

On the Importance of Self-Determination for Intrinsically-Motivated Behavior¹

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Abstract. Yoked pairs of subjects solved puzzles such that one member of each pair was given choice about what puzzles to work on and how much time to allot to each, while the yoked subject was assigned the same puzzles and time allotments as those chosen by the first subject. It was predicted and found that subjects who chose the activities and time allotments - in other words, who had additional self-determination--would be more intrinsically motivated than subjects doing the same activity without choice.

Intrinsic motivation has been a central concept in several recent empirical investigations. The most common theoretical definition suggests that intrinsically motivated behaviors are energized and directed by a basic, innate need to interact effectively with the environment and to have an impact on the environment (White, 1959; deCharms, 1968; Deci, 1975; Harter, 1978). Stated more simply, people need to feel competent and self-determining; they need to feel a sense of personal causation.

If the need for self-determination is indeed an important basis of intrinsic motivation, one would expect people to be more intrinsically motivated for activities over which they have greater self-determination. This assumption is widely accepted. In organizational psychology, for example, the areas of participative management and job enrichment are based solidly on the assumption that greater self-determination leads to higher levels of motivation and better performance (McGregor, 1960). Similarly, in the area of education, theorists assert that greater freedom tends to enhance intrinsic motivation and performance (e.g., Bruner, 1962).

There is considerable indirect support for the postulate in that control has been shown to have various positive effects. Seligman (1975) reported that when people encounter outcomes which are independent of their responses (i.e., over which they have no control), they lose motivation for responding and experience impaired learning and emotional responses which might be labelled anxiety and depression. Experiments by Glass and Singer (1972) have shown that people who believe they have control over unpleasant noises can tolerate them without deficits in performance whereas those who believe they have no control show marked deficits when exposed to the noise. Schultz (1976) and Langer and Rodin (1976) found that institutionalized elderly people who were given modest amounts of additional control over aspects of their lives displayed greater physical and psychological well-being than others who were not given the added control.

This research, when related to the theoretical definition of intrinsic motivation, suggests the hypothesis that people who have greater freedom to choose what they will do and how they will do it should have more intrinsic motivation for the activity than people who do the exact same activity without having had choice.

There is one experiment reported by Swann and Pittman (1977) which bears directly on the hypothesis. In their study, children worked on drawing games under various conditions. Half the children were assigned the task whereas the other half were told they could choose what activity to play with, though it was added, "Well since you're already sitting in front of it, why don't you start with the drawing

game?" (p. 1129). In other words, the study used an "illusion of choice" manipulation in which children were led to believe they had choice although they were actually "induced" to pick the game which the experimenters preferred. The results of the experiment showed a marginally significant effect in which children with the "illusion of choice" were more intrinsically motivated than subjects without choice.

The present study expands on the Swann and Pittman study. The primary conceptual difference is that a yoking procedure allowed subjects to be given *actual* choice rather than the *illusion* of choice. Further, we employed college students to complement their experiment with children. In the present investigation, yoked pairs of subjects worked on the exact same activities and had the exact same time allotments for doing so. The only difference between the two people comprising each pair was that one person chose the activities to work on and how long to spend working on them, whereas the other member of the pair was assigned the activities and times chosen by the former member. Of interest was the difference between the intrinsic motivation of the two members of the pair for the task being engaged in, the prediction being that those with greater freedom of choice would be more intrinsically motivated.

Method. Subjects in this experiment were 80 undergraduates from the University of Rochester who comprised 40 yoked pairs. Six pairs were females and the rest were males. Each subject participated for a one-hour session, working on a spatial relations puzzle called *Soma*.

The first experimenter met each subject, escorted the subject to an experimental room where he or she was seated at a table, and then left the room to assume his position behind a one-way window. Subjects communicated with the experimenter through an intercom.

On the table in front of the subject were the puzzle pieces. For subjects in the task-choice condition, there were drawings of six configurations, whereas for the task-no-choice subjects there were only the three which they would be asked to work on. In addition, for all subjects, there were three other configurations on the table: one was a sample, and the others were used in relation to the dependent measure and will be discussed below. On another table to the subject's right were the microphone, speaker, and recent issues of three magazines (*New Yorker*, *Time*, and *People*).

Subjects were told that it was an experiment to study certain problem-solving concepts and that they would be asked to solve some puzzle problems. They were then directed to the sample puzzle, told which pieces were used to solve it, and then allowed about a minute to do it.

Subjects in the choice condition were told that they would have a total of 30 minutes available for solving puzzles and that they would work on three of the six available to them. They were then asked to select which puzzle they would like to work on first and how many of the 30 minutes they would like to allot to that puzzle. They then worked on that puzzle and terminated either when they solved it or when they had used up their allotted time. They then moved on to the next puzzle by selecting one from the remaining five and making a time allotment for that puzzle. The procedure continued until they had worked on the three puzzles.

Subjects in the task-no-choice condition were given only the three configurations selected by the yoked counterpart and were told how much time they would have for each.

To obtain the dependent measure of motivation, the experimenter left his position for a period of eight minutes following the puzzle solving. The pretext was that the experimenter was going to a teletype so the computer could select an appropri-

ate questionnaire for this subject — it being based on his/her puzzle solving performance. The experimenter told the subjects he'd be gone for about 5 to 10 minutes and that they could do what they liked during that time. He took with him the configurations which had been used for the first part of the experiment and left the sample and two other configurations. This was done so that all subjects would have exactly the same stimulus materials during the time the experimenter was absent.

The subject was then alone in the room and was free to work on the puzzles, read magazines, or do whatever. The amount of time out of the eight minutes which a subject spent working on the puzzles was used as the main dependent measure of intrinsic motivation. This was determined by a second experimenter who observed through the one-way window and used a stop watch to record the time. The second experimenter was blind to the condition and also to the hypotheses of the experiment.

The two configurations (other than the sample) which were left during this free-choice period were impossible to do. This precluded the possibility that subjects would finish a configuration in the eight-minute period and have that be a causal factor in whether or not they continued working on the puzzle.

After eight minutes, the first experimenter returned to the room and asked the subject to complete a post-experimental questionnaire.

Results and Discussion. A post-experimental manipulation check was used to assess the extent to which subjects, on a 10-point scale, felt that they had control over the puzzle selection. Task-choice subjects indicated greater felt control than no-choice subjects; the t of 4.95 being significant well beyond the .01 level with 39 degrees of freedom.

The primary dependent measure in this experiment was the difference score between the free-choice time of the task-choice subject minus the no-choice subject in each yoked pair. The hypothesis predicts that the average difference score will be significantly greater than zero. The average difference score was 94.5 seconds, with task choice subjects spending an average of 259.4 seconds and the no-choice subjects spending an average of 164.9 seconds. Thus, subjects who had had choice about puzzles and time allotments displayed greater intrinsic motivation than no-choice subjects as evidenced by their spending an average of 94.5 seconds more working on the puzzles during the free-choice period. This difference yielded a t of 2.15 which is significant at the .05 level (two-tailed), with 39 degrees of freedom.⁴

Since the choice-subjects selected puzzles, there is the possibility that they chose configurations which were uniquely easier for them, thereby having performance differences mediate the intrinsic motivation effects. To test this we analyzed the average time to solve each puzzle and also the average number of puzzles not completed. There were no differences between the two groups on either measure (each of which yielded an F of less than 1.0). We then did an analysis of covariance on the free choice measure using both of the performance measures as covariates and found that the significant main effect for choice remained.

A supplemental dependent measure asked subjects to rate on a 17-point scale, their willingness to return to the laboratory to do additional puzzle solving. The average difference score on this question was 2.0, again indicating greater intrinsic motivation among task choice subjects. This difference produced a t of 2.84 which is significant at the .01 level with 39 degrees of freedom.

The results of this experiment are consistent with the growing body of literature which suggests that people's motivation is greater when they have more rather than less control over their environment. In the present experiment subjects who were given a modest amount of additional self-control — namely the opportunity to select

which three of six puzzles to solve and how to apportion their 30 minutes of puzzle solving time to the three puzzles — showed significantly greater intrinsic motivation for the activity than those subjects who were assigned the same puzzles and time allotments.

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Footnotes

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⁴Some yoked pairs were paid for solving the puzzle while some were not. There was a tendency for larger average difference scores among paid subjects than among unpaid subjects; however, the trend was not significant (Note, of course, that comparisons between paid and unpaid subjects could not be made since each yoked pair of subjects worked with different puzzles and time allotments.)