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ABSTRACT

This study examined the effects of moods on problem solving. Subjects (N=64) were randomly assigned to either a happy, sad, angry, or neutral condition. Moods were induced and then subjects worked on a commons dilemma problem. Subjects were given 18 trials in which to figure out by trial and error how many tons of fish could be taken from a pool while still maintaining the maximum propagation rate. The propagation rate was defined by a continual curvilinear function. Whether the subject discerned the rule was inferred from his or her predictions. The results concerning the subjects' ability to learn the function underlying the task revealed that subjects in the neutral condition were better able to decipher the correct function than were subjects in the happy, sad, or angry conditions. The results concerning actual performance on the task revealed that subjects in neutral and happy moods performed better on measures of subjects' outcomes on the task than did subjects in either the sad or angry conditions. These findings confirm the predictions that happy, angry, and sad moods would all interfere with learning of a function underlying a commons dilemma problem, and that negative moods would likely be detrimental to effective performance on such a task. (NB)

The effects of induced moods on solving a commons dilemma[1]

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This research examined the effects of moods on problem solving. Specifically we examined the effects of happy, sad and angry moods on subjects' ability to learn the function underlying a "commons dilemma" problem as well as on their actual performance when faced with this problem.

Moods were induced by having subjects read either a "happy," "sad," "angry," or neutral mood inducing story. Immediately thereafter subjects worked on a commons dilemma problem. The subject was told that there was a pool of fish. On each trial the subject would be told how many tons of fish existed and could draw out as many tons as desired. (That number could be exchanged for money later.) After each trial, the remaining stock would be subjected to a "propagation function" and would be increased. Then a new trial would begin. On each trial, the subject drew fish out, predicted what the new number would be following progagation, was told the actual new number and the next trial began. Subjects in such tasks must figure out by trial and error how much can be taken out while still maintaining the maximum propagation rate.

The propagation rate in our case was defined by a continual curvilinear function. Whether the subject discerned the rule was inferred from his or her predictions. In addition we recorded how much stock was actually taken on over trials (cumulated profit) as well as how many fish were actually reproduced (an indication of how well the dilemma was being handled). Ideally, the subject would figure out the function and draw off only the new propagation in each trial.

Predictions. We proposed that moods would influence task performance in two ways. First, all moods--happy, sad, angry or neutral--ought to have a detrimental effect on subjects' ability to learn the function underlying the task because: 1) moods compete for attentional space (e.g. Ellis et al., 1984); 2) moods take up capacity in working memory as a result of cueing similarly-toned material (Clark & Isen, 1982); and 3) moods often give rise to intentional, effortful strategies to alleviate the mood or to maintain it. These strategies also take up capacity in working memory (Clark & Isen, 1982).

Second, the two negative moods were expected to interfere with actual performance oon the task to a greater degree than either happy or neutral moods. To perform well on the task subjects must be able to delay gratification, and it was expected that negative moods such as sadness and anger would interfere with this ability. Specifically, negative moods but not happiness or neutral moods were expected to cause subjects to draw excessive numbers of fish from the pool resulting in less than optimal use of the pool. This prediction is based on past findings that people in negative moods often do attempt to alleviate those moods (e.g. Manucia et al., 1984) and may do so by trying to quickly accumulate high profits. It is also based on direct evidence that people in negative moods have more difficulty delaying gratification than others--presumably because they are attempting to alleviate their negative states. (e.g. Mischel et al., 1968; Seeman & Schwarz, 1974).

Procedure.

Sixty-four students participated. Each was randomly assigned to either a: 1) happy, 2) sad, 3) angry or 4) neutral condition. Under the guise of a first study subjects read a story designed to induce a happy, sad, angry or neutral mood. Next, subjects went to a separate room and were greeted by a second, supposedly unrelated experimenter. The experimenter explained the fishing "game." In each trial the subject was allowed to catch nothing or as many tons of fish as the subject wished. However, the stock was limited. The amount in the pool decreased whenever some were drawn out. On the other hand the fish also propagated as long as there were enough left in the pool. If the stock dropped to zero the game would be over. The subject was to maximize winnings. The game started with 120 tons in the pool. In each trial subjects had to record the amount they took and the amount they predicted would remain on the next trial including progagation. Then the experimenter told them the actual amount left, subjects recorded that, and the next trial took place. The game was unexpectedly ended after the 18th trial.

After finishing the game, the subjects were asked to rate how the story they had read made them feel: from uplifted (+5) to neutral (0) to depressed (-5). They were informed of their overall profit, paid, debriefed and thanked.

Results.

Accuracy of predictions. We predicted that all moods would interfere with ability to learn the function underlying the task. This ability was measured by the accuracy of subjects' predictions of the stock for the next trial. Differences between the predicted and the real amount of stock were squared and divided by the predicted value so that both over and underestimations were taken into account and the result was related to the absolute amount of the prediction. The sum of these transformed relative squares is equivalent to Chi-square and represents the ordinate in Fig. 1 (attached). Figure 1 reveals that subjects in the neutral mood condition were better able to decipher the correct function than subjects who were happy, sad or angry. Their sum of chi-squares does not exceed the significance border. The predicted amounts by subjects in all mood conditions differs from the real amount of stock.

Actual performance on the task/Delay of gratification. Three measures of subjects' outcomes on the task were taken. First, the final level of fish in the pool was recorded. The greater this amount, the better subjects solved the problem not to depelete the stock over trials. Second, the total catch was calculated. The higher this sum, the more subjects were paid. However, a high profit could result from depleting hte stock rather than from catching the reproduced fish and effective problem solving requires not wasting the stock but rather drawing off the new propagation. Thus, a third measure was designed to assess cumulated draw without having simultaneously wasted any fish. The combination of both variables is the amount of reproduced fish taken over all trials.

The means for each of these variables are shown in Table 1 (Attached). As can be seen and as predicted, subjects in neutral and happy moods performed better on each of these measures than did subjects in either sad or angry moods. Two attached figures (Figs. 2 & 3) reveal why this is the case. Subjects in negative moods do start out drawing out more stock than those in neutral or positive moods, apparently because they have trouble delaying gratification (see Fig. 2). However, in the end they earn less profit because they have wasted stock (see Fig. 3). (These Figures will be explained in more detail in the presentation should this paper be accepted.)

One-way ANOVAs for all three measures were conducted. Significant effects were obtained for the final amount of stock $F=3.12$, $p=.04$, and the number of reproduced fish across all trials $F=3.72$, $p=.02$. The analysis for cumulated profit revealed a marginal effect $F=2.26$, $p=.09$.

Discussion.

The results clearly confirmed the predictions that: 1) happy, angry and sad moods would all interfere with learning of a function underlying a commons dilemma problem, and that 2) negative moods are particularly likely to be detrimental to effective performance on such a task presumably because they interfere with subjects' ability to delay gratification.

References

Clark, M.S., & Isen, A.M. (1982). Toward understanding the relationship between feeling states and social behavior. In A.H. Hastorf & A.M. Isen (Eds.), Cognitive Social Psychology. New York: Elsevier/North Holland.

Ellis, H.C., Thomas, R.L., & Rodriguez, I.A. (1984). Emotional mood states and memory: Elaborative encoding, semantic processing, and cognitive effort. Journal of Experimental Psychology: Learning, Memory and Cognition, 10, 470-482.

Manucia, G.K., Baumann, D.J., & Cialdini, R.B. (1984). Mood influences on helping: Direct effects or side effects. Journal of Personality and Social Psychology, 46, 357-364.

Mischel, W., Coates, S., & Raskoff, A. (1968). Effects of success and failure on self-gratification. Journal of Personality and Social Psychology, 19, 321-390.

Seeman, G., & Schwarz, J.C. (1974). Affective state and preference for immediate versus delayed reward. Journal of Research in Personality, 7, 384-394.

Table 1

Means for Final Stock, Cumulated Profit, and Reproduction as a function of Induced Moods

MOOD	MEANS Final Stock	Cum. Profit	Reproduction
Happy	80	151	564
Neutral	79	150	559
Sad	45	124	421
Angry	46	122	414

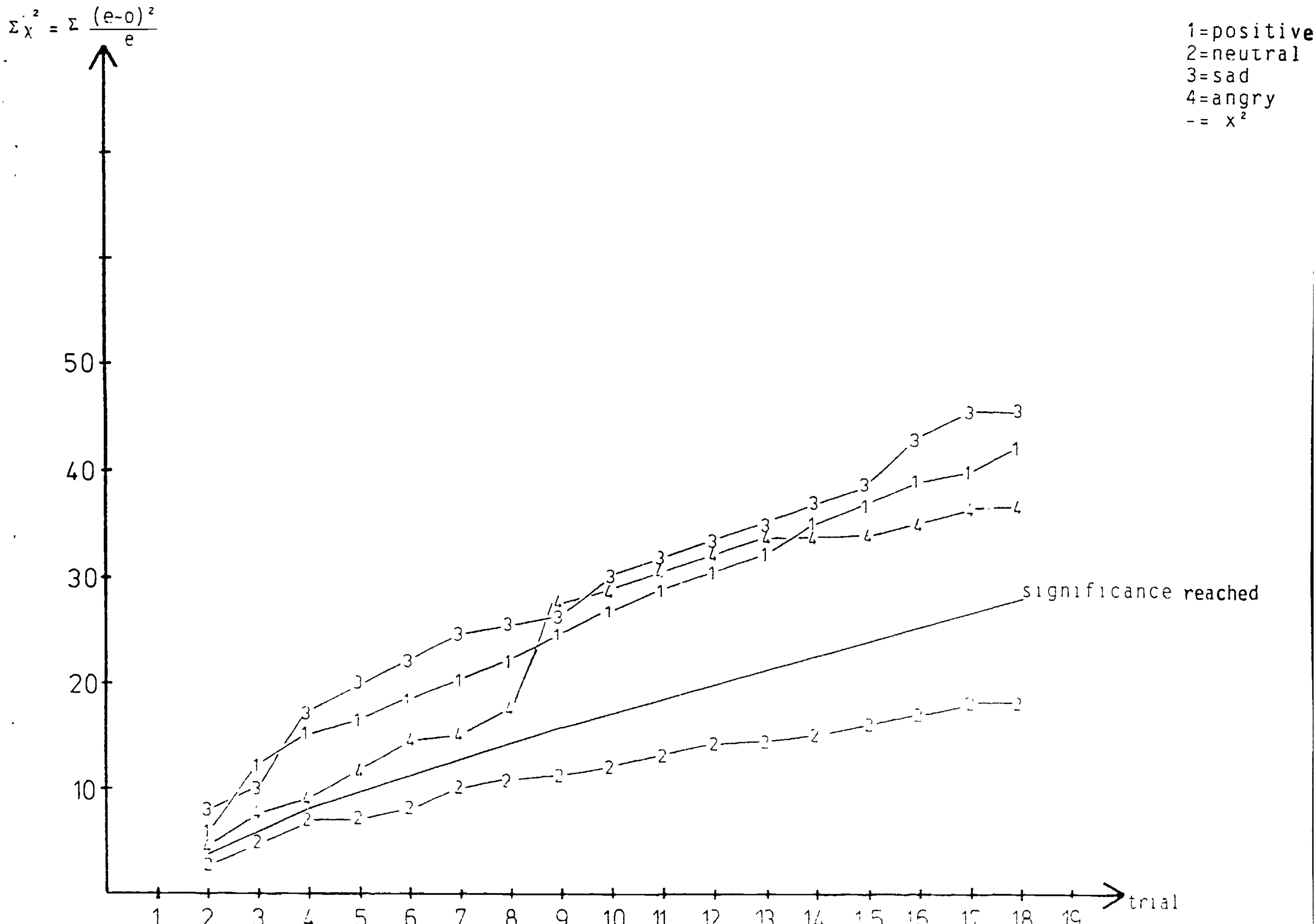

Fig. 1 Cumulative accurancy of predictions by treatment variable

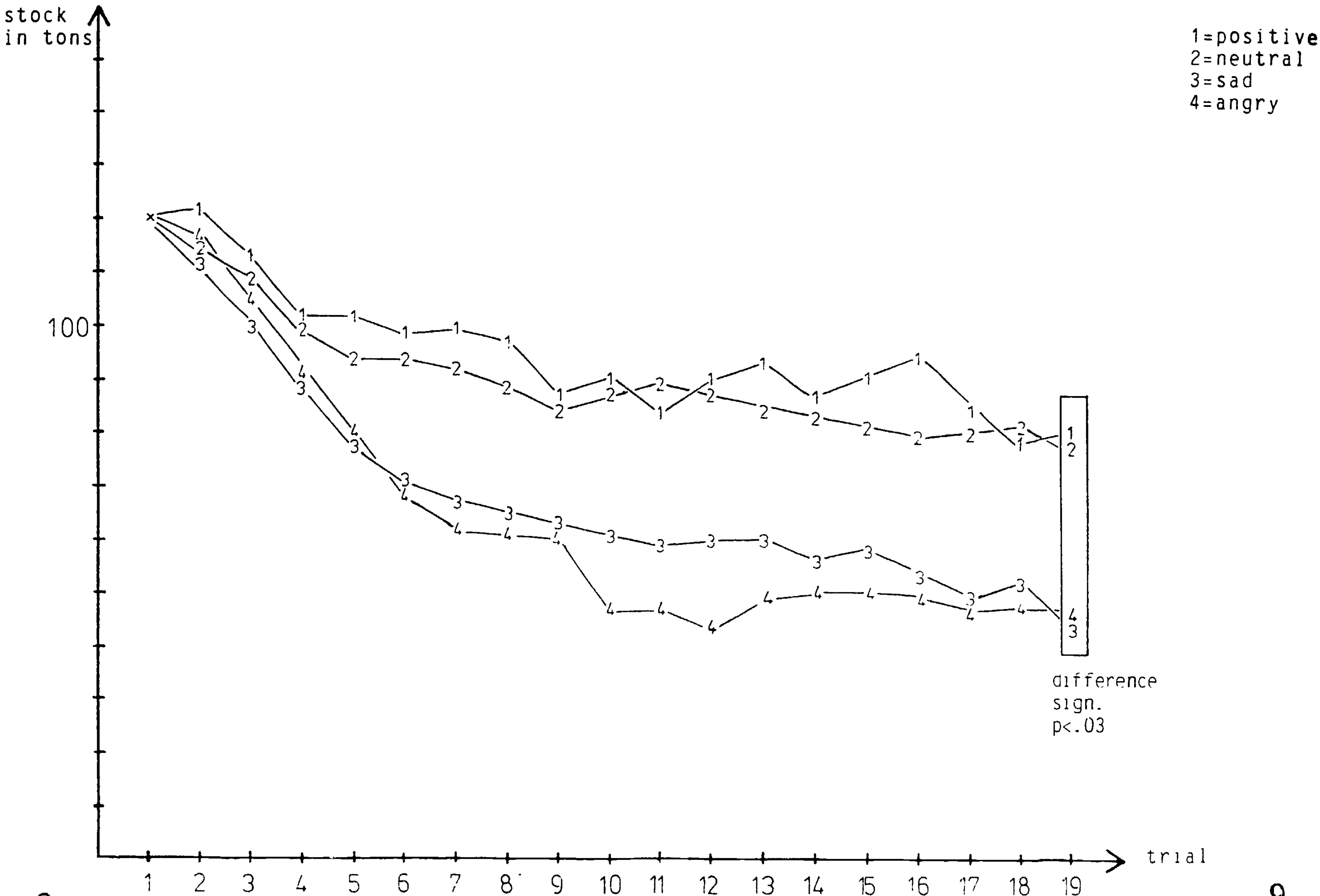

Fig. 2 Actual amount of stock over trials by treatment variable

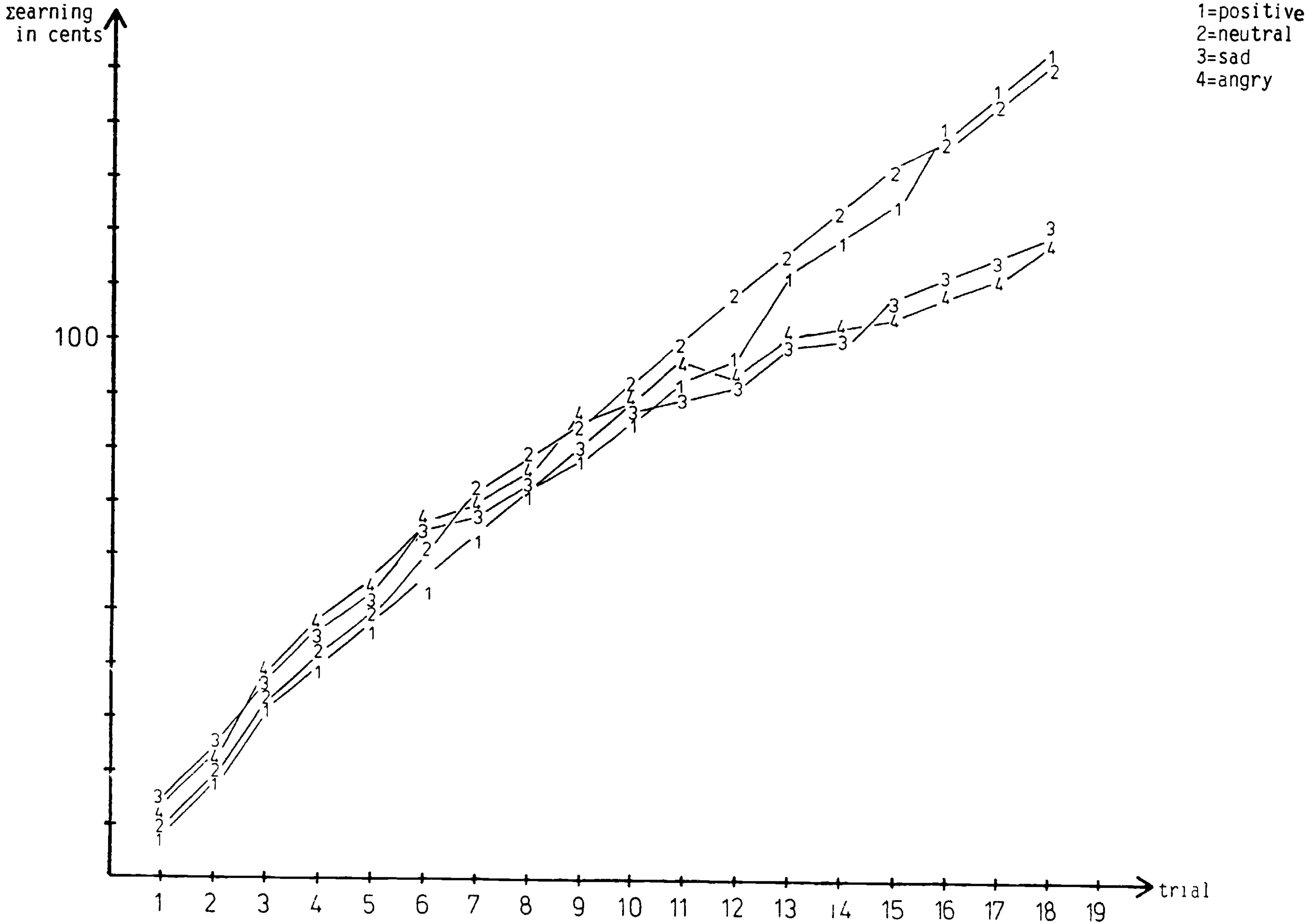

Fig. 3 Cumulative profits over trials by treatment variable