Intrinsic Motivation in Competition: The Intervening Role of Four Individual Differences following Objective Competence Information

JOHN MARSHALL REEVE
Texas Christian University

BRADLEY C. OLSON
University of Rochester

AND

STEVEN G. COLE
Texas Christian University

The individual differences of need for achievement, anxiety (plus resultant achievement motivation), locus of control, and gender were explored to determine their intervening role in intrinsic motivational processes following objective competence information. In two experiments, participants were either allowed to win or were made to lose a puzzle-solving contest against a same-gender confederate with the success/failure experience via the competitive outcome serving as the objective source of competence information. In Experiment 1, outcome, locus of control, and the resultant achievement motivation x outcome interaction predicted level of intrinsic motivation, thereby substantiating the claim that individual differences are important in the prediction of intrinsic motivation. Experiment 2 tested the impact of each individual difference on intrinsic motivation-relevant moderating processes (performance expectancy, actual and perceived performance, and affect) to highlight the processes by which individual differences function to impact level of intrinsic motivation. It was shown that need for achievement affected level of intrinsic motivation through the high achievers' favorably biased performance expectancy and heightened positive affect, and, after losing, through both a favorable actual and perceived performance relative to low achievers. High anxiety impacted level of intrinsic motivation by depreciating performance expectancy and actual performance relative to low levels of anxiety.

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For locus of control, internals showed a higher level of intrinsic motivation than externals via a more favorable performance expectancy and, after winning, via greater positive affect and a more successful perceived performance appraisal.

Perception of competence has been clearly identified as a determinant of a person's level of intrinsic motivation (Bandura, 1982a, 1982b; Deci, 1975; Deci & Ryan, 1980, 1985a; Harter, 1981; White, 1959). To demonstrate the interdependency of competence information and intrinsic motivation, researchers have experimentally manipulated individuals' perceptions of competence and consistently have reported that participants display more intrinsically motivated behaviors when they perceive themselves as competent rather than incompetent (Arkes, 1979; Bandura & Schunk, 1981; Reeve, Cole, & Olson, 1986a; Reeve, Olson, & Cole, 1985; Rosenfield, Folger, & Aldeman, 1980; Vallerand & Reid, 1984; Weiner & Mander, 1978).

To convey an objective message of competence, some researchers give participants normative data such as "you did better than the average student on these puzzles" (Harackiewicz, 1979, p. 1357). Other researchers present the experimental task as very difficult and then involve participants in a task which in truth is readily mastered (Arkes, 1979). Our experimental approach of providing individuals with the perception of competence has been to produce a success/failure manipulation against a referent-other in a competition paradigm (Jones, Reeve, Olson, & Cole, 1985; Olson, 1985; Olson & Reeve, 1984; Reeve et al., 1985, 1986a). Participants compete against a same-gender confederate in a puzzle-solving contest in which the outcome is prearranged. Consistently, winners show more intrinsically motivated behavior and report a greater willingness to volunteer for a similar task in the future than do losers. Further, winners rate their performance as a "complete success" and report that it turned out better than expected, while losers rate their performance as a "complete failure" and report that their performance turned out worse than expected (e.g., Olson, 1985).

In the link between the perception of competence and level of intrinsic motivation, it is reasonable to speculate that individual differences play an important role. Though it is largely a neglected area at present, one can hypothesize that there are individual differences that systematically influence individuals' perception of an objective source of competence information. The present investigation was initiated on the premises that individual differences may predispose individuals to respond differently in terms of subsequent effort and persistence as a function of the competence feedback (viz., need for achievement), to be more apprehensive over the competence evaluation processes than others (viz., anxiety),
and to attribute the competence message internally while others might externalize it (viz., locus of control).

In the present study, we chose to examine four individual differences: need for achievement, anxiety, locus of control, and gender. A composite measure of need for achievement and anxiety, resultant achievement motivation (e.g., Weiner, 1966), was also examined so that the interrelationship between need for achievement and level of anxiety might also be studied. The remainder of the introduction reviews the literature that directed our efforts to predict each individual difference’s role in affecting intrinsic motivation.

Need for Achievement

Relative to persons low in the need for achievement, high need achievers tend to persist at a task longer after failure than after success (Weiner, 1965). High need for achievement individuals respond to failure feedback not with task avoidance but with additional effort (Kuhl, 1978; Kuhl & Blankenship, 1979). In addition to greater effort and persistence, persons high in the need for achievement also show more task persistence for a hard task compared to an easy one (Maehr & Stallings, 1972). Individuals low in the need for achievement, on the other hand, display decrements in persistence after failure but react positively to encouragement or success (Horn & Murphy, 1985; Weiner, 1965, 1978). Accordingly, one would predict that messages of competence may relatively augment the motivational tendencies of the low need achievers, while messages of incompetence may relatively increase the motivational tendencies of high achievers.

Though the above investigations have focused on behavioral persistence, others have focused their attention on the relationship between need for achievement and intrinsically motivated behavior (Harackiewicz, Sansone, & Manderlink, 1985; Maehr & Stallings, 1972; Olson, Reeve, & Cole, 1985). For example, Harackiewicz et al. (1985) have demonstrated that the effects of competence information tends to vary according to achievement motivation, and they argue that the relationship between perception of competence and intrinsic motivation is a contingent one. Specifically, for persons high in achievement orientation feelings of competence are predictive of increases in intrinsic motivation only when the task is seen as an important one, and for persons low in achievement orientation the relationship becomes evident only when the task is initiated with relatively high expectations of success.

Using a traditional intrinsic motivation paradigm, Olson et al. (1985) have found a relationship between need for achievement and intrinsically motivated behaviors that parallels Weiner’s (1965) relationship between
need for achievement and persistence at a task. Like Weiner, Olson et al. (1985) found that need for achievement interacted with a success/failure manipulation such that high need achievers displayed more intrinsically motivated behaviors than low need achievers after failure but relatively less intrinsically motivated behaviors after success. The similarity between the Olson et al. (1985) findings and the findings by Weiner (1965) is important because the similarity implies that the motivational processes underlying the effect of the need for achievement on intrinsic motivational processes and on those that lead to task persistence may be comparable.

While we realize that there are significant distinctions between persistence at a task and intrinsically motivated behaviors (e.g., Maehr, 1976), both directions of achievement motivation research offer the prediction that need for achievement would play a moderating role in intrinsic motivation such that information that one has performed competently would increase the intrinsic motivation for low need achievement persons, whereas information that one has performed incompetently would produce relatively more intrinsic motivation for high need for achievement persons.

**Anxiety**

If anxiety is defined as evaluation apprehension, then it follows that high anxious persons will be apprehensive in situations where task competency is evaluated and particularly in those situations in which failure is experienced (O’Neil, 1972; Spence & Spence, 1966; Weiner, 1966). Anxiety, therefore, would seem to be a prominent individual difference in intrinsically motivated behaviors, because the act of placing an individual in a position to receive objective competence information simultaneously places the person in an apprehensive evaluative situation. That is, subjecting oneself to a performance appraisal potentially offers both the objective competence information and feelings of anxiety.

It has been demonstrated that intrinsic motivation is reduced by the perception of pressure to do well (Ryan, 1982; Ryan, Mims, & Koestner, 1983). For high anxious persons, the pressure to perform well in a competitive situation, which they would perceive as performance evaluation, would especially undermine intrinsic motivation. Low anxious persons should interpret competition as a less evaluative climate and consequently be in a more favorable position to attend to the competent/incompetent cues offered from competence information.

Olson and Reeve (1984) examined the relationship between intrinsic motivation and anxiety by placing participants high or low in anxiety into the competitive puzzle-solving paradigm. They found that participants’ level of anxiety interacted with competitive outcome. In particular, after losing participants high in anxiety displayed dramatically less intrinsic motivation than participants low in anxiety; after winning participants...
high in anxiety showed a slightly greater intrinsic motivation than participants low in anxiety. Seemingly, the high and low anxious participants attended to or interpreted the competency-related information from the outcome differently. Based on the findings of the literature presented above, we predicted that high anxious persons, who are apprehensive concerning performance evaluations, would show lower levels of intrinsic motivation in competitive situations than would low anxious persons.

**Locus of Control**

The individual difference of locus of control as it relates to intrinsic motivation has been given little attention (see Baron & Ganz, 1972; Earn, 1982; Lonky, 1978). According to Rotter (1966), locus of control refers to how people perceive reinforcements or outcomes as a consequence of their behavior. Individuals with an internal locus of control are more likely to perceive outcomes as contingent on their own behavior or own permanent characteristics and more likely to believe that the initiation of a behavior will lead to an expected or desired outcome. Individuals with an external locus of control are more likely to perceive outcomes as results of chance, luck, or the influence of others.

Deci and Ryan (1985b) found that external locus of control was strongly related to an impersonal orientation on their General Causality Orientation Scale. The impersonal orientation is reflected by individuals who conceive they are unable to regulate their behavior in such a way to obtain desired outcomes. They perceive themselves as incompetent in mastering tasks and view outcomes as independent of their behavior. Such a belief, according to Deci and Ryan (1985a, 1985b), leads individuals to an amotivating style regarding the initiation and maintenance of behavior. Consequently, external locus individuals would be expected to be impervious to information that typically increases intrinsic motivation, such as objective competence information.

One study has documented a relationship between locus of control and intrinsically motivated behaviors (Lonky, 1978). The author found that locus of control mediated participants' responses to verbal reinforcements with praise increasing intrinsic motivation for internals relative to externals. Presumably, internals were able to interpret the feedback as competence information and mastery for the task, an interpretation that would increase intrinsic motivation. Externals were apparently less receptive of the competence feedback, possibly perceiving their outcomes as a result of chance and not mastery, and intrinsic motivation for externals did not increase as it had for the internals.

Since it is assumed that externals would not perceive a relationship between their performance and the outcome of the competition, it was expected that externals would show little difference in intrinsic motivation
as a result of the competitive outcome. In fact, externals were expected to show relatively low levels of intrinsic motivation following both competent and incompetent feedback, due to a general impersonal orientation and its consequent amotivating style (Deci & Ryan, 1985b; Spector, 1982). Internals, who are able to perceive a relationship between their performance and the outcome of the competition, should display higher levels of intrinsically motivated behavior than externals when they succeed/win and decreased intrinsic motivation when they fail/lose.

**Gender**

A decade ago, Deci (1975) suggested that verbal reinforcements differentially affected females and males, presumably traceable to traditional socialization practices. Females, Deci reasoned, have learned to be more dependent on others and tend to perceive social rewards as “controlling” their behavior, while males, who have learned to be more independent, tend to perceive social rewards as “informational” and as a reflection of their competence. Feedback perceived to be controlling suppresses intrinsic motivation, while feedback perceived to be informational increases intrinsic motivation (Deci & Ryan, 1980, 1985a). If gender is important in the perception of competency-related feedback, one might argue, then it should not be tied to socialization practices since they change over time. Instead, it would be preferable to find those individual differences that are important and that may be related to gender at one time or in one culture but that do not differ across time or cultures. For the present study, we included gender, but it was included only to remain consistent with the previous literature on intrinsic motivation and for purposes of comparison with need for achievement, anxiety, and locus of control.

Recent research has consistently found that gender is not an important individual difference in intrinsic motivational processes (Blanck, Reis, & Jackson, 1984; Jones et al., 1985; Olson, 1985; Reeve et al., 1985; Ryan et al., 1983), though others argue its relevance (see Deci & Ryan, 1985a, for a review). Jones et al. (1985), for example, found that males who experienced success and females who experienced success displayed virtually identical high levels of intrinsic motivation, and males who experienced failure and females who experienced failure displayed virtually identical low levels of intrinsic motivation. Olson and Reeve (1984), in fact, have argued that the design of the typical intrinsic motivation study—which includes a test for gender differences—masks more functional individual differences. Since only suggestions that gender is related to intrinsic motivation have been found (Ryan et al., 1983; Zinser, Young, & King, 1982), it appears that contemporary males and females tend to
perceive rewards and respond to competency feedback similarly. Therefore, no prediction was made in the present investigation concerning gender, because it was expected that gender would not be an important predictor of intrinsic motivation.

**EXPERIMENT 1**

Intrinsic motivation is essentially manifest as a behavioral choice whether to pursue an activity or not, and is operationally defined as the extent to which the person engages in a focal activity and relatively ignores attention-competing activities (after Deci, 1971). As discussed, a vast literature indicates that persons' behavioral choices to pursue activities are influenced by the feeling of competence, or incompetence, associated with the activities. As such, individual differences are important in determining one's subjective felt degree of competence following the exposure to an objective message of competence information. The essence of our predictions in Experiment 1 was exploratory with the general aim of identifying the individual differences that transmute an objective message of competence into a more subjective interpretation of the objective message. In general, it was predicted that winners would display more intrinsically motivated behaviors than losers, because winning offers competent performance feedback and losing offers incompetent performance feedback. More centrally, it was predicted, as discussed, that the effect of competitive outcome would be moderated, predictably, by the individual differences of need for achievement, anxiety, and locus of control.

**Method**

**Participants.** Participants were 117 undergraduate students, 71 females and 46 males, enrolled in introductory psychology courses at Texas Christian University. Each participated as a partial fulfillment of a course requirement. Nine participants were deleted from the sample either because the participant did not complete all the personality inventories or the confederate failed to apply the appropriate criterion of winning or losing the competition.

**Materials.** The puzzle used was a three-dimensional, eight-cubed assembly that can be shaped into a variety of forms. Participants were asked to discover five forms/solutions of the puzzle. As a visual aid, an ink drawing of each solution was presented simultaneously with a wooden replica of each puzzle solution.

Three questionnaires were used in the investigation: Horner's (1968) version of the Thematic Apperception Test (TAT: Atkinson, 1958; McClelland, Atkinson, Clark, & Lowell, 1953); the Test Anxiety Scale (TAS: Sarason, 1977); and the Locus of Control scale (LOC: Rotter, 1966).

**Procedure.** In the first week of classes during the semester, all students enrolled in introductory psychology courses were asked to complete the TAT and TAS inventories. For the scoring of the Thematic Apperception Test, two of the principal investigators scored all the TAT protocols \((N = 351)\) before the experiment began and obtained a high interjudge reliability \((r = .92)\). Two months after the administration of the TAT and TAS
inventories, a different experimenter than the one who administered the inventories recruited participants for a “psychology experiment.” Participants were not told that the experiment was related to the inventories, and the name “psychology experiment” was used so participants who avoided either competition or puzzle solving would not decline to participate.

Participants were randomly assigned into one of two groups: competitors who were to win and competitors who were to lose. The participant and a same-gender confederate were escorted by a same-gender experimenter to a room which contained a large round table, two puzzles, and two example figures with their associated drawings and blocks.

Each participant was informed that the experiment involved puzzle solving in a competitive situation, and that the object of the task was to complete the puzzle before the other person. After two example figures were presented, the two participants were informed that five trials would be conducted, two practice and three competitive. A maximum time allotment of 3 and 5 min was allowed for the practice and competitive trials, respectively. The practice trials allowed the participant to become familiar with the puzzle and to make the initial impression that the participant and the confederate were of comparable ability. On the first practice trial, the confederate never completed the puzzle in the allotted 3 min, thus the participant always completed the first practice trial before the confederate. On the second practice trial, the confederate always solved the puzzle in the first minute and before the participant. For the competitive solutions, the confederate either won or lost all three trials. When the confederate lost, he or she did not solve any of the three puzzles in the allotted 5 min. When the confederate won, he or she solved each puzzle in the first minute and always before the participant.

After the competitive trials were completed, the experimenter requested a private interview with each competitor, apparently to discuss the personal effects of the competition. The confederate was always selected first for interview and asked to return to the original meeting room with the experimenter. As the two left for the alleged interview, the experimenter promised to return in “about 5 or 10 minutes.” The participant was left alone in the room for 8 min. In addition to the puzzles, the experimental room was equipped with a number of attention-competing activities including several magazines, a television, and the experimenter’s behavioral notes. To allow an accurate rating of the participants’ puzzle-playing time, the 8-min interval was videotaped through a two-way mirror. When the 8 min had elapsed, the experimenter reentered the room and asked the participant to return to the original meeting room. Here, the participant was asked to complete the LOC. Once the inventory was finished, the participant was debriefed.

A no-competition control group was also included with the purpose of establishing a baseline measure of participants’ level of intrinsic motivation toward the puzzle task independent of the competitive participation. As expected, winners displayed significantly more intrinsically motivated behaviors than the no-competition controls while losers displayed significantly less intrinsically motivated behaviors than the controls. The data for the control group was reported in Jones et al. (1985).

The measure for locus of control in Experiment 1 was obtained 10–15 min after the competitive outcome. It is possible that the win/lose experience might influence an individual’s responses on the questionnaire. Thus, the datum used for the analyses concerning locus of control was not the participant’s raw score, but an adjusted score so that the mean of the winners equaled the mean of the losers. After the participant’s score was converted to a standard score (z score), the following transformations were used to equate the mean scores of the competitors who won and lost: winners = 0.95(LOC); and losers = 1.05(LOC). The sample’s mean score was 10.3 (SD of 4.0) with the LOC of winners averaging 9.8 and the LOC of losers averaging 10.7 (mean difference t(106) < 1).
Results and Discussion

The behavioral index of intrinsic motivation was the duration of time the participant spent playing with the puzzle during the free-choice interval. The videotapes were used to allow two scorers independently to measure the participant's puzzle-playing time. The intrarater reliability was extremely high since the raters' judgments were virtually identical.

As expected from our previous research (e.g., Reeve et al., 1985), competitors who won exhibited significantly more puzzle-playing time than competitors who lost, $F(1, 106) = 6.90, p < .01$. In the conduct of the test for the effects of the four individual differences on the behavioral index of intrinsic motivation regression analyses were used. The need for achievement, anxiety, and locus of control were regressed as continuous variables, while outcome and gender were regressed as dichotomous independent variables.\(^3\) Resultant achievement motivation, the standard score on the TAS minus the standard score on the TAT, was also regressed on the behavioral index of intrinsic motivation as a continuous variable. In addition, all first-order interaction terms (each individual difference $\times$ outcome) were computed to test for their effect on the behavioral index of intrinsic motivation.

Inspection of the individual $F$ ratios in Table 1 reveals that the predictor variables were outcome, $F(1, 106) = 6.90, p < .01$, locus of control, $F(1, 106) = 6.54, p < .01$, and the resultant achievement motivation $\times$ outcome interaction, $F(1, 106) = 3.64, p < .06$. From the data in Table 1 it appears that intrinsic motivation was affected by a situational manipulation (outcome), an individual difference (locus of control), and a situation $\times$ individual difference interaction (resultant achievement motivation $\times$ outcome).

While the data succeed in demonstrating the importance of the moderating role of individual differences in the behavioral measure of intrinsic motivation following objective competence information, the data fail to specify the nature of the individual differences' intervention. Recent research has shown that a number of factors (notwithstanding external contingencies) significantly impact intrinsic motivational processes, such as perceived task difficulty (Hom & Maxwell, 1983); performance expectation (Bandura, 1982a); importance of task (Harackiewicz et al., 1985); affect (Reeve et al., 1986b); actual performance (Arnold, 1976); and perceived performance (Vallerand & Reid, 1985). Conceivably, each individual difference's impact on level of intrinsic motivation, may be traceable to its effect on one or more of these moderating variables. Indeed, Experiment 2 was initiated on the assumption that the individual differences' effects on intrinsic

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\(^3\) The dichotomous independent variables of competitive outcome and gender were coded as follows: (a) outcome: winners 1, losers -1; (b) gender: females 1, males -1.
motivation was through their effect on one or more of these moderating variables. Thus, while the function of Experiment 1 was to describe the general relationship between the individual differences and level of intrinsic motivation, the purpose of Experiment 2 was to specify the specific locus of that intervention.

**EXPERIMENT 2**

Potentially, the individual differences of the need for achievement, anxiety, resultant achievement motivation, and locus of control might affect any one of these intrinsic motivation moderating variables. As an illustration of the potential impact of an individual difference on intrinsic motivational processes, research on the need for achievement has found this person variable to be related to several of these moderating predictors. Persons high in the need for achievement tend to initially perceive challenging tasks as easier than low achievers, tend to expect to perform well relative to low need achievers, and tend both to perform better and to perceive that they have performed better than low need achievers (Olson, 1985). Accordingly, Experiment 2 assessed (1) the role of the individual differences on level of intrinsic motivation, (2) the relationship between each moderating variable and level of intrinsic motivation, and (3) the impact of the individual differences on these six moderating variables.

Because Experiment 1 used the behavioral free-choice operational def-

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**TABLE 1**

**Predictors of the Behavioral Measure of Intrinsic Motivation**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$F(1, 106)$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Situation effect</strong></td>
<td></td>
</tr>
<tr>
<td>Outcome</td>
<td>6.90**</td>
</tr>
<tr>
<td><strong>Individual differences effects</strong></td>
<td></td>
</tr>
<tr>
<td>Need for achievement</td>
<td>0.68</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.45</td>
</tr>
<tr>
<td>Resultant achievement motivation</td>
<td>1.21</td>
</tr>
<tr>
<td>Locus of control</td>
<td>6.54*</td>
</tr>
<tr>
<td>Gender</td>
<td>0.07</td>
</tr>
<tr>
<td><strong>Situation × individual differences effects</strong></td>
<td></td>
</tr>
<tr>
<td>Need for achievement × outcome</td>
<td>1.94</td>
</tr>
<tr>
<td>Anxiety × outcome</td>
<td>1.34</td>
</tr>
<tr>
<td>Resultant achievement motivation × outcome</td>
<td>3.64*</td>
</tr>
<tr>
<td>Locus of control × outcome</td>
<td>0.01</td>
</tr>
<tr>
<td>Gender × outcome</td>
<td>0.20</td>
</tr>
</tbody>
</table>

* * $p < .06$.
* $p < .05$.
** $p < .01$. 
inition of intrinsic motivation, it was not possible to distinguish between intrinsically motivated behavior and behavioral persistence. Thus, it was not clear whether the individual differences affected intrinsic motivation, or task persistence, or both, or neither. To remedy the potential confusion between the operational definitions of intrinsic motivation and task persistence, Experiment 2 assessed level of intrinsic motivation with a combined index of the four traditional indices of intrinsic motivation—namely, task interest (e.g., Enzle & Ross, 1978); task enjoyment (e.g., Harackiewicz et al., 1985), willingness to volunteer for the task in the future (e.g., Arnold, 1976), and free-choice duration (e.g., Amabile, DeJong, & Lepper, 1976). The computation of the intrinsic motivation index (outlined in the Method section) was used in Experiment 2 to substantiate the study’s claim to assess intrinsic motivation and intrinsic motivational process, ones not necessarily related to or dependent on behavioral persistence.

**Method**

*Participants.* Subjects were 36 female and 32 male undergraduate students enrolled in introductory psychology courses at Texas Christian University. Each participated as partial fulfillment of a course requirement. Four participants were deleted from the sample since they did not complete the set of personality inventories.

*Materials.* The same forms of the puzzle in Experiment 1 were used in Experiment 2. The visual aids again accompanied each puzzle solution. The questionnaires employed, the TAT, TAS, and LOC, were the same as the ones used in Experiment 1.

A preperformance questionnaire, the Activity-Feeling scale (Reeve, 1986), and a postperformance questionnaire were added to the experimental procedure. The preperformance questionnaire included the following items asked on a 0–10 Likert scale: (1) How do you expect to perform? (not at all well/extremely well); (2) How important is it that you do well? (not at all important/extremely important); (3) How difficult do you anticipate the puzzle forms to be? (not at all difficult/extremely difficult).

The Activity-Feeling Scale (AFS) asks how a particular activity makes the respondent feel (e.g., “Puzzle-solving makes me feel —”). Synonyms and antonyms of the experiences of competence, excitement, affiliativeness, and self-determination are listed with 0–10 Likert scales (Strongly disagree/Strongly agree) to the right of each adjective. The Likert scales are to be used to indicate the extent of agreement, or disagreement, that the respondent feels the adjective is descriptive of the activity. The psychometric properties of the AFS including its scale development process and predictive validity of the outcome measures of intrinsic motivation are detailed in Reeve (1986).

The postperformance questionnaire also included 0–10 Likert scales, and its items probed perceived performance and the outcome measures of intrinsic motivation: (1) Did you feel that your performance was a success, a failure, or something in between? (a complete failure/a complete success); How enjoyable was the puzzle? (not at all enjoyable/extremely enjoyable); How interesting was the puzzle? (not at all interesting/extremely interesting); and (4) How willing would you be to participate in a similar experiment in the future? (not at all willing/extremely willing). Actual performance times were also recorded by the experimenter as the participant’s total number of seconds to discover the solutions to the five forms of the puzzle.

*Procedure.* In the first week of classes during the semester, all introductory psychology students were asked to complete the TAT, TAS, and LOC inventories. For the scoring
of the TAT, two raters again scored all the protocols and obtained high interjudge reliability, \( r(330) = .91 \). The experiment, again introduced as a "psychology experiment" for the same reasons as in Experiment 1, ensued 1 month after the scoring of the inventories.

The procedure in Experiment 2 duplicated the procedure in Experiment 1 with the amendments of the AFS, preperformance, and postperformance questionnaires. The preperformance questionnaire was administered after the two practice trials and before the three competitive trials, the AFS was administered following the last competitive trial, and the postperformance questionnaire was completed after the free-choice interval.

Results

Besides the question of the general impact of the individual differences on level of intrinsic motivation, the subject of the analyses included the impact of each individual difference on each of the moderating variables and the impact of each moderating variable on level of intrinsic motivation. To index level of intrinsic motivation the operational definition of intrinsic motivation that combined the four traditional measures of intrinsic motivation was used. Participants' scores on each of the four outcome measures were converted to \( z \) scores and summed. The four-variable total was divided by 4 and yielded the "intrinsic motivation index." The construct validity of the derived intrinsic motivation index was assessed by the four contributing variables' intercorrelations and by each outcome measure's zero-order correlation with the intrinsic motivation index. These correlations are shown in Table 2. As can be seen in Table 2, all the correlations were significant except for the willingness to volunteer/free-choice duration bivariate relation.

The effects of outcome, the individual differences, and the outcome \( \times \) individual differences interactions for both the intrinsic motivation index (IM index) and the behavioral measure of intrinsic motivation are shown in Table 3. The focus of the analyses to follow is on the IM index, but Table 3 includes the behavioral measure of intrinsic motivation to allow a comparison with Experiment 1. As in Experiment 1, winners displayed more behavioral duration with the target activity than did
TABLE 3
SUMMARY OF THE PREDICTORS OF THE BEHAVIORAL MEASURE OF INTRINSIC MOTIVATION AND OF THE DERIVED INTRINSIC MOTIVATION INDEX

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Behavioral measure</th>
<th>Derived IM index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$F(1, 62)$</td>
<td>$F(1, 62)$</td>
</tr>
<tr>
<td>Situation effect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome</td>
<td>5.27*</td>
<td>9.63**</td>
</tr>
<tr>
<td>Individual differences effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need for achievement</td>
<td>2.39</td>
<td>4.60*</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.54</td>
<td>0.00</td>
</tr>
<tr>
<td>Resultant achievement motivation</td>
<td>0.77</td>
<td>2.07</td>
</tr>
<tr>
<td>Locus of control</td>
<td>0.07</td>
<td>0.46</td>
</tr>
<tr>
<td>Situation × individual differences effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need for achievement × outcome</td>
<td>6.57*</td>
<td>6.98**</td>
</tr>
<tr>
<td>Anxiety × outcome</td>
<td>4.52*</td>
<td>8.39**</td>
</tr>
<tr>
<td>Resultant achievement motivation × outcome</td>
<td>1.23</td>
<td>0.26</td>
</tr>
<tr>
<td>Locus of control × outcome</td>
<td>3.18</td>
<td>5.86*</td>
</tr>
</tbody>
</table>

* $p < .05$.
** $p < .01$.

losers, $F(1, 62) = 5.27, p < .05$. The significant locus of control main effect found in Experiment 1 did not replicate, $F(1, 62) = 0.07$, n.s., rather, locus of control interacted with outcome, $F(1, 62) = 3.18, p < .08$. Descriptively, internal losers and external competitors in general tended to show low levels of behavioral free-choice time while internal winners showed high levels of behavioral free-choice time. The resultant achievement motivation × outcome interaction found in Experiment 1 partitioned into a need for achievement × outcome interaction, $F(1, 62) = 6.57, p < .05$, and an anxiety × outcome interaction, $F(1, 62) = 4.52, p < .05$.

The effects of the predictor variables on the intrinsic motivation index were similar to their effects on the behavioral measure. Winners showed higher levels of intrinsic motivation than losers, $F(1, 62) = 9.63, p < .01$. Internal winners showed greater intrinsic motivation than external winners and external losers showed relatively greater intrinsic motivation than internal losers, as revealed through the locus of control × outcome interaction, $F(1, 62) = 5.86, p < .05$. High need for achievement competitors showed less intrinsic motivation than low need for achievement competitors after winning but more intrinsic motivation after losing, as revealed through the need for achievement × outcome interaction, $F(1, 62) = 6.98, p < .01$. A third significant interaction was that low anxious winners showed high levels of intrinsic motivation relative to high anxious winners while low anxious losers showed low levels of intrinsic motivation...
relative to high anxious losers, $F(1, 62) = 8.93, p < .01$. In addition, Table 3 shows that there was a significant main effect for the need for achievement with high need achievers showing a higher level of intrinsic motivation than low need achievers, $F(1, 62) = 4.60, p < .05$.

**Analyses of the Moderating Variables**

Correlational analyses were used to assess each individual difference's impact on the six moderating variables and each moderating variable's impact on the intrinsic motivation index. Zero-order correlations were computed for each individual difference with performance expectancy, task importance, anticipated task difficulty, actual performance, perceived performance, and affect. Further, zero-order correlations were calculated for each of the six moderating variables and the intrinsic motivation index.

Because performance expectancy, task importance, and anticipated task difficulty were measured previous to the outcome manipulation, the outcome interactions with these moderating variables were not calculated. The outcome manipulation was concurrent with actual performance and previous to the assessment of perceive performance and affect. Thus, besides each individual difference's overall relationship with the performance measures and affect, each individual difference's relationship with the moderating variables broken down by outcome, that is, for winners and losers, were also computed.

**Preperformance measures.** The three preperformance measures were performance expectancy, perceived task importance, and anticipated task difficulty. The zero-order correlations of need for achievement (nAch), anxiety (Anx), resultant achievement motivation (RAM), and locus of control (LOC) to each of the three preperformance measures were computed and these bivariate relationships are illustrated in Fig. 1.

High need for achievement individuals tended to expect to perform well, $r(64) = .20, p < .06$, and reported that it was important to do well, $r(64) = .25, p < .05$, relative to low need for achievement individuals. Low anxious competitors expected to perform better than did the high anxious competitors, $r(64) = .21, p < .05$. When the need for achievement and anxiety were considered as a unitary measure, that is as RAM, the high RAM individuals expected to perform well relative to the low RAM individuals, $r(64) = .28, p < .05$. Internal locus competitors both expected to perform better, $r(64) = -.23, p < .05$, and felt that it was more important to do well, $r(64) = -.24, p < .05$, than did the external locus competitors.

Figure 1 reveals that neither task importance, $r(64) = .10, \text{n.s.}$, nor anticipated task difficulty, $r(64) = .11, \text{n.s.}$, were significantly related to the intrinsic motivation in the present study. Thus, the importance of
Expectancy: "How do you expect to perform?"

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation</th>
</tr>
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<tbody>
<tr>
<td>nAch</td>
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</tr>
<tr>
<td>Antx</td>
<td>-.21</td>
</tr>
<tr>
<td>RAM</td>
<td>.28</td>
</tr>
<tr>
<td>LOC</td>
<td>-.23</td>
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</tbody>
</table>

Intrinsic Motivation Index

Importance: "How important is it that you do well?"

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation</th>
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<tbody>
<tr>
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<td>.14</td>
</tr>
<tr>
<td>LOC</td>
<td>.24</td>
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</tbody>
</table>

Intrinsic Motivation Index

Task Difficulty: "How difficult do you anticipate the puzzle to be?"

<table>
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<th>Variable</th>
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<tbody>
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<tr>
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<td>-.13</td>
</tr>
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<td>LOC</td>
<td>-.10</td>
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</table>

Intrinsic Motivation Index

Fig. 1. Preperformance moderating variables' correlations with individual differences and intrinsic motivation index. Numbers indicate bivariate zero-order correlation coefficients. Solid lines represent significant correlations, \( p < .05 \); dashed lines represent nonsignificant correlations.

The individual differences to task importance and task difficulty do not seem of primary importance to the understanding of the role of individual differences as measured in the present study in intrinsic motivational processes. Performance expectancy, however, was significantly related to the intrinsic motivation index, \( r(64) = .24, p < .05 \). Thus, the impact of need for achievement, anxiety, resultant achievement motivation, and locus of control on performance expectancy provides a measure of information to explicate the general impact of each individual difference on level of intrinsic motivation.

Performance measures. Before analysis, the actual performance measures were reverse scored such that higher numbers corresponded to quick performance scores (i.e., a low number of seconds to discover the solutions). For actual performance, all four individual differences showed
associations: need for achievement, $r(64) = .20, p < .06$; anxiety, $r(64) = -.23, p < .05$; resultant achievement motivation, $r(64) = .30, p < .01$; and locus of control, $r(64) = -.21, p = .05$, indicating that high need achievers, low anxious, high resultant achievement motivation, and internal locus competitors tended to outperform their counterparts. The individual differences' correlations with the performance measures for winners, losers, and all competitors are illustrated in Fig. 2.

Considering outcome, the tendency for internals to outperform externals, though weak, was roughly parallel for winners, $r(30) = -.17$, n.s., and losers, $r(34) = -.23, p < .10$. The resultant achievement motivation measure was significant for both winners, $r(30) = .33, p < .05$, and losers, $r(34) = .29, p < .05$. Looking at the need for achievement and level of anxiety separately revealed that the RAM-performance correlation for winners was largely traceable to the result that low anxious winners performed better than the high anxious winners, $r(30) = -.36, p < .05$, while the RAM-performance correlation for the losers was largely a function of individuals' high need for achievement, $r(30) = .27, p < .06$.

The relationship of the individual differences to actual performance seems to be an important one in that actual performance was significantly related to the intrinsic motivation index, $r(64) = .30, p < .01$. Across outcome, the performance of losers was significant related to the intrinsic
motivation index, \( r(34) = .50, p < .01 \), but the performance of winners was not related to the intrinsic motivation index, \( r(30) = -.03, \text{n.s.} \).

For perceived performance, the need for achievement and locus of control were the two prominent individual differences. Across outcome, the high need for achievement, \( r(64) = .21, p < .05 \), and the internal locus individuals, \( r(64) = -.22, p < .05 \), judged their performances to be more successful than did the low need for achievement and external locus individuals. By outcome, the high need for achievement losers tended to perceive their performance as more successful than did the low need for achievement losers, \( r(34) = .25, p < .06 \). For locus of control, the internal winners judge their performance as more successful than did the external locus winners, \( r(30) = -.40, p < .05 \). Internal locus losers also tended to see their performance as more successful than external losers, \( r(34) = -.23, p < .10 \).

For winners and losers, perceived performance was significantly associated with the intrinsic motivation index: winners, \( r(30) = .54, p < .01 \); losers, \( r(34) = .36, p < .05 \). Across outcome, individuals rating their performance as successful scored higher on the intrinsic motivation index, \( r(64) = .53, p < .01 \). Thus, the individual difference measures related to the actual performance of losers and perceived performance of both winners and losers are especially relevant to intrinsic motivation processes, since these performance measures were found to predict the intrinsic motivation index.

**Affect measures.** Collapsing experimental conditions across outcome, several individual differences were correlated with affect. High need achievers, \( r(64) = .35, p < .01 \), high resultant achievement motivation persons, \( r(64) = .26, p < .01 \), and internal locus individuals, \( r(64) = -.22, p < .05 \), reported significantly greater positive affect than did their counterparts. Importantly, affect was further predictive of the intrinsic motivation index, \( r(64) = .70, p < .01 \), irrespective of outcome. This latter relation is important in that if an individual difference is related to affect, then, through affect, the individual difference is related to the intrinsic motivation index.

Affect was further predictive of the intrinsic motivation index following both competence and incompetence information. That is, the relationship between affect and the intrinsic motivation index was significant for winners, \( r(30) = .84, p < .01 \), and losers, \( r(34) = .56, p < .01 \). The individual differences’ correlations with affect and the affect measure’s correlation with the IM index for all competitors, winners, and losers are shown in Fig. 3.

Both following winning and losing, the high need achievement competitors reported greater positive affect than did the low need achievers: winners, \( r(30) = .33, p < .05 \); losers, \( r(34) = .34, p < .05 \). For resultant
achieved or low in need for achievement, high anxious, and internal locus competitors and, after losing, high need for achievement, low anxious, and external locus competitors showed higher levels of intrinsic motivation than did their counterparts. Amending these interactions was the finding that competitors high in the need for achievement showed higher levels of intrinsic motivation than did the low need for achievement competitors.

Experiment 2 furthered the understanding of the effect of individual differences on intrinsic motivation in two additional ways. First, Experiment 2 utilized an operational definition of intrinsic motivation that allowed...
the result to be differentiated from task persistence and applied to intrinsic motivational processes. The question of an appropriate dependent measure for intrinsic motivation is one of primary importance, since the behavioral measure of intrinsic motivation is inherently subject to a bimodal distribution and huge in-cell variances (see Deci, 1971; Farr, Vance, & McIntyre, 1977; McGraw & Fiala, 1982; Reeve et al., 1986a). Farr et al. (1977) critically examined various dependent measures of intrinsic motivation and concluded that important difficulties existed with the construct of intrinsic motivation. The present paper recognized the cautiousness of Farr et al. over the construct validity of intrinsic motivation, a recognition that motivated our derivation of the intrinsic motivation index. The correlations reported in Table 2 provide an easing of that cautiousness in that they demonstrate high construct validity for intrinsic motivation.

A second way that Experiment 2 furthered the understanding of the effect of individual differences on intrinsic motivation was by illustrating each of the four individual difference's relationship to six moderating variables empirically related to level of intrinsic motivation. Performance expectancy, actual performance, perceived performance, and affect had significant associations with the intrinsic motivation index. High need achievers, low anxious, high resultant achievement motivation, and internal locus individuals expected to perform better than did their counterparts, a bias of importance since performance expectancy significantly predicted level of intrinsic motivation. All these correlations, however, were in the .2 to .3 range. Thus, while the relationship of each individual difference to performance expectancy contributed to the understanding of the general impact of the individual differences on intrinsic motivation (especially for the main effect of the need for achievement), the magnitude of the correlations seems insufficient to explicate the individual differences' intervening role.

On the other hand, the performance measures and affect tended to dramatically illuminate the intervening role of the individual differences. For actual performance, the performance of losers was predictive of intrinsic motivation while the performance of winners was unrelated to level of intrinsic motivation. Since the performance times of winners did not predict level of intrinsic motivation, the finding that low anxious winners outperformed high anxious winners is not of considerable im-

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4 Importance to do well and perceived task difficulty were not significantly predictive of the intrinsic motivation index. Thus, despite the finding that high need achievers and internal locus individuals felt it was important to do well relative to low need achievers and external locus individuals, the moderating variables of importance and task difficulty do not appear to provide significant insight as to the understanding of the relationship of the individual differences examined in the present investigation to intrinsic motivational processes.
portance. However, because performance times were predictive of intrinsic motivation following losing, it is interesting that the high need achievement losers significantly outperformed the low need achievement losers. Such a finding helps illustrate a mechanism by which high need for achievement losers show higher levels of intrinsic motivation than do low need for achievement losers.

The relationship between affect and intrinsic motivation showed the most substantial predictive relationship and thus likely provides significant insight into each individual difference’s relationship to level of intrinsic motivation. Following both winning and losing, the high need achievers reported greater positive affect than did the low need achievers. This bias on the part of the high need achievers to experience greater positive affect likely reveals the tendency of high need achievers to show higher levels of intrinsic motivation than low need achievers (see main effect in Table 3). In addition, the internal locus winners reported greater positive affect than did the external locus winners. Apparently, locus of control impacted level of intrinsic motivation through the internals’ relative benefits of the consequences of winning, positive affect given earned competence feedback (or from the externals’ relative indifference).

Finally, the perceived performance judgments of both winners and losers is of importance, since perceived performance predicted level of intrinsic motivation following both winning and losing. Like actual performance, the high need for achievement losers tended to perceive their performance as more successful than low need for achievement losers. For locus of control, the internal winners judged their performance as more successful than did the external winners. Thus, one way locus of control affected intrinsic motivation was through the internals’ enhanced perceived performances after winning relative to the externals’ perceived performances.

While the moderating variables provided persuasive insight into the mechanisms by which need for achievement and locus of control affect intrinsic motivation, the moderating variables did not fully explain the anxiety $\times$ outcome interaction. High anxiety was hypothesized to yield low levels of intrinsic motivation across outcomes, due to the high anxious participants’ apprehension over the evaluation process. Anxiety was found to interact with outcome such that high and low anxious competitors did not differ in level of intrinsic motivation, but the low anxious winners and the high anxious losers tended to show generally greater intrinsic motivation than high anxious winners and low anxious losers, respectively. The directions of the correlations between anxiety and the moderating variables suggests that the effect of anxiety on the intrinsic motivation index was that high anxiety disrupted performance expectancies, actual performances, and positive affect after winning. Unfortunately, affect
antithetic to intrinsic motivation (e.g., feelings of tension, pressure, anxiety, frustration, and helplessness, discussed in Reeve & Robinson, 1987) were not measured in the present investigation. Additional work remains necessary for a more complete understanding of the effect of anxiety on intrinsic motivation, but it appears that high anxiety interferes with the positive affect states concomitant with intrinsic motivation such that high anxious winners experience less intrinsic motivation than low anxious winners while high and low anxious losers do not necessarily differ.

The conclusion of the present investigation is that individual differences are important predictor variables of level of intrinsic motivation following objective competence information. Need for achievement, anxiety, and locus of control (but not gender) were found to interact with the objective source of competence information and the moderating variables served to illustrate the nature of the individual differences' intervention. The present investigation also provides a framework on which other individual differences can be assessed for their impact on intrinsic motivational processes (e.g., self-esteem, Baumeister & Tice, 1985). If the importance of individual differences are to be recognized in theoretical models of intrinsic motivation, then researchers must provide more than median-split main effect tests in exploratory attempts to outline macroscopic effects. When an individual differences-moderating variables-intrinsic motivation approach is taken, then perhaps intrinsic motivation theorists will end their neglect of individual differences.

REFERENCES


INTRINSIC MOTIVATION


