The Effects of Mastery, Competitive, and Cooperative Goals on the Performance of Simple and Complex Basketball Skills

John M. Giannini
University of Illinois

Robert S. Weinberg, and Allen J. Jackson
University of North Texas

This study investigated the effects of different goal and feedback conditions on performance of a basketball shooting task and a more complex one-on-one offensive basketball task. Subjects (N=100) were matched, based on pretest performance, into one of five conditions: competitive goal, cooperative goal, mastery goal, "do your best" with feedback, and "do your best" without feedback. Subjects also responded to questionnaires to allow an assessment of the strength of mastery, competitive, and social goal orientations, which reflected personal achievement goals held before goal-setting instructions were offered. Results indicated that the competitive goal group performed significantly better than the do-your-best-without-feedback group in one-on-one posttest trials. No other between-group performance differences were significant. Subjects' goal orientations were not related to performance in the competitive and cooperative goal conditions, but significant relationships were found for mastery goal group subjects. The results are discussed in terms of Locke's theory of goal setting as well as achievement motivation research on goal orientations, and future directions for research are offered.

Goal setting is often viewed as a practical technique to increase and direct motivation in achievement oriented fields such as business, education, and sport. The acceptance and use of goal setting in these fields came in response to overwhelming evidence for the motivational and performance enhancing effects of goals in the organizational and industrial literature. A review of this literature (Locke, Shaw, Saari, & Latham, 1981) revealed that 99 of 110 studies have supported the hypothesis that specific, difficult goals, if accepted, result in higher

Requests for reprints should be sent to John Giannini, University of Illinois, Department of Kinesiology, 906 S. Goodwin Ave., Urbana, IL 61801.
performance than easy goals, vague goals, or no goals (Locke, 1968). This basic finding has been obtained using a variety of laboratory tasks and field settings and continues to receive support in the current literature (Garland, 1982; Locke, 1982; Locke, Frederick, Lee, & Bobko, 1984; Wood, Mento, & Locke, 1986).

The empirical support for the effectiveness of goal setting in organizations and industry has not been demonstrated in the sport literature, however, as the results of goal-setting studies in sport have been equivocal. Specifically, subjects in goal-setting conditions have performed better than subjects without goals in intercollegiate swimming (Burton, 1983), archery (Barnett & Stanicek, 1979), and hand-grip endurance (Botterill, 1977; Hall, Weinberg, & Jackson, 1987), but no between-group differences were observed in studies using juggling performance (Barnett, 1977; Hollingworth, 1975) or a muscular endurance timed sit-up task (Hall & Byrne, 1986; Weinberg, Bruya, & Jackson, 1985). The information available on goal setting in sport is obviously limited by the sparse number of studies conducted, but there are other limiting factors in the sport literature.

One limiting factor in previous goal-setting studies is that only specific, difficult goals to encourage mastery and improvement have been employed. Although such goals have proven to be effective in various settings, other goal conditions may be more useful in the sport environment. For instance, Locke and Latham (1985) encourage the study of competitive goals in sport. Competitive goals are ones in which the goal becomes the performance of another person (i.e., competitor) and the goal can change as the competitor's performance changes. In addition to competing against opponents, sport participants often cooperate with and encourage each other. The influence of cooperative group goals, as well as competitive goals, have yet to be investigated in sport studies. Thus, this was one of the purposes of the present investigation.

The purpose of examining the effects of different goal conditions is consistent with recent research indicating sport participants often possess personal competitive and social goals (Duda, 1981, 1985, 1988, in press; Ewing, 1981; Pemberton, Petlichkoff, & Ewing, 1986). This research is based on the notion that individuals have their own achievement goals that are determined by what is considered desirable in personal characteristics (Maehr, 1974; Maehr & Nicholls, 1980; Nicholls, 1984). In a review of this literature, Roberts (1984) has proposed that sport participants may be oriented toward goals that involve demonstrating competitive ability, gaining social approval, and increasing sport mastery.

Recognizing the existence of multiple achievement goals has important implications for goal-setting research. First, it indicates that the specific, difficult, mastery oriented goals typically used in research are not pertinent to all individuals. This realization emphasizes the need to incorporate other types of goals in research. Second, it seems reasonable to believe that the existing achievement goals of an individual, based on personal convictions of desirable behavior, could override the influence of experimenter-set goals. For example, a subject may receive specific, mastery goal-setting instructions but still focus on personal competitive goals. Thus, it could be predicted that a mastery goal-setting condition would only be motivating to the extent that an individual perceives the situation as personally meaningful (i.e., possesses a strong mastery orientation). The present study adopts this view and hypothesizes that there will be a significant, positive
relationship between goal orientation strength and performance under goal conditions when there is similarity between the goal condition and goal orientation. Such similarities may also be found between competitive and cooperative goal conditions and the competitive ability and social approval goal orientations, respectively.

Another limiting factor often suggested in studies demonstrating no goal-setting effects is the use of inappropriate tasks. For example, Barnett (1977) suggested that novel or complex tasks, such as juggling, may limit the effectiveness of goals because subjects lack the ability to improve in short periods of time under any condition. In studies using a 3-min sit-up task (Hall & Byrne, 1986; Weinberg et al., 1985), the absence of goal-setting effects could have been due to salient fatigue and pain cues that helped subjects reach physiological ceilings or maximal performance. In view of the questions raised regarding task appropriateness, a definite need emerges to establish the effects of goals in various types of tasks. Wood et al. (1986) have developed a framework to investigate the role of task characteristics as potential limiting conditions of goal effects that may prove useful for determining appropriate goal-setting tasks in sport. Wood et al. (1986) conducted a meta-analysis of task complexity and goal effects in 125 industrial goal-setting studies and found that goal-setting effects were strongest for simple tasks (e.g., reaction time, brainstorming) and weakest for more complex tasks (e.g., engineering work, research productivity). Using the complex simple framework of Wood et al. (1986), the present study explored differences in the strength of goal-setting effects in sport tasks of varying complexity.

**Method**

**Subjects and Design**

Subjects were 100 volunteer male recreational basketball players recruited from open gym periods in a university’s physical education building and from physical education classes. They were assigned to one of five conditions. In three goal-setting conditions subjects received either competitive, cooperative, or mastery goal instructions, and two control groups were instructed to “do your best,” with one group receiving performance feedback and the other receiving no specific feedback.

Subjects were assigned to their experimental conditions by a matching procedure based on pretest scores for the two tasks employed, as well as data from a pilot study that produced interquartile ranges for pretest scores. Pretest scores for the tasks were combined and subjects were matched into conditions, so that an equal number were found in each of the interquartile ranges. This procedure was adopted out of a need to assign relatively evenly matched subjects to the competitive condition to make those goals challenging and realistic. Furthermore, the pretest allowed for more accurate goal setting in posttest trials and minimized initial between-group differences. Thus, the design was a $5 \times 2$ (Goal Condition $\times$ Pretest and Posttest) design.

**Experimental Tasks**

All subjects performed two tasks under their assigned conditions. One was a 3-min basketball shooting task in which a 15-ft arc was marked around the basket
and subjects were instructed to make as many shots from beyond the arc as possible in 3 minutes. Subjects rebounded their own shots and chose where they shot from beyond the arc. Scoring was achieved by counting each made basket as 1 point.

The other experimental task was one-on-one offensive basketball against a defensive player. Subjects played offense for 2 minutes and were instructed to score as many points as possible against a defender. The rules of the one-on-one were as follows: the ball must be checked back to the experimenter after a basket is scored; only the defender may call a foul, in which case two free throws will be shot; the clock will only stop on fouls and while the ball is out of bounds. Scoring was accomplished by counting each basket as 2 points and each free throw as 1 point. The defenders used in the task were three research assistants selected by the experimenter. They served as common opponents for all subjects and any ability differences between them were controlled for by balancing their use across all conditions. Of the 20 subjects in each condition, 12 faced 1 defender and 8 faced the other 2 defenders (4 against each).

Pilot testing indicated the test-retest reliability of the basketball shooting and one-on-one tasks to be .91 and .84, respectively. The tasks also fit the simple complex framework used by Wood, Mento, and Locke (1986) to test for task characteristics limiting goal effects. The timed shooting task is low in component, coordinative, and dynamic complexity compared to one-on-one offensive basketball. Any differences in the goal-setting effects observed between the tasks will provide information on the role of task complexity in sport goal setting.

Instrumentation

The Sport Achievement Questionnaire (SAQ) developed by Ewing (1981) and recently revised by Pemberton et al. (1986) was used to measure the strength of existing goal orientations in subjects. Because achievement goals are influenced by perceived ability and situational demands (Maehr, 1974), the SAQ was modified to measure the strength of subjects’ achievement goal orientations in performing each of the two experimental tasks. This modification consisted of asking subjects to respond to the original items based on events that made them feel successful while performing the experimental tasks. Thus, the modification only involved changing the critical incident for the questionnaire to reflect situation specific concerns, which is the manner in which this instrument was intended to be utilized.

Goal Conditions

Competitive Goal Condition. Subjects received feedback on their performance and the performance of the other subject present after pretest trials. They were then instructed to compete against each other in the following two trials with the goal being to beat the other subject. Before each subsequent trial, subjects were given feedback concerning both their own and their competitor’s performance. Subjects then recorded specific performance goals based on this information.

Mastery Goals. In this condition, subjects received feedback on performance in each trial. However, unlike the other experimental goal conditions, subjects did not observe the other subject performing and had no visual or written
specific feedback on the other subject’s performance. This procedure was adopted to discourage any competitive or social approval goals and to achieve a truer mastery goal condition. Subjects were instructed to strive for improvement over their previous best score. Before each subsequent trial, subjects expressed their performance goal.

**Cooperative Goals.** Each pair of subjects received feedback on their combined performance on the pretest trials. They were then instructed to cooperate with and encourage each other to improve upon their previous best team score on the opening test trials. Before each subsequent test trial, the two subjects collaborated on a team goal and provided their individual goal to contribute to the team goal.

**Do-Your-Best Without Feedback.** Subjects received no goal setting instructions and did not receive any specific feedback regarding their performance scores. Previous studies (Hall & Byrne, 1986; Hollingworth, 1975; Weinberg et al., 1985) have reported that most subjects in control do-your-best conditions use performance feedback spontaneously to set goals, thereby confounding the purpose of the control group. The present study hoped to avoid this by limiting the feedback available to control-group subjects. It should be pointed out, though, that subjects still received the visual feedback that is commonly available to sport participants, which maintained the natural sport environment the study strived to create.

**Do-Your-Best With Feedback.** In this control condition, subjects were treated as those in the control condition without feedback, except that verbal performance feedback was provided to subjects following each posttest trial. This control condition was adopted to determine whether feedback would be responsible for any differences between subjects receiving specific goal-setting instructions and those receiving no goal instructions but told to do their best.

**Procedures**

Subjects were scheduled in pairs. Present at each testing session were two subjects, the experimenter, and a research assistant. Upon arriving, subjects had a 5-min warm-up period. Following this, each subject performed two trials of each experimental task, which served as the pretest score. The order of the tasks were counterbalanced in each goal condition and subjects performed both trials of the first task before beginning the second task. In the timed shooting task, one subject rested while the other performed, so there was no need for delays between trials. On the one-on-one task, there was a 2-min rest between trials for the benefit of the defensive players. After the pretest data were collected, subjects completed the Sport Achievement Questionnaire. Upon receiving goal condition instructions, subjects performed two more posttest trials of one task. Similar goal instructions were then given for performance of two posttest trials on the other experimental task. The same procedures and task order used to collect pretest data were used to collect posttest data.

**Results**

**Task Performance**

The data from the timed basketball shooting task were analyzed by a $5 \times 2$ MANOVA (Group $\times$ Trials). Results indicated a significant main effect for trials,
Performance of Basketball Skills

$F(1, 95)=68.44, p<.001$, as subjects improved performance in posttest trials ($M=34.97$) over performance in pretest trials ($M=30.41$). The group main effect and Group × Trials interaction were not significant. Follow-up ANOVAs showed the groups were not significantly different on pretest or posttest trials. Means and standard deviations are presented in Table 1.

The data from the timed one-on-one offensive basketball task were also analyzed by a $5 \times 2$ MANOVA. Another significant main effect for trials was obtained, $F(1, 96)=28.88, p<.001$, as subjects improved performance on posttest trials ($M=35.73$) over performance on pretest trials ($M=31.38$). In addition, a significant group-by-time interaction was found, $F(4, 95)=4.87, p<.01$. Follow-up ANOVAs indicated that the groups were not significantly different in pretest performance, but a significant between-group difference was indicated on posttest performance, $F(4, 95)=2.94, p<.02$. A post hoc Newman-Keuls analysis ($p<.05$) found that the competitive goal group performed significantly better than the do-your-best group without feedback on posttest trials. No other between-group differences were significant. Table 2 displays the means and standard deviations for the one-on-one task.

Table 1
Means and Standard Deviations of Successful Shots in the 3-Minute Shooting Task

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest performance</th>
<th>Posttest performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Competitive goal</td>
<td>32.35</td>
<td>9.13</td>
</tr>
<tr>
<td>Cooperative goal</td>
<td>31.05</td>
<td>13.26</td>
</tr>
<tr>
<td>Mastery goal</td>
<td>27.50</td>
<td>11.57</td>
</tr>
<tr>
<td>Do-your-best with feedback</td>
<td>32.10</td>
<td>10.50</td>
</tr>
<tr>
<td>Do-your-best without feedback</td>
<td>29.05</td>
<td>8.80</td>
</tr>
</tbody>
</table>

Achievement Goal Orientations and Performance

Pearson product-moment correlations were obtained between the strength of task-specific achievement goal orientations and performance under each goal condition. More specifically, competitive ability, sport mastery, and social approval goal orientations were correlated with performance. Only in the mastery goal group were significant, positive relationships observed between goal-orientation strength and performance. Correlations for this group ranged from .37 to .61, as each goal-orientation measure was significantly ($p<.05$) related to performance on both tasks. In direct opposition to the mastery goal group were the competitive and cooperative goal groups, in which all the correlations obtained were very low or negative, with none reaching significance.
Table 2
Means and Standard Deviations of Points Scored in the One-on-One Task

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest performance</th>
<th>Posttest performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Competitive goal</td>
<td>34.50</td>
<td>12.70</td>
</tr>
<tr>
<td>Cooperative goal</td>
<td>33.60</td>
<td>11.18</td>
</tr>
<tr>
<td>Mastery goal</td>
<td>29.70</td>
<td>15.57</td>
</tr>
<tr>
<td>Do-your-best with feedback</td>
<td>29.40</td>
<td>12.56</td>
</tr>
<tr>
<td>Do-your-best without feedback</td>
<td>31.20</td>
<td>10.63</td>
</tr>
</tbody>
</table>

Discussion

Goal Conditions and Performance

The results of the present study provide limited support for the effectiveness of different goal conditions. The competitive goal group performed significantly better on one-on-one posttest trials than the do-your-best group without feedback, but all other between-group performance differences were nonsignificant.

The lack of differences between most groups adds to the growing number of sport studies showing no significant differences between subjects given specific goals and subjects without explicitly stated goals. These results indicate that performance feedback alone seems to produce similar performance and motivational levels as formal goal-setting instructions. The most likely explanation for this similarity is that upon receiving performance feedback, individuals who are intrinsically interested in performance, such as the volunteer recreational basketball players used here, will independently set their own goals. Weinberg et al. (1985) found that 83% of subjects in a do-your-best group with feedback actually had set specific goals. Although no postexperimental data were obtained here on the extent to which control group subjects set goals, there is sufficient reason, based on past research and the performance data, to suspect this was indeed the case. This explanation is also consistent with the findings of Locke (1967), in which feedback only improved performance to the degree that it let to the setting of specific goals.

As previously stated, the only significant between-group difference occurred in one-on-one performance. The greater goal-setting effects observed in the more complex one-on-one task as compared to the shooting task contradicts evidence in the organizational literature which shows that goal setting effects are strongest in simple tasks (Wood et al., 1986). Wood et al. (1986) persuasively argue, with supporting data from a meta-analysis of task complexity in 125 goal-setting studies, that the motivating effects of goals can more easily direct increased effort to the responses necessary to improve performance when fewer informational cues and acts are involved in a task. However, further consideration of the tasks used in
the present study and those common in sport may limit the generalization that goal-setting effects are strongest in simple tasks.

Specifically, Locke et al. (1981) suggest that in order for goals to be effective in increasing performance, increased effort at a task must lead to increased performance. Basketball shooting, like many sport skills, requires extensive practice to reach significantly higher levels of performance, and an immediate increase in effort may not be met by a corresponding increase in performance. Goals may still be effective in such cases, but the time frame for goal attainment may have to be extended to allow for necessary practice.

Alternatively, performance in one-on-one basketball may be improved by immediate increases in effort through goal setting, as summoning greater endurance, speed, and strength is important and useful in scoring more points against a defender. The stronger goal-setting effects found with the more complex task should not be viewed as a total contradiction of Wood et al. (1986), though, as one-on-one basketball may still be on the simple end of the continuum of basketball task complexity when one considers the increased demands of additional players and strategy. Rather, the findings suggest that goal-setting programs in sport should consider the motoric difficulty of tasks (e.g., fine vs. gross motor skills) as well as their conceptual complexity, and should base goals on the appropriate rate of improvement.

Goal Orientation, Goal Conditions, and Performance

Based on the rationale that meaningful, effective goal setting should match, emphasize, and increase personal achievement goals, it was hypothesized that there would be a positive relationship between the strength of achievement goal orientations and performance under goal conditions, when there was similarity between goal orientation and goal condition. The observed positive relationship between mastery goal orientation strength and performance under the mastery goal condition reflects the assumption that mastery goals will motivate individuals to the degree that mastery goals are perceived as being important in the achievement situation.

The unexpected positive relationships between competitive ability and social approval goal-orientation strength and performance under the mastery goal condition might be explained in terms of the similarities between the various achievement goals and the field setting, which allowed these similarities to surface. Specifically, the field setting likely allowed subjects to continue pursuing competitive and social approval goals in the mastery condition. For example, subjects still had the opportunity to demonstrate high ability relative to others and to win the approval of the experimenter and his assistant with high effort, if these were perceived as being desirable outcomes for the subject. The mastery goal instructions provided certainly could not prevent such personal achievement goals. In view of this, it is not surprising that the strength of these forms of achievement motivation would be positively related to performance. Effort and performance should be a function of motivation, whether personal mastery, competitive ability, or social approval goals fuel that motivation.

Furthermore, it should be noted that data on the strength of goal orientation for all subjects reveal that subjects tended to be more oriented toward mastery goals in pretest trials and possessed very moderate orientation strength toward competitive or social approval goals. Thus, competitive or cooperative goal in-
structions likely did not coincide with the personal goals of many subjects in pretest trials, but subjects appeared to follow those instructions and change in goal orientation after providing data on the achievement questionnaires. Such changes in goal orientation following the completion of the SAQ, but prior to performance, may have been responsible for the low correlations observed. It is not surprising that goal orientations would be unstable in an artificially created novel situation, and future research may employ naturally occurring settings with longer performance histories and greater personal investment.

In conclusion, the present study indicated that goal-setting programs emphasizing competition may be helpful in increasing performance above levels achieved with only sensory feedback available to sport participants. However, there is evidence that competitive goals can foster negative motivational patterns when they become ego threatening due to repeated failures (Ames, 1984; Burton & Martens, 1987; Elliott & Dweck, 1988; Ewing, 1981). In view of this, recent authors have suggested that a mastery orientation is most conducive to effective long-term achievement striving (Nicholls, 1984). Thus, the results of the present study are limited to more immediate goal-setting effects and short-term interventions. It should be pointed out though, that the positive motivational effects of competitive goals may be maintained when those goals are achieved and perceived ability remains high (Burton & Martens, 1986; Nicholls, 1984).

Finally, it is suggested that special attention be given to organizing goal-setting interventions based on the effort and practice necessary to improve performance in the task of interest, while being aware of task complexity as a possible limiting factor of goal effects. Further research is also necessary to determine the role of achievement goal orientations in goal-setting programs for sport participants in naturally occurring field settings.

References


