
Effects of self-efficacy, satisfaction and personal goals on swimming performance

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Manuscript submitted: May 19, 1994
Revision submitted: August 20, 1994
Running head: Goal setting and swimming performance

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Acknowledgments

I would like to thank Dr. S. Biddle and Dr. R. Weinberg, for their comments on an earlier draft of this article. I also would like to thank Dr. M. Goudas for his assistance with data analysis.
Abstract

There has been limited research on how personal goals combine with other factors to determine performance in sport. The present study tested the effects of self-efficacy, past performance, personal goal-setting and self-satisfaction, on swimming performance. Subjects (N=42) performed four trials of a specific swimming task with ten minutes interval between each trial. During the third and fourth trials they performed after setting personal goals and completing self-efficacy and self-satisfaction scales. Results showed significant improvement in their level of performance in these two trials. Past performance, self-efficacy, self-satisfaction, and personal goal-setting were predictors of performance at the third and the fourth trial. A LISREL VI path analysis indicated that past performance was the main determinant of future performance. Personal goal-setting was affected by level of past performance, as well as by perceived self-efficacy and satisfaction. In a second stage of analysis, past performance was eliminated and results supported the mediating role of personal goals between self-efficacy and performance. Practical implications and future directions for research are offered for the development of an effective psychological model to predict performance in sport.
Effects of self-efficacy, satisfaction and personal goals on swimming performance

Several studies have found support for the effectiveness of goal-setting techniques to enhance performance in industrial and organizational settings (e.g., Cevrone, Jiwani, & Wood, 1991; Earley & Lituchy, 1991; Locke & Latham, 1990; Locke, Frederick, Lee, & Bobco, 1984) indicating that specific, challenging goals lead to higher levels of performance than easy goals, no goals, or "do your best" goals. In the last decade, a growing body of research in sport settings has also examined goals (Anshel, Weinberg, & Jackson, 1992; Giannini, Weinberg, & Jackson, 1988; Hall & Byrne, 1988; Smith & Lee, 1992; Weinberg, Fowler, Jackson, Barnall, & Bruya, 1991). However, unlike the consistent and replicable results found in organizational settings, the findings concerning the effectiveness of goals in sport and exercise settings have been equivocal and inconsistent (Weinberg & Weigand, 1993). Some of these studies have failed to find differences in performance between groups of subjects who set easy or difficult goals or chose their own goals. Locke (1991), criticising these results, stated that it is anomalous that general studies on goal setting in sport and exercise psychology have obtained null results and that the inconsistent findings are due to methodological flaws. Weinberg and Weigand (1993) reacted that it is overly simplistic to argue that inconsistent findings can all be attributed to methodological problems. They stated that the motivation of the participants, as well the type of tasks in sport and exercise, are different from those in industrial/organizational settings.
Also, there has been limited research on how goals combine with other factors to determine performance (Locke et al., 1984). The psychological mechanisms through which personal standards create motivational effects, and how these mechanisms govern motivation, have received less attention (Bandura & Cervone, 1983). A number of studies have dealt with the development of an effective goal-setting psychological model. Variables which are related to task performance are: self-efficacy (Bandura & Jourden, 1991; Cervone, et al., 1991; Earley & Lituchy, 1991; Locke et al., 1984), ability (Earley & Lituchy, 1991; Locke et al., 1984), personal goal setting (Bandura & Jourden, 1991; Earley & Lituchy, 1991), self-evaluative reaction (Cervone, et al., 1991), performance valence, (Earley & Lituchy, 1991), task strategy (Locke et al., 1984), goal level (Garland, 1982), and commitment (Hollenbeck, Williams & Klein, 1989). The present study focused on examining the effects of the above variables on goal-setting since this has not been done in sport psychology to date.

Results have indicated a positive relationship between efficacy and subsequent performance in sport and exercise settings. Feltz (1988) and McAuley (1992) have reviewed studies reporting relationships between self-efficacy and performance in sports and physical activities. McAuley (1992) stated that self-efficacy was related not only to performance but also to many other psychological and behavioral variables. Examination of such relationships in physical activity contexts is necessary if we are to better understand the role of self-efficacy as a mediator of behavior change. Locke and Latham (1990) reported 11 studies in which self-efficacy (or expectancy) affects the level of the personal goal but is also independently related to performance. There were also effects for self-set goals on performance. However, a few studies in the sport domain that have addressed assigned versus self-set goals have not reported significant differences (Âoyce, 1992;
Hall & Byrne, 1988). Locke and Latham (1990) concluded that self-set goals are not consistently more effective in increasing performance than other methods of goal-setting.

Bandura and Cervone (1983) addressed the issue of self-satisfaction. When people commit themselves to explicit standards or goals, perceived negative discrepancies between what they do and what they seek to achieve create self-dissatisfactions that serve as motivational inducements for enhanced effort. Their study showed that the higher the self-dissatisfaction with a standard of performance the greater the subsequent intensification of effort. Locke and Latham (1990) concluded that the effect of satisfaction on action is indirect, and that it is a key to high performance.

According to the model presented in the Locke et al. (1984) study, an assigned goal affects simultaneously an individual's self-efficacy expectations and personal goals, which in turn influence performance. The relation of assigned goals to performance is mediated by an individual's self-efficacy expectations and personal goals. Ability is unlikely to affect self-efficacy expectations or personal goals if the person is unaware of his or her ability. Additionally, the study of Early and Lituchy (1991) showed that assigned goals influence both self-efficacy and personal goals and that they, in turn, have direct effects on performance. Also, the mediating role of personal goals in self-efficacy and performance was supported. According to the model in Bandura and Jourden (1991), perceived self-efficacy enhances performance both directly and indirectly by its effects on personal goal-setting, on affective self-reactions, and on the use of analytic strategies. Goal setting is affected by level of prior attainments as well as by perceived self-efficacy. The stronger the perceived self-efficacy and the higher the prior accomplishments, the more challenging are the goals. A strong sense of
self-efficacy and high prior attainments activate positive self-evaluative reactions. High self-set goals, positive self-evaluative reactions and analytic strategies enhance the level of performance. Finally, with increasing experience, prior performance makes a weaker contribution and perceived self-efficacy accounts for a large share of the variance in performance attainments.

According to Weinberg, Burton, Yukelson and Weigand (1993) the ways in which athletes actually set and prioritize goals is a fruitful area of future research. The usefulness of the above models in goal-setting theory and in the sport domain has not yet examined. The aim of this study, therefore, was to examine the effects of past performance, personal goal-setting, self-satisfaction and perceived self-efficacy on performance. For this purpose, a specific swimming task was selected. It was hypothesized that personal goal-setting would be affected by the level of prior attainments as well as by perceived self-efficacy. Also predicted was that high self-set goals, positive self-evaluative reactions, strong perceived self-efficacy and past performance will enhance the level of performance.

Method

Subjects and Procedure

Subjects (N=42) of physical education classes in a Greek university agreed to participate in an experiment. The subjects were instructed to attempt to achieve the greatest number of meters swimming in a time of 20 seconds. A total of
four trials were given to all subjects. Subjects were given a 10 min warm up in the swimming pool and then performed two trials. These two trials were a pretest and was used as a measure of the past performance variable. A 10 min rest period was given to enable the subjects to recover from the effects of fatigue. Then subjects informed about their previous performance, set a personal goal orally and in writing and after that efficacy expectations and self-satisfaction were both assessed. After the assessment of psychological variables, the third trial was performed. Again, a 10 min interval was given. Next, subjects were informed about their performance, set again a new personal goal, completed the self-efficacy and self-satisfaction scales and performed the fourth trial.

Measures

Self-efficacy expectations. Subjects were asked to rate the strength and magnitude of their self-efficacy expectations for six performance levels - 20, 25, 30, 35, 40, and 45 meters in 20 seconds. The format used is comparable to that used by Locke et al., (1984) and Bandura and Jourden (1991) (e.g. "I can swim 20 meters in 20 seconds" Yes-No, and "How certain you are?" answered on a 10 point scale anchored by "certain" (10) and "uncertain" (1). The strength of perceived self-efficacy was the mean level of confidence for the six levels of performance. Cronbach alphas for this six item scale were .88 and .91 for the third and fourth trial respectively.

Self-satisfaction. It was measured with the method outlined by Early and Lituchy (1991) study. Subjects were asked to indicate how satisfied they would be if they swim 20, 25, 30, 35, 40, and 45 meters in 20 seconds. Responses were
given on a 7-point scale ranging from "extremely dissatisfied" (1) to "extremely satisfied" (7). The response to these six performance levels were averaged for a composite self-satisfaction score. The response to these six performance levels were averaged for a composite self-satisfaction score. Cronbach alphas for this six item scale were .89 and .85 for the third and fourth trial respectively.

Past performance was indicated by the mean time of the first two trials. Also, performance 1 and performance 2 variables in the analysis were the meters that subjects swam in the third and fourth trial respectively. In the left and the right of the swimming lanes there were marks indicating the distance covered and these were visible to the swimmers.

Results

Table 1 presents means and standard deviations of all the examined variables. Results showed that the highest level of performance was observed at the third trial. Significant differences between past performance and personal goal 1 (t=4.58, p<.001), and past performance and personal goal 2 (t=4.33, p<.001) were observed. Also a significant difference between past performance and performance 1 was observed (t=2.54, p<.01). The difference between past performance and performance 2 was not significant (t=1.56, p>.05). There were no differences between self-efficacy and satisfaction measures for the two performances. Finally, there were significant correlations (p<.001) between the performance and the predictor variables (see Table 2).
Structural equation modelling analysis using LISREL VI (Joreskog & Sorbom, 1984) was employed in order to examine the network of relationships between the observed variables. The two trials were analysed separately, that is the third trial and the corresponding psychological measures represent the first phase of the analysis, and the fourth trial and the corresponding psychological measures the second phase of the analysis.

The model that was specified is that from Locke and Latham (1990) and Bandura and Jourden (1991). Self efficacy was modelled to mediate the effect of past performance on personal goal setting which in turn influences performance. Self-efficacy and self-satisfaction both influence performance, and ability or past performance affects his or her current performance. However, the indexes of fit provided by LISREL were not satisfactory for this model suggesting that there was space for improvement. Examination of the modification indexes suggested that the model would be significantly improved by including paths from past performance to personal goal and from past performance to self-satisfaction. Figure 1 presents the structural coefficients for this model. In the first phase of the analysis (left network), the goodness of fit index (0.938) and the adjusted goodness of fit index (0.689) for this model indicated an acceptable fit. Also the mean square residual (.036) was considered satisfactory. In the second phase of the analysis (right network) the goodness of fit index (0.972) and the adjusted goodness of fit index (0.859) for this model indicated an acceptable fit, and the mean square residual (.039) was also considered satisfactory.
As can be seen, the effects of goals on performance were rather small. This may have been caused by the high effects of past performance. Two additional analyses were therefore conducted to test another model with the elimination of past performance. In a similar model which appeared in Locke and Latham's (1990) meta-analysis, self-efficacy affects the level of the personal goal but is also independently related to performance. Also, there was a main effect for self-set goals on performance. However, the indexes of fit provided by LISREL were not satisfactory for the above model suggesting that there was space for improvement. Figure 2 (left network) presents the refined model for the first phase of the analysis. In this model self-efficacy affected goals. Its contribution to performance was not significant. A path from satisfaction to personal goal was added. The satisfaction variable affected only personal goals and its contribution to performance was not significant. The goodness of fit index (0.989) and the adjusted goodness of fit index (0.946) for this model indicated a good fit. Also the mean square residual (.015) was considered satisfactory (see Figure 2). Again, in the second phase of the analysis (right network), the paths from satisfaction and self-efficacy to performance were eliminated because they were not contributing to the fit of the model. The goodness of fit index (0.979) and the adjusted goodness of fit index (0.894) for this model indicates a good fit and the mean square residual was a satisfactory (.022).

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Insert Figures 1 & 2 about here
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Discussion
The results of the path analyses provide evidence that self-efficacy, self-satisfaction and personal goal-setting operated as significant determinants of performance. In the first stage of analysis, findings indicated the strong effect of past performance on all the variables of the model. Past performance is a key determinant of self-efficacy, self-satisfaction and personal goal-setting. These results support previous studies (e.g. Bandura & Jourden, 1991; Early & Lituchy, 1991; Locke et al., 1984).

In the second stage of analysis, in which past performance was eliminated, results provide consistent support for the mediating role of personal goal-setting in the relation of self-efficacy to performance. These findings are consistent with the previously mentioned studies. In contrast, an unexpected finding was the effect of self-efficacy and self-satisfaction only on personal goal-setting and not on performance. Another unexpected finding concerned the role of self-satisfaction in the goal-efficacy models. Contrary to the results provided in Early and Lituchy's (1991) models, the present data indicated a correlation between self-satisfaction and performance. The path analysis also provided support for the inclusion of the satisfaction variable in the model. Personal goal-setting was again a mediator between self-satisfaction and performance.

Early and Lituchy (1991) stated that the null findings for performance valence call into question the necessity of this variable for the prediction of performance. The present findings demonstrated that in sport motivation self-efficacy is a key mechanism in affecting personal goals and performance. Also contrary to their results self-satisfaction seemed to be an important factor in determining personal goal-setting.
Bandura and Jourden (1991) stated that on simpler tasks, in which success is attainable solely by an increased level of effort, self-discontentment with substandard attainments is the major regulator of performance accomplishments. In contrast, on complex tasks that make heavy attentional and cognitive demands, self-satisfaction with personal progress toward challenging standards provides a positive motivational orientation for performance accomplishments. Also they stated that personal goals have weaker effects on organizational accomplishments than on individual accomplishments. Results of the present study indicated that personal goals operate as the stronger regulators of performance compared to self-efficacy and self-satisfaction.

**Implications for sport psychology**

An important implication of these results is that cognitive processing plays a central mediating role in sport and exercise motivation. A practical implication is that personal goal-setting, combined with adequate training, will help athletes to ensure that they have the requisite abilities and skills to perform physical activities. Poag and McAuley (1992) showed that more efficacious participants perceived themselves to have been more successful in achieving their goals at the end of an exercise program. Boyce (1992) stated that goal-setting strategies (either participant-set or assigned) may provide teachers and coaches with a viable way of enhancing skill acquisition and retention with their students and athletes. Martens (1987) also supported the importance of setting personal goals, and stated that the more mature,
experienced, and confident an athlete, the less the coach should direct his or her setting of goals. Currently, results of this study showed that the more confident an athlete is the higher was the personal goal and subsequent performance.

Another practical implication for coaches and physical educators is that between personal goal-setting and performance, a number of factors acts as mediators. These factors are self-satisfaction, previous performance and self-efficacy. In helping athletes to choose or to attain their own goals, coaches should work with self-efficacy and self-satisfaction strategies. Also feedback of previous performance is needed. Athletes should participate actively in setting their own goals because this is likely increase their feelings of responsibility for their own actions.

The development of an effective psychological model to predict performance in sport is of great importance for physical education teachers and coaches. These results support the importance of self-efficacy, personal goal-setting and self-satisfaction in sport performance. Also this study makes clear two points: the first one is that personal goal-setting is affected by past performance. Second, self-efficacy affects performance but is mediated by the effect of personal goals. It seems that self-efficacy is a critical factor in determining personal goals but not directly performance outcome.

Obviously, additional replications are called for. Replications should be performed with alternative tasks and with designs in experimental and sport specific field settings. It seems that there are not great differences between sport specific tasks and the tasks that have been used on other psychological studies.
References


Table 1.

Descriptive statistics of study variables

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<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Minimum</th>
<th>Maximum</th>
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<td>1. Past performance</td>
<td>26.85</td>
<td>4.34</td>
<td>18.75</td>
<td>37.00</td>
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<tr>
<td>2. Self-efficacy 1</td>
<td>26.02</td>
<td>12.28</td>
<td>5.00</td>
<td>54.00</td>
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<td>3. Self-satisfaction 1</td>
<td>38.67</td>
<td>9.53</td>
<td>7.00</td>
<td>49.00</td>
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<td>4. Personal goal 1</td>
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<td>4.56</td>
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<td>37.00</td>
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<td>4.24</td>
<td>18.0</td>
<td>37.00</td>
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<td>6. Self-efficacy 2</td>
<td>25.98</td>
<td>11.42</td>
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<td>7. Self-satisfaction 2</td>
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<td>8.39</td>
<td>10.00</td>
<td>49.00</td>
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<tr>
<td>8. Personal goal 2</td>
<td>28.13</td>
<td>4.51</td>
<td>20.0</td>
<td>37.00</td>
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<tr>
<td>9. Performance 2</td>
<td>27.07</td>
<td>4.33</td>
<td>19.0</td>
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Table 2

Correlation matrix of the examined variables

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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<td></td>
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<tr>
<td>2. Self-efficacy 1</td>
<td>.79**</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3. Self-satisfaction 1</td>
<td>-.39*</td>
<td>-.20</td>
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<td>4. Personal goal 1</td>
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<td>.83**</td>
<td>-.44*</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Performance 1</td>
<td>.97**</td>
<td>.78**</td>
<td>-.37*</td>
<td>.90**</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Self-efficacy 2</td>
<td>.64**</td>
<td>.71**</td>
<td>-.11</td>
<td>.72**</td>
<td>.68**</td>
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<tr>
<td>7. Self-satisfaction 2</td>
<td>-.43*</td>
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<td>.69**</td>
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<td>.77**</td>
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<td>.91**</td>
<td>.72**</td>
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<tr>
<td>9. Performance 2</td>
<td>.97**</td>
<td>.79**</td>
<td>-.37*</td>
<td>.91**</td>
<td>.97**</td>
<td>.67**</td>
<td>-.41*</td>
<td>.91**</td>
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* p<.01
** p<.001
FIGURE 1. Path diagram of the estimated structural models. Path coefficients greater than .16 are significant at $p<.01$. 
FIGURE 2

Path diagram of the estimated structural models. Path coefficients greater than .16 are significant at $p<.01$. 

Self-efficacy 1

- .77

Personal goal 1

.90

Self-satisfaction 1

- .29

Performance 1

- .29

Self-efficacy 2

.68

Personal goal 2

.91

Performance 2

Self-satisfaction 2
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Self-efficacy 1

- .77

Personal goal 1

- .29

Self-satisfaction 1

Performance 1

.90

Self-efficacy 2

.68

Personal goal 2

.91

Self-satisfaction 2

Performance 2

-.29
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goal setting and swimming performance

- Past performance
  - Self-satisfaction 1
  - Self-efficacy 1
  - Personal goal
  - Performance 1
    - .27
    - .02
    - .80
  - .97
- Performance 2
  - .86
  - .13
  - Self-efficacy 2
  - Personal goal
  - Performance 1
    - .18
    - .69
    - .49
  - Self-satisfaction 2
  - .01
  - .13
  - .80

- Self-satisfaction 1
  - .39
- Self-satisfaction 2
  - .02
- Performance 1
  - .27
  - .02
  - .80
  - .97
  - .86
  - .13
  - Self-efficacy 1
  - .02
  - .80
  - .97
  - .86
  - .13
  - Personal goal
  - .27
  - .02
  - .80
  - .97
  - .86
  - .13
  - Self-satisfaction 1
  - .39
- Performance 2
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  - .02
  - .80
  - .97
  - .86
  - .13
  - Self-efficacy 2
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  - .86
  - .13
  - Personal goal
  - .27
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  - .86
  - .13
  - Self-satisfaction 2
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  - .80
  - .97
  - .86
  - .13
  - Performance 1
  - .27
  - .02
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  - Self-efficacy 1
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  - Personal goal
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  - Self-satisfaction 1
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- Performance 2
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  - .86
  - .13
  - Personal goal
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Figure 2