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Methodological Observations on Applied Behavioral Science

In recent years, social scientists have increasingly come to recognize a point that has been obvious to applied practitioners for a long time: the influence of many factors on human behavior is *conditional* upon the presence or absence of other factors. While experienced practitioners have encountered many situations where a seemingly mild social factor becomes extremely powerful when the conditions are right, social scientists are still spending most of their time attempting to assess the general impact of factors after controlling for the effects of all other important factors.

Because of this peculiar orientation in social science, methods for assessing conditional hypotheses have only recently been perfected. These methods fall under the general category of "interaction analysis." In this issue, Scott and Grasmick provide a set of guidelines for using interaction analysis for testing conditional hypotheses. They take the case of income tax cheating and argue that the effects of motivation on income tax cheating are conditional on the costs of deterrence. And conversely, the effects of costs as a deterrent to income tax cheating are conditional on the presence or absence of motivations to cheat. Applied practitioners should find these methods useful for tests of most conditional hypotheses.

Kenneth L. Wilson

Deterrence and Income Tax Cheating: Testing Interaction Hypotheses in Utilitarian Theories

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Deterrence theory is rooted in the utilitarian paradigm in viewing social actors as "rational," and, therefore, is closely linked with exchange theory in sociology and utility theory in economics (Geerken & Gove, 1975; Stover & Brown, 1975). Within the confines of their values and information, individuals are expected to estimate the "rewards" and "costs" from projected behavior. Whether an individual engages in a particular behavior will depend on some combination of these perceived costs and perceived rewards (cf. Camic, 1979).

Recent deterrence research, however, has examined only the cost factor in the utilitarian equation in attempts to account for variation in involvement in illegal behavior within the premises of utilitarianism and to estimate the magnitude of the deterrent effect of various types of costs or sanctions. The omission of the reward factor has serious implications not only for the development of deterrence theory but also for policy decisions that are based on the findings of deterrence research. Failure by deterrence researchers to include perceptions of rewards in their research designs has led to an underestimation of the deterrent effects of sanctions. This underestimation occurs because the utilitarian equation ought to contain a term which captures the hypothesis that only those individuals who are motivated to commit a crime, who perceive it as potentially rewarding, are influenced by estimates of cost. In the absence of a potential reward, sanction threats are irrelevant; the individual will not commit the crime even if there are no projected costs. In other words, perceived costs influence behavior in *interaction* with perceived rewards, not merely in *addition* to perceived rewards.

In this paper we develop a deterrence model based on the interaction of motivational (reward) variables and inhibitory (cost) variables, a model that should be viewed as a specific case of a more general utilitarian theory of behavior. Hypotheses in the model are tested with survey data on self-reports of income tax cheating, and the analysis incorporates recent arguments concerning the appropriate statistical procedures for examining the interaction effects. We hope our findings will encourage other researchers who view behavior as a "rational" outcome of projected rewards and costs to incorporate interaction models into their theories and research and to use the procedure we present to examine interaction hypotheses.

PERCEIVED COSTS: THE EVIDENCE FROM DETERRENCE RESEARCH

The early deterrence research that utilized perceptions of sanctions and self-reports of behavior was simply an attempt to determine if perception of the threat of legal sanctions (certainty and severity of punishment) were inversely related to involvement in crime (Jensen, 1969;

Waldo & Chiricos, 1972). These studies uncovered a modest deterrent effect of perceived threat of sanctions.[1] Since these seminal studies, researchers have added other "costs"—guilt feelings and social stigma—to their hypotheses and research designs (cf. Burkett & Jensen, 1975; Grasmick & Appleton, 1977; Jensen, Erickson & Gibbs, 1978; Silberman, 1976). As a result, the scope of deterrence theory and research, which initially focused exclusively on legal sanctions, has been expanded, and a more general "theory of criminal inhibition" has emerged.

Recently, the various hypotheses in this theory have been incorporated into a single, summary piece of research by Grasmick and Green (1980). These authors note that general sociological theory posits three mechanisms of social control, mechanisms which inhibit norm violations: the threat of guilt feelings resulting from the internalization of norms (i.e., self-imposed punishment); the threat of social stigma resulting from informal sanctions imposed by peers; and the threat of physical and/or material deprivation, one source of which is formal, legal punishment (Wrong, 1961). Using survey data, Grasmick and Green developed an index of perceptions of each of these potential costs and found that the three inhibitory variables accounted for 40% of the variance in a scale of self-reported involvement in illegal behavior. Furthermore, the results tended to suggest that the effects of the three independent variables were additive; the inhibitory effectiveness of one variable was not contingent upon the level of another.

A UTILITARIAN MODEL OF CRIMINAL INVOLVEMENT

Grasmick and Green conclude their argument by suggesting that the next major step in developing a utilitarian theory of criminal involvement is an exploration of the theoretical and empirical linkages between the three inhibitory variables and variables which motivate individuals to violate norms. Several years ago, Blake and Davis (1964) noted that criminal behavior is a function of perceived rewards (motivation) *and* perceived costs (inhibition) and criticized existing theories for failure to consider both factors. Merton's (1957) anomie theory, for example, proposes a discrepancy between aspirations and availability of legitimate means as the source of deviant motivation, but tends to overlook the possibility that some factors may *inhibit* those individuals experiencing this motivation. Hirschi's (1969) control theory, on the other hand, focuses exclusively on inhibition ("belief in legitimacy of legal norms"

[1]Other researchers have used aggregated data—arrest clearance rates, median prison sentences, crime rates (cf. Gibbs, 1968; Tittle, 1969; Greenberg, Kessler & Logan, 1979). Our argument applies to the aggregate level as well as to the individual level. However, it would be more difficult, perhaps impossible, to measure all the relevant variables as properties of aggregates.

and "attachment to conventional others") and almost seems to assume that deviant motivation is universal and constant (Harris, 1977). In this respect, the theory of criminal inhibition which has emerged from deterrence research is similar to control theory as formulated by Hirschi.[2] So far, motivation, or projected reward, has not been considered.

From the utilitarian perspective of the rational actor, motivation and inhibition are not expected to combine in a simple, additive manner. Rather, an interaction model is implied. If actors are not motivated to violate the law—in other words, if they anticipate no reward from the offense—they will not violate the norm even if they anticipate no costs. In the absence of motivation, the behavior will not occur even if no inhibition is present.

The argument implies that, for any particular behavior, only certain individuals, those who are motivated to engage in the behavior, are inhibited by anticipated costs. Failure to isolate these motivated actors in an analysis leads to an underestimation of the effect of an inhibitory variable on behavior *among those individuals who are expected to be influenced by inhibitory factors.*

This same reasoning, assuming rational actors, also applies to motivational factors. The effect of motivation on behavior should be contingent on level of inhibition. Among those with a high level of inhibition, motivation may not be strongly related to behavior because even the highly motivated individuals are inhibited by their perceptions of costs. On the other hand, at a low level of inhibition, a stronger relationship is expected between motivation and behavior: in the absence of inhibition, the higher the motivation, the greater the likelihood that the behavior will occur.

THE TESTING OF INTERACTION HYPOTHESES

The argument above can be represented by the following regression equation, with the prediction that $b_3 \neq 0$. In the equation, C represents criminal behavior; M, motivation to commit the crime; I, inhibition against committing the crime.

$$C = a + b_1M + b_2I + b_3MI + \text{Error} \qquad (1)$$

The form of the equation and the prediction that $b_3 \neq 0$ reflects the hypothesis that the magnitude of the effect of an independent variable on the dependent variable is a linear function of the level of the other independent variable (Namboodiri, Carter & Blalock, 1975, p. 175).

The use of products (such as MI in the equation) to test hypotheses concerning interaction has been a source of controversy in the statistical

[2]The two major variables in Hirschi's theory—belief in the legitimacy of legal norms and attachment to conventional peers—are very similar to variables in the deterrence literature—threat of guilt and threat of social stigma.

literature for nearly a decade (cf. Althauser, 1971; Kerlinger & Pedhauzer, 1973; Sockloff, 1976). Recently, however, the issue appears to have been resolved independently by Allison (1977) and by Cohen (1978). The controversy centered around the stability of significance tests under linear transformations of independent variables in a regression equation. It is commonly known that in additive solutions, significance levels are not altered by such linear transformations. For example, in the equation $Y' = a + b_1X_1 + b_2X_2$, the p associated with b_1 would be the same as the p associated with b_1' in the equation $Y' = a + b_1'(X_1 + 10) + b_2X_2$.

With product terms in the equation, however, some p's are not invariant over linear transformations of the independent variables. For example, the significance level associated with b_1 in the equation

$$Y' = a + b_1X_1 + b_2X_2 + b_3X_1X_2 \tag{2}$$

normally will not be the same as the significance level associated with b_1 in the equation

$$Y' = a + b_1 (X_1 + 10) + b_2X_2 + b_3 (X_1 + 10)X_2 \tag{3}$$

The problem, therefore, is readily apparent. Most variables in behavioral science are not true ratio variables with a defined zero-point. Thus, any linear transformation of X ought to be equivalent to X as a measure of the concept. This apparently is not the case, however, in equations containing product terms. The researcher, for example, might conclude that X_1 has an effect on Y, but $X_1 + 10$ does not have a significant effect on Y. Such a conclusion, which could be implied by the analysis, would make no sense conceptually.

Both Allison (1977) and Cohen (1978) have examined this issue with simulated data and mathematical proofs. The evidence they provide suggests that product terms *can* be used as tests for interaction but that the coefficients associated with the additive terms in an equation containing a product *cannot* be used simultaneously as estimates of additive effects. In the equation

$$Y' = a + b_1X_1 + b_2X_2 + b_3X_1X_2 \tag{4}$$

the significance levels associated with b_1 and b_2 do change with linear transformations of X_1 and/or X_2. However, the significance of b_3, associated with the product term, *is invariant* over all possible linear transformations of X_1 and/or X_2. We have confirmed this conclusion in our own data by estimating the interaction model using M and then using various linear transformations of M. The significance levels of the b's associated with M and its various transformations vary considerably. The significance levels of the b's associated with the product term remain the same, however, under all linear transformations of M.

The evidence described above suggests that in order to examine both additive and interaction effects, a two-step process must be followed. First, a product term can be added to a regression equation, and a significance test for the regression coefficient associated with the product term is a test for the *presence* of interaction. In this equation, however, the coefficients associated with the additive terms should be ignored. If the interaction term is significant, then it is necessary to examine the effects of an independent variable within categories of the other independent variable treated as a "conditional" variable. The question then becomes: what are the effects of the independent variable in the various categories of the conditional variable, having already determined that these conditional effects differ? Our theory, developed above, leads to the following predictions:

1. In a regression equation containing M, I, and the product of M and I, the coefficient associated with the product will differ significantly from zero;
2a. The inverse effect of I on C will be greater when M is high than when M is low;
2b. The positive effect of M on C will be greater when I is low than when I is high.

MOTIVATION FOR TAX CHEATING: A UTILITARIAN APPROACH

The equation above is compatible with any theory of deviant motivation. For example, if the discrepancy between aspirations and means is the major source of motivation to violate the law, as Merton has argued, then some measure of the discrepancy could be inserted as M (cf. Bryjak, Note 1). In our own research, however, we have tried to use a nominal (and operational) definition of M which best reflects the utilitarian paradigm. The definition we have developed also happens to correspond to explanations of tax paying behavior that have been offered by other writers. Hence, we estimate the coefficients in the regression equation with survey data concerning tax cheating.

It might seem that utilitarianism would propose that all taxpayers are motivated to cheat when declaring their income taxes. Surely it is more "profitable" to keep one's money than to give it to the government. One might assume, therefore, that the motivation to cheat is a constant. (As noted earlier, this type of assumption seems to be implicit in Hirschi's control theory.) The assumption of constant motivation, however, would not be compatible with either classical utilitarianism or with contemporary exchange theory (which is a modern version of utilitarianism). In utilitarian thinking, from Adam Smith's (1861) *The Theory of Moral Sentiments* to George Homans's (1974) *Social Behavior: Its*

Elementary Forms, individuals never have been viewed as motivated by pure greed, although, as Camic (1979) has noted, critics often have attributed this assumption to the paradigm.

Homans's (1974) "rule of distributive justice" is the source of a utilitarian theory of motivation to tax cheat. Spicer and Lundstedt (1976) have developed the argument that the payment of taxes can be thought of as an exchange in which a portion of an individual's purchasing power in the marketplace is traded for government services made possible by tax monies. The concept of distributive justice—of "equity," to use Adams's (1965) terminology—implies that so long as taxpayers consider the exchange to be fair, the exchange will be stable, and taxes will be paid in an orderly fashion. Research on tax paying behavior indicates that this seems to be the case (Strumpel, 1969; Vogel, 1974; Likert, 1966).

When actors, however, perceive the presence of "injustice" or "inequity," when they believe that their outcomes (services received) are not commensurate with their contributions (taxes paid), then they are motivated to alter the nature of the exchange. According to Homans (1976, p. 232),

> when people do not get as much reward as they expect, they are. . . apt to feel some degree of anger and to take aggressive action against the source or beneficiary of their frustration. . .*provided that such action does not cost them too much in other ways.* [emphasis added]

Consistent with exchange theory, therefore, we will consider "perceived injustice in the exchange" to be the motivation to cheat. For individuals who perceive inequity in the exchange, tax cheating is a way to re-establish distributive justice through decreasing contributions (taxes paid) while maintaining the same level of outcomes (services received).[3] As our equation predicts, however, and as Homans recognizes at the end of the quote above, the motivation will not lead to tax cheating if the perceived costs of that behavior—perceived threats of sanctions—are too high.

DATA AND MEASUREMENT

Data for estimating the coefficients in the equation were collected during the spring of 1980 in a survey of the Oklahoma City metropolitan area. A simple random sample of 350 names was drawn from the Polk Directory. Contacts to schedule appointments were made either by

[3]There are, however, alternative ways, besides tax cheating, to establish equity if the actor believes the current exchange is unjust. For example, he or she could vote for political candidates who advocate changes in tax laws and/or provision of government services. Alternatively, the actor could attempt to receive additional services, including ones to which he or she is not legally entitled. In this paper we do not consider these alternative responses to perceived inequity.

phone or at the door, and refusals were replaced by re-samplings until 350 interviews were conducted. The analysis below is based on 329 cases for whom complete data are available.

"Perceived injustice in the exchange," the motivational variable M in our model, was assessed by the following six items:

1. Very few tax dollars are spent by the government on things which are useful to a person like me.
2. All things considered, I feel that the amount of income tax I am asked to pay is about right.
3. Generally, I get a reasonable level of service from the government for the amount of taxes I pay.
4. There are a number of government services and programs for which I am very thankful.
5. Current tax laws require me to pay more than my fair share of income taxes.
6. I don't seem to use government services and programs as much as other people do.

A Likert-type response format was provided with four points ranging from strongly agree (scored "1") to strongly disagree (scored "4"). In coding, items 1, 5, and 6 were recoded so that, for each of these items, a high score indicates high perceived injustice. The scree test (Gorsuch, 1974), applied to the complete principal components solution, justified the creation of a single scale by summing responses to the six items. (The six eigenvalues were 2.45, 1.02, .86, .77, .48, and .41.) All items had loadings of .48 or higher in a one-factor solution, and the alpha reliability coefficient for the scale is .69. The scale has a mean of 15.67 and a variance of 11.73.

To measure the three inhibitory variables—Guilt, Stigma, and Legal Punishment—respondents were presented the following three statements as possible reasons why they are not dishonest, or not more dishonest than they are, when filling out their income tax returns:

1. "I am afraid I would feel bad about doing it even if no one found out" (Guilt);
2. "I am afraid people I know would find out and lose respect for me" (Stigma);
3. "I am afraid I would be caught and punished" (Legal Punishment).

Respondents were asked to indicate, on a 4-point scale ranging from strongly disagree (scored "1") to strongly agree (scored "4"), whether each reason applied to their own tax paying behavior. Guilt, symbolized as I_G in the tables, had a mean of 3.34 and variance of .86; Stigma (I_S), a mean of 2.85 and variance of 1.18; Legal Punishment (I_L), a mean of 3.10 and variance of 1.09.

To measure the dependent variable (C), respondents were first reminded of the two general types of tax cheating—failing to report all income and claiming undeserved deductions. They were then asked how many times they had done each of these in the past five years, producing a scale with a possible range of 1 to 10. Respondents were permitted to record their answers privately on a separate sheet of paper. The relatively low mean of .67 (variance = 2.86) reflects the fact that a large percentage (80.2%) of the respondents reported no tax cheating.

The bivariate product-moment correlations upon which the following multivariate analysis is based are reported in Table 1. Note that all correlations between tax cheating and the inhibitory variables are significant beyond the .001 level, while the correlation between tax cheating and perceived injustice is significant at the .05 level.

ESTIMATES OF REGRESSION COEFFICIENTS

In order to evaluate the interaction model, we first present the additive solutions, which assume no interaction, as a point of comparison. We will present separate solutions for each of the three inhibitory variables and will use standardized regression coefficients (B′s) since we will be comparing the direct effects of the two independent variables within the same sample (Blalock, 1966).

In the additive equations in the top half of Table 2, the direct effects of motivation and inhibition are in the predicted direction—positive for M and inverse for I. While effects of the three inhibitors (Guilt, Stigma, and Legal Punishment), however, are significant at the .001 level, the effect of motivation (perceived injustice) does not achieve significance at the .05 level. Hence, motivation has no direct effect on tax cheating while each of the inhibitory variables does.

The interactional hypothesis suggests, however, that the additive estimates are misleading. The apparent lack of an effect of M on tax cheating occurs because the additive equation does not incorporate the hypothesis that motivation is expected to influence tax cheating only

Table 1. Bivariate Correlations (N = 329)

	I_G	I_S	I_L	M	C
I_G: Guilt	—	0.60[c]	0.43[c]	-0.29[c]	-0.40[c]
I_S: Stigma		—	0.65[c]	-0.19[b]	-0.31[c]
I_L: Legal Punishment			—	-0.14[a]	-0.25[c]
M: Perceived Injustice				—	-0.12[a]
C: Tax Cheating					—

[a] $p < .05$
[b] $p < .01$
[c] $p < .001$

when inhibition is low. Furthermore, the interactional hypothesis suggests that inhibition has a greater effect on tax cheating when motivation is high. Thus, the inverse effects of I in the additive equations underestimate the effects of the I's among those who are expected to be influenced by I.

The first step in the testing of an interactional hypothesis consists of weighing the significance of a product term added to the regression equation. In a regression equation containing M, I, and the product of M and I, the coefficient associated with the product will differ significantly from zero. This prediction is examined in the bottom half of Table 2 where, for each inhibitory variable, we have estimated the regression coefficients in an equation of the form $C' = B_1M + B_2I + B_3MI$. For all three inhibitory variables, B_3, the standardized regression coefficient associated with the product term, is significant beyond the .01 level. This indicates that the particular combination of high inhibition and high motivation (i.e., a high score on MI) has an effect on tax cheating (C) beyond the simple additive effects of M and I. However, the coefficients in these equations do not readily reflect the nature of the interaction. Table 2 suggests that the effect of I is not the same under all conditions of M and that the effect of M is not the same under all conditions of I, but Table 2 does not indicate what these conditional effects are. (Note also the increments in R resulting from the addition of the product term. Since the B's associated with the products are significant, the increments in R also are significant.)

Table 2. Effects of Independent Variables on Tax Cheating (C)

Additive Models	*B*	F^a	*p*	*R*
M	0.02	0.14	>0.05	0.40
I_G	-0.39	55.53	<0.001	
M	0.07	1.49	>0.05	0.31
I_S	-0.30	31.17	<0.001	
M	0.10	2.77	>0.05	0.26
I_L	-0.24	19.41	<0.001	
Interactive Models				
M	0.63	12.26	<0.01	
I_G	0.45	3.39	<0.05	0.44
MI_G	-0.92	12.56	<0.01	
M	0.46	9.56	<0.01	
I_S	0.38	2.42	>0.05	0.35
MI_S	-0.73	8.08	<0.01	
M	0.49	10.16	<0.01	
I_L	0.40	2.85	<0.05	0.30
MI_L	-0.72	7.72	<0.01	

[a] F is a function of B and the standard error. Degrees of freedom for additive solutions are 2, 326; for interactive solutions, 3, 325.

Table 3. Effects of Inhibitory Variables Under Conditions of High and Low Motivation

	B^a	b^b	p	n
Effect of Guilt on Tax Cheating				
high motivation	-0.51	-0.89	<0.001	168
low motivation	-0.21	-0.41	<0.01	161
Effect of Stigma on Tax Cheating				
high motivation	-0.37	-0.60	<0.001	168
low motivation	-0.22	-0.33	<0.01	161
Effect of Legal Punishment on Tax Cheating				
high motivation	-0.32	-0.54	<0.001	168
low motivation	-0.13	-0.21	<0.01	161

[a] In the bivariate case, the standardized regression coefficient (B) is equivalent to the product-moment correlation.

[b] Blalock (1966) recommends a comparison of unstandardized regression coefficients (b's) when comparing the effects of a single variable in two samples.

Having determined that there is an interaction effect, it becomes necessary to examine: (a) the effects of inhibition on tax cheating at different levels of motivation, and (b) the effects of motivation at different levels of inhibition. Tables 3 and 4 report this second stage of the analysis of interaction.

First, we dichotomized M (perceived injustice) at its median, creating a subsample with high scores on M and a subsample with low scores on M. Then, in both subsamples we regressed tax cheating on each of the inhibitory variables. For all three inhibitory variables our hypothesis is supported, as indicated in Table 3. The inverse effect of the inhibitory variable is noticeably greater when motivation is high than when motivation is low. When individuals are not motivated to cheat, their perceptions of sanctions do not have a strong effect on their behavior. Among individuals who are motivated, however, perceptions of sanctions have rather strong inverse effects on tax cheating (all p's are less than .001).

Table 4 confirms our prediction that the effect of motivation on cheating is greater when inhibition is low than when inhibition is high. For each inhibitory variable, we isolated the subsamples who scored high and low and then regressed tax cheating on motivation within each of the two subsamples. For all three inhibitory variables, the positive effect of motivation on tax cheating is greater when inhibition is low. In other words, when inhibition is high, motivation has little influence on tax cheating (all three p's are greater than .05). When inhibition is low, however, motivation has a significant ($p < .05$) effect on tax cheating for two of the inhibitory variables (Stigma and Legal Punishment). For the third inhibitory variable, Guilt, the distribution was highly

Table 4. Effects of Motivation Under Conditions of High and Low Inhibition

	B^a	b^b	p	n
Effect of Motivation on Tax Cheating				
high guilt	0.05	0.02	>0.05	273
low guilt	0.24	0.21	>0.05	56
Effect of Motivation on Tax Cheating				
high stigma	0.02	0.01	>0.05	205
low stigma	0.17	0.12	<0.05	124
Effect of Motivation on Tax Cheating				
high legal punishment	0.01	0.00	>0.05	239
low legal punishment	0.21	0.16	<0.05	90

[a] In the bivariate case, the standardized regression coefficient (B) is equivalent to the product-moment correlation.

[b] Blalock (1966) recommends a comparison of unstandardized regression coefficients (b's) when comparing the effects of a single variable in two samples.

skewed with only 56 cases in the low category. The effect of motivation was much greater under the condition of "low guilt" than "high guilt" (b = .21 vs. b = .02) but was not significant at the .05 level, partly because of the small number of cases.

CONCLUSION

Our findings provide rather strong evidence for the desirability of interaction models in research which attempts to predict behavior as a function of motivation (projected reward) and inhibition (projected cost). With three alternative types of inhibition, the regression coefficient associated with the interaction term was statistically significant. In addition, a more detailed examination of conditional relationships indicated that the nature of the interaction was as expected. The effect of inhibition was greater when motivation was high than when motivation was low, and the effect of motivation was greater when inhibition was low than when inhibition was high. We encourage other researchers operating within the utilitarian paradigm to use the procedures we have presented in this paper to test interaction hypotheses.

REFERENCE NOTE

1. Bryjak, G. *Deterrence and anomie.* Unpublished doctoral dissertation, University of Oklahoma, 1980.

REFERENCES

Adams, J. Inequity in social exchange. In L. Berkowitz (Ed.), *Advances in experimental social psychology, Vol. 2.* New York: Academic Press, 1965. Pp. 267-299.

Allison, P. Testing for interaction in multiple regression. *American Journal of Sociology*, 1977, **83**, 114-153.

Althauser, R. Multicollinearity in non-additive regression models. In H. Blalock (Ed.), *Causal models in the social sciences*. Chicago: Aldine, 1971. Pp. 453-472.

Blake, J., & Davis, K. Norms, values and sanctions. In R. Faris (Ed.), *Handbook of modern sociology*. Chicago: Rand-McNally, 1964. Pp. 456-484.

Blalock, H. Path coefficients vs. regression coefficients. *American Journal of Sociology*, 1966, **72**, 675-676.

Burkett, S., & Jensen, E. Conventional ties, peer influence, and the fear of apprehension: A study of adolescent marijuana use. *The Sociological Quarterly*, 1975, **16**, 522-533.

Camic, C. The utilitarians revisited. *American Journal of Sociology*, 1979, **85**, 516-550.

Cohen, J. Partialled products are interaction; partialled powers are curve components. *Psychological Bulletin*, 1978, **85**, 858-866.

Geerken, M., & Gove, W. Deterrence: Some theoretical considerations. *Law and Society Review*, 1975, **9**, 497-513.

Gibbs, J. On crime, punishment, and deterrence. *Social Science Quarterly*, 1968, **49**, 157-162.

Grasmick, H., & Appleton, L. Legal punishment and social stigma: A comparison of two deterrence models. *Social Science Quarterly*, 1977, **58**, 15-28.

Grasmick, H., & Green, D. Legal punishment, social disapproval and internalization as inhibitors of illegal behavior. *Journal of Criminal Law and Criminology*, 1980, **71**, 325-335.

Greenberg, D., Kessler, R., & Logan, C. A panel model of crime rates and arrest rates. *American Sociological Review*, 1979, **44**, 843-850.

Harris, A. Sex and theories of deviance: Toward a functional theory of deviant type-scripts. *American Sociological Review*, 1977, **42**, 3-15.

Hirschi, T. *Causes of delinquency*. Berkeley, Calif.: University of California Press, 1969.

Homans, G. *Social behavior: Its elementary forms*. New York: Harcourt, Brace & World, 1974.

Homans, G. Commentary. In L. Berkowitz & E. Walster (Eds.), *Advances in experimental social psychology, Vol. 9*. New York: Academic Press, 1976. Pp. 231-244.

Jensen, G. Crime doesn't pay: Correlates of a shared misunderstanding. *Social Problems*, 1969, **17**, 189-201.

Jensen, G., Erickson, M., & Gibbs, J. Perceived risk of punishment and self-reported delinquency. *Social Forces*, 1978, **57**, 57-78.

Kerlinger, F., & Pedhazur, F. *Multiple regression in behavioral research*. New York: Holt, Rinehart & Winston, 1973.

Likert, D. Public preferences in state-local taxes. In M. Frazier (Ed.), *Essays in state and local finance*. Ann Arbor: Michigan Governmental Studies, 1966.

Merton, R. *Social theory and social structure*. Glencoe, Ill.: The Free Press, 1957.

Namboodiri, N., Carter, L., & Blalock, H. *Applied multivariate analysis and* *experimental designs*. New York: McGraw-Hill, 1975.

Silberman, M. Toward a theory of criminal deterrence. *American Sociological Review*, 1976, **41**, 442-461.

Smith, A. *The theory of moral sentiments*. London: Bohin, 1861.

Sockloff, A. The analysis of nonlinearity via linear regression with polynomial and product variables: An examination. *Review of Educational Research*, 1976, **46**, 267-291.

Spicer, M., & Lundstedt, S. Understanding tax evasion. *Public Finance*, 1976, **2**, 295-305.

Stover, R., & Brown, D. Understanding compliance and noncompliance with the law: The contributions of utility theory. *Social Science Quarterly*, 1975, **56**, 361-375.

Strumpel, B. Contribution of survey research. In A. Peacock (Ed.), *Quantitative analysis in public finance*. New York: Praeger, 1969. Pp. 29-32.

Tittle, C. Crime rates and legal sanctions. *Social Problems*, 1969, **16**, 409-423.

Vogel, J. Taxation and public opinion in Sweden: An interpretation of recent survey data. *National Tax Journal*, 1974, **27**, 499-513.

Waldo, G., & Chiricos, T. Perceived penal sanction and self-reported criminality: A neglected approach to deterrence research. *Social Problems*, 1972, **19**, 552-540.

Wrong, D. The oversocialized conception of man in modern sociology. *American Sociological Review*, 1961, **26**, 183-192.