COGNITIVE DISTORTION AND EGO-INVOLVEMENT[1]

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Since the advent of what might be called *dynamic perception* as demonstrated by the experiments of Bruner and Postman and their associates (1, 2, 7, 8), there appears to be some confusion as to what is perceptual process and what is cognitive process   If we think of cognition in the generic sense as all of knowing or understanding or interpreting, that is, as a higher mental process which *begins with* perceptual data (12), then it is confusing to include (as some experimenters have done) the involved consequences of perception within the perceptual process itself   This inclusion is a philosophical heritage—Descartes and Leibnitz among others defined perception as encompassing cognitive responses   Unwittingly perhaps, modern psychologists who speak of "perceiving the world" when they really mean *knowing* the world, foster the philosopher's definitions and the confusion.

Recently the Bruner-Postman group has made partial attempts to delineate the shape of perceptual process as distinct from cognitive process   McGinnies (5) distinguishes between perception and "reaction" occurring in that sequence   Postman, Bruner, and Walk (9) have separated accumulated knowledge from perception with the phrase "cognitive support "

It can be shown that the perception-cognition dichotomy is primarily an heuristic one, but it is nonetheless of some significance. Bruner and Postman (2), Murphy (6), and Krech and Crutchfield (4) have expressed the opinion that principles of perception (cf 3) apply to cognition as well.   If this univalence were already a demonstrable fact, there would be little value in distinguishing between cognition and perception, although the distinction could, of course, still be made on the heuristic level   Since, however, the generality

of principle is still far from fact, we must differentiate cognition from perception so that this generality may be put to the test

As a possible heuristic distinction, the following definitions of cognition and perception are offered   *Cognition is the awareness of facts, relationships, conditions and objects which is independent of specific sense modality.*   Perception is a similar awareness which *is dependent upon specific sense modality*   Thus most of what we generally refer to as attitude, opinion, and belief is cognitive

Having defined cognition, we can set up some hypotheses concerning the operation of functional factors in the process   These hypotheses for the most part follow from the experimentation in dynamic perception and specifically from propositions set forth by Krech and Crutchfield (4)

1   Where reality conflicts with the individual's strong need or motivation or belief, that is, with ego-involvement, cognitive *distortion* may result

2. The magnitude of cognitive distortion is proportionate to the degree of ego-involvement, that is, to the strength of the underlying need

3   The resistance of cognitive distortion to change is proportionate to the degree of ego-involvement.

The value-loaded term "distortion" is widely avoided by psychologists because its connotation is something more than asymmetry   It implies a condition which is not only inaccurate, but undesirable   The scientist ordinarily avoids such recrimination. Nonetheless, it is difficult to avoid at least its implication when we deal with matters like race prejudice or psychopathology   We devote time and energy towards the development of methods for the alleviation of these conditions because we do, in fact, consider them to involve undesirable distortions   Let us not pretend that value judgments do not exist in social science all the while we are making them.

In those experiments in which the word *distortion* has been applied to results, there is usually a concrete, clearly definable reference point from which to establish and measure the deviance   Such a reference point is usually absent in cognitive situations and often an experimenter will hesitate to attempt to gauge it even where it might be found   This is true of many attitude and public opinion studies.

In the experiments to be described here, an attempt will be made

to establish the fact of distortion scientifically The distortions in cognitive process here dealt with are overestimations of financial income The idea of these estimates as distortions has been taken from the prior work of Thomsen (11). Thomsen surveyed these estimates and made some effort to provide a reference point for distorted evaluation, but his results do not go farther than our first hypothesis The experiments in this paper will attempt to test all three of these hypotheses

THE EXPERIMENTS

Two experiments were conducted, the first using 159 male freshman college students Each subject originally made two estimates. an estimate of his own annual income at the age of 45, and an estimate of the median annual income for all college graduates for the year 1950. A check-up showed that all subjects estimated future income on the basis of the contemporary dollar value On the basis of these results, the original group was broken down into an experimental group of 38 subjects and an equivalent control group of 31 subjects,[2] all of whose estimates of their own future income were at least $10,000 The reason for truncating the groups at this point will be explained when the fact of distortion is established The mean estimates for each group are summarized in Table I

TABLE I

MEAN ESTIMATES AND RE-ESTIMATES OF INCOME, FIRST EXPERIMENT

	SUBJECT'S OWN INCOME AT THE AGE OF 45		MEDIAN INCOME OF COLLEGE GRADUATES	
	Estimate	Re-estimate	Estimate	Re-estimate
Experimental	$11,259	$7,867	$4,880	$3,641
Control	11,520	9,111	4,638	4,584
		CR−1 47 of Diff		CR−3 71 of Diff

Ten days later the control group was required to duplicate the original estimates The experimental group also made re-estimates, but at the same time each subject had in front of him a sheet upon

[2] The discrepancy between the two groups resulted from absences of subjects from classes and improperly filled-out questionnaires

which were listed various U S Census Bureau statistics which offered an outline picture of the true economic situation in the country. These figures, each with its source plainly marked, included median incomes for various vocational groups, for the nation for certain years, percents of all wage-earners earning certain amounts, and so forth [3]   These re-estimate means are also listed in Table I.

The two groups were equated on the basis of the estimate results (experimental group own future income, mean $11,259, college graduate median, $4,880—control group own future income, mean $11,520, college graduate median, $4,638)   For the re-estimate means, the critical ratio of the difference between the two groups is 1 47 for own future income, and 3 71 for median income of college graduates   The former is not significant at the 05 level, the latter is significant at the 01 level

The subjects for the second experiment were 33 female college sophomores   The procedure was essentially the same as in the first experiment with the following differences (1) The required estimates were of the *husband's* income at the age of 45[4] and of the median annual income for the nation for 1950   (2) Because of the smallness of the group, it was not truncated at the $10,000 mark All subjects went on to the experimental phase   The experimental group had 17 subjects, the equivalent control, 16   (3) Somewhat less information was tendered the experimental group in the experimental phase.

The results are noted in Table II   On re-estimate the critical ratio of the difference between experimental and control groups for the estimate of the husbands' future income is 0 56, which is not significant   For the estimate of the median national income, the critical ratio of the difference between re-estimate means is 4.01, which is significant at the 01 level

Correlations were computed between own estimates and estimates

[4] All subjects were unmarried (average age, 19 4) but all stated that they intended, at some time, to be married.

TABLE II
MEAN ESTIMATES AND RE-ESTIMATES OF INCOME, SECOND EXPERIMENT

	SUBJECT'S HUSBAND'S INCOME AT AGE OF 45		MEDIAN NATIONAL INCOME	
	Estimate	Re-estimate	Estimate	Re-estimate
Experimental	$11,940	$12,200	$3,247	$2,801
Control	13,040	14,510	3,353	3,873
		CR−0 56 of Diff		CR−4 01 of Diff

of median income of college graduates, and between estimates of husband's income and estimates of national median income   These correlations were measured separately for experimental and control groups, and for estimate and re-estimate results   No correlation coefficient was significant, the range of coefficients being − 06 to 15 with probable errors ranging from 06 to .14.

DISCUSSION

In analyzing the results, the assumption is made that a subject will be more ego-involved in a more personal estimate of income than in a less personal one   It is assumed that our subjects were more ego-involved in making an estimate of his own, or her husband's, future income than in the more removed estimates   It is, of course, also assumed at this point that ego-involvement will play some part in the estimations.

It is observed that the mean original estimates of future income for both groups in both experiments is $11,000-13,000 per year   According to the U S Commerce Department figures[5] presented to the experimental groups, the median annual income for males in 1947 (latest available datum at the time these experiments were performed) was $2,230   Since our subjects expect to be, or expect to marry college graduates, this datum must be corrected if it is to serve as a reference point [6]   Unfortunately, the most recent figures

[5] *Current Population Reports,* Series P-60, No 5, Department of Commerce, Bureau of the Census, February 7, 1949   Since the experiments were done, No 6 in this series has come out with the 1948 data. The changes are slight, the median national income for males for 1948 was $2,396
[6] The fact that not all of our freshman subjects will become college graduates, and probably not all of the sophomore women will marry college graduates adds reliability to the corrected reference datum

on the incomes of college graduates are for 1940,[7] at that time the median income for persons between the ages of 45 and 54 was about twice that of the general population in that age category   On the plausible assumption that this relationship still holds, we can estimate the median income for college graduates for 1947 at about $4,500 The mean estimates for our subjects (based, as they were, on the present dollar value) were then, almost 2½ greater than actuality.

Percentages furnish a better medium of comparison   In 1947, 1 6 per cent of all the male wage-earners had an income of $10,000 *or more*   If we treble this figure, less than 5 per cent of a group of random college graduates can reasonably estimate for themselves an income of $10,000 or more   In other words, it is probable at the 05 level of confidence that any individual selected at random from a college population will NOT eventually earn $10,000 or more

Trebling the general population datum is a rough approximation based on the writer's perusal of past income statistics   That is, the trend of the ratio of percentages of college graduates earning $10,000 or more to the percentages of total population earning that much over the years is such that the ratio 3 1 appears a fair estimation for 1947 or 1948   However, even if we raise the ratio to 6 1, the probability of any random student ever earning $10,000 is still below 10, and it is this probability point which the writer feels is a satisfactory level for measuring distortion   If an individual has only one chance in ten of achieving a cherished goal, his confident expectation of that achievement is so exaggerated that it can safely be called distorted

The selection of this level is, of course, arbitrary   It would be easier to justify the 05 level on the basis of its customary use in psychological statistics, but it is felt that this level is lower than necessary under the circumstances

The Census data thus provide a reasonable definable reference point and ordinary statistical procedure may be used to establish the fact of distortion   All of the subjects who went on to the experimental phase in the first experiment showed this kind of distortion   It was for this reason that only those subjects in the first experiment who had original estimates of own future income of

[7] *Population—Special Reports, Educational Attainment by Wage and Salary Income 1940,* Department of Commerce, Bureau of the Census, Series P-46, No 5, June 18, 1946.

$10,000 or more (N = 69) were used in the experimental phase. Those below that figure were dropped out   There is no particular reason to believe that a subject whose estimate was, say, $4,000 was distorted, and it was thought to be desirable to have the mean estimate represent only distorted estimates   The similar results for the second experiment in which the group was not so truncated, however, show that this is not a basic part of the experimental design.

While this kind of distortion may not be as undesirable as race prejudice of psychopathic delusions, it doubtlessly has attendant frustrating effects   Thomsen (11) has based a theory of paranoia on this expectancy-reality discrepancy, and Krech and Crutchfield (4) point out that it may lead to a "variety of maladaptive behaviors "

Having substantiated the phrase *cognitive distortion,* we can now test the hypotheses against the experimental results   It would be circular to infer the existence of underlying need from the presence of distortion, but the need for status, prestige, and security based on material accumulation, and the belief constellation which Thurman Arnold once called "the folklore of capitalism" and which Krech and Crutchfield call "the official ideology of free enterprise," are so well established as part of American culture that the relationship is difficult to contra-indicate   The naïve individual, without real experience in the economic world, still thinks that any man with reasonable intelligence, ambition, and parsimony ought to be able to make $10,000 a year by the time he is 45   If he fails to achieve this status, he is a failure, as one of Razran's (10) young subjects labeled his father, a lawyer with an income of $4,000 per year. There seems little doubt then that where ego-involvement conflicts with reality, cognitive distortion may result

Accepting the assumption that individuals will be more ego-involved in estimating personal income than in income of others, all the results support the hypothesis that the greater the ego-involvement, the greater the magnitude of distortion   For both experiments, the personal estimates are on the average $8,000 greater than the nonpersonal estimates   As a matter of fact, according to the evaluative criteria outlined here, the estimates of the median income of college graduates and the estimates of the median national income are not distorted at all.

The experimental phases of the study are concerned with the third hypothesis, that the resistance of the distortion to change is proportionate to the magnitude of ego-involvement   The introjection of the Census Bureau data into re-estimates by the experimental groups shows the relative persistence   It will be seen that in both experiments, after the introduction of the Census statistics, the experimental group still did not deviate significantly from the uninformed control group in the estimates of own or husband's future income [8]   However, for the less personal estimates, the experimental groups in each instance did deviate significantly from the control after being faced with the government figures   Plainly, the more personal estimates—those with which a greater degree of ego-involvement is concerned—are more resistant to change and the hypothesis is validated

One cautioning note concerning the term "proportionate" should be added   In the strict mathematical sense, these experiments have not established a true proportionality   Only two points have been dealt with   a point of higher and a point of lower ego-involvement. It is possible that if a number of degrees of ego-involvement are examined, the proportionality of ego-involvement to resistance to change may not continue in the same fashion as it has here   This must be the subject of future experimentation

The absence of correlation between personal and less personal estimates offers general support for the hypotheses and evidence for the operation of functional factors in cognition   An individual is able to conceive of the median income of college graduates objectively, while need impels him to make an entirely inconsistent appraisal of his own financial future as a college graduate   The strength of ego-involvement apparently has no relation to the degree of objectivity   If there were no functional factors operating, or if the degree of operation of functional factors was the same for both types of estimates, some positive correlation would be expected

The mechanism by which the individual ignores objects which

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[8] It is interesting to note that while the experimental group fell to a mean of $7,867 on re-estimate, a drop of almost $3,400, the control group fell over $2,400 Exactly what accounts for the control group's decrease is not apparent   It may be due to the fact that a number of subjects did not take the experiment seriously when first estimates were done   At any rate, we must allow that a proportionate amount of the experimental group's fall is due to some factor other than the experimental one   The same consideration extends to the estimate-re-estimate differences for the estimate of national median income in the second experiment

do not concur with a rigid perceptual structure has been called by Bruner and Postman (3) "perceptual defense " It is suggested here that the analogous mechanism which has been demonstrated in the experiments just described be called *cognitive defense,* and that this is a verification of the univalence of this principle for perception and cognition

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