

Competition and Intrinsic Motivation in Physical Activity: A Comparison of Two Groups

Christina M. Frederick-Recascino
Embry-Riddle Aeronautical Univeristy

Hana Schuster-Smith
University of Central Florida

Using the theoretical perspectives of Self-Determination Theory and Cognitive Evaluation Theory (Deci & Ryan, 1985; Ryan & Deci, 2000), the present study examines the relationships between competitive attitudes, physical activity, participation motivation, and adherence levels in two groups. Fifty-eight adult, bicycle racers and sixty-five fitness exercisers were surveyed. The cyclists ranged in age from 19 to 56 with a mean age of 36.16 years. The exercise group ranged in age from 16 to 72 with a mean age of 25.03 years. Both groups completed a survey packet containing a demographic measure that included information about levels of adherence to participants' sport or exercise activity, a measure of participation motivation (MPAM-R; Ryan et al., 1997), and two measures of competitiveness (Sport Competition Trait Inventory: Fabian & Ross, 1983; Competitive-Cooperative Attitude Scale: Martin, 1976). Results of the study indicated that in the cyclist group, sport competitiveness was positively correlated with level of interest/enjoyment motivation and days per week of exercise. In the exercise group, sport competitiveness level was positively related to interest/enjoyment, competence and appearance motives, while showing no relationship to adherence levels. For both groups, sport-based competitiveness was positively related to higher levels of intrinsic motivation. These results are interpreted using Cognitive Evaluation Theory (Deci & Ryan, 1985).

Address Correspondence To: Dr. Christina Frederick-Recascino, Human Factors Department, Embry-Riddle Aeronautical University, 600 Clyde Morris Blvd., Daytona Beach, FL 32114-3900. Phone: (386) 226-7037, Fax: (386)-226-7050, Email: frederic@cts.db.erau.edu

Competition exists both within sporting environments and in other life domains. Of particular interest to sport psychologists and researchers is how competition relates to variables such as motivation and adherence. One specific theoretical perspective that attempts to clarify these relationships is Self-Determination Theory (Deci & Ryan, 1985). The current study will discuss this perspective as it relates to sport and exercise participation motivation, competitiveness, and adherence.

Self-Determination Theory

Self-Determination Theory is built on the presumption that human behavior is motivated by three primary psychological needs: autonomy, competence, and relatedness with others (Deci & Ryan, 1991; 1985; Ryan & Deci, 2000). When individuals freely participate in activities, without the presence of external pressures, they are fulfilling the need for autonomy. At a challenging skill level, an individual will develop ability and confidence. The increased perception of competence and self-determination creates a state of intrinsic motivation (Deci & Ryan, 1991; 1985).

Intrinsic motivation, then, is a key outcome of self-determination (Deci & Ryan, 1985; Ryan & Deci, 2000). In application, Self-Determination Theory focuses on how intrinsic motivation influences people to develop, persist and even compete in sports and other activities (Frederick & Ryan, 1993; 1995). When an individual is choicefully engaged in a sport at the optimal level of difficulty, he/she feels challenged and efficacious. These feelings of competence and autonomy may motivate an athlete to ride countless circles around a cycling track to learn perfect cornering form, or to practice a sport for many hours a week with no apparent reward. Intrinsic motivation level of the individual, while reflective of self-determination, can be affected by aspects of the participation environment, such as feedback received after performance, or the reward structure of the activity (Vallerand & Losier, 1999; Vallerand, Deci & Ryan, 1987; Ryan, Vallerand, & Deci, 1984).

However, engagement does not always begin with intrinsic motivation. When activities are not freely chosen or challenging, they are said to be extrinsically motivated. Much of human behavior begins with an extrinsic focus and moves toward greater self-regulation. Extrinsically motivated behaviors can move through three levels of internalization, occurring as an individual becomes increasingly self-determined (Chandler & Connell, 1987; Deci & Ryan, 1985; Ryan & Connell, 1989). The first level of regulation is *external regulation*. At the external level behavior is directly and externally controlled or coerced. At the second level, *introjected regulation*, the formerly external control has been internalized to the extent that the individual's desire to gain social approval and avoid disapproval motivates behavior. The next level, *identified regulation* is characterized by a higher level of internalization and self-deter-

mination. In identified regulation, the individual is motivated through interests, abilities, and the desire to achieve self-initiated goals.

In sport and exercise activities, intrinsic and extrinsic motives have been shown to relate differentially to adherence variables and perceptions toward exercise. Frederick and Ryan (1993) found that intrinsic motivation correlated positively with greater number of hours and days per week of participation in an exercise or sport activity, as well as with higher levels of perceived satisfaction and competence for the activity. On the other hand, extrinsic motivation was positively related to anxiety, while negatively relating to self-esteem. More recently, Hodgins, Yacko, Gottlieb, Goodwin & Rath (2002) have also found that members of a college crew who were in autonomous motivational states performed better on a rowing machine than crew members in extrinsic motivational states. These findings show support for the fundamental assumption of Self-Determination Theory that motivation is the driving force for both psychological and behavioral outcomes within life domains (Deci & Ryan, 1985). Therefore, it is motivational differences that lead to differential levels of participation and/or psychological outcomes for sport participants rather than vice versa.

Cognitive Evaluation Theory and Physical Activity

Self-Determination Theory has been applied in the world of sport and exercise through the premises of Cognitive Evaluation Theory (CET; Deci & Ryan, 1985; Ryan, 1982). CET, a sub-theory of Self-Determination Theory, addresses how external factors such as reward, competition, feedback and choice are interpreted in sport and exercise domains. The theory then predicts how these factors either work to enhance or undermine intrinsic motivation (Frederick & Ryan, 1995).

According to CET, individuals can interpret their sport and exercise performance in two ways, either informationally or in a controlling manner (Ryan, Vallerand, & Deci, 1984). If an event has a rigid structure, many rules, and even punishment, it would be labeled as being highly controlling. A highly controlled event would limit an individual's autonomy and would, in turn, be perceived as facilitating an external locus of causality, which would result in lower levels of intrinsic motivation. In the opposite scenario, in an event with low levels of external control, the individual would feel self-motivated or autonomous. This would result in a high level of intrinsic motivation (Ryan, Vallerand, & Deci, 1984). Lessened external control will not only enhance intrinsic motivation it will increase the likelihood of adherence to an activity (Frederick & Ryan, 1995). A shift to an external source of motivation may result in increased extrinsic motivation, creation of unattainable goals, or suspension of activity entirely. Even factors such as external rewards and competitive environments can have a negative impact on participation, if they are interpreted as mechanisms of control (Vallerand & Losier, 1999; Vallerand, Gauvin, & Halliwell, 1986; Orlick & Mosher, 1978).

The second interpretive stance is referred to as an informational perspective. Using this interpretive style, events are personally reviewed and provide the individual with positive or negative information about outcomes (Ryan, Vallerand, & Deci, 1984). Positive interpretation would promote competence, while a negative interpretation would suggest incompetence. Information also may be presented in a self-determined or nonself-determined context. Positive information presented within a low perceived control atmosphere will enhance self-determination and therefore increase intrinsic motivation. Positive information presented within a controlling environment would strengthen extrinsic motivation. The controlling conditions overcome the positive information provided and the individual is no longer autonomous in initiating the decision making process. This nonself-determining environment reinforces extrinsic motivation. Negative information provided in this context suggests incompetence, undermining both intrinsic and extrinsic motivation and resulting in learned helplessness (Boggiano & Barrett, 1985; Ryan, Vallerand, & Deci, 1984).

Fortier, Vallerand, Briere & Provencher (1995) tested the premises of Cognitive Evaluation Theory in a sport and exercise context. In their study, competitive athletes were compared to recreational athletes in terms of motivational style. Results indicated that competitive athletes exhibited lower levels of intrinsic motivation and higher levels of identified regulation and amotivation, than experienced by recreational athletes. Fortier et al., interpreted these results as supportive of the supposition of Cognitive Evaluation Theory that the competitive environment can have a detrimental effect on intrinsic motivation. Competitive athletes focus on the outcome of winning, which then facilitates a personally controlling environment and an external locus of causality. Results consistent with this interpretation were found by Kavussanu & Roberts (1996) in a study of novice tennis players. In the Kavussanu & Roberts study, a competitive, outcome-oriented tennis environment was found to be detrimental to players' intrinsic motivation.

Research has referred to the context or environment and how it affects an individual's motivation within Cognitive Evaluation Theory (Deci, Betley, Kahle, Abrams, & Porac, 1981; Watson, 1984). The theory also emphasizes perception of the context, so it becomes important for sport researchers to examine individual differences that can influence individual's motivational orientations. For instance, McAuley and Tammen (1989) showed that individuals high in perceived success showed higher levels of competence and enjoyment in a competitive sport activity. Likewise, Tauer and Harackiewicz (1999) found that high achievement orientation moderated the deleterious effect of competition on intrinsic motivation for a word game. Although this research was conducted outside the sport context, the competitive context of the experiment lends support to the basic premises of CET.

One individual difference of importance to Cognitive Evaluation Theory is perceived competitiveness. Within sport situations, individuals make judgements about how they perceive the competitive environment, as well as evaluating their own competitive thoughts and behaviors in the environment. Perceptions of competitive aspects of the sport environment have been categorized as being either task-oriented or outcome-oriented (Ames, 1992; Duda, 1989; Duda, Chi, Newton, Walling, & Catley, 1995). Individuals who are task-oriented focus on the challenge and process of the competitive event, and are typically able to maintain their intrinsic motivation. Task oriented individuals give importance to the feelings and experiences their activity engagement provides them, regardless of outcome. Outcome-oriented people are particularly focused on the end result of their competitive situation, namely winning or beating an opponent, therefore they resort to comparing themselves to others. This perspective can be referred to as an ego orientation. Since outcome-oriented individuals place personal importance on competitiveness and have no control over their competitors, their perceived competence could quickly be shattered by a defeat. This would lower enjoyment and the likelihood of continued participation would diminish. Outcome-oriented individuals adopt a more extrinsic motivational orientation.

The Present Study

The present study addresses the relationships between competitive attitudes, intrinsic and extrinsic participation motives, and adherence levels. More specifically, the work examines two elements of the sport and exercise experience related to competition. First, the study compares the participation motives of individuals engaged in a competitive situation (bicycle racing) to a group of non-competitive exercise participants. Using the premises of Cognitive Evaluation Theory and prior research (Deci & Ryan, 1985; Fortier et al., 1995; Frederick & Ryan, 1993), it is predicted that cyclists in a direct competitive situation would show lower levels of intrinsic motivation, than general exercise participants. Additionally, it is predicted that as extrinsic motivation increases for both groups, adherence levels for the activity will decrease. Second, the study examines personality-based levels of sport competitiveness and general competitiveness in both groups, and relates these types of competitiveness to motivation and adherence. Regardless of activity type, it is further predicted that high levels of both sport and global competitiveness would correlate negatively with intrinsic motivation and positively with extrinsic motivation. Last this study examined the relative strength of the competitive situation versus competitive attitudes in relation to level of intrinsic motivation.

Method

Participants and Procedures

The present sample consisted of 123 participants. Fifty-eight participants were adult, competitive, amateur bicycle racers competing in races throughout the Central Florida region. This group ranged in age from 19 to 56 years with a mean age of 36.16. They reported exercising an average of 12.04 hours per week over an average of 5.3 days per week. Survey packets and consent forms were distributed to these individuals during cycling competitions. Participants were given a SASE in order to return the survey packet. Fifty-nine of the 150 packets distributed were returned for an overall return rate of 39%. The second group consisted of 65 general exercisers who completed the survey packet to receive extra credit for an undergraduate class in psychology. The total number of students in the psychology classes was 120, producing a response rate of 54% for this group. The exercisers were members of a college fitness center and engaged in both aerobic and weight training activities. Surveys and consent forms were administered individually by a trained research assistant. The ages of this second group ranged from 16 to 72 years with a mean age of 25.03 years. The exercise group reported exercising for an average of 9.07 hours per week over an average of 4.55 days per week.

Measures

Demographic Information. Participants were asked to complete a demographic questionnaire. The questionnaire assessed the athletes' age, gender, days per week of exercise activity and hours per week of activity engagement.

Motivation for Physical Activity Measure (MPAM-R: Ryan et. al., 1997). The MPAM-R is a thirty item survey assessing participation motivation for sport and exercise activities. The MPAM-R measures five motivational factors: interest/enjoyment motivation, competence motivation, appearance motivation, fitness motivation and social motivation. Of the five subscales, interest/enjoyment and competence motives have been shown to reflect an intrinsic motivational orientation, while the other three subscales reflect varying levels of extrinsic motivation (Deci & Ryan, 1985; Frederick & Ryan, 1993; Ryan et al., 1997). Previous research (Frederick & Ryan, 1993; Ryan et. al, 1997) has established the validity and reliability of the MPAM-R. In the present study, only the interest/enjoyment, competence, and appearance scales of the MPAM-R were used. These subscales were chosen as the three most reflective of intrinsic and extrinsic motivation. For the present sample, the Cronbach alpha reliability estimate for the interest/enjoyment subscale was .93 and for the competence subscale it was .92 (Frederick & Ryan, 1993). The Cronbach alpha estimate for the appearance sub-scale was

.94. MPAM-R items were presented on a seven-point Likert scale, which ranged from (1) *not at all true for me* to (7) *very true for me*. Calculating the mean score for all items within each sub-scale creates sub-scale scores.

Sport Competition Trait Inventory (SCTI: Fabian & Ross, 1983). The Sport Competition Trait Inventory is a twenty item scale measuring an individual's trait competitiveness levels within the sport domain. Participants endorsed the twenty items on a seven point Likert scale with 1=*hardly ever*, 7=*almost always*. Items are summed to create a total sport competitiveness score. Fabian and Ross (1983) provide adequate reliability and validity estimates for this scale, as used with college-aged athletes. The Cronbach alpha reliability estimate for the present sample was .92. In the present study, a high-low sport competition variable was created using a mean split procedure.

Competitive-Cooperative Attitude Scale (Martin, 1976). This scale is a thirty-item general measure of an individual's trait competitiveness. Items are responded to on a five-point scale. Each score ranges from (1) *very much unlike me* or strongly disagree to (5) *very much like me* or strongly agree. Items on the scale are summed to create a total competitiveness score with a higher score indicating more competitiveness. Martin (1976) provides adequate validity and reliability estimates for this scale. The Cronbach alpha reliability coefficient for the present sample was .81. In the present study, a high-low total competitiveness variable was created using a mean split procedure.

Design

Differences in motivation, sport competitiveness, general competitiveness and adherence levels between groups were assessed using a Multivariate Analysis of Covariance (MANCOVA). The MANCOVA strategy was chosen as the most appropriate means by which to examine group differences on multiple dependent variables. It also allows for the researcher to adjust for the potential effect of age on the results, and assists in control of Type I error. Since both groups had wide ranges of ages in their members, this was felt to be a potential confound in the study and age was entered as the covariate in the MANCOVA. The p-value for the MANCOVA was set at .01 to further control for any Type I error. Pearson correlations were used to examine relationships between competitiveness, participation motives and adherence variables within the two physical activity groups. To assess the relative influence of sport competitiveness and general competitiveness on levels of intrinsic motivation, two general linear models were tested. A 2 (physical activity group) X 2 (high versus low sport competitiveness) X 2 (high versus low general competitiveness) factorial model was used to predict interest/enjoyment motivation and then to predict competence motivation.

Table 1
Motivation, Competitiveness and Adherence Differences Between Groups

	Mean	Standard Deviation	Significance
Hours Per Week of Exercise	C= 11.90 A= 9.07	C= 5.41 A= 8.28	$P = .02$
Days Per Week of Exercise	C= 5.27 A= 4.55	C= 1.32 A= 1.70	$P = .03$
Interest/Enjoyment Motivation	C= 5.85 A= 5.02	C= 0.78 A= 1.70	$P < .01$
Competence Motivation	C= 5.50 A= 4.85	C= 1.01 A= 1.69	$P < .01$
Appearance Motivation	C= 3.87 A= 5.12	C= 1.55 A= 1.70	$P < .01$
Total Competitiveness	C= 59.12 A= 62.16	C= 15.18 A= 11.84	ns
Sport Competitiveness	C= 111.35 A= 76.81	C= 19.62 A= 31.90	$P < .01$

C= Cyclists A= Adult Exercisers

Results

Motivation, Competitiveness and Adherence Differences Between Groups

Results of the MANCOVA analyses indicated that there was a significant overall group difference on the seven dependent variables of interest: interest/enjoyment motivation, competence motivation, appearance motivation, days per week of exercise, hours per week of exercise, sport competitiveness level and general competitiveness level ($F = (7, 112) 11.67, p < .01, \eta^2 = .44$). Post hoc between group comparisons using Scheffe's F-test (with p -value set at .01) revealed significant group differences for the variables of interest/enjoyment motivation, competence motivation, appearance motivation and sport competitiveness level. See Table 1 for means associated with these analyses.

Correlation Among Participation Motives, Competitiveness and Adherence Variables Within the Competitive Bicycling Group and the General Exercise Group

Pearson correlations were used to examine within group relationships among variables of interest. For the cycling group, level of sport competitiveness was positively and significantly related to interest/enjoyment motivation, appearance motivation, and days per week of participation. For the same group, level of general competitiveness was significantly and negatively correlated with interest/enjoyment motivation. In the exercise group, sport competition level was positively and significantly correlated with all three types of participation motivation. General competitiveness was found to correlate positively with days per week of exercise engagement. See Tables 2 and 3 for correlation coefficients.

The Competitive Situation versus Competitive Attitudes: Relationships with Intrinsic Motives

Two general linear models were created and tested to determine the relative contributions of the competitive situation versus competitive attitudes in relation to intrinsic motives. In the first 2x2x2 model, interest/enjoyment motivation was entered as the dependent variable and group (cyclists versus exercisers), sport competitiveness (high versus low) and general competitiveness (high versus low) were entered as factors. The overall model was significant ($F(7, 119) = 5.46, p < .01, \eta^2 = .21, \text{power} = .93$). The model indicated that those with high sport competitiveness had significantly higher interest/enjoyment motivation than did those individuals with low sport competitiveness ($F(1, 119) = 12.98, p < .01$). One interaction term also reached significance. Results indicated that the group by sport competitiveness interaction was significant ($F(1, 119) = 4.21, p < .05$). The highest interest/enjoyment motivation score was exhibited by the high sport competitiveness-exercise group, followed in order by the

high sport competitiveness-cyclist group, the low sport competitiveness- cyclist group and the low sport competitiveness exercise group.

In the second 2x2x2 model, competence motivation was entered as the dependent variables with group, sport competitiveness and general competitiveness entered as factors. The overall model was significant ($F(7, 120) = 5.68, p < .01, \eta^2 = .21, \text{power} = .93$). The model indicated that those with high sport competitiveness had higher levels of competence motivation than those with in the low sport competitiveness group ($F(1, 120) = 14.83, p < .01$). Results further indicated that the group by sport competitiveness interaction was significant ($F(1, 120) = 4.57, p < .05$). The highest competence motivation scores were exhibited by exercisers in the high sport competitiveness group followed by high sport competitiveness cyclists, low sport competitiveness cyclist and low sport competitiveness exercisers.

Table 2
Correlations Among Participation Motives, Competitiveness
and Adherence Variables for the Cyclist Group

	Sport Competitiveness	General Competitive-ness
Interest/ Enjoyment	0.26*	-0.34**
Competence	0.22 ^{ns}	-0.23 ^{ns}
Appearance	0.31*	0.08 ^{ns}
Days per Week	0.32*	0.17 ^{ns}
Hours per Week	0.17 ^{ns}	0.12 ^{ns}

* Correlation is Significant at <0.05

**Correlation is Significant at <0.01

^{ns}Not Significant

Table 3
Correlations Among Participation Motives, Competitiveness
and Adherence Variables for the Adult Exercise Group

	Sport Competitiveness	General Competitiveness
Interest/Enjoyment	0.56**	0.03 ^{ns}
Competence	0.74**	0.16 ^{ns}
Appearance	0.27*	-0.02 ^{ns}
Days per Week	0.19 ^{ns}	0.25*
Hours per Week	0.09 ^{ns}	0.19 ^{ns}

* Correlation is Significant at <0.05

** Correlation is Significant at <0.01

^{ns}Not Significant

Discussion

Results of the present study both support and challenge the premises of Self-Determination Theory and Cognitive Evaluation Theory (Deci & Ryan, 1985). Contrary to expectations, competitive cyclists had higher intrinsic-oriented motives and lower extrinsic motives than a comparison group of non-competitive exercisers. It was also found that sport competitiveness levels were positively related to intrinsic motivation and one measure of sport adherence in the cyclists. On the other hand, general competitiveness levels were related to lower levels of intrinsic motivation in the cyclist group as was originally hypothesized. Although other explanations may also exist, one can present a potential interpretation of these results that would be consistent with Cognitive Evaluation Theory. It is possible that the competitiveness associated with sport participation is anticipated in seasoned competitors, such as the cyclist

group. When competition is an expected element of the sport experience and resulting behaviors can be interpreted informationally, adaptation may occur so that competition is attended to differently after an initial novice period. Thus, more seasoned participants might be able to focus on the process of participation, interpret competitive outcomes in an informational manner, and continue to maintain higher levels of intrinsic motivation and adherence within a competitive sport situation. It must be noted that the present research was solely correlational in nature and that future studies would be needed to assess how athletes actually interpret behavior in competitive sport situations.

On the other hand, competitiveness as a more dispositional personality characteristic can in certain circumstances and for specific age groups reflect an ego-orientation toward life and would not facilitate an informational interpretation of life events, such as sport and exercise outcomes (Deci & Ryan, 1985). The finding that general competitiveness was correlated negatively with interest/enjoyment motivation in cyclists could indicate that certain types of competitiveness might undermine aspects of intrinsic motivation. This finding supports the propositions of Cognitive Evaluation Theory. Again, additional research is needed in order to elaborate on the relationship found between general competitiveness and intrinsic motivation in the present study.

Findings for the exercise group can be contrasted with those of the cyclist group. Consistent with results from earlier studies (Frederick & Ryan, 1993; Ryan et al., 1997), the exercisers showed higher levels of appearance motivation, an extrinsic motive, than did the sport group. What was interesting in the present study was that even though cyclists and exercisers did not differ in their levels of general competitiveness, in the exercise group general competitiveness was not correlated with lowered levels of interest/enjoyment motivation as it was in the cyclist group. Furthermore, in the exercise group, level of sport competitiveness was correlated positively with both intrinsic and extrinsic participation motives. These results, although not supportive of Cognitive Evaluation Theory, should be interpreted cautiously. The highest mean motivational orientation for the exercise group was appearance motivation, an extrinsic motive. For a group that is already highly extrinsically-oriented, the premises of Cognitive Evaluation Theory may not be as relevant as they are for a more intrinsically-oriented group (Deci & Ryan, 1985; Frederick & Ryan, 1995).

Results of this study also helped to clarify how competitive attitudes influence intrinsic motivation. From the analyses presented, the importance of sport competitiveness was apparent, although not necessarily as might be predicted. Regardless of group, high sport competitiveness was positively related to intrinsic sport motives.

There are certain weaknesses of the present study that must be noted. First, there were large age ranges in both groups of participants. Although the analyses controlled for the effects of age, a study with larger numbers of participants in all age groupings might be able to more definitively assess the influence of age on motivation and competitiveness levels. Second, the effect size associated with the MANCOVA, was moderate. Although the model used in the study helped to better define group differences in motivation and competition levels, future researchers could perhaps refine the model focusing less on adherence variables and general competitiveness as variables of interest.

Overall, more research is needed to assess how, and in what circumstances, competitiveness works to undermine intrinsic motivation in sport and exercise domains. Results of the present study imply that competition within a sport environment relates to motivation differently than does a dispositional, competitive attitude. Elaboration of this information could be potentially useful to coaches and athletes in order to optimize the experience of participants in sport and exercise activities.

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