

level of probability, then the hypothesis that the samples were taken from the same population was rejected. The formulation for calculation is:

$$x^2 = \frac{(F_a - F_p)^2}{F_a} + \frac{(F_a - F_p)^2}{F_p}$$

Where F_a is the frequency for applicants and F_p is the frequency for participants. In cases involving one degree of freedom, a correction was made by subtracting 0.05 from the value of the differences of the frequencies.⁷

STUDENT'S "t" TEST

In comparing some kinds of expenditures, the mean expenditure for the applicant group was compared with the mean expenditure for the participant group. The Student's "t" test was used:

$$t = \frac{\bar{x}_p - \bar{x}_a}{\sqrt{\frac{S_p^2}{n_p} + \frac{S_a^2}{n_a}}}$$

"t" is the quotient of the differences of the mean expenditures divided by the square root of the squared standard deviations of the two samples divided by the sample size.⁸ If the value of "t" was large enough, the hypothesis that the difference between the means was due to chance was rejected. The 95 per cent confidence level was used in this study.

Income Elasticity of Demand

The concept of income elasticity of demand was used to measure the effect of changes in income upon the expenditures by participants for certain categories of goods. Income elasticity of demand may be defined as the ratio of the percentage change in expenditure to the percentage change in income, holding everything else constant:

$$E_v = \frac{(E_p - E_a)(Y_p + Y_a)}{(E_p + E_a)(Y_p - Y_a)}$$

where: E_v is income elasticity of demand
 E_p is expenditures by participants
 E_a is expenditures by applicants
 Y_p is monthly income by participants
 Y_a is monthly income by applicants

Arc elasticities were calculated since incomes were aggregated for the month of October.⁹

Multiple Regression

Multiple regression will be used in Chapter IV to investigate which characteristics of the participants are associated with changes in expenditures for several categories of expenditures and to what degree they are associated. The participant characteristics were the independent variables, and the categories of expenditure were the dependent variables. The complete specification of all important independent variables and any interaction between them, as well as the indication of any important degree of curvilinearity is necessary prior to quantifying the relationship. Thus the regression equation:

$$x_1 = a + f_2(x_2) + f_3(x_3) + f_4(x_4) + \dots$$

indicated that while any one of the independent variables, $x_2, x_3, x_4, \dots$ changed and the remainder were held constant, there would be an accompanying change in x_1 , the dependent variable.¹⁰

CHAPTER III.—DEVELOPMENTALLY SIGNIFICANT EXPENDITURES AND ACTIVITIES

INTRODUCTION

This study was concerned with the developmental significance of certain kinds of expenditures. This is a rather new and unconventional conceptualization of

⁷ *Ibid.*, p. 217.

⁸ John E. Freund, *Modern Elementary Statistics* (Englewood Cliffs, New Jersey: Prentice-Hall, 1960), p. 268.

⁹ George Stigler, *The Theory of Price* (New York: Macmillan Company, 1952), p. 35.

¹⁰ Snedecor, *op. cit.*, p. 413.