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IS THERE A MULTIPLE CHANCE EFFECT IN HUMAN PERFORMANCE? A PRELIMINARY STUDY OF EXPECTED OPPORTUNITY

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ABSTRACT

Extrapolating from scarcity and dissonance principles of social cognition, the effect of expected opportunity was explored with $N = 48$ male, introductory psychology students told the study involved a test of motor coordination. First and only trial dart-throwing accuracy was found to be significantly better for participants told they would have only one try at the task, than for those told their recorded score would be based on the higher of two attempts. Second trial scores for those given two tries, were not significantly different from first and only trial scores of those given only one chance to throw darts at a wall-mounted target. The results thus indicate that expectation of subsequent opportunity may inhibit first effort performance relative to circumstances where one chance is all you get. Potential facilitative effects on performance of a one-and-only-one chance mind set are discussed in terms of an attention hypothesis based on scarcity and dissonance principles, along with the cue utilization statement of the Yerkes-Dodson Law proposed by Easterbrook. Limitations on inferences from these data are noted. Empirical questions for programmatic subsequent inquiry are considered.

INTRODUCTION

Problem, Objectives, and Data Source

Situational differences in the opportunity conditions of our goal-directed activities constitute one of the most fundamental realities of everyday life. The number of chances we have to accomplish anything we set out to do varies from place to place and case to case depending upon all sorts of factors. Central as these realities may be to understanding the nature of human functioning in general and social cognition in particular, causal associations between expected opportunity and life outcomes in work, play, and interpersonal affiliative interaction have pretty much escaped the focused light of direct, systematic inquiry by social scientists. The work reported in this paper was undertaken out of a conviction that the variables of interest here may have substantively important theoretical as well as applied implications, across a wide range of human experiential contexts from academic and athletic achievements to the development of intimate relationships. Using an experimental laboratory paradigm involving measurements of performance by college students on a sensory-motor coordination task, this project was designed as a preliminary step toward more detailed exploratory study of expected opportunity.

Theoretical-Empirical Rationale

There is a substantial body of literature supporting the scarcity principle that items and even our relationships with people are valued in proportion to how difficult it is to get them. The implicit heuristic apparently underlying the results of research validating the scarcity principle hypothesis (e.g., Brehm & Weinraub, 1977; Driscoll, Davis, & Lipetz, 1972; Worchel, Lee, & Adewole, 1975), seems to be that the harder things are to get the more they are appreciated. Reactance theory as stated by Brehm (1966), provides a conceptual framework within which findings validating the scarcity principle are seen as reflecting a reaction to the perception of limited availability as a threat or potential threat to freedom of action. Cognitive dissonance theory (Festinger, 1957), which has spawned an extensive network of social cognition research, offers a balance concept to explain and predict the inclination to value things in proportion to how difficult they are to get.

So, there has been a good deal of conceptual and empirical attention to the way availability and personal cost may influence the valuation of tangible items, personal relationships, or a change in social status as the quest objects. The present study involves exploratory inquiry into expected scarcity or abundance of opportunity as a factor in human performance. More specifically, the focal question here is as follows: To what extent is performance affected by awareness of how many chances one will have at something? In the absence of any systematic research in social psychology directed explicitly to this issue, the following experiment was conducted to collect preliminary data on what could be a phenomenon with potentially wide-ranging theoretical as well as applied implications.

METHOD

Participants

The test sample was comprised of 48 male college freshmen, participating in partial completion of an introductory psychology course research requirement. No females were available for this study, in that all women in the Psychology 1 research participation pool had been recruited earlier in the semester for a project which totally fulfilled their research participation requirement.

Laboratory Setting

The experiment was conducted in a conference room twelve feet wide by sixteen feet long, with drapes closed and furniture moved to provide the space needed.

Research Design and Procedure

All participants were told the experiment was designed to investigate individual differences in motor coordination among young adults. They were further instructed that the measure used would be total score earned by throwing six darts at a wall mounted target ten feet from the throwing line, with center ring five feet four inches above the floor. The only apparatus used was a fourteen-inch diameter, magnetic dartboard with a six-ring target face and matched set of six magnet-tipped darts, all in good condition, purchased at the San Jose Flea Market for just under ten dollars (after customary haggling over price). The six concentric rings of the target face were designated as counting for one, two, three, four, five, and ten points, respectively, from outermost to center ring.

Half of the participants ($n = 24$) were randomly assigned to one of the following conditions. Those assigned to Condition I were told they would get two tries at the task, and that the score recorded for them would be whichever six-dart total was higher, on either their first or second try. The $n = 24$ students assigned to Condition II were told they would get only one try at the task.

Participants were tested individually, with no one else in the test room but the experimenter. In an effort to minimize experimenter effects, instructions were given by one of two male experimenters, A or B, and the test data were gathered by the other of those two assistants. Half ($n = 12$) of the 24 participants in each condition were randomly assigned to be instructed by Assistant A and tested by Assistant B, with the remaining half instructed by Assistant B and tested by Assistant A. In every case, only the experimenter administering the instructions was aware of the experimental condition to which the participant had been assigned. The order in which one or the other of the two test session conditions were conducted, was randomized across all participants. Participants were debriefed in their Psychology 1 class, where this experiment was presented as part of the instructional unit on Social Psychology.

RESULTS

Performance as measured by dart throwing accuracy was significantly better ($t = 3.01$, $df = 46$, $p = 0.004$) for participants in Condition II (Mean = 16.54, SD = 4.52) on their only trial at the experimental task, than was the case for participants assigned to Condition I (Mean = 12.42, SD = 4.96) for what was the first of their two trials. Effect size was evaluated using Omega squared (Cohen, 1965; Guilford & Fruchter, 1973; Hays, 1963; Olejnik & Algina, 2000) and that value was $est\ w^2 = .14$. The latter estimate just reaches the minimal numeric value suggested by Cohen (1988) as indicating a large association between the variables tested, as compared with minimal values of .01 or .06 Cohen refers to as reflecting small or medium effects, respectively. Scores for participants assigned to Condition I on their second trial (Mean = 16.79, SD = 5.08) were slightly but not close to significantly higher ($t = 0.18$, $df = 46$, $p = 0.858$) than scores for Condition II participants on their first and only trial (Mean = 16.54, SD = 4.52). There were no significant mean differences between the scores of participants instructed and tested by different combinations of the two assistants (that is, A/B versus B/A).

DISCUSSION

In short, the data reported here suggest that first trial performance may be inhibited by the expectation of subsequent opportunity. Conversely put, these findings may be seen as indicating something of a facilitative effect on performance of a one-and-only-one chance mind set. The absence of a significant difference between average performance of the *two trial group* on their second trial, as compared with that of the *one trial group* on their first and only trial, may be noteworthy. Empirically, the indication is that in *this* task situation, the one-and-only-one try mind set was equivalent to at least one practice trial. How many more trials would it have taken for the multiple chance group to do significantly better on a single trial than did the one chance group on their only trial? Unfortunately, the data reported here do not permit appropriate analyses for more detailed estimates as to just how much of a performance advantage the one-and-only-one trial mind set may have been worth. This is a matter open to investigation by any who may choose to pursue further inquiry into the psychology of expected opportunity, using any number of different tasks. But for now, let us look at some considerations in terms of which to interpret the data we *do* have here.

For more than a century, the so-called the Yerkes-Dodson Law or YDL (Yerkes & Dodson, 1908) concerning the relationship between emotional arousal and performance, has been scrutinized in a number of scientific reports (e.g., Baumler & Leinart, 1993; Teigen, 1994), and invoked as a way of understanding and improving human performance in all sorts of contexts including sports psychology (Williams, Landers, & Boutcher, 1993). Addressing organismic processes underlying the YDL, the cue utilization hypothesis proposed by Easterbrook (1959; see also Eysenck, 1982; Mandler, 1975), which has itself become the object of considerable scholarly attention (Hanoach & Vitouch, 2004), suggests one mechanism in terms of which to explain the results we present here.

Cue utilization theory assumes an inverted-U shaped relationship between performance as indexed on the vertical or Y-axis, and level of arousal as given on the horizontal or X-axis of a line graph. The inverted-U curve is postulated as reflecting a narrowing of attention caused by

increased arousal. The notion is that as attention narrows with increased arousal, cues are eliminated and attention becomes steadily more focused. The increase in arousal from a low to a moderate point is hypothesized to *facilitate* performance by elimination of cues *irrelevant to the task*; the *decrement in performance* from moderate to high arousal is attributed to a dropping out of *task relevant cues* once the irrelevant ones are focused out. Mediated by cognitive processes of valuation such as those postulated in the scarcity and dissonance principles described above, a one-and-only-one chance mind set may lead to a more functionally optimal level of psychophysiological arousal than does the expectation of multiple opportunities, with performance thus facilitated by an associated reduction in attention to task irrelevant cues and sharpened focus on cues relevant to the task.

Does the sense that we are going to get only one chance at a task on which our proficiency is measured, facilitate performance on that task relative to the expectation we will have at least one more chance at it? The results we report here affirm the foregoing analysis. Accordingly, this preliminary study provides supports the hypothesis that dispositions toward achievement and thus the actualization of human potential as measured against objective performance criteria, may be affected and perhaps even profoundly so, by the expectations as to just how many chances there will be to meet or excel those performance criteria.

Are these findings reliable? The data for this study were collected in 1968 and have been only recently discovered among stacks of boxes (containing raw data and manuscripts in various stages of development) the first author self-servingly calls *deep files*, while in the process of cleaning out his university faculty office as is customary prior to retirement. For all we know, the results obtained in analyzing the almost 40 year-old data in this study may be *Zeitgeist-bound* to thinking characteristic of the late sixties, as evidenced in a test sample drawn from the San Jose State University service population at that time.

The reliability/validity of multiple or one-and-only-one chance effects in human performance may or may not be affirmed in subsequent research, programmatically conducted to investigate issues such as the relevance of situational factors including time pressure, number of chances, salience of the activity as a competitive one and/or other forms of ego involvement in the task. And what about the task itself? Given indications of performance criterion relevance to the YDL (Baumler & Leinart, 1993; Hanoch & Vitouch, 2004), type of task, task difficulty, and task complexity are all variables which could influence whatever effect or effects may obtain here. Then there is the possible role of gender and/or personality factors like achievement motivation, evaluation apprehension, self-esteem and so on.

A number of provocative questions follow from consideration of possible interactions between and among such variables, as they may influence the effects of expected opportunity. Assuming establishment of their reliability/validity, a most intriguing line of research with substantive applied implications is suggested by the question as to how these effects might be neutralized or eliminated by heightened awareness of them through forewarning *before* the task is performed. In other words, to what extent and in what kinds of situations might human performance be enhanced by *sensitizing* the task performers as to multiple or one-and-only-one chance effects? Studies of such *proactive* intervention could lead to important discoveries concerning enhancement of effectiveness in various aspects of human performance endeavors.

It also remains to be determined whether or not the finding reported in the present study reflects a more generalized, cognitive-motivational-behavioral principle relevant to domains of human circumstance other than those involving evaluations of functioning relative to objectively quantified performance criteria, such as morally responsible social conduct. The apparent ubiquity of redemption as a narrative theme in American culture (McAdams, 2005), gives contextual impetus for further inquiry into the broader, societal implications of expected opportunity.

The objectives of this preliminary study will have been totally fulfilled, insofar as it leads to meaningfully productive insights along any of the lines considered here.

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