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## Effects of Zero-Sum Competition on Children's Intrinsic Motivation and Perceived Competence

ROBERT J. VALLERAND  
*Laboratory for Social Psychology  
University of Quebec at Montreal, Canada*

LISE I. GAUVIN  
*School of Physical Education  
Queen's University, Canada*

WAYNE R. HALLIWELL  
*Department of Physical Education  
University of Montreal, Canada*

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**ABSTRACT.** This study assessed the effects of competition on intrinsic motivation and perceptions of competence. Using Church's (1968) reward conceptualization of competition, the competency aspect of competition was made salient by offering a Best Performance Award to tournament winners. Subjects were randomly assigned to conditions of winning or losing the competition. Results revealed that subjects not winning the competition perceived themselves as less competent and displayed less intrinsic motivation than subjects winning the competition. These findings corroborate predictions based on Deci and Ryan's (1985) cognitive evaluation theory, which explains the psychological processes underlying changes in intrinsic motivation that occur in competitive situations.

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COMPETITION IS AN OMNIPRESENT PHENOMENON in North American culture. Educational, sport, work, and even social settings often require the individual to strive to attain some external objective. One can compete to win a sport contest, to obtain good grades in school, to be awarded a job

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*Requests for reprints should be sent to Robert J. Vallerand, University of Quebec at Montreal, Department of Psychology, P. O. Box 8888, Station "A," Montreal, P. Q., Canada, H3C 3P8.*

promotion, or to be the focus of another person's undivided attention. Given the prevalence of this social phenomenon, a better understanding of human social behavior and social psychological processes may be acquired through an examination of the potential effects of competition on the individual.

Anecdotal evidence indicates that competition may have desirable effects on an individual's motivation to perform well. For example, when faced with the possibility of elimination from the NBA playoffs in 1969, the Boston Celtics demonstrated high levels of intensity and motivation that allowed them to defeat the Los Angeles Lakers. Similarly, in vying for the electorate's vote, Canadian Prime Minister Pierre Trudeau delivered some of his most important speeches and produced some of his most creative ideas. Such examples encourage the widespread popular belief that competition breeds motivation.

Contrary to this layman's belief, cognitive evaluation theory (Deci & Ryan, 1980, 1985) posits that competition may either increase or decrease intrinsic motivation, depending on the individual's perception of the competitive situation. Specifically, this theory explains the processes underlying intrinsically motivated behavior or behaviors fueled by the individual's need to feel competent and self-determining. According to the most recent reformulation of cognitive evaluation theory (Deci & Ryan, 1985), two processes occurring in any event, including a competitive event, can affect intrinsic motivation: Changes in perceived competence and/or modifications in perceived locus of causality may be linked to motivational fluctuations.

The perceived locus of causality process deals with perceptions and feelings of self-determination. When the competitive situation allows for self-determination, the individual's perceived locus of causality is internal. In that event, the competitive setting may enhance intrinsic motivation (e.g., Zuckerman, Porac, Lathin, Smith, & Deci, 1978). Conversely, when the competitive situation hampers feelings of self-determination, the individual's locus of causality is external. In such cases, when the controlling aspect of the competitive situation becomes salient, feelings of self-determination may be lost and intrinsic motivation may decrease. Recent empirical evidence (Deci, Betley, Kahle, Abrams, & Porac, 1981; Vallerand, Gauvin, & Halliwell, in press) supports the viability of this interpretation.

The second process that explains changes in intrinsic motivation deals with perceived competence. Specifically, increases and decreases in feelings of competence are linked to enhanced and diminished levels of intrinsic motivation. Indeed, research findings indicate that individuals receiving competence information through self-assessment (Vallerand & Blais, 1986, Experiment 3), experimenter feedback (Deci, 1971; Vallerand, 1983), or norm comparison (Weinberg & Jackson, 1979) experience perceptions and feelings of competence that in turn cause increases in intrinsic motivation (Vallerand & Blais, 1986; Vallerand & Reid, 1984). In addition, when performance

feedback yields perceptions and feelings of incompetence, decreases in intrinsic motivation generally ensue (Vallerand & Blais; Vallerand & Reid; see also Ryan, Vallerand & Deci, 1984).

Competition constitutes a social event that can provide the individual with competence/incompetence information because social comparison processes are very prominent. For instance, in face-to-face or *direct* competition, such as singles tennis, the loser may feel incompetent and less intrinsically motivated, whereas the winner may feel competent and intrinsically motivated. In *indirect* competition, individuals compete against the performance of selected others, or against norms. In the latter case, competence information is obtained by comparing one's output against norms. For example, in a study conducted by Weinberg and Jackson (1979), subjects were required to perform a motor task to the best of their ability. Following performance, subjects were provided with bogus information regarding their standing in relation to others. Specifically, half the subjects were told that they scored on the 82nd percentile (success), whereas the other half were informed that they had scored on the 18th percentile (failure). Results revealed that successful subjects had higher levels of intrinsic motivation than subjects in the failure condition.

Other forms of competition such as zero-sum competition may also yield information pertaining to one's capabilities. In this setting, several individuals vie for limited resources. Accordingly, zero-sum types of competition have been referred to as a reward approach because "competition [constitutes] a situation in which rewards are distributed unequally among participants, based on their performance in an activity" (Scanlan, 1978, p. 68).

Examples of zero-sum types of competition can be pinpointed in several domains. For instance, in sports, only one player receives the most valuable player award offered by the league. In the workplace, only one among a group of employees is awarded a highly sought after promotion.

Zero-sum competition provides individuals with first-hand information about their competence vis-à-vis others, with important repercussions for their intrinsic motivation. Because in most zero-sum competitions such as tournaments and contests, there is only one winner and several losers, the negative effects of competition on intrinsic motivation may be even more widespread than at first suspected. Notably, if the predictions of cognitive evaluation theory that relate to fluctuations of intrinsic motivation in competitive situations are accurate, the numerous competition losers may perceive themselves as being less competent and may experience decreased levels of intrinsic motivation whereas only the winner of the competition may feel competent and intrinsically motivated.

Studying the dynamics of intrinsic motivation in competitive situations is pertinent from both theoretical and applied perspectives: The conceptual underpinnings of cognitive evaluation theory may be empirically tested to

elicit valuable information regarding the effect of competition. Therefore, the purpose of this study was to ascertain the effects of zero-sum competition on participants' intrinsic motivation and perceptions of competence. In line with cognitive evaluation theory (Deci & Ryan, 1985), we hypothesized that subjects failing to win the competition would perceive themselves as being less competent and would consequently display lower levels of intrinsic motivation than individuals who won the competition.

## Method

### Subjects

Subjects were 26 fifth- and sixth-grade male French-Canadian children ranging from 10 to 12 years of age ( $M = 11.19$  years). They were participating in one-day camps held at a French-Canadian University in Montreal, Canada. Informed consent was obtained from the accompanying teacher and the children themselves.

### Task

A pilot study showed the stabilometer task to be very interesting for children 10 to 12 years old. The task required a subject to maintain relative stability in a standing position on a platform that rotates around a central pivoting shaft. Magnetic switches positioned on each side of the platform close when the platform is in balance and open when the platform touches either side of the base. These switches are connected to a clock so that time in balance (TIB) is recorded each time the switch is closed. TIB was the ostensible performance indicator in this study.

### Procedure

Subjects were brought individually to the experimental room by an assistant, where they were greeted by the experimenter. While the experimenter introduced himself and proceeded with the session, the assistant left the room and positioned herself behind a one-way mirror in order to record the time spent on the task during the free-choice period (intrinsic motivation index). Prior to performance, the children were shown how the stabilometer works and asked if they wanted to try it. All agreed and were allowed one practice trial. Following that trial, subjects in both conditions were told that they would participate in a tournament in which other children their age had previously performed a balancing task and the experimenter had recorded the best TIB performance. Subjects were then informed that they would be requested to perform 8 trials lasting 20 s each with a 20-s intertrial rest period. If their

overall TIB performance was better than the best performance, they would receive the Best Performance Award of \$1.00. They were told, however, that if they did not surpass the best performance, they would not receive the award. It was further mentioned that not receiving the award did not necessarily mean that their performance was poor, but simply that it was not the best one. These procedures ensured that the reward approach of zero-sum competition would be enacted.

To verify whether the subjects understood the meaning of the instructions, they were asked to repeat the instructions they had received (cf. Karniol & Ross, 1979). Once they had demonstrated an understanding of instructions, they were wished good luck and the trials began. To emphasize the competitive aspect of the situation, the experimenter showed the \$1.00 to the subject and placed it on the experimental table, where it stayed in front of the subject for the entire session. Similarly, in an attempt to enhance further the competitive features of the situation, subjects were informed, following the fourth trial, that they were now at midpoint and that they could still win the award.

Following performance on the stabilometer, all subjects were told to sit down and relax in a chair placed near the wall in the experimental room while the experimenter tabulated the scores and verified if the subject had won the award. This allowed the subjects to rest for approximately 45 s so that fatigue would not interfere with the free-choice period. At the end of 45 s, subjects in the winning condition were called by the experimenter and provided with the following feedback: "Congratulations! You have won the Best Performance Award. Here is your \$1.00." They were then given the \$1.00. Those in the losing condition were told: "Unfortunately, you have not won the Best Performance Award." The experimenter then put the \$1.00 back in his pocket.

Subjects were then told by the experimenter that they would be asked to answer a questionnaire. Unfortunately, after looking very carefully, the experimenter "realized" that he had run out of questionnaires and that he would have to go to his office in order to get one. This would take about 5 min. Subjects were informed that during this time they could do whatever they liked—sit and relax, play on the stabilometer, or look at the sport posters on the walls. They were told not to leave the room. The experimenter then left the room. Meanwhile, an assistant blind to the manipulations and positioned behind a one-way mirror recorded the time spent on the stabilometer during the free-choice period. This served as one dependent measure of intrinsic motivation (cf. Deci, 1971). A second intrinsic motivation measure was also taken. It pertained to whether subjects went directly to the stabilometer once the experimenter left the room, or whether they chose to do other things first (e.g., sit down, look at sport posters). This measure of initial choice has been used successfully by other researchers (cf. Swann & Pittman, 1977).

Following the 5-min free-time period, the experimenter returned to the experimental room and asked subjects to answer a questionnaire containing a target question on perceived competence scored on a 4-point scale adapted from Harter's (1982) perceived competence scale.

Finally, upon completion of the questionnaire, the experimenter "realized" that he had made a mistake and had forgotten to add the score of one trial to the total score of subjects in the losing condition. This changed subjects' overall performance to the point where they now deserved the Best Performance Award. The experimenter apologized for his "mistake" and gave the Best Performance Award (\$1.00) to the subjects. This served as a debriefing session for subjects in the losing condition. No debriefing session took place with subjects in the winning condition because it was felt to be more important to let subjects leave the room with a positive feeling than to explain the actual procedures of the experiment. Subjects were thanked for their participation, congratulated for their outstanding performance, and brought back to the playground.

### Results

The effect of winning or losing the competition on perceived competence was assessed through Student's *t* test. The analysis indicated, as expected, that subjects losing the competition ( $M = 2.69$ ) perceived themselves as being less competent on the stabilometer,  $t(24) = 3.35, p < .002$  (one tail), than those winning the competition ( $M = 3.62$ ). The effect of losing on the free-time period, the first measure of intrinsic motivation, was also analyzed by Student's *t* test. Results of the analysis showed a marginally significant effect,  $t(24) = 1.47, p < .08$  (one tail). Subjects losing the competition spent less time ( $M = 72.08$  s) on the stabilometer than subjects winning the competition ( $M = 129.54$  s).

Finally a test for significance of difference between proportions (Bruning & Kintz, 1977) was also performed in order to ascertain whether the two groups differed regarding the task subjects turned to first during the free-time period. The analysis yielded a significant *z* value of 1.99,  $p < .02$  (one tail). As expected, a smaller proportion of subjects losing the competition (23%) went to the stabilometer first during the free-time period than subjects who had won the competition (62%).

### Discussion

The purpose of this study was to compare the intrinsic motivation and perceptions of competence of winners and losers of a zero-sum competition. Based on cognitive evaluation theory (Deci & Ryan, 1980, 1985), we hypothesized that subjects losing the competition would display lower levels of intrinsic

motivation and would perceive themselves as being less competent than subjects who won the competition. The results support this hypothesis: Subjects losing a zero-sum competition displayed lower levels of intrinsic motivation and perceptions of competence than subjects who won the competition.

The results demonstrate the application of cognitive evaluation theory to the competitive process. The theory posits that competition, like any context, can yield performance or competence information. When this information is available, individuals' intrinsic motivation varies in accordance with changes in perceptions of competence. The results show that subjects losing the competition had lower levels of intrinsic motivation and perceived competence than those who won the competition. Predictions derived from cognitive evaluation theory were validated and thus corroborated this conceptual framework. Given that perceptions of competence were obtained following the free-time period, however, it cannot be concluded that they are causally linked to changes in intrinsic motivation. Nevertheless, these results are consistent with those of two recent studies (Vallerand & Blais, 1986; Vallerand & Reid, 1984) indicating that, when individuals focus on their level of proficiency at a given task, competence-related affects and perceptions constitute a major determinant of their intrinsic motivation for the activity.

The present findings obtained with French-Canadian children support the theory of Deci and Ryan (1980, 1985) that has evolved from research largely conducted with American college students. Thus, the present findings suggest that the same determinants of intrinsic motivation may be operating for both adults and children of different cultures. Consequently, these findings increase confidence in the ecological validity of cognitive evaluation theory.

A final implication of the results pertains to the process of competition. Previous research has focused mainly on the effects of performance-related experimenter feedback (e.g., Deci, 1971; Vallerand, 1983; Vallerand & Reid, 1984) as well as on the influence of individuals' self-assessment of performance (e.g., Vallerand & Blais, 1986, Experiment 3) on intrinsic motivation. Results from this study reveal that social comparison processes represent another important source of competence information that can affect intrinsic motivation. Hence, in addition to undermining intrinsic motivation through restrictions of people's sense of self-determination (i.e., the controlling aspect of competition, Deci et al., 1981; Vallerand et al., in press), competition may also reduce intrinsic motivation by leading individuals to perceive themselves as being incompetent through their inability to obtain scarce performance-contingent rewards.

The present findings have underscored the potential negative effects of competition on participants' intrinsic motivation and perceived competence. Although the present study was limited in scope—only boys served as subjects and competition was only of the zero-sum type—the results are nevertheless encouraging.

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