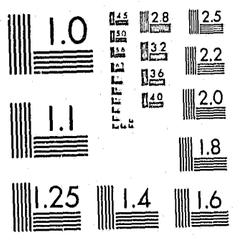

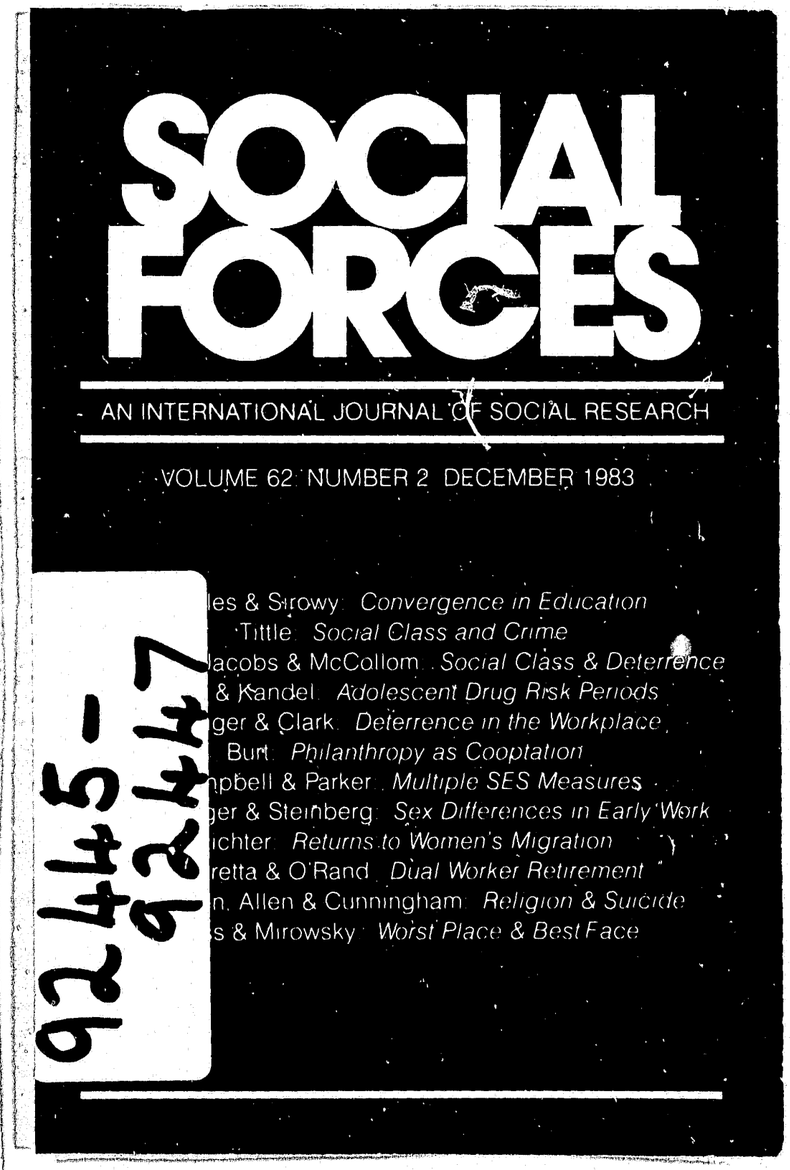

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Deterrence in the Workplace: Perceived Certainty, Perceived Severity, and Employee Theft*

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Abstract

The phenomenon of employee theft is examined empirically, utilizing a deterrence paradigm. Employees selected randomly from three different industry sectors and metropolitan areas were asked to self-report their involvement in a number of property theft activities within the employment setting. Using a weighted least-squares logit regression analysis, the study found that the perception of both the certainty and severity of organizational sanctions were related to employee theft. Males reported more theft than did females, but contrary to previous research, no gender/certainty or gender/severity interactions were observed. The best-fit model did, however, contain two significant first-order interactions: age/certainty and age/severity. These interactions strongly suggest that younger employees are not as deterrable as their older peers, especially under conditions of both high certainty and high severity of punishment. While a number of possible explanations might account for differential deterrability according to age, a commitment to or stakes in conformity explanation is proposed.

Despite a renewal of interest during the past decade in topics related to white-collar crime, there has been relatively little attention devoted to occupationally related crimes *against* the work organization (Clinard and Quinney) compared with that paid to corporate crimes committed *by* the organization itself (e.g., Clinard and Yeager; Ermann and Lundman a,b). In fact, only a handful of empirical investigations have been concerned with why employees commit crimes against the property and assets of the formal work organization (e.g., Horning; Tatham). This study is an effort to correct this imbalance by investigating the phenomenon of employee theft.

The few available studies on employee theft utilize an assortment of

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theoretical models to explain the phenomenon. First, there are those studies which focus on the external financial pressures which induce "borrowing" or "absconding" from the company in order to finance some "unsharable problem" (Cressey), commonly attributed to "gin, girls, or gambling" (e.g., Seidman). A second, more recent explanatory model interprets employee theft as an attempt to resolve various workplace inequities that are generally expressed in terms of job dissatisfaction (Ditton; Hollinger and Clark, a; Mangione and Quinn; Quinney; Zeitlin). A third category of explanation is provided by those authors who draw on their lengthy industrial security careers. Working from the assumption that every employee has larceny in his or her heart, these studies generally hypothesize that employee theft is simply a consequence of physical opportunities present in the workplace (Astor; Hemphill; Lipman).

A fourth commonly expressed, but generally untested, theoretical model suggests that employee theft is caused by an "epidemic of moral laxity," especially among younger members of the work force (Merriam). Despite the absence of systematic scientific testing, available empirical data on the incidence of workplace theft does yield some tentative support for this view. Specifically, two separate studies of apprehended retail employees have indicated a disproportionately greater theft involvement among younger and newly hired employees (Franklin; Robin, a). These findings suggest that the threat of organizational sanctions do not uniformly constrain workplace theft, at least among certain groups of employees. In other words, we may infer that deviant employee behavior is not sufficiently deterred by the threat of existing formal or informal negative sanctions (Hollinger and Clark, b).

Although the question of whether formally proscribed *objective* sanctions actually have a deterrent effect remains unresolved, writers who have examined the "deterrence doctrine" do agree that the *perceived* threat of sanctions influences personal behavior (Gibbs). Specifically, of the three major variables in the deterrence process—perceived certainty, severity, and celerity of punishment—the consensus of empirical research is that perceived certainty of punishment is the most effective in shaping behavior (Tittle, b; Tittle and Logan).

The principal research question for the deterrence doctrine is: Under what conditions will perceived risk (or certainty) of punishment provide the intended deterrent effect? For this reason, Jensen at al. conclude that the priorities for future research "should focus on the perceptual properties of punishment in relation to criminal or delinquent behavior in various social settings and control for other sociocultural correlates of crime and delinquency" (57–8). In addition, noting that the typical deterrence study has dealt with high school or college students, these same authors suggest that future deterrence researchers survey more representative segments of the population. It has not been until recently that deterrence doctrine variables

have been examined using adult samples with nondelinquent forms of deviance as the dependent variable (e.g., Grasmick and Bryjak; Grasmick and Milligan; Kraut; Tittle, a).

The present study is designed to achieve four specific research objectives. First, we want to better understand the conditions under which employees commit theft in the formal organization. Second, we wish to test the principles of deterrence in a unique social setting, the workplace, using a little-examined category of deviant behavior—occupational crime. We hypothesize that employees who perceive the dual sanction threats of apprehension and punishment to be minimal or nonexistent will also be more involved in various types of property offenses against the work organization. Third, we want to compare the relative deterrent capacity of both certainty and severity of sanction on employee theft. And finally, we wish to determine whether the various possible combinations of perceived certainty and severity of sanction will deter employee theft in an additive or interactive model that simultaneously examines all logically possible effects controlled by both the age and gender of the employee.

Methods

Data for the present study were collected during 1979 and 1980 as part of a more comprehensive study of employee theft and workplace deviance (Hollinger and Clark, c). Forty-seven separate business corporations (in addition to their respective labor and professional associations) located in Minneapolis—St. Paul, Cleveland, and Dallas–Ft. Worth gave permission for their employee mailing lists to be randomly sampled. These 47 corporations—including 16 retail store organizations, 21 general hospitals (representing the service industry), and 10 electronic manufacturing firms (located in Minneapolis–St. Paul only)—were purposively chosen from the three most populous business sectors. While not intended to be representative of all business organizations, they included firms ranging in size from 150 employees to large, multi-location corporations employing in excess of 10,000 workers. A total of 9,175 randomly sampled employees responded[1] to an anonymous, self-administered, mailed survey questionnaire focusing on various aspects of their present employment experience, especially their personal involvement in a broad range of deviant workplace activities that included the theft of company property.

EMPLOYEE THEFT

The unauthorized taking of organization property by adult employees is an example of larceny committed by individuals who generally have a nondeviant self-concept (Altheide et al.; Merriam). In order to measure the

prevalence of theft in the workplace, respondents were asked to anonymously report their past year's level of participation in thefts of merchandise, supplies, tools, equipment, and other material assets belonging to their employers. As shown in Table 1, the employee was asked to indicate, "How often have you done any of these things in the past year?" The response choices were "daily," "about once a week," "4 to 12 times per year," "1 to 3 times per year," or "never." Because the different manifestations of employee theft vary by type of work setting, three different sets of

Table 1. PROPERTY THEFT ITEMS AND PERCENT OF REPORTED INVOLVEMENT BY SECTOR

	Percent of Involvement				
Items	Almost Daily	About Once a Week	4-12 Times a Year	1-3 Times a Year	Total
Retail Sector (N=3,567)					
Misuse the discount privilege	.6	2.4	11.0	14.9	28.9
Take store merchandise	.2	.5	1.3	4.6	6.6
Get paid for more hours than were worked	.2	.4	1.2	4.0	5.8
Purposely underring a purchase	.1	.3	1.1	1.7	3.2
Borrow or take money from employer without approval	.1	.1	.5	2.0	2.7
Be reimbursed for more money than spent on business expenses	.1	.2	.5	1.3	2.1
Damage merchandise to buy it on discount	--	.1	.2	1.0	1.3
Total percent involved in property theft					35.1
Hospital Sector (N=4,111)					
Take hospital supplies (e.g., linens, bandages)	.2	.8	8.4	17.9	27.3
Take or use medication intended for patients	.1	.3	1.9	5.5	7.8
Get paid for more hours than were worked	.2	.5	1.6	3.8	6.1
Take hospital equipment or tools	.1	.1	.4	4.1	4.7
Be reimbursed for more money than spent on business expenses	.1	--	.2	.8	1.1
Total percent involved in property theft					33.3
Manufacturing Sector (N=1,497)					
Take raw materials used in production	.1	.3	3.5	10.4	14.3
Get paid for more hours than were worked	.2	.5	2.9	5.6	9.2
Take company tools or equipment	--	.1	1.1	7.5	8.7
Be reimbursed for more money than spent on business expenses	.1	.6	1.4	5.6	7.7
Take finished products	--	--	.4	2.7	3.1
Take precious metals (e.g., platinum, gold)	.1	.1	.5	1.1	1.8
Total percent involved in property theft					28.4

theft items were developed to correspond to each industry sector studied (i.e., retail organizations, hospitals, and manufacturing plants).

As can be seen in Table 1, a consistent minority of the respondents reported at least some property theft involvement. This yielded a skewed distribution of the dependent variable—a common situation encountered in the study of deviant behavior. Furthermore, many of those who did report some employee theft were infrequently involved, and only in the less serious items. A detailed analysis of the distribution of theft convinced us that even though theft appears to be a continuous variable, it is more reasonably ordinal, with two primary categories of involvement. The largest group of employees reported either never taking any company property or were infrequently (i.e., 1 to 3 times a year) involved in minor thefts. However, there does seem to be a small, but qualitatively different, minority of employees who are involved in stealing an assortment of company property on a regular or somewhat regular basis.

Thus, the observed frequencies for the dependent variable suggest a dichotomous treatment, namely, those employees reporting no involvement or below average levels (low theft) and those reporting above average levels of involvement (high theft).[2] In order to create a dependent variable which could be compared across industry sectors, responses for each theft item were first standardized using sector-specific means and standard deviations. Summation across offenses then yielded a composite score for each employee.

PERCEIVED CERTAINTY

Perceived certainty (or risk) of punishment has been operationalized in many different ways. In an attempt to arrive at a methodological consensus, one study concluded that "measures of perceived personal risk are more inversely related to self-reported delinquency than are either of the measures of perceived aggregate risk" (Jensen et al., 66). However, despite the theoretical reference to the term "punishment," the question which Jensen et al. utilized was worded to determine whether the respondents thought they could "commit the act and not get caught" (78). The wording of this item, in addition to further empirical research by Tittle (a), suggests that sanction threats are best studied by exploring the employee's perceived risk of being discovered by an unspecified control agent, not necessarily by investigating the combined threat of apprehension *and* punishment as was previously assumed.

Jensen et al. also conclude that the perceived risk of apprehension does not have to be act-specific as is suggested by Teevan. In short, the data analyzed by Jensen et al. support an earlier conclusion by Silberman that a general or combined perception of personal apprehension risk can deter a wide range of offenses. For these reasons, the following general measure of perceived certainty was presented to all employee respondents

in the present study: "I believe I would be caught if I took something belonging to my employer." The Likert-type response choices were "very true," "somewhat true," "not very true," or "not at all true." Given the current debate between the differential effectiveness of informal versus formal sanctions, the social control agent was not specified (Anderson et al.). We simply wanted to know the employee's general perception of detection risk for thefts of company property—whether by management, co-workers, or any other source. Employees who indicated that the above statement was "very true" or "somewhat true" were classified as high perceived risk of apprehension, while respondents who answered "not very true" or "not at all true" were labelled low perceived risk.

PERCEIVED SEVERITY

Because of the overwhelming consensus that perceived certainty is a more important condition of deterrence than perceived severity, the latter has been almost ignored. Only a handful of deterrence studies have examined the marginal deterrent effect of perceived sanction severity above and beyond the net effect of certainty (e.g., Anderson et al.; Bailey and Lott; Grasmick and Bryjak; Kraut; Tittle, b). The relative absence of research on sanction severity is puzzling, given the hypothetical importance that perceived severity should have for rational actors (Grasmick and Bryjak). Recognizing its potential theoretical importance, we have incorporated a measure of perceived sanction severity in our analysis to assess both the additive and often ignored interaction effects.

Perceived severity is usually operationalized in terms of the logically possible criminal justice punishment options. Since deviance in organizational settings most often does *not* involve a criminal sanction, our measure of perceived severity includes a range of informal and formal organizational sanctions that culminate in notifying the police. Specifically, each employee respondent was asked to indicate "what would be the most common reaction of persons in authority to (your participation in) each of the following activities." The possible response choices ranged from a positive sanction item (i.e., reward or promotion) to "do nothing," "reprimand or punish," "fire or dismiss," and ultimately "inform the police." Thus, for each of the items used to measure theft activity, we obtained the employee's personal, not general (Tittle, b), assessment of the degree to which negative consequences could be expected from management. As with the theft items, each response was standardized on the industry mean and then summed to yield an item-specific index of perceived sanction severity. By dichotomizing the mean score, two groups of employees were derived: those who perceived average or below average sanction severity and those employees who predicted above average sanction severity.

AGE

Deterrence researchers have examined the issue of differential deterrent effect according to the age of the individual with inconclusive results. In an early study, Jensen found age to be negatively related to perceptions of aggregate (qualitative) risk of apprehension and punishment. Grasmick and Milligan took the question one step farther by testing for a possible interaction between age and perceived aggregate risk after noting that both of the zero-order correlations showed negative relations to self-reported highway speeding. The authors concluded that the threat of punishment is a deterrent for older drivers (i.e., over 25) but not for drivers 25 years of age and younger. Contrary to the above, two recent examinations of this relationship observed no significant age/perceived certainty interaction (Jensen et al.; Meier). In order to assess the effect of age on our hypothesized perceived certainty-employee theft relationship, the employee's age was dichotomized (cf. Grasmick and Milligan) into two categories, "25 and under" and "over 25."

GENDER

The second of our proposed interactions is the effect of gender. In Tittle and Rowe's "classroom cheating" experiment, the authors found that females were much more likely than males to be deterred from cheating after receiving a verbal sanction threat. For reasons not easily explained by the experimenters, females were less willing than males to violate norms of honesty under conditions of higher apprehension risk. Silberman found a gender/certainty interaction and concluded that the "deterrent effect of punishment is clearly specific to males" (448). However. Silberman's finding that females were not deterred by high certainty of punishment may be an artifact of an extremely low level of self-reported female delinquency compounded by a small female *N*.

The relationship between gender and perceived certainty has not been satisfactorily clarified by more recent research. For example, Jensen et al. concluded that gender and perceived certainty (or risk) have separate effects on delinquency and did not find the gender/certainty interaction that Silberman observed. "The relation between perceived risk and delinquency is neither specific to males, nor spuriously attributable to common links with gender" (Jensen et al., 69). Because the most recent examination of gender and sanction threats suggests that "women perceive systematically higher chances of arrest than do men" (Richards and Tittle, 1982), the present study will examine both the additive and interactive effects of gender. Because of the high proportion of women in hospital and retailing employment, our results will not suffer from inadequate female sample

size. In fact, approximately 71 percent of the present sample is female, thereby insuring sufficient variance.

Data Analysis

The frequency distribution of our dependent variable prevents us from utilizing ordinary least-squares (OLS) regression, since our data violate two of its basic assumptions, (1) equal variances (i.e., homoscedasticity) and (2) normal distribution of the error variances with the independent variables. Although there are a number of different ways to deal with this problem, we will employ a weighted least-squares (WLS) regression procedure in which the dependent variable represents the odds that a given employee will report high-theft rather than low-theft involvement (Swafford). This technique, modeled after Grizzle et al. does not require the above two assumptions and substitutes an appropriate chi-square significance test for the inappropriate F-test. Using a backward selection analysis, as described by Swafford, we estimated a predicted set of logits for the dichotomized dependent variable from the logically possible models, including both the main and interaction terms of the dummy-coded independent variables. One approximates the most parsimonious model short of the saturated model using the common chi-square goodness-of-fit test.

The procedures utilized in the present analysis included dummy coding the four dichotomous independent variables in the following manner: age (1=25 and under/0=26 and over), gender (1=males/0=females), perceived certainty of apprehension (1=low/0=high), and perceived severity of sanction (1=average or below/0=above average). These codings in addition to the marginal frequencies, proportions, observed odds, and logits of employee theft involvement for each of the 16 subpopulations, are presented in Table 2.

The equation underlying the saturated logit model including the above variables is as follows:

$$Ln(\Omega) = \lambda_1 + \lambda_2 A + \lambda_3 G + \lambda_4 C + \lambda_5 S + \lambda_6 AG + \lambda_7 AC + \lambda_8 AS + \lambda_9 GC + \lambda_{10} GS + \lambda_{11} CS + \lambda_{12} AGC + \lambda_{13} AGS + \lambda_{14} ACS + \lambda_{15} GCS + \lambda_{16} AGCS$$

where Ω is the odds of reporting above-average theft involvement, λ_1 is the regression constant, $\lambda_2 \ldots \lambda_5$ are the main effects, $\lambda_6 \ldots \lambda_{11}$ are the first-order interaction effects, $\lambda_{12} \ldots \lambda_{15}$ are the second-order interaction effects, and λ_{16} is the third-order interaction effect.

Table 2. MARGINAL FREQUENCIES, PROPORTIONS, ODDS, AND LOGITS FOR THE 16 SUBPOPULATIONS

Sub-population	Independent Variables				Sub-Total	Employee Theft Frequencies				Logits
	Age	Gender	Perceived Certainty	Perceived Severity		High (above avg.)	Low (below avg.)	Prop. High Theft	Odds High Theft	
1	≤25	M	L	L	205	125	80	.61	1.56	.44
2	≥26	M	L	L	470	242	228	.51	1.06	.06
3	≤25	F	L	L	375	201	174	.54	1.16	.15
4	≥26	F	L	L	601	268	333	.45	.80	-.22
5	≤25	M	H	L	211	77	134	.36	.57	-.56
6	≥26	M	H	L	474	124	350	.26	.35	-1.05
7	≤25	F	H	L	791	254	537	.32	.47	-.76
8	≥26	F	H	L	1477	255	1222	.17	.21	-1.56
9	≤25	M	L	H	161	96	65	.60	1.48	.39
10	≥26	M	L	H	328	111	217	.34	.51	-.67
11	≤25	F	L	H	253	111	142	.44	.78	-.25
12	≥26	F	L	H	389	122	267	.31	.46	-.78
13	≤25	M	H	H	203	68	135	.33	.50	-.69
14	≥26	M	H	H	558	83	475	.15	.17	-1.77
15	≤25	F	H	H	722	160	562	.22	.28	-1.27
16	≥26	F	H	H	1739	172	1567	.10	.11	-2.21

Since the log of the odds, $Ln(\Omega)$ is not an intuitively meaningful statistic, logit equations are more commonly presented by applying the exponential function or the anti-log to both sides of the above equation, after which we obtain the following:

$$\Omega = \gamma_1 * \gamma_2 A * \gamma_3 G * \gamma_4 C * \gamma_5 S * \gamma_6 AG * \gamma_7 AC$$

$$* \gamma_8 AS * \gamma_9 GC * \gamma_{10} GS * \gamma_{11} CS * \gamma_{12} AGC$$

$$* \gamma_{13} AGS * \gamma_{14} ACS * \gamma_{15} GCS * \gamma_{16} AGCS$$

This represents the saturated model in terms of odds with γ_1 as the regression constant, $\gamma_2 \ldots \gamma_5$ as the odds of the main terms, $\gamma_6 \ldots \gamma_{11}$ as the odds of the first-order interaction terms, $\gamma_{12} \ldots \gamma_{15}$ as the odds of the second-order interaction terms, and γ_{16} as the odds of the third-order interaction term.

Findings

Our review of the deterrence literature leads us to expect that each of our independent variables—age, gender, perceived certainty, and perceived severity—will predict employee theft. Therefore, before we analyze the partial and interaction effects of our four independent variables, we will first individually examine the zero-order relations. The order of variable presentation will be determined by the strength of the zero-order relationship.

By far the strongest independent variable of the four in predicting theft involvement is the employee's perception of the certainty of being detected for theft activity; this is represented in the following equation:

$$\Omega = \gamma_1 * \gamma_2 C$$

$$\Omega = .239 * 3.538$$

The employee who perceives a low certainty of detection for acts of employee theft is over three and one-half times more likely to steal from his employer than the employee who perceives a high certainty of apprehension.

As expected, we also found that the younger (aged 16 to 25) employees are more likely to steal from their employers than are their older co-workers.

$\Omega = \gamma_1 * \gamma_2 A$

$\Omega = .296 * 2.020$

Younger employees are twice as likely to be involved in above average theft activity than are their older peers.

Although previous studies have questioned the deterrent effect of sanction severity, the employee's perception that theft will result in serious negative consequences seems to yield a significant deterrent effect.

$\Omega = \gamma_1 * \gamma_2 S$

$\Omega = .269 * 1.879$

Those employees who perceive little severity in the management response to theft behavior are almost twice as likely to report above average levels of larcenous workplace activity.

Even though the self-reported levels of many forms of nonviolent crime may be converging for males and females (Smith and Visher), our data indicate that males consistently report more workplace theft.

$\Omega = \gamma_1 * \gamma_2 G$

$\Omega = .321 * 1.712$

Males are almost one and three-quarters times more likely to report higher than average levels of theft activity against their employers than are their female co-workers.

All four of our variables of interest are independently related to employee theft. Even though perceived certainty of punishment is a statistically more important factor than perceived severity, it is clear from the strength of the other two zero-order relationships that the deterrence of theft is also dependent upon the age or gender of the employee. The specific relationships of these variables, however, remains a question. To address this issue, the next stage of the analysis assesses the relationship between certainty of detection and employee theft under the various conditions.

Using a backward solution as suggested by Swafford, we present in Table 3 a progression of logically possible models. The interaction terms (beginning with the most complex) are excluded sequentially from the regression equation until we arrive at the most parsimonious model, which does not differ significantly from the saturated model. When Models 2 and 3 are compared with Model 1 (the saturated model), the exclusion of the single third-order and then the four second-order interaction terms has no

Table 3. BACKWARD MODEL SELECTION PROCESS

Model Number	Independent Variables in the Model	d.f.	X^2	Explanation
1	k,age,gender,certainty,severity,AG,AC, AS,GC,GS,CS,AGC,AGS,ACS,GCS,AGCS	0	.000	Saturated model
2	k,age,gender,certainty,severity,AG,AC, AS,GC,GS,CS,AGC,AGS,ACS,GCS	1	.016	Exclude single third order interaction
3	k,age,gender,certainty,severity,AG,AC, AS,GC,GS,CS	5	7.46	Exclude second order interactions
4	k,age,gender,certainty,severity	11	26.92*	Exclude all first order interactions/ Main effects model
5	k,age,gender,certainty,severity,AC,AS, GC,GS,CS	6	7.53	Exclude AG interaction
6	k,age,gender,certainty,severity,AG,AS, GC,GS,CS	6	16.13	Exclude AC interaction
7	k,age,gender,certainty,severity,AG,AC, GC,GS,CS	6	15.79	Exclude AS interaction
8	k,age,gender,certainty,severity,AG,AC, AS,GS,CS	6	9.36	Exclude GC interaction
9	k,age,gender,certainty,severity,AG,AC, AS,GC,CS	6	7.82	Exclude GS interaction
10	k,age,gender,certainty,severity,AG,AC, AS,GC,GS	6	7.83	Exclude CS interaction
11	k,age,gender,certainty,severity,AS,GC, GS,CS	7	16.14	Exclude AG,AC interactions
12	k,age,gender,certainty,severity,AC,GC, GS,CS	7	15.93	Exclude AG,AS interactions
13	k,age,gender,certainty,severity,AC,AS, GS,CS	7	9.46	Exclude AG,GC interactions
14	k,age,gender,certainty,severity,AC,AS, GC,CS	7	7.90	Exclude AG,GS interactions
15	k,age,gender,certainty,severity,AC,AS, GC,GS	7	7.90	Exclude AG,CS interactions

(Continued)

Table 3. Continued

16	k,age,gender,certainty,severity,AG,GC, GS,CS	7	25.12*	Exclude AC,AS interactions
17	k,age,gender,certainty,severity,AG,AS, GS,CS	7	17.46	Exclude AC,GC interactions
18	k,age,gender,certainty,severity,AG,AS, GC,CS	7	16.54	Exclude AC,GS interactions
19	k,age,gender,certainty,severity,AG,AS, GC,GS	7	16.40	Exclude AC,CS interactions
20	k,age,gender,certainty,severity,AG,AC, GS,CS	7	17.77	Exclude AS,GC interactions
21	k,age,gender,certainty,severity,AG,AC, GC,CS	7	15.93	Exclude AS,GS interactions
22	k,age,gender,certainty,severity,AG,AC, GC,GS	7	16.03	Exclude AS,CS interactions
23	k,age,gender,certainty,severity,AG,AC, AS,CS	7	9.82	Exclude GC,GS interactions
24	k,age,gender,certainty,severity,AG,AC, AS,GS	7	9.68	Exclude GC,CS interactions
25	k,age,gender,certainty,severity,AG,AC AS,GC	7	8.32	Exclude GS,CS interactions
26	k,age,gender,certainty,severity,AC,AS	9	10.38	Best-fit model

*X^2 is significantly different from the saturated model (#1) with $p \leq .01$.

significant effect on the predictive power of the remaining terms. However, Model 4, which excludes all the first-order interaction terms, is significantly different from the saturated model. We must conclude, therefore, that at least one of the first-order interaction terms is necessary in the final model. Furthermore, after all the first-order interactions are sequentially omitted from the regression equation (i.e., Models 5–10), we still observe that no single term will satisfy our probability requirements.

Next, all possible pairs of first-order interactions are sequentially excluded from the regression equation (i.e., Models 11–25). This process yields a significantly different model (16) in which both the age/certainty and the age/severity terms are dropped at the same time. Therefore, from our backward solution, we conclude that both of these two first-order interaction terms are necessary in our best fit model. This best fit model is represented by Model 26, in which the chi-square error of 10.38 is clearly not significantly different ($X^2 = 21.67$, $p \leq .01$, 9 d.f.) from the saturated model. Thus, the specific terms of the most parsimonious model are as follows:

$$\Omega = \gamma_1 * \gamma_2 A * \gamma_3 G * \gamma_4 C * \gamma_5 S * \gamma_6 AC * \gamma_7 AS$$

$$\Omega = .113 * 2.734 * 1.459 * 3.545 * 1.924 * .745 * .744$$

From Model 26, we see that of the four main effects, only gender is not a component of either of the two significant first-order interactions. Furthermore, when the above partial for gender (1.459) is compared with its respective zero-order gamma (1.712), we see slightly reduced odds. However, if all other factors are held constant, males are still almost one and one-half times more likely than females to be involved in theft.

Given the inconsistencies in previous research, the absence of an interaction effect for gender is an important finding. We have shown, as did Jensen et al., that the greater involvement of males in employee theft is not dependent upon either their age or differential perceptions of sanction certainty or severity. Rather, we have simply found an additive effect of gender, demonstrating that higher male theft rates are independent of the other three variables.

However, there is a significant interaction of age with both perceived certainty of detection and perceived severity of sanction. To better elucidate both the age/certainty and age/severity interactions and also to better demonstrate the lack of a gender interaction, Figure 1 presents the plot on semi-log paper of the "expected odds" in above average theft involvement for each of the 16 subpopulations (see Table 2) as generated by our "best fit" model. Specifically, the eight lines in Figure 1 represent the age/high-theft odds ratio for males and females among the four possible certainty/severity conditions.

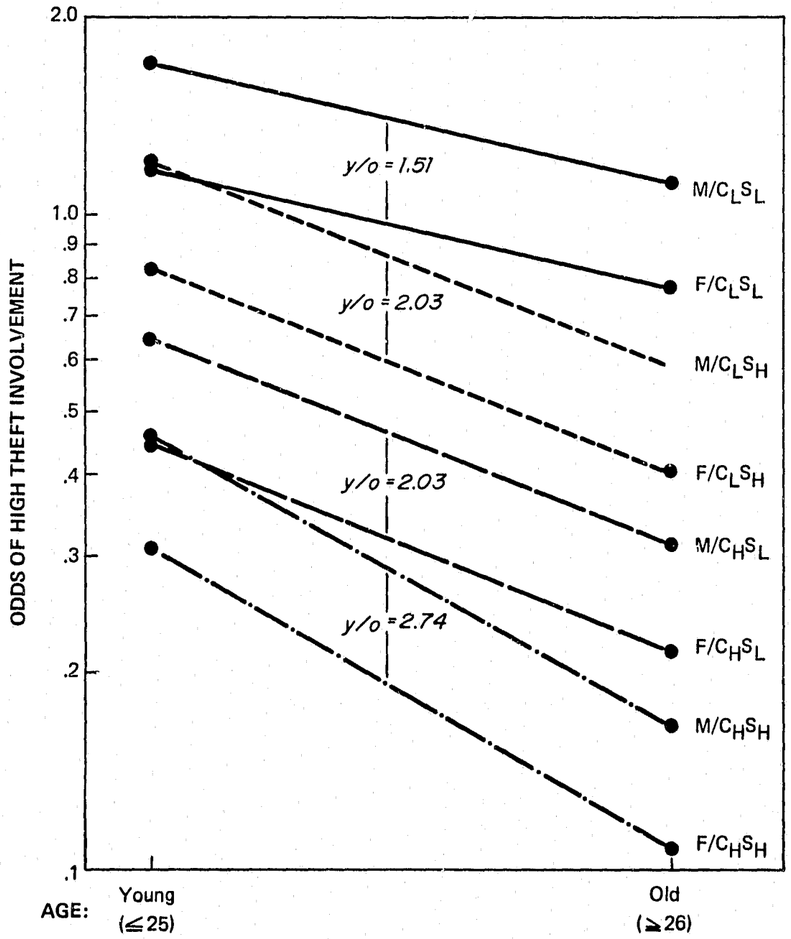

Figure 1. PLOTTED EXPECTED ODDS OF HIGH THEFT INVOLVEMENT BY AGE CONTROLLING FOR GENDER AND THE FOUR POSSIBLE CERTAINTY/SEVERITY CONDITIONS. (LEGEND: *Y*=YOUNG, *O*=OLD, *F*=FEMALE, *C*=CERTAINTY OF DETECTION, *S*=SEVERITY OF SANCTION, *L*=LOW, *H*=HIGH)

First, when we compare each of the similarly designated pairs of lines, we see that males consistently report a higher incidence of theft than females, independent of either age or perception of risk. Furthermore, all of the male/female lines are parallel to each other, denoting the absence of an interaction with gender. In other words, the odds ratio of male to female theft is identical for both young and old and for each of the four possible certainty/severity combinations.

Next, when the four possible deterrence conditions (each designated with a different coded line) are compared, the data show the additive effect of perceived certainty and severity on the odds of above average employee theft involvement. By examining the differences in the magnitude of the odds (i.e., the *Y* values) from the top to the bottom of Figure 1, we see that as the perceived certainty of detection and the perceived severity of the sanction increase (for both males and females), the odds of above average theft involvement decrease. As expected, the highest level of employee theft was reported by those who perceived both the certainty and severity of sanction to be low. Alternatively, under the condition of greatest perceived threat (high certainty and high severity), we find the lowest level of theft involvement. Thus, not only have we established that the threat of organizational sanction does indeed have a deterrent effect on theft behavior, but we can also document the additive effects of perceived severity in conjunction with perceived certainty.

Of greatest interest to the student of deterrence are the middle two pairs of lines in Figure 1. Here we can assess the relative, simultaneous importance of both certainty and severity in a Guttman-like progression. The data show that, all other things being equal, we find lower theft odds under conditions of high certainty and low severity than under opposite conditions of low certainty and high severity. This would suggest that severity's additive effect, above and beyond the influence of certainty, is not as inconsequential as had been previously assumed. Although perceived severity effect is second in impact to certainty, we still find (unlike Grasmick and Bryjak who suggest an interactive model) a significant additive effect of severity under conditions of *both* low and high perceived certainty of detection.

Figure 1 also graphically displays the characteristics of the age/deterrence interaction. Specifically, the change in the odds ratio for the four possible configurations of certainty and severity indicates that the odds of theft involvement are dependent upon the employee's age. Under perceptions of both low certainty of apprehension and low severity of punishment, employees aged twenty-five and under are one and one-half times more likely to steal company property than their older co-workers. However, under perceptions of both high certainty of detection and high severity of punishment, younger employees are over two and three-quarters times more likely to be involved in above average theft activity. Put another way, employees aged 25 and under are, in general, not only more likely to be involved in theft than their older co-workers, but the differences between the two groups become even greater as the perceived chances of getting caught and/or punished are increased. In short, older employees are substantially more deterrable than younger employees.

Discussion

Prior research on deterrence has consistently reported a negative relationship between perceived certainty of apprehension (or risk) and self-reported involvement in illegal activity. In recent years, a small number of other studies have shown a weaker, but statistically significant relationship between deviance and severity of sanction as well. It has generally been assumed that the primary deterrent effect is produced by the threat of formal legal sanctions originating from the criminal justice system. However, despite the substantive provisions of the criminal code, deviant behavior against formal organizations, such as the taking of company property, is not usually perceived by employees as law-breaking activity (Altheide et al.). These data suggest that the theoretical boundaries of deterrence are not necessarily limited to criminal and legal controls but can also apply to the sanctions promulgated by a formal organization. As discussed in previous research, employee theft is deterred principally by the threat of such noncriminal and informal work group sanctions as being fired or socially ostracized (Hollinger and Clark, b). From this, we must conclude that the deterrence process seems to be less dependent on the characteristics of the social control agent than on the perceived risk of discovery and sanction.

It is theoretically important to note that these data suggest an additive interrelationship between perceived certainty and perceived severity—that the highest degree of deterrent effect is yielded when both certainty and severity are perceived to be high. Furthermore, the situation of high certainty and low severity yields a greater deterrent effect than the converse situation of low certainty and high severity. These findings are important because of the fact that, until recently (e.g., Grasmick and Bryjak), severity has been discarded as a variable of interest to the deterrence doctrine. It is possible that the stronger variable, perceived certainty, has been masking the marginal deterrent effect of the weaker variable, perceived severity. Future deterrence research will have to re-incorporate this obviously important factor.

When we controlled for two demographic variables hypothesized to affect the character of the perceived sanction/theft relationship, age (but not gender) was found to interact significantly with both perceived certainty and severity. Age/certainty and age/severity interactions imply that younger employees are more involved in theft than their older co-workers, especially when the employees perceive the risks of apprehension and penalties to be high. Continued deviant activity in the face of significant risks of punishment poses a problem for our "rational man" assumptions of deterrence.

Under Jeremy Bentham's "felicific calculus," the deviant actor was either viewed as mentally unable to calculate the risks of sanctions or was considered to be operating under a different set of normative expectations. Because we have operationalized certainty and severity as a perceptual rather than an objective variable, the inaccurate or demented calculus explanation is inappropriate. It may be, however, that the younger employee's behavior is influenced by a different normative system. For example, perhaps the stimulation or thrill of committing the theft counteracts the fear of apprehension and punishment. Younger workers may be flaunting their deviant activity in order to receive ego gratification from their co-workers. Although this reason for deviance has been observed in studies of juvenile delinquency, existing data suggest that employee theft is usually a private phenomenon (Horning) that is not committed for reasons of group approval.

The logically remaining explanation is that if employees are not deterred by the threat of detection or punishment, it is due to the fact that the sanctions which they expect to receive do not provide sufficient pain to negate the pleasure derived from the acts. While the threat of an embarrassing detection or dismissal may deter older employees, it may not constrain younger employees because of their lesser social and economic vulnerability to the effects of detection or punishment. Since an employee's behavior is differentially determined by *both* age and sanction, it becomes increasingly clear that the deterrence doctrine must be refined to account for theft-involvement variance when there are identical perceptions of sanction threat.

Our age/certainty and age/severity interactions do not concern a really new theoretical problem. Twenty years ago, juvenile delinquency researchers faced a similar dilemma when they tried to explain differential delinquent involvement when presumably the same drives and motives were perceived by both the deviant and the nondeviant. In an analysis by Jackson Toby, later refined by Briar and Piliavin, delinquent involvement was attributed to the actor's specific "commitments" or "stakes in conformity." In other words, the more one risked to lose if detected and sanctioned for deviant activity, the greater the resultant deterrent effect. In subsequent empirical tests, both Piliavin et al. and Hirschi demonstrated the importance of understanding the "stakes" that a deviant places in jeopardy while committing rule-breaking behavior.

This "stakes in conformity/commitment" explanation is also applicable to the problem of employee theft. Apparently, the sanctions which organizations typically use to deter theft are simply not as effective with younger employees. Even when both young and old employees perceive exactly the same sanction risks, the social severity perceived by the two groups differs substantially for two primary reasons (Erickson and Gibbs). First, if younger employees are apprehended for theft they are subjected to less informal social stigma because many of their peers are either involved in theft themselves or are sympathetic to deviant acts by others against

the work organization (e.g., Altheide et al.; Bensman and Gerver; Mars, a, b). Second, given the fact that very few companies actually use criminal prosecution as a punishment for theft (Hollinger and Clark, c; Robin, b), the threat of being fired is also not as severe a punishment for the younger worker as for the older employee. Assuming that younger employees are more likely to be at the bottom of the status hierarchy, are paid a lower-than-average wage, have accumulated little or no tenure with the company, enjoy few fringe benefits, and have fewer dependents relying on their salaries, the social and economic impact of being forced to leave a particular job will not be as great. Since it will generally be easier for younger employees to obtain comparable replacement jobs if they are terminated, it is clear that younger employees have much less to lose than do their older co-workers if they are apprehended and punished.

In conclusion, we have seen how complex the deterrence process becomes as new variables, such as age, are discovered to influence the process of formal social control differentially. Certainly, age and gender are not the only variables which reflect an actor's "stake in conformity." No doubt there are many other structural factors which interact with certainty and severity of sanction to determine the resultant deterrent effect. Substantially more research will be required before we adequately understand the apparent "differential" nature of the deterrence process.

Notes

1. The proportion of employees who responded to the survey was 53.8%. However, this return rate cannot be directly compared with the return rate from other self-administered, mail questionnaires without an adjustment for errors and attrition due to employee turnover. In other words, if one deletes from the employee population those persons who terminated employment between the time that the mailing list was drawn up and the time that the sample was selected, the adjusted return rate will better approximate the levels at which variable relationships are not significantly affected by non-response (Goudy). Based on an intensive reexamination of corporate personnel files in five randomly selected organizations, the "adjusted" return rate was found to be 74, 69, 66, 75, and 56%, respectively.
2. Including the "no involvement" with the "below average" theft respondents was done to minimize the chances of classifying the low-involvement employees with the higher-theft respondents. This more conservative treatment was based upon our preliminary analyses, which suggested that the high-theft employees were qualitatively different than their below average and never-involved peers.

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