes who participate in competitive and non-competitive sport activities. The intention was to include both interpersonal competitive standards and personal standards. Items that pertain to competitive orientation reflect will and trying hard to win competitions, enjoying the challenge, and being successful. Items that describe winning orientation reflect the joy of winning and the aversion to losing. Goal orientation consists of items that describe the will to meet specific personal goals. The SOQ used in this study consisted of 25 items with a 5-point, Likert-type response format ranging from “strongly disagree” (1) to “strongly agree” (5). For each dimension, the average rating response determined the score. The higher the score, the stronger the respective orientation.

Gill and Deeter (1988) reported alpha reliability coefficients of .94 (SOQ-comp), .86 (SOQ-win), and .81 (SOQ-goal). Temporal stability coefficients over a four-week period with 218 university students were .89 (SOQ-comp), .82 (SOQ-win), and .73 (SOQ-goal).

Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda & Nicholls, 1992). The TEOSQ is a modified sport-specific version of the inventory developed by Nicholls (1989) to assess task and ego orientations in the academic context. Respondents are required to recall when they felt most successful in their sport and respond to 13 items, of which seven are task-oriented and six are ego-oriented. The item format is based on the same 5-point, Likert-type scale as employed by the SOQ. For each dimension, the average rating response determined the dimension score. The higher the score, the higher the respective orientation.

Alpha values reported by Duda and Nicholls (1992) ranged from .62 to .89. EFA with both orthogonal and oblique rotations indicated a stable two-factor solution. Construct and concurrent validities were established by correlating the two scales with several variables that were believed to be associated with them.

Perception of Success Questionnaire (POSQ; Roberts et al., 1998). The POSQ was designed specifically for the context of sport and recognizes the differences between the sport and educational environments. Competitive orientation includes items that reflect the desire to be superior to and defeat other performers. The task orientation reflects the desire to work hard and reach personal goals. The

POSQ used in the present study consisted of 12 items: six items for each subscale where participants responded to each item on a 5-point Likert-type scale ranging from strongly disagree (1) to strongly agree (5). The score on each dimension was the sum of all items comprising that dimension. The higher the score, the stronger the respective orientation.

Procedure

Participants were approached after training sessions for their sport or while watching other competitions in their sport. They were asked to complete the four questionnaires in full as presented, without referring to another person. The questionnaires were given in the following order: the SOQ, the TEOSQ, the WW, and finally the POSQ.

The project was approved by the USQ Human Research Ethics Committee.

Results

Summary statistics and correlations for the eight scales are presented in Table 1. Three scales, SOQ competitiveness (SOQ comp), POSQ mastery (POSQ mast), and SOQ goal, were somewhat negatively skewed. Otherwise distributions were acceptable, with skewness and kurtosis coefficients not significantly different from zero. Internal consistency estimates (α) were also above .80 and acceptable except for WW win, which had an alpha value of .66.

Table 1. Descriptive statistics, correlations, and reliability coefficients for the goal orientation scales

Scale	1	2	3	4	5	6	7	<u>M</u>	<u>SD</u>	<u>α</u>
1. TEOSQ ego	-	-	-	-	-	-	-	15.97	4.97	.84
2. SOQ win	.30	-	-	-	-	-	-	22.00	4.82	.82
3. SOQ comp	.12	.62	-	-	-	-	-	55.35	7.84	.90
4. POSQ comp	.49	.54	.49	-	-	-	-	21.29	5.28	.90
5. WW win	.24	.62	.36	.40	-	-	-	0.39	0.12	.66
6. TEOSQ task	-.01	.02	.32	.08	-.08	-	-	27.21	4.23	.81
7. SOQ goal	-.03	.39	.69	.25	.13	.41	-	25.32	3.73	.82
8. POSQ mast	-.03	.02	.24	.30	.00	.32	.32	26.18	4.18	.91

The correlations among the eight scales indicated that (a) the scales used to measure win/ego/competitive orientation (variables 1-5 in Table 1) were moderately related, with a median correlation of 0.45, (b) relationships among the scales used to measure task and personal goal orientation (variables 6-8 in Table 1) ranged from weak to moderate, with a median correlation of 0.32, and (c) relations among the task and ego scales ranged from very low to moderate, with a median correlation of 0.02. A moderate/ strong

correlation ($r = .69$) was obtained between SOQ comp and SOQ goal.

To test the structure underlying the variance/covariance matrix established by the eight scales, a CFA was carried out. The model described the ego measures as indicators for a single latent variable and the task measures as indicators for a second latent construct. To leave the model relatively unconstrained in other ways, a covariance pathway was specified between the latent constructs. The model, with parameter estimates, is shown in Figure 1.

Although all path coefficients were significant, the fit statistics for this model were far from satisfactory: χ^2 (19, $N = 201$) = 204.42, $p < .01$; GFI = 0.78; AGFI = 0.62; and RMSEA = .22. Parameter estimates suggested that the two latent traits were unduly influenced by SOQ goal and SOQ comp, both of which had extremely high loadings on their respective traits. Allowing the two error terms for these measures to correlate (suggested also by Marsh, 1994: possibly tapping an additional, unspecified latent variable) did not result in an improved fit. A satisfactory fit was obtained by making other modifications to the basic measurement model, but the result was a model that did not reflect a clear two-factor structure for the eight goal orientation scales.

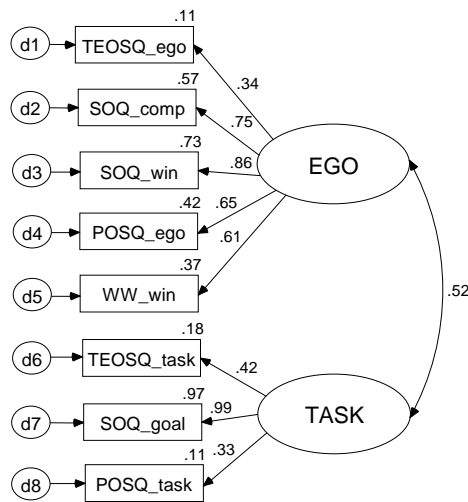


Figure 1. Poorly fitting Ego and Task latent trait model

Rasch analysis was used next to examine individual item fit statistics and fit statistics for each of the subscales for the four instruments separately. These analyses indicated that most scales (WW was the exception) contained misfitting items, indicating a lack of unidimensionality. To further elaborate on the suitability of the subscales to measure goal-orientation, we mapped the spreads (i.e., range) of items and persons separately to illustrate how much overlap exists between the two continua. Ideally, the range of the items should be larger than the range of the persons to enable appropriate discrimination of persons along the entire measurement linear continuum. The eight item-person maps (not reported here) showed clearly that none of the eight subscales covered the ranges they were designed to measure. The spreads of the measures (persons) were substantially broader than those of the items, in complete contrast to what is desirable for a measurement tool. The items within each of the eight subscales were perceived and rated very similarly to each other. Ideally, items that represent a variable should vary in the magnitude of elicited responses.

Unfortunately, this is not the case in any of the eight goal orientation subscales used here. The most appropriate in this respect was the WW scale.

The final step in the analysis involved a re-run of the CFA with the problematic items detected through the Rasch analysis removed from each scale. Improved fit was expected, given that the unidimensionality of each of the revised scales was now confirmed through Rasch analysis. Observed misfit is thus more likely due to lack of convergent validity among the various ego and task measures. The fit statistics for the model for all four instruments using revised scales were again unsatisfactory: χ^2 (19, $N = 201$) = 166.09, $p < .01$; GFI = 0.83; AGFI = 0.67; and RMSEA = .20.

Discussion

The results of this study confirm Marsh's (1994) results on the POSQ and the SOQ and extend those findings to the single-subscale WW and two TEOSQ subscales. The hypothesized two latent dimensions were not supported by CFA. Marsh (1994) concluded that different instruments that would appear to be measuring identical constructs are in fact tapping different dimensions. Due to lack of a reasonable confirmatory fit of the model, a similar interpretation is made in this study.

Aside from the lack of convergent validity, a second and somewhat greater concern regarding the goal orientation scales is their limited ability to discriminate sufficiently between athletes who are high and low on each of the latent variables. The Rasch analysis (Wright & Masters, 1982) indicated that all the scales contain items that are spread in such a manner that many of the participants cannot be separated. For example, the TEOSQ ego fails to differentiate persons with high and low ego orientations, while the TEOSQ task needs more psychometrically sound items to discriminate persons with high task orientation. Most of the participants chose values of 4 or 5 (on a 5-point scale) in all seven TEOSQ task items, resulting in both misfit and a lack of sensitivity (see also Harwood et al., 2000). The SOQ competitiveness and win scales need more items to discriminate between persons high and low in both orientations, while SOQ goal and WW require more psychometrically sound items to discriminate among individuals high in these orientations, as is also the case with POSQ competitiveness and mastery scales. Until such changes are made, none of these scales can be considered to be sufficient measures of the underlying goal orientations.

In addition to these psychometric issues, we believe that the framing of the questionnaires may explain why the instruments are not measuring the same constructs. When responding to the TEOSQ and the POSQ, there is the possibility that the participants may be making value judgments on *how* they believe they are, rather than on *when* they feel *most successful*. For example,

the initial statement in the TEOSQ reads, "I'm the only one who can do the play or skill." A participant could respond to this statement alone without starting the statement with "I feel most successful in sport when..." as the initial instructions would suggest. Thus, an individual may respond to this statement by disagreeing that he or she is the only one that can do the play or skill, whereas the point of the questionnaire is for a judgment to be made on this situation and how it makes the individual feel in terms of success in his or her sport. Structuring these questionnaires so that each statement begins with "when" may alleviate the possibility of this occurring. This should remind participants what each statement is referring to when they feel most successful in sport.

A further explanation for the lack of convergent validity is that the task and ego involvement of an athlete may be dependent on the situation, a view expressed clearly by Harwood et al. (2000). That is, these states are proposed to be transitory. If this is the case, then only the SOQ's structure is sufficient, as it specifically asks participants to indicate how they usually feel. The other questionnaires may be reflecting situation specific or general orientations dependent on the individual completing the questionnaire. Therefore, in terms of measuring similar constructs, the SOQ has been designed so that if participants follow instructions correctly, it will measure general orientation, whereas one cannot be certain that the POSQ, TEOSQ, or WW are measuring specific or general orientation.

To conclude, the results of this study point out the limitations of scales developed to measure goal orientation dimensions in sport and exercise. Further development is needed to satisfy the basic requirement of goal orientation measurement. The scales contain many items which fit the measurement model very well. However, more items are needed to cover sufficiently the linear continuums of each of the eight variables. The conceptual and statistical differentiation of goal orientation dimensions is not clear as yet. We have specified some areas for improvements to existing instruments that should lead to a better conceptualisation of the mastery and win orientations.

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