
COMMENTS

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Goal Setting in Sport and Exercise: A Reaction to Locke

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Over the past 25 years, goal setting as a motivational technique to enhance performance and productivity has received consistent, reliable, and robust support from the industrial/organizational literature with over 400 studies indicating that specific, challenging goals lead to higher levels of task performance than easy goals, no goals, or do-best goals (Locke & Latham, 1990a). Although sport and exercise professionals (coaches, teachers, exercise leaders) have long been using goal setting to enhance performance, little empirical research had been conducted prior to 1985 to test the effectiveness of goals for enhancing sport performance. However, in their seminal article, Locke and Latham (1985) state that "tasks performed in organizational settings and in the laboratory have much in common with sport activities in that both involve mental and physical actions directed toward some end" (p. 206). Thus, they argue that goal setting should work equally as well in sport settings. In fact, they feel that goal setting could work even better in sport settings since the measurement of an individual's performance is typically easier in sports than it is in organizational settings. With this in mind, they proposed 10 different hypotheses based on the findings in the organizational/industrial literature which they felt would be applicable to sport environments.

At the time of Locke and Latham's (1985) paper, there was a dearth of goal-setting research in sport and exercise settings with a few notable exceptions (e.g., Barnett, 1977; Barnett & Stanicek, 1979; Hollingsworth, 1975). Their paper helped spur a great deal of research in the late 1980s and into the 1990s that investigated the effects of goal setting in sport and exercise. However, unlike the consistent and replicable results found in organizational settings (see Locke & Latham, 1990b, for a review), the findings concerning the effectiveness of goals in sport and exercise settings have been equivocal and inconsistent (see Weinberg, 1992, for a review). Specifically, some studies have supported the effectiveness of goals in enhancing performance (e.g., Hall, Weinberg, & Jackson, 1987; Tenenbaum, Weinberg, Pinchas, Elbaz, & Bar-Eli, 1991; Weinberg, Bruya, Longino, & Jackson, 1988) whereas others have found no differences between specific-goal groups and control/do-your-best groups (e.g., Weinberg, Bruya, Jackson, & Garland, 1987; Weinberg, Bruya, Garland, & Jackson, 1990; Weinberg, Bruya, & Jackson, 1985, 1990).

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Recently, Locke (1991) argued that the inconsistent findings in the goal-setting research conducted in sport and exercise settings (especially the studies obtaining null results) are due to methodological flaws rather than the goal-performance relationship might be somewhat different in these settings than in the organizational/industrial environment. Although Locke specifies seven different problems that have plagued the goal-setting research in sport and exercise, he notes three specific areas in which the major flaws occurred: (a) manipulation failure of "do-best" condition, (b) measurement of personal goals, and (c) making specific goals difficult. Locke goes on to highlight the methodological shortcomings in each area, providing examples from the empirical goal-setting literature in sport and exercise to substantiate his points.

Locke (1991) makes a number of valid points that future goal-setting researchers should heed to improve our methodology. We agree with Locke that there have definitely been methodological concerns plaguing the goal-setting research in sport and exercise. However, we would like to take issue with Locke's view that all null findings can be simply explained away as due to methodological shortcomings.

After conducting 22 experiments using over 1,200 subjects, we believe that it is overly simplistic to argue that inconsistent and equivocal findings can all be attributed to methodological and procedural issues. It would appear more likely that methodological problems are only in part responsible for the differences in findings between the organizational and sport settings. Specifically, we believe that the motivation of the participants as well as the type of tasks in sport and exercise settings are different from those in industrial/organizational settings. For example, subjects in many of the goal-setting studies in sport and exercise voluntarily chose to be in specific physical-activity classes or activities; thus, their motivation to perform physical fitness tasks (e.g., sit-ups) would be expected to be higher than subjects performing ordinary tasks in the industrial area (e.g., typing, card sorting, letter cancellation).

In addition, sport and physical activity tasks typically have very salient feedback that cannot be manipulated as it can in industrial settings. Because feedback is an important mediating factor in goal-setting effectiveness, this distinction between the industrial and sport literatures is important. It is these differences, along with some methodological shortcomings, that have produced the equivocal goal-setting findings in sport and exercise settings. We would now like to address some of the specific comments and criticisms of the sport psychology goal-setting literature, focusing on the three areas which Locke feels have been most problematic.

1. *Manipulation failure of "do-best" condition.* Locke correctly notes that many goal-setting studies conducted in sport and exercise settings have had difficulty preventing subjects in control, or "do-best," conditions from spontaneously setting goals on their own. In those studies that have actually assessed spontaneous goal setting, anywhere from 16.7% (Boyce, 1990b) to 88% (Weinberg, Fowler, Jackson, Bagnall, & Bruya, 1991, Experiment 2) of subjects in control conditions reported setting specific goals on their own. Locke also aptly noted that in several studies in which control subjects set spontaneous goals; no significant differences between specific-goal conditions and control conditions were found (e.g., Barnett, 1977; Weinberg, Bruya, Garland, & Jackson, 1990; Weinberg Bruya, & Jackson, 1985, 1990).

To further support his view, Locke cites studies in which subjects in do-best or control conditions did not set goals and in which specific-goal conditions exhibited superior performance, as would be predicted. For example, Locke points out that in Weinberg et al.'s (1988) study control subjects (elementary school children) apparently did not set goals, and significant differences were found between goal-setting and control conditions. Furthermore, in Giannini, Weinberg, and Jackson's (1988) study, Locke notes that the do-best/no-feedback condition consistently demonstrated the lowest level of performance on both the one-on-one and 3-minute basketball shooting tasks. (Presumably, the lack of formal experimenter feedback would prevent subjects from setting specific goals.) Finally, Locke states that only 16.7% of control subjects in Boyce's (1990b) study set specific goals and that the study found a significant goal effect when comparing specific-goal and do-best groups. Taking all these studies together, Locke concludes that "it seems clear that when do-best subjects either, for some reason, do not set goals or are prevented from doing so, then the specific, hard goal versus do-best goal differences emerge" (1991, p. 312).

We believe that a closer inspection of all the evidence would argue against this conclusion because there are a number of studies, not included by Locke, which do not support his contention. First, there are studies in which do-best subjects did set specific goals and differences were still found between do-best and specific-goal conditions. For example, Locke notes that 55% of do-best subjects in Hall and Byrne's (1988) study set specific goals and significant goal effects were still found in favor of the specific-goal groups. In addition, Boyce (1992), using a rifle-shooting task, found that both specific-goal conditions (participant set and experimenter set) produced significantly higher performance than the do-best condition even though 43% of do-best subjects set specific goals for themselves. In fact, 80% of do-best subjects indicated that they set goals to improve their score by a few points in each trial.

Second, a number of studies found that specific-goal conditions produced significantly better performance than do-best control conditions although no measures were taken concerning the degree to which do-best subjects set spontaneous goals (e.g., Giannini, Weinberg, & Jackson, 1991, Experiment 2; Hall, Weinberg, & Jackson, 1987; Tenenbaum, Weinberg, Pinchas, Elbaz, & Bar-Eli, 1991). Because do-best subjects in other goal-setting studies using similar methodologies were spontaneously setting specific goals, it would seem likely that do-best subjects in these studies were also setting specific goals. If this is the case, according to Locke, there should have been no differences between the do-best and specific-goal groups; however, all these studies reported that the specific-goal groups were superior in performance to do-best control groups.

Third, Locke points to the study by Boyce (1990b), which found significant goal effects when comparing specific-goal and do-best groups, and argues that this occurred because only 16.7% of do-best subjects set specific goals. In looking at other studies in which spontaneous goal-setting was assessed, we find a continuum in the percentage of do-best subjects who set specific goals. These percentages are provided below:

- Boyce (1990a)—20%
- Boyce (1990b)—16%
- Boyce (1992)—43%

- Boyce (in press)—27%
- Frierman, Weinberg, & Jackson (1990)—22%
- Hall and Byrne (1988)—55%
- Weinberg, Bruya, Garland, and Jackson (1990)
 - Experiment 1—22% (long-term goals); 41% (short-term goals)
 - Experiment 2—24%
- Weinberg, Bruya, and Jackson (1985), Experiment 2—83%
- Weinberg, Bruya, and Jackson (1990)—32%

Taken together, these studies contradict Locke's conclusion that goal-setting differences between do-best and specific-goal groups occur only when subjects in do-best groups do not set specific goals. For example, Locke argues that Boyce's (1990b) study (in which 16.7% of do-best subjects set specific goals) found differences between do-best and specific goal groups because do-best subjects did not set goals. However, Locke also argues that Weinberg, Bruya, Garland, and Jackson's (1990) study, which found no differences between do-best and specific-goal groups, resulted from do-best subjects setting specific goals (24% in Experiment 2). It appears arbitrary to say that, if 16.7% of do-best subjects set goals, then goal-setting effects should still occur, but if 24% of do-best subjects set goals, then this shows why no differences occurred. Is there some minimum amount of spontaneous goal-setting by do-best subjects that is "acceptable" to show that goal-setting works? If so, what is this minimum level?

Based on our experience in conducting goal-setting research, attempting to explain the inconsistent findings based on the percentage of do-best subjects who happen to set specific goals does not appear to be an appropriate approach. It is our view that the data are complex and that the seemingly inconsistent findings cannot be easily explained. Other important mediating variables such as type of task (simple versus complex), individual differences (motivation, goal orientation), developmental differences (elementary school, high school, and college students), and setting (laboratory vs. field) have differed across studies and would appear to offer viable explanations for the equivocal nature of goal-setting studies. Future goal-setting research needs to carefully consider these mediating variables when designing and implementing studies.

We feel that one final point should be made concerning Locke's contention that poor methodology has often resulted in do-best subjects setting goals. Locke states that "when subjects are given feedback about their past performance, they may use it to set specific goals" (1991, p. 311). He argues that researchers in sport and exercise psychology have not designed their experiments to prevent subjects from receiving feedback. Thus, do-best subjects spontaneously set goals, and differences between specific-goal and do-best conditions are not found. Locke (1991) suggests that the best methods for preventing subjects from setting goals are (a) to withhold feedback, or (b) to give feedback based on work periods of varying time lengths (not revealed to subjects) so that subjects cannot calculate their average rate (e.g., per minute).

However, we feel that eliminating or providing ambiguous feedback to subjects can be problematic from several perspectives. First, Locke and Latham (1990b) argue that feedback indicating personal progress toward a goal is potentially reinforcing. Reinforcements, in turn, enhance effort, persistence, and commitment, thus impacting (raising) future goals. However, Locke and Latham also

state, "If feedback is incorrectly interpreted or cannot be interpreted, it does not lead to any increase in desired actions" (Locke & Latham, 1990a, p. 187). Therefore, significant differences between specific-goal groups with feedback and do-best groups without feedback may be due to differences in feedback rather than the actual goals. In addition, giving feedback to goal groups while denying the same feedback to the no-goal group would constitute a situation where subjects were treated differently.

Second, if feedback is eliminated (or misleading), individuals may experience a decrease in motivation which can result in less effort, persistence, commitment, and performance. Along these lines, Locke and Latham (1990a) suggest,

It is virtually axiomatic that a goal a person is not *really* trying for, is not *really* a goal, and therefore cannot have much effect on subsequent action. Only an individual who is genuinely trying for a goal can be described as being committed to that goal. (p. 124)

And what kind of goal can an individual set other than "do my best" if an accurate numerical goal is impossible to determine? Similarly, what kind of corresponding commitment can an individual have if there is no specific goal for which to strive? Because Locke and Latham (1990a) argue that commitment is a critical factor in working hard to achieve a difficult goal, not allowing subjects in do-best conditions to set goals by withholding or distorting feedback would obviously reduce commitment and subsequent performance.

Third, Locke and Latham (1990a) state that false feedback raises the possibility of conflict between the feedback the subjects get from the task and that which they get from external sources. This is particularly problematic in sport and exercise settings because Locke and Latham (1990a) acknowledge that "the meaning of feedback is less equivocal in physical activity settings than in organizational settings" (p. 71). In essence, the type of feedback ordinarily available in sport versus industrial settings is different. In many industrial settings, it is possible to withhold feedback, or to give feedback based on varying work periods so that subjects cannot calculate their work rate. However, for many of the tasks employed in sport and exercise settings, feedback is inherent in the task itself. In fact, participants in physical activity receive feedback from the sensory systems during execution of skills and movements (kinesthetic) as well as feedback from their actual performance (such as a basketball player seeing the ball go in the basket or a tennis player seeing the serve go in the service box).

If this feedback is tampered with or eliminated (as Locke suggests should be done to prevent do-best subjects from setting goals), then this clearly creates an artificial setting which would bear little resemblance to a real-world physical activity situation. Any differences among do-best and specific-goal conditions due to inaccurate or no feedback would be more like what Cialdini (1980) has referred to as "trapping an effect." That is, if it is important "to build a sensitive mechanism for snaring the predicted effect" (Cialdini, 1980, p. 23), you are more likely to find an effect, but at the cost of increasing the likelihood of committing a Type I error.

Consequently, in sport and exercise settings, eliminating or distorting feedback from do-best goal conditions may produce significant differences between do-best and specific-goal groups, ensuring that the "experimental manipulations

'take' and that spontaneous goal setting be prevented'' (Locke, 1991, p. 313). However, doing so runs the risk of finding an effect due to Type I error. Furthermore, this effect would have little application to the real world of sport and exercise, thus significantly reducing the external validity of the findings. More empirical research is necessary to systematically examine the relationship between goals, feedback and performance.

2. *Measure personal goals.* Locke notes that "to a great extent, people in laboratory settings work toward the goals assigned to them but this is by no means always the case. Thus, to know how a person will perform, it is imperative to know what personal goals each person sets in response to the goal that as assigned" (1991, p. 313). We agree with Locke on the importance of measuring personal goals; we have found that not only do subjects in do-best conditions spontaneously set their own goals, but many subjects assigned goals do not adhere to those set.

But the propensity of subjects in sport and exercise settings to set personal goals also brings up another interesting point. Specifically, it becomes increasingly difficult to manipulate specific-goal conditions (e.g., improve foul shooting percentage by 10%, 20%, or 30%) and to compare them to each other or a do-best condition if a large percentage of subjects are setting their own goals. In essence, it becomes difficult to test the effectiveness of different goal-setting conditions (e.g., goal difficulty or goal proximity) for improving performance when subjects routinely set personal goals. For example, in one of our earlier studies (Weinberg et al., 1985) 50% of subjects assigned short-term goals also set long-term goals, and 55% of subjects assigned long-term goals also set short-term goals. Similarly, Howe and Poole (1992), using a basketball shooting task, found that 52% of subjects assigned short-term, long-term, or short-term plus long-term goals set their own personal goals that were different from their assigned goals. This tendency to set personal goals would, with all likelihood, be even greater in real-life activities where improved performance or the competition outcome is important. This makes it virtually impossible to provide an accurate test of the effectiveness of long-term versus short-term goals for improving performance.

Subjects tending to set personal goals despite being assigned specific goals will certainly complicate the designing of neat, clean goal-setting studies. But maybe more importantly, the message that the subjects are sending us is that having someone else set goals for them is ineffective because they will set their own goals anyway. This is consistent with data that we recently collected using collegiate athletes in which the athletes reported that they definitely preferred setting their own goals rather than have them set by their coach (Weinberg, Burton, Yukelson, & Weigand, 1991).

Thus, when no differences are found among specific-goal conditions or between do-best and specific-goal conditions, it may not be appropriate to conclude that goal setting does not work. Rather, the more valid conclusion may be that most individuals in sport and exercise settings set goals for themselves and strive to reach those goals. Consequently, researchers may want to focus on how to make goal setting most effective for specific individuals rather than simply trying to determine if goal setting is indeed effective.

3. *Make specific goals difficult.* Locke argues that many studies fail to find that specific goals lead to higher levels of performance than do-best goals

because "the specific goals have been moderate rather than difficult" (1991, p. 314). To support this conclusion, Locke aptly cites studies finding no significant performance differences between specific-goal and do-best groups, such as Hollingsworth (1975) in which 44% of specific-goal subjects attained their goals and Weinberg et al. (1985) in which 57% of subjects reached their goals (Experiment 1). Locke also notes that in Weinberg et al.'s (1985) study (Experiment 2) only 18% of the subjects reached their difficult goal, but Locke argues that no differences were found since 83% of subjects in the do-best condition also set goals of unknown difficulty. This seems a convenient, rather than realistic, explanation of the null findings because it is unlikely that a large percentage of these subjects set very difficult, as opposed to moderate, goals. For example, in several of our previous studies we found that when do-best subjects did set specific goals, they tended to be of moderate difficulty, being achieved approximately 50% of the time.

Furthermore, Locke also notes that in Hall et al.'s (1987) study, the two specific-goal groups attained their goals 46% and 68% of the time, thus the goals were not really very difficult. But he fails to mention that the two specific-goal groups each performed significantly better than the do-best group on a grip endurance task. Given that the specific goals were only moderately difficult, no significant goal differences would have been predicted. These findings are therefore contrary to Locke's hypothesis that only difficult goals produce higher levels of performance.

The results of several other studies, not mentioned by Locke, would also argue against the notion that difficult goals would produce significantly better performance than moderate, easy, or do-best goals. For example, Weinberg, Bruya, Jackson, and Garland (1987) conducted two studies investigating the goal difficulty-performance relationship. In Experiment 1, no significant performance differences were found among easy goals, moderate goals, or very difficult goals. In Experiment 2, again no significant differences were found between subjects given very hard goals, highly improbable goals, or do-best goals.

More recently, Weinberg, Bruya, Garland, and Jackson (1990) in Experiment 1, found no performance differences between subjects assigned a moderately difficult goal (achieved by 40% of subjects) and those assigned an extremely difficult-highly improbable goal (achieved by 1% of subjects). In their Experiment 2, once again no significant differences were found among subjects assigned moderate (68%), moderately difficult (40%), extremely difficult (4%), or do-best goals. Finally, Weinberg, Fowler, Jackson, Bagnall, and Bruya (1991) in two experiments assigned subjects easy (73%), moderately difficult (44%), very difficult (11%), improbable (less than 1%) and do-best goals. Once again, consistent with the earlier studies, no significant differences were found among the goal difficulty conditions.

Taken together, these three studies (which included six experiments) did not find that specific difficult goals produced higher performance than do-best, easy, or moderate goals as predicted by Locke. It should be noted that all three studies included a difficult goal condition which satisfied Locke's operational definition of a difficult goal which is "a goal in which no more than 10% of the subjects can reach" (1991, p. 314). These results were replicated across different tasks (sit-ups, basketball shooting, grip strength), different subjects (elementary school vs. college students), and different settings (field vs. laboratory).

Thus, at least in sport and exercise settings, it appears that difficult goals are not necessarily superior to easier or do-best goals. This may result from subjects setting personal goals that were different than their assigned goals as we previously discussed. More research is necessary which focuses on subjects' personal goals as determinants of performance rather than artificially attempting to assign goals. This would add external validity to the goal-setting research in sport and exercise and would help provide information concerning how individuals set goals for themselves.

Conclusion

We have attempted to demonstrate that the inconsistent results found concerning the goal setting-performance relationship cannot be attributed totally to methodological flaws as Locke (1991) concludes. When one includes all of the evidence bearing on the goal setting-performance relationship, it becomes evident that the equivocal findings cannot be attributed to a single source. We want to emphasize that we agree with Locke that goals can enhance performance in sport and exercise. However, the challenge for researchers is not to simply attempt methodologically rigid experiments that lack any external validity to demonstrate that goal setting does indeed enhance performance. Rather, the greater challenge is to determine what kind of goals are most effective for different individuals, performing different tasks, under different situations. If we begin to answer some of these questions, not only will we better understand goal setting, but this information would be important for developing and implementing effective goal-setting programs in sport and exercise programs.

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