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INTERPERSONAL PROBLEM-SOLVING AND DETERRENCE:
EFFECTS ON PRISON ADJUSTMENT AND RECIDIVISM

by

Moira Tweedale

A thesis submitted to the School of Psychology
in conformity with the requirements of
the degree of Doctor of Philosophy

University of Ottawa
Ottawa, Ontario, Canada



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UNIVERSITÉ D'OTTAWA
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Abstract

This study investigated the relationships between problem-solving ability, perceived aversiveness and deterrence of sanctions for institutional misbehaviour, and subsequent institutional and community adjustment in convicted adult offenders. Subjects completed a battery of tests designed to assess certain interpersonal problem-solving skills. They also provided subjective ratings of aversiveness and deterrence value of 10 common institutional sanctions. Institutional conduct was subsequently monitored for 3 months following testing. In addition, further criminal activity was monitored for a period of 1 year following release from incarceration.

The results reveal a modest relationship between problem-solving ability and institutional adjustment and a much stronger relationship between problem-solving ability and subsequent recidivism. Poorer problem-solvers incurred more institutional charges in the early phase of incarceration and more followup criminal charges. In contrast, ratings of aversiveness or deterrence were more strongly related to

institutional adjustment and in general were not predictive of subsequent criminal recidivism.

Perceptions of aversiveness or deterrence of sanctions, though positively correlated, were not identical. For example, a number of subjects rated the sanctions as aversive but not deterrent, indicating that to some extent these factors are independent. Of the two, perceived aversiveness appeared to be a more accurate predictor of actual institutional behaviour, especially where there was a discrepancy between perceived aversiveness and perceived deterrence.

There was some evidence of a relationship between problem-solving ability and perceptions of aversiveness. Good problem-solvers tended to rate sanctions as more aversive than poor problem-solvers. Thus, the greater cognitive flexibility that results from well-developed problem-solving skills may potentiate perceptions of aversiveness.

In addition, subjective perceptions of aversiveness and deterrence of sanctions were found to

be unstable over time. This was unrelated to whether or not subjects had actually experienced the sanction in the interim between pretesting and posttesting.

The findings are discussed in terms of their implications for deterrence theory and treatment-rehabilitation.

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Chapter 1

Introduction

The mid-seventies saw the publication of an unabashedly pessimistic view of rehabilitation and correctional treatment which came to be known as the "nothing-works" philosophy (e.g., Lipton et al., 1975; Martinson, 1976). As a direct and logical consequence of the popularization of this view, increased attention was given to deterrence as the model on which to base crime control policy (Gendreau & Ross, 1981). Stated simply, the deterrence approach operates on the notion that punishment deters crime and that the inhibiting effects of punishment serve to curtail criminal behavior in both a general (aggregate) and a specific (individual) way.

The theoretical rationale for the deterrence model is derived from the classical school of criminology and in particular the doctrines of rational thought and psychological hedonism. Taken together, these two principles suggest that human behaviour (including crime) is governed by the rational calculation of

potential benefits (pleasure, rewards) of various options in relation to potential costs (pain, punishment) prior to selecting a course of action. The model suggests that rational crime-control policy should "weight" the costs-benefits balance of criminal behavior towards greater costs by increasing the certainty and the severity of legal sanctions. The effect would be to deter potential offenders from committing crimes because the expected losses of contemplated criminal acts would outweigh the expected gains (Palmer, 1977).

This approach has a certain pleasing simplicity about it. Unfortunately, it has not received a great deal of empirical support (Gendreau & Ross, 1981). Theorists (e.g., Paternoster, 1987; Piliavin et al., 1985; Gendreau & Ross, 1981) have come to recognize that this view of deterrence is inadequate for an understanding of the complexities of individual criminal decision-making: the model relies too heavily on a simplistic economic cost-benefit analysis to be useful in formulating socially responsible crime-control policies and it fails to explain individual

variations in responses to legal sanctions. Recent views conceive of deterrence more as a psychological process, influenced by individual variations in perceptions of potential gains and costs in evaluating the net utility of a criminal act (Erickson et al., 1977).

A fundamental problem with the deterrence model may be the assumption of "rationality" in the offender's decision-making. The notion that criminals make entirely or even primarily rational, objective estimates of how much they stand to gain or lose as a result of an illegal act has been cogently disputed by Carroll (1978), among others. It is necessary to consider individual differences in the way offenders think about the consequences of illegal behavior, how and what they think about the probability of being apprehended, and indeed whether they consider, or even possess the capacity to consider, the consequences of their behaviours (Bailey & Lott, 1976; Gendreau & Ross, 1981; Ross & Fabiano, 1981, 1985).

In addressing the issue of how offenders think about deterrence, there have been some important empirical advances regarding the relationship between antisocial behavior and cognitive functioning. Adequate social adjustment has been linked to the development of various interpersonal problem-solving skills (e.g., Spivack, Platt, & Shure, 1976). Several studies have demonstrated that improvements in specific cognitive skills are associated with reductions in subsequent criminal offending (Andrews, 1980; Andrews et al., 1986; Andrews, Bonta, & Hoge, 1990; Collingwood et al., 1980; Platt, Labate, & Wicks, 1977; Ross & Fabiano, 1985; Ross et al., 1988).

Given the paucity of empirical support for the deterrence doctrine and the demonstration of links between social cognitive skill and prosocial adjustment, what is needed are systematic examinations of how social-cognitive functioning affects the way offenders respond to societal deterrence practices. The present study examined the hypothesis that lack of responsivity to deterrence, i.e., resistance to the effects of punishment or threats of punishment, is at

least partly a function of deficiencies in certain social-cognitive skills which, in effect, restrict rational decision making. Specifically, this study evaluated and compared the interpersonal problem-solving skills of offenders who repeatedly violate and are punished for violation of institutional rules (presumably because they are resistant to the effects of punishment) with the problem-solving skills of those offenders who violate rules infrequently or not at all (presumably because they are deterred by the experience or threat of punishment). The aims were (1) to provide information regarding the extent to which social-cognitive functioning can enhance or diminish the deterrence effectiveness of institutional sanctions with individual incarcerates; (2) to consider what implications this may have for subsequent criminal recidivism; and (3) to provide information regarding the link between problem-solving skill deficiencies and failure to respond to the "social control" mechanisms of punishment.

General Deterrence (Aggregate Effects)

The concept of general deterrence refers to the suppressing or inhibiting effects of punishment of apprehended offenders on potential or unidentified criminals within the general populace. Research in this area has focused on aggregate level data, primarily correlations between crime rates and regional sanctioning practices, as opposed to the specific effects of punishment on the behavior of individuals who actually experience the legal sanctions (Nagin, 1978). Typically, general deterrence effects have been evaluated in terms of degree of association between local crime rates and variations in certainty of apprehension, indicated by per capita police expenditures, clearance rates, and statistics on ratio of arrests to reported offences; certainty of punishment, reflected in the ratio of incarcerations or commitments to reported crimes; and severity of punishment, reflected in mean or median length of incarceration (for a review, see Brown & Esbensen, 1988; Cousineau, 1988; Nagin, 1978).

Effects of Certainty and Severity of Sanctions on Crime Rates. There is a substantial body of literature examining the relationship between certainty or severity of punishment and crime rates (cf. Klepper & Nagin, 1989; Paternoster, 1987). By and large, the data concerning certainty of punishment provide the best support for the deterrence doctrine (Atunes & Hunt, 1983; Carr-Hill & Stern, 1973; Chiricos & Waldo, 1970; Logan, 1971a, 1971b, 1972, 1975; McPheters & Stronge, 1974; Orsagh, 1973; Phillips & Votey, 1972; Sjoquist, 1973; Swimmer, 1974; Tittle, 1969; Tittle & Rowe, 1974; Vandaele, 1973). However, while some studies have reported fairly high negative correlations between sanction certainty and crime (e.g., Erickson & Gibbs, 1976), the majority of the correlations have been quite low, often accounting for no more than 10% of the variance (Bailey, 1976; Bailey & Lott, 1976; Bailey & Smith, 1972; Logan, 1972; Pontell, 1978). In addition, some of this research has revealed inconsistent correlations for different crimes or for the same crimes over different studies.

The data regarding severity of punishment is even more equivocal. Some studies have reported slight negative correlations between severity of sanctions and crime rates (Bean & Cushing, 1971; Ehrlich, 1973; Gibbs, 1968, 1975; Gray & Martin, 1969) while others have reported correlations in the opposite direction, i.e., positive associations between sanction severity and crime rate (e.g., Avio & Clark, 1974; Greenwood & Wadycki, 1973). Finally, Forst (1976) and Brier & Fienberg (1980) employed a number of statistical and demographic controls not used in earlier studies and found no significant relationship between either certainty or severity of sanctions and crime rate.

For proponents of the deterrence principle, the ultimate sanction or threat is, of course, capital punishment. Here the evidence for deterrence is even less clear. Much of the relevant data comes from studies examining the effects of reductions in rates of executions on subsequent homicide rates; comparing homicide rates in the same geographic areas during pre- and post-abolition periods; comparing the homicide rates of adjacent regions with and without the death

penalty; assessing the rate of murder involving law enforcement personnel in states with the death penalty as compared to those without it; or examining homicide trends immediately following publicized executions (Fattah, 1981).

Ehrlich (1975) examined the association between national homicide rates and execution rates for the period 1933 to 1969 and reported a significant deterrent effect which he attributed to capital punishment. However, later replications of his study revealed fundamental weaknesses in his design, his limited control procedures, and his statistical analyses (Bowers & Pierce, 1975; Forst, 1976, 1977; Passell & Taylor, 1975). The majority of other findings in this area have been uniformly negative, aptly summarized in Tift's (1982) assertion that "there is no discernable statistical association between the existence of the death penalty and wilful homicide rates" (p. 63; see also Black & Orsagh, 1978; Schuessler, 1952; Sellin, 1980). In some studies, correlations emerged opposite to predictions: executions were followed by increases in homicide rates

(e.g., Bailey, 1976; Bowers & Pierce, 1975; Sellin, 1967). Silberman (1976), noting that Ehrlich's analysis was particularly sensitive to the time period he examined, demonstrated that, depending on the era selected for analysis, Ehrlich's equations could support the hypothesis that the death penalty actually encourages homicides. These findings have been interpreted as demonstrating that, far from being a deterrent, state executions may in fact act as a formal legitimization of violent conflict resolution practices (Bowers & Pierce, 1975; Tift, 1982). Thus, even if one is willing to accept the deterrence doctrine, it is necessary to postulate a critical level of severity of sanction, beyond which increasingly more severe sanctions may have negative social influences such as legitimizing violence as a valid social response.

Limitations of General Deterrence Studies.

Studies of general deterrence suffer from a number of common methodological weaknesses, inaccurate data sources, and errors in logic (cf. Brier & Fienberg, 1980; Nagin, 1978) that limit or invalidate their conclusions. First, there are wide variations in

practices of recording offences by police and law enforcement agencies over different regions, as well as from one time period to another. The problem of unreported crimes, which may be as large as 50-70% of total crimes (e.g., data from Victim Surveys, U.S. Bureau of Census, Department of Justice, 1977) further confounds attempts to relate crime rates to sanctions. Under-reporting or under-recording of crimes can give the appearance of unrealistically low crime rates which may lead researchers to infer an inverse relationship between crime rate and sanctions that does not, in fact, exist (Nagin, 1978).

In addition, community and/or political pressure may encourage overt manipulation of clearance reports, causing further distortion or exaggeration of the actual association with sanctions. The increased use of plea bargaining that may occur in overloaded judicial systems is also a factor since this may reduce the apparent rates of more serious offences while increasing the apparent rates of lesser offences. This could yield statistical relationships between gross measures of certainty of imprisonment and specific

crime rates which are unrelated to actual deterrence effects.

A related problem derives from the logical errors inherent in inferring temporal causality from temporal correlation. That is, one may observe that increases in the number or severity of sanctions in a region are followed in due course by reductions in crime rates or rates of specific types of crimes. However, it does not necessarily follow that the two are causally related. In particular, it may not be the case that the first event causes the second rather than vice versa. Crime rates and sanctions may exert a mutual impact on one another. In some cases fluctuations in crime rate may "cause" changes in sanctioning practices. For example, increased crime rates coupled with severe sanctions may overload available judicial resources, thereby introducing incentives to avoid the imposition of sanctions likely to further strain the system's capacity (see the discussion of plea bargaining above). This would give the appearance of severe sanctions "causing" a drop in future serious crimes or future severe sanctions (i.e., increased

rates of incarceration at time A resulting in decreased rates of incarceration at time B). In such cases, the apparent deterrent effects of the imposed sanctions would be merely spurious (Minor, 1977; Nagin, 1978).

An additional common problem in the general deterrence literature is the confounding of incapacitation effects with deterrence effects. In jurisdictions where incarceration is more extensive (i.e., in terms of rate of incarceration, length of sentence imposed, and/or proportion of sentence served), a larger percentage of offenders will be incapacitated at any given time and therefore deprived of opportunity to re-offend. Thus, reductions in crime rates may reflect an incapacitation effect rather than a general deterrent effect. Nagin (1978) argues that this confounding effect may be quite large (see also Vicher, 1987, for a review and critique).

Applied Deterrence Studies. Applied deterrence studies are based on naturalistic or quasi-experimental designs intended to evaluate actual law-enforcement interventions that are "tried out" on a

target population during a given period of time. These interventions are designed to make the threat of punishment more salient in some way, either by increasing perceptions of certainty (e.g., heightened surveillance visibility) or by increasing perceptions of severity of sanction.

For example, Vito (1984) assessed the impact of "shock probation", a procedure in which offenders are given a brief period of incarceration preceding community supervision to give them a taste of the more severe consequence that might follow future offences. Vito found this technique to be largely ineffective, or, at best, no more potent than other sentencing options in deterring various types of offenders, a finding supported by several similar evaluations (e.g., Boudouris & Turnbull, 1985; Buckner & Chesney-Lund, 1983; Lewis, 1983; Waldron & Angelino, 1977). Although Lewis (1983) reported increased prosocial attitudes towards police and crime in general among subjects who experienced the "shock" intervention, he observed no differences between this group and matched controls with respect to subsequent arrest rates.

A naturalistic opportunity for evaluating the effects of increased severity of sanctions occurred as a result of the Jamaican legislature's imposition of indeterminate prison sentences for the possession of firearms in the late 1970s. Although homicide rates as well as the rates of several related crimes declined immediately following this legislation, the deterrent effect did not endure for even as little as a year (Gendreau & Surridge, 1978).

A series of extensively documented deterrence interventions is provided in the Nashville police studies (Schnelle et al., 1975, 1977, 1978, 1979). These studies yielded inconsistent findings which varied according to the specific measures imposed. For example, some of the more dramatically visible measures such as helicopter patrols proved to be effective deterrents, whereas increased car patrols produced variable results and security hardware systems (e.g., alarms) were generally ineffective in deterring criminal activity (i.e., rates of police reported crimes showed little change). To complicate the picture even

further, Hart (1978), in a particularly well designed evaluation study, observed that subjects in army units responded to more intensive punishment practices from supervisors with increased lawlessness.

These and other tests of the deterrence hypothesis, however, have limited themselves to examining the phenomena of general or "symbolic" deterrence. While a substantial number of these studies suggest that there is a significant negative association between certainty of punishment and gross crime rate, and a much less clear association between severity of punishment and crime rate, the inherent methodological weaknesses and inaccuracies in the data render these findings far from definitive. Moreover, such macro-level tests of the deterrence hypothesis rest on the assumption that actual punishment practices accurately reflect individual perceptions of the certainty and severity of existing sanctions. As we shall see, the validity of this assumption is questionable.

Specific Deterrence (Individual Differences)

Studies based on aggregate data assume that all offenders are more or less alike in terms of their knowledge of and response to legal sanctions and their knowledge of alternative non-criminal choices, and also that offenders are equivalent in terms of pressures (motives or incentives) to commit offences. In other words, most of these studies are based on a straightforward and rather simplistic economic analysis of the utility of criminal acts.

It is, however, important to also consider the notion of specific deterrence and the wide variations across individual offenders in terms of responsiveness to deterrence. In its assumption of a "rational man", the deterrence model ignores the fact that many crimes are the result of irrational, emotional, or situational (unintentional) acts. Thus, a distinction needs to be made between "expressive" and "instrumental" motives underlying a behavior, and in turn the expressive and instrumental acts themselves (Chambliss, 1967).

Instrumental motivation underlies behaviours that are

aimed at attaining a specific goal, whereas expressive motivation refers to the tendency to act or react for emotional reasons, rather than as a means to an end (Chambliss, 1967). Because they are to a greater or lesser extent rationally motivated, it may be the case that instrumental acts are more readily deterred by threat of sanction, whereas expressive acts, being more impulsive and emotional in character, may be much less responsive to legal sanctions.

If this is so, deterrence through legal sanctions may be relevant for only a limited subgroup of the total offender population. The threat of punishment may be largely ineffective as a deterrent for those individuals who are prone to act on impulse or emotion rather than reason. Even offenders whose crimes are primarily instrumentally motivated may fail to be deterred if their perceptions of potential costs are inaccurate, or if they believe that the commission of the crime is the only viable means of attaining a desired goal.

As Erickson et al. (1977) argue, the deterrence doctrine is actually a psychological theory involving psychological phenomena (e.g., fear, perceived risk, pain). As such, adequate tests of the theory must consider individual differences in subjective perception of costs and benefits, and differential responsiveness to specific deterrence measures. As Henshel and Carey (1975) put it:

People are deterred (if at all) by what they think is the certainty of capture, and by what they think is the severity of the sanction, not by what the certainty and severity are objectively... It is clear that most existing studies of deterrence have unconsciously related differences in objective sanctions to corresponding objective crime rates, without sufficient examination of the deterrence concept to recognize the hidden intermediary (Henshel & Carey, 1975, pp. 54, 63).

Fortunately, recent research from a variety of different perspectives (e.g., sociological, economic, psychological) has begun to focus on the issue of

subjective perceptions of the various factors in the deterrence equation. This interest in perceptual-mediational variables constitutes an important advance towards unravelling the complexities of the deterrence phenomena, specifically in understanding differential responses to deterrence. Several studies (e.g., Anderson et al., 1977; Bailey & Lott, 1976; Burkett & Jensen, 1975; Cohen, 1978; Erikson, 1976; Erickson et al., 1977; Erickson & Gibbs, 1978; Grasmick & Green, 1980; Jensen et al., 1978; Meier & Johnson, 1977; Minor, 1977; Piliavin et al., 1985; Silberman, 1976; Teevan, 1975, 1976a, 1976b; Tittle, 1977, 1980; Waldo & Chiricos, 1972; see reviews by Paternoster, 1987; Saltzman et al., 1982) have examined the association between subjective perceptions of various sanctions and either self-reports of past criminality or self-estimations of future criminal involvement.

These factors demand scrutiny because, as Piliavan et al. (1985) argue, "of central importance in modelling crime as a rational choice process are measures of individual's assessments of the rewards and costs of illegal and legal activities and their

perceptions of the opportunities for such activities" (Piliavin et al., 1985, p. 6). In an early classic study, Waldo & Chiricos (1972) examined university students' perceptions of certainty and severity of punishments for two offences (marijuana use and theft) in relation to admission of having committed one of these offences. Their findings lend support to the deterrence hypothesis to the extent that perceptions of higher probability and severity of punishment correlated inversely with admission of involvement in these offences. These findings can be criticized, however, on several grounds. Piliavin et al. (1985) argue that the experimental paradigm fails to control for the problem of temporal causality between sanctions and crime admissions. Furthermore, it fails to account for extra-legal phenomena which may influence an individual's self-reported behavior, thus rendering the assumed association between sanctions and behavior spurious. It also does not allow for estimates of expected gain in relation to perceptions of costs, deals with relatively minor offences, and relies on an unrepresentative sample (college students).

In a later replication of the Waldo & Chiricos study, Bailey & Lott (1976) asked subjects to make their own estimations regarding likelihood and type of punishment they could expect if they participated in various crimes. In contrast to Waldo & Chiricos, they found only a minor deterrent effect of certainty and severity of punishment on criminal involvement. However, their data were also drawn from an unrepresentative sample.

In a somewhat more comprehensive analysis, Tittle (1980) included a variety of ecological variables and individual attributes and attitudes in addition to perceptions of risk of informal and formal sanctions in assessing their relationship to criminal activity. While he observed a weak negative correlation between criminal activity and fear of sanctions, extra-legal factors (fear of social disapproval, peer influence and moral commitment) proved much more powerful as predictors of projected behavior. However, though Tittle's findings suggest that the deterrence model may be relevant only for those less "morally committed" individuals, his large sample consisted of ordinary

citizens and again may not be representative of the attitudes and perceptions of criminal offenders.

A number of interesting observations have been made in studies measuring the perceptions and attitudes of actual offenders. Claster (1967) found that delinquents, compared with non-delinquents, felt more immune to arrest if they were to commit a crime, in spite of the fact that the delinquents had already experienced arrest and conviction while the non-delinquents had not. This suggests an interesting possibility: It may be that the perceived aversiveness of an anticipated but not yet experienced sanction is greater, at least for some individuals, than the perceived aversiveness of an anticipated sanction with which the individual has already had some experience, and survived. Similarly, Teevan (1976) observed that offenders believed it was unlikely that individuals like themselves would be apprehended for criminal acts, even though they had already been apprehended. Erickson's (1978) offender group also estimated that there was little risk of receiving severe sanctions. Lotz et al. (1978), in a replication of Claster's

(1967) study, found that delinquent boys, relative to non-delinquents, gave higher and more accurate estimates of offences resulting in arrest and conviction. Nonetheless, the delinquents were more likely to say that they would commit such an offence in the future. Erickson (1976) observed that drug users receiving the most severe sanctions reported the strongest intentions to continue using the drug in the future. It would seem that the econometric model of deterrence, which assumes that criminal acts are the outcome of a rational cost-benefit assessment of utility vs. risk, is a somewhat inaccurate and certainly oversimplified model.

As is the case with aggregate level studies, perceptual studies are also plagued with methodological problems which seriously undermine any conclusions about the deterrence process. Perhaps, as Paternoster et al. (1982) and Paternoster (1987) suggest, these problems may explain some of the ambiguities in the perceptual deterrence literature. Apart from differences in statistical analysis, types of punishment, and measures of perceived risk used in the

various studies, Paternoster et al. (1982) identify the core problem as one of temporal confounding. Since perceptual deterrence research has relied on the measured association between current perceptions of sanctions and past behavior, Paternoster et al. contend that what has been presumed to be a "deterrent" effect was actually a measurement of an "experiential" effect. In other words, these studies have actually been evaluating the perceived aversiveness of a sanction after the sanction has been applied and this may be quite different from the deterrence value of the sanction in an inexperienced individual or even for an experienced offender at a future point in time.

Most perceptual studies have correlated respondents' perceptions of sanction risk with a self-reported measure of past criminal behavior collected at the same time as the perceptions. These reported correlations, then, reflect the relationship between the perceptions measured at that point and illegal behavior that preceded the perceptions in time. Deterrence researchers have interpreted negative correlations between current

perceptions and prior behavior as evidence of a deterrent effect: Perceived Sanctions --> Behavior. Inasmuch as the behavior occurred before the measurement of perceptions, however, what these researchers may actually be describing is an "experiential effect," the effect of previous behavior on current perceptions: Behavior --> Perceived Sanctions (Saltzman et al., 1982, p. 173).

To avoid the confounding of experiential and deterrence effects, some studies have employed "panel designs" (complex two and three wave multivariate causal models) in which subjective perceptions of an expected deterrent effect are evaluated prior to the reported relevant behavior (for a review and critique of the literature on temporal ordering in perceptual deterrence research, see Paternoster, 1987). When Saltzman et al. (1982) employed this approach using a two-wave panel design, they concluded that experiential effects were poorly representative of actual deterrent effects. Similarly, Paternoster (1987) concludes that "when researchers employing panel designs have

estimated the deterrent relationship with variables in their correct temporal ordering and with more fully specified causal models, the moderate inverse effect (between punishment and deterrence) for both perceived certainty and severity disappears" (p. 173).

The Psychological Perspective

Decision-Making Strategies. The economic model of deterrence theorizes that potential offenders engage in a decision-making process that involves evaluation of possible alternative courses of action and an accurate appraisal of the likely potential outcomes (cf. Palmer, 1977). Drawing from the experimental literature on human decision-making, researchers have begun to take a more careful look at the actual decision-making strategies utilized by individuals in various choice situations, including choosing between criminal and non-criminal alternatives (e.g., Carroll, 1978; Janis & Mann, 1979; Kahneman & Tversky, 1984; Slovic et al., 1977).

These studies reveal that individuals, even when presented with explicit alternatives and cost-benefit ratios, tend to use only part of the available information and to rely on one dimension of the equation more than another in making decisions (Kahneman & Tversky, 1984; Slovic & Lichsteinstein, 1968). Carroll (1978) examined offender decision-making in a three-outcome gamble paradigm consisting of four dimensions: probability of successful crime, financial gain if successful, probability of capture, and punishment if caught. His findings indicate that, for many offenders, the decision to commit a crime is not typically the outcome of a careful assessment of potential cost vs. potential gain. Rather, the decision is often based on a rudimentary and unidimensional perception of opportunity for gain. In fact, Carroll found that the possible rewards of crime were twice as potent as the possible penalties in influencing the individual's decision to offend. Similarly, probability of success was twice as influential as probability of capture in most of the decision-making. He also found substantial individual differences in motivation for the crime: some offenders were motivated

primarily by financial gain, others primarily by risk or excitement. In general, sensation-seeking and other non-financial motives for crime have been given insufficient emphasis in the deterrence literature.

Some partial support for the rational-choice model was reported by Piliavin et al. (1985; see also Paternoster, 1987; Piliavin et al., 1986). Their findings suggest that offenders exhibit a form of "subjective" or "limited" rationality insofar as subjects did assess opportunity and comparative reward to be gained from the crime, relative to other courses of action. Contrary to the rational-choice model, however, there was a significant failure of the subjects to estimate the risks associated with the crime. In other words, little attention or "weight" was given to potential costs as opposed to potential gains in formulating decisions about criminal activities. Simply, it seems that offenders are more aware of rewards than potential sanctions when they are committing criminal acts. Summarizing some sophisticated research in the area of human decision making, Piliavin et al. (1985) note:

Kahneman & Tversky (1984) have demonstrated that the context, or the frame of reference within which a decision problem occurs will lead to choices which can systematically vary from strict rationality rules. Thus, where an outcome of a choice is framed in terms of its gains rather than losses, or where losses are described as costs, there is likely to be a discounting of the negative outcome (Piliavin et al., 1985, p. 26).

Cognition and Crime. Recent studies of cognition and personality in offenders have emphasized the role that individual 'thinking styles' and cognitive development plays in chronic criminal behavior (Andrews, 1980, 1982; Andrews & Wormith, 1984; Andrews, Wormith, & Kiessling, 1985; Ross & Fabiano, 1981, 1985). These findings suggest that chronic criminal behavior is associated with deficiencies in cognitive functioning; i.e., that the thinking processes of many offenders are underdeveloped or inadequate and this accounts, at least in part, for their criminal behavior patterns. Moreover, improvements in certain cognitive

problem-solving skills may be one of the important predictors of decreased criminal recidivism (Andrews, Bonta, & Hoge, 1990). It is further suggested that the primary problem lies in deficient or underdeveloped interpersonal thinking skills, or 'social cognition'.

The skills involved in interpersonal cognition are different from those involved in impersonal cognition (Ross & Fabiano, 1981). Impersonal cognition involves an understanding of concepts related to the physical world and notions of causality, time, movement and space. Interpersonal cognition, on the other hand, requires skills involving the social realm: those aspects of thinking and perceiving which enable an individual "to make inferences about others, to take the perspective of another, to understand the perceptions others have of oneself, and to understand social institutions" (Ross & Fabiano, 1981, p. 7; cf. Little, 1978; McColgan, 1975; Selman & Yando, 1980). In other words, interpersonal or social cognition involves those thinking skills necessary for understanding other people and for solving

interpersonal dilemmas (Spivack, Platt, & Shure, 1976; Temoshok et al., 1978).

The cognitive skills required for basic adult interpersonal adjustment are conceptual in nature and, like other cognitive skills, involve processes of mediation and organization of information. In terms of the specific implications for criminal behavior, the emphasis is on how rather than what one thinks. Interpersonal problem-solving skills have been identified and systematically investigated for many years by Spivack, Shure, Platt and their colleagues. Originally concerned with the social adjustment of children, their work eventually extended to the skills development of adolescents and adults and is thoroughly documented in three seminal volumes published in the mid-seventies (Spivack & Shure, 1974; Spivack, Platt, & Shure, 1976; Shure & Spivack, 1976; for more recent reviews, see Platt, Prout, & Metzger, 1986; Platt & Metzger, 1987). The primary conclusions of these investigations are that there are specific cognitive-mediational skills necessary to both facilitate behavioural adjustment and inhibit maladaptive

behavioural tendencies such as impulsiveness, aggressiveness, and overemotionality, traits not infrequently observed in offender populations. In fact, as Tisdelle & St. Lawrence (1986) note:

Socially skilful functioning has been conceptualized as a prerequisite for adjustment rather than its consequence... a view supported by both correlational and longitudinal data. Correlational evidence suggests that socially ineffective children (those with poor peer relations and deficient communication skills) are more likely to have future life adjustment problems, such as dropping out of school, delinquency, and academic underachievement, and to exhibit high levels of physical or verbal aggression (Tisdelle & St. Lawrence, 1986, p. 338; see also Kelly, 1982; Roff, Sells, & Golden, 1972; Ullman, 1957).

These skills have been categorized into five specific though somewhat overlapping functions which together represent components of an overall

Interpersonal Cognitive Problem-Solving Procedure (ICPS) or strategy (Platt & Spivack, 1985; Spivack, Platt and Shure, 1976):

(a) a sensitivity, or ability to perceive and clearly define potential problems that may arise out of an interaction (interpersonal sensitivity: problem identification).

(b) the ability to generate alternative courses of action in solving a problem (alternative solution thinking);

(c) the ability to imagine the consequences of actions both for oneself and for others (consequential thinking);

(d) the ability to recognize cause-and-effect relationships between one's actions and another's behavior (causal thinking); and

(e) the ability to develop a step-by-step plan for achieving a goal, with recognition of potential

obstacles and means by which to circumvent these obstacles (means-ends thinking).

Spivack, Platt, and Shure (1976) suggest that deficiencies in any one of these cognitive-mediational skills may be related to seemingly irrational, deviant behavior, though the importance or influence of each of the skills may vary as a function of age (cf. Spivack, Platt, & Shure, 1976, pp. 5-8). However, three of the skills - alternative solution thinking, consequential thinking, and means-ends thinking - appear intuitively as well as in the context of the literature related to problem-solving and criminality to be both primary as well as orthogonal. It can be argued that these three skills assume and subsume the other two skills: problem identification and causal thinking.

One of the most ubiquitous characteristics of behavioural disorders is the ineffective handling of interpersonal problem situations (e.g., Bandura, 1969a; Costello, Cohen, Goldstein, & Almanta, 1983; D'Zurilla & Goldfried, 1971; D'Zurilla & Nezu, 1982; Grier, 1988; Intagliata, 1978; Jahoda, 1958; Platt, Scura, & Hannon,

1973; Spivack, Platt & Shure, 1976). For example, when tested on their ability to generate solutions to typical interpersonal problem situations faced by adolescent males, residents of training schools for delinquents demonstrated significantly poorer problem-solving abilities than non-delinquent school students (Ross & Fabiano, 1981). Furthermore, deficits in specific problem-solving skills (means-end thinking, alternative thinking, perspective-taking) were noted in both incarcerated heroin addicts and non-addicted offenders compared to matched non-offender controls (Platt, Scura, & Hannon, 1973; Spivack & Levine, 1963). Qualities of aggressiveness, impulsivity, and general antisocial ideation have also been found to a greater degree in males with these problem-solving deficits than in males who exhibit well developed problem-solving skills (Platt & Siegel, 1973, 1976). Ross and Fabiano (1981) conclude:

Not knowing how to analyze problems or how to consider the possible consequences of alternative ways to resolve them, the individual may respond in a non-reflective, stereotyped and inflexible

way and in order to avoid the problem, may do so immediately without any self-regulating thought. Problem situations for such individuals become situations to be avoided, rather than solved (Ross & Fabiano, 1981, p. 39).

As noted earlier, Ross & Fabiano (1981, 1985) have suggested that those offenders who exhibit the most pronounced deficits in cognitive skills also tend to be the most persistent in their criminality. It may be that these individuals are less likely to be deterred by the threat of formal punishment because they are less able to foresee or anticipate the consequences of their actions or to generate viable alternatives. Thus they would be likely to exhibit patterns of chronic recidivism in part because of the fundamentally distorted thinking styles which are maintained by these cognitive insufficiencies. In a very real sense, these individuals are locked into immature, rigid styles of perceiving, thinking, and reacting which preclude rational decision-making. This prevents them from generating, evaluating, and selecting more adaptive alternative responses to environmental demands. To this

extent, they may appear to be resistant or immune to the effects of social or legal sanctions.

Parameters of Punishment. Punishment is operationally defined as a contingency between a sequence of behaviour (response) and an aversive outcome (punisher), such that when the particular response occurs the aversive event follows with some degree of certainty and generally with some degree of temporal proximity (Hulse, Deese, & Egeth, 1975). In theory, the consistent application of an aversive consequence within a punishment paradigm should have the effect of decreasing the strength or probability of the response. However, this is not always the case:

Punishment can have quite varied and apparently unpredictable effects upon behaviour. It surely is not the case that punishment just weakens the response upon which the punishing stimulus is made contingent. There are situations in which punishing a response appears to strengthen it (Bolles, 1970, p. 44, emphasis added).

There have been a number of systematic investigations and reviews of punishment and it is generally concluded that punishment can be an effective mechanism for behavioural change and control, though certain procedures in the administration of punishment are necessary to maximize its effectiveness in deterring undesired behaviours (e.g., Azrin & Holz, 1966; Bandura, 1969a; Johnston, 1972; Mackintosh, 1974; Walters & Grusec, 1977; Williams, 1973). These include: high initial punishment intensity (Appel, 1963; Azrin, Holz, & Hake, 1963; Church, 1969; Tarpay & Mayer, 1978; Rachlin, 1976); close temporal contiguity between the undesirable behaviours and punishment delivery (Azrin, 1956; Tarpay & Mayer, 1978); decreased availability of rewards and consistent application of punishment for the undesired behaviours (Azrin, Holz, & Hake, 1963); and availability of alternative behaviours for achieving the reward previously provided by the punished behavior (Bandura, 1969a; Moffitt, 1983). Where these parameters are not present, the effects of punishment can be quite inconsistent (Bolles, 1970; Church, 1963; Solomon, 1964).

Some of these parameters are particularly relevant to the question of judicial/societal punishment. For example, it is well known that the effectiveness of punishment diminishes rapidly in direct relation to delays in the delivery of punishment following the undesired behaviour (Aronfreed & Reber, 1965; Bandura, 1969a; Church, 1969; Tarpy & Mayer, 1978). In many animal studies, even the introduction of a delay of a few seconds or a minute or two may be sufficient to disrupt the suppressant effects of punishment (Mackintosh, 1974; Tarpy & Mayer, 1978; Williams, 1973), though there are various cognitive factors which may mediate longer delays in human subjects (e.g., Cheyne & Walters, 1969; Parke, 1969). Even with close temporal contiguity between response and punishment, the suppressive effects are much weaker if punishment is administered at a later rather than earlier point in a complex sequence of behaviour (Aronfreed & Reber, 1965; Walters & Demkow, 1963; Walters, Parke, & Cane, 1965). This is presumably because any suppressive effects are countermanded by the effects of rewards derived earlier in the sequence. Certainly, where a response is concomitantly rewarded and punished,

punishment typically has at best only temporary effects (Bandura, 1969a). And if the behaviour is followed by immediate reward and some time later punishment is administered (a situation which arguably occurs in all criminal acts which are subsequently adjudicated in the courts), the suppressive effects may be extremely attenuated (Bandura, 1969a; Solomon, 1964; Solomon, Turner, & Lessac, 1968).

In view of the logistic and ethical constraints in existing judicial systems, a particularly relevant finding is that behavior change is more rapid and more durable when alternative behaviours are rewarded during the period of time that old behaviours are being suppressed by punishment (Bandura, 1969a, 1969b; Johnston, 1972; Lester, 1979; Walters & Grusec, 1977). This is particularly the case where the alternative responses are incompatible with the punished response (Bandura, 1969a; Holz, Azrin, & Ayllon, 1963). Numerous studies have demonstrated that with no alternative response available punishment may sometimes have only minimal effects on behaviour (Herman & Azrin, 1964; Holz, Azrin, & Ayllon, 1963; Johnston, 1972).

However, if a previously reinforced response is punished, and then a second unpunished response is introduced that will earn a similar reinforcement, the subject will almost invariably engage in the latter (Johnston, 1972).

The effects of punishment are especially complicated when a response is associated with both positive and negative consequences, i.e., approach-avoidance behaviour. In such cases, the positive contingency tends to increase the strength or probability of the response at the same time as the negative contingency tends to decrease the strength or probability of the response. The net effect may depend on the relative magnitudes of the positive and negative consequences as well as the perceived or actual certainties of their delivery. However, it may also depend on adverse reactions to the conflict. "If subjects are punished when they are in a high state of conflict, such as trying to deal with an important but insoluble problem or engaging in innate behavior that is biologically important for survival, neurotic-like behaviors may result" (Tarpy & Mayer, 1978, p. 116).

Moreover, there is evidence that in an approach-avoidance situation, appetitively motivated behaviours may generalize to other environmental contexts more readily or more extensively than aversively motivated behaviours, so that behaviours punished in approach-avoidance situations may be temporarily suppressed and yet fail to generalize beyond the specific punishment situation (Mackintosh, 1974).

Cognition and Punishment. Although the principle of immediacy of punishment suggests a poor prognosis for judicial deterrence measures, human cognitive mediating processes may mitigate the temporal relationships revealed in laboratory research. Aronfreed (1968) suggests that human social communication abilities "may be the most crucial function of cognitive representation (in the) mediation of the temporal gap between a child's behavior and its rewarding or punitive consequences" (Aronfreed, 1968, p. 72). Several studies have demonstrated that, when presented with "reasoning procedures" emphasizing the consequences of certain behavior violations, subjects seem better able to mediate time delays between conduct

violation and the delivery of punishment (e.g., Bandura, 1969b; Cheyne & Walters, 1969; Parke, 1969). The addition of reasoning to time delayed punishments markedly increased its overall effectiveness in suppressing further violations.

As we have seen, punishment is most effective when it is consistently applied and when the individual is aware of and reinforced for alternative courses of action. However, in order to select prosocial alternatives, the offender must also be able (a) to conceive or generate possible alternative courses of action; (b) to formulate the steps inherent in each of the alternatives; and (c) to imagine or visualize the potential outcomes or consequences of each alternative. A rigid, impulsive, or stereotyped style of thinking would necessarily preclude this.

What is lacking in the existing deterrence literature is a systematic examination of the relationship between specific aspects of cognitive functioning and offenders' responses to actual deterrence measures (punishment). In part, this is

because it is often difficult to devise appropriate studies using cause-effect designs and relatively tight control of experimental variables within the constraints of current guidelines for ethical research (Gendreau & Ross, 1981; Gibbs, 1982).

The Present Study

As Paternoster (1987) has noted, "all we know in general is that perceptions of the certainty and severity of punishment do not seem to deter the trivial and infrequent behaviours of high school and university students" (p. 214). There has been little or no examination of the important questions in deterrence research with high criminality adult samples. In addition, the majority of previous research has been retrospective rather than prospective and almost none of it has been individualized (i.e., there has been insufficient attention given to specific individual differences in responsiveness to punishment).

The correctional centre is a potentially useful experimental setting for studying deterrence effects.

In such an environment, illegal behaviours (e.g., theft, assault, etc.) occur with some frequency and are subject to legal sanctions as defined by the prison administration on a relatively consistent, predictable, and immediate basis. In this sense, the prison environment is a microcosmic representation of a "society" with its own laws, restrictions, and consequences. However, with the advantage of greater control over both the apprehension of transgressors and the swift and the more or less certain administration of sanctions, a prison-based study potentially allows the experimenter an opportunity to determine much more precisely the individual and collective effects of punishment.

The purpose of the present study was to investigate the role of certain basic problem-solving abilities in individual responsiveness to punishment. Perceptions of aversiveness and deterrence of sanctions were examined in incarcerated adult offenders. Relationships between these perceptions, cognitive-behavioural skill level, and subsequent infractions of institutional rules and regulations were examined in

order to determine the effectiveness of such sanctions in the control of individual behavior. In addition, these variables are examined in relation to subsequent criminal activity in the community.

Chapter 2

Method

Subjects

The subjects were 71 adult male offenders incarcerated at Rideau Correctional Centre (RCC), a 160 bed medium security institution located approximately southwest of Ottawa and operated by the Ontario Ministry of Correctional Services. The mean age was 23.7 (S.D. = 6.3) at the time of testing and subjects had completed an average of 10.3 years of formal education (S.D. = 1.5). Two subjects escaped from the institution prior to completion of the followup period and an additional seven subjects failed to complete the study for other reasons.

Subjects were volunteers randomly recruited from the inmate population. They were asked to participate in a study examining inmates' attitudes towards institutional punishment practices. They were advised that a series of tests would be administered to assess

"types of imagination and how this relates to feelings about punishment". Subjects were then asked to sign a consent form indicating agreement to participate and containing assurances of full confidentiality (see Appendix 1).

Subjects had served an average of 58.1 days (S.D. = 52.1; minimum = 7 days) at RCC prior to participation in the study. This ensured some familiarity with institutional rules and routine. Only those subjects who remained incarcerated at RCC for at least 3 months following testing (mean = 127.2 days, S.D. = 82.7) were included in the study, to allow for followup of subsequent institutional adjustment.

Procedure

Subjects participating in the study were administered the following test battery:

(1) General Questionnaire. This instrument was devised expressly for this study. The questionnaire consists of two sections scored separately.

(a) Section 1 (Aversiveness). This was administered to all subjects and was intended to assess subjects' perceptions of the aversiveness of institutional sanctions (see Appendix 2).

(b) Section II (General Deterrence). This was also completed by all subjects and was intended to assess the perceived deterrent effect of each sanction in terms of preventing misconducts. Subjects were also asked to predict the number of misconducts they expected to receive during a 3 month followup period (see Appendix 2).

(2) Misconduct Questionnaire. This was administered only to those subjects who were subsequently charged and punished for committing an institutional misconduct. It was administered as soon as possible after the subject incurred the punishment. There were three sections to this questionnaire (see Appendix 3).

(a) Section I. This was intended to assess the subject's ratings of the impulsivity of his

misbehaviour and his awareness and expectations of possible sanctions.

(b) Section II (Aversiveness). This section assessed the subject's perception of the aversiveness of the punishment received.

(b) Section III (Specific Deterrence). This was intended to assess the subject's perception of the deterrent effect of the sanction he received and his prediction of the number of further misconducts he expected to receive over the remainder of the 3 month followup period.

(3) Questionnaire for Subjects Receiving No Further Misconducts. This was administered at the end of the three month followup period to all subjects who received no misconducts during the followup period. This questionnaire asked subjects about their perceptions of the degree to which sanctions played a deterrent role in preventing misconducts; whether any other factors (e.g., job satisfaction, relationships with staff, visits, counselling, etc.) played a role in

preventing misconducts; and what characteristics they felt distinguished themselves from inmates who did receive misconducts (see Appendix 4).

(2) Problem-Solving Skills Battery. Three instruments from the Interpersonal Cognitive Problem Solving Procedure (Spivack, Platt, & Shure, 1976) were selected to make up a test battery intended to measure cognitive problem-solving skill ability. Each of the tests in this battery were scored according to the criteria outlined in the authors' scoring manuals (Platt & Shure, 1977, 1985; Spivack, Platt, & Shure, 1976). The tests were scored by an assistant who was blind to the identities of any of the participants. Additionally, the experimenter scored approximately 20% of the protocols, which at the time were identified only by a subject code. Interrater reliability was 0.80 or higher for those protocols scored by both.

There has been little in the way of published normative data or studies of the psychometric reliability and validity of the instruments in this battery. Spivack, Platt, & Shure (1976) describe some

norms for some of the instruments (also summarized below in Table 5, p. 72) although these are generally based on rather small and specific groups (e.g., psychiatric patients, delinquents, etc.). However, the same criticisms can be made for alternative instruments and, on the basis of current research findings, the ICPS battery appears to evaluate the relevant skills in a more direct and thorough fashion than the currently available alternatives.

(i) Social Means-Ends Problem Solving Test (MEPS).

This test is designed to measure the ability to conceptualize or plan appropriate step-by-step means of attaining a specified or desired goal (see Appendix 5). The MEPS consists of 10 stories. In each, a protagonist is presented in a scene in which some need is generated at the beginning, and which ends with a resolution of that need. However, the steps or means by which the protagonist achieves this end is left out. The task for the subject is to create whatever steps he thinks would logically connect the beginning of the story to the resolution of the story. The subject's score is determined in terms of total number of

'relevant means', 'enumerations', 'obstacles', and 'time'. (Platt & Spivack, 1977; Spivack, Shure, & Platt, 1985). Relevant means are considered those steps which would be effective and realistic in achieving the resolution to the story. Enumerations are descriptions which elaborate or further illustrate the basic means or steps that have been mentioned. Obstacles represent the subject's recognition of potential barriers to attaining the goal. The time score is given to any indication of the awareness of a passage of time over the course of the story they create. In addition, a 'relevancy score' is calculated as the ratio of total number of relevant means to total number of irrelevant, ineffective, or unrealistic means provided in the subject's text.

(ii) Optional Thinking Test (Alternative Thinking). This test measures the ability to generate more than one alternative solution to hypothetical but typical real-life problems (see Appendix 6). Subject's are scored on the number of realistic alternative solutions they provide for each problem. As is the case with the MEPS scoring categories, responses on the

Optional Thinking Test can be scored, in a similar manner, for irrelevant solutions, enumerations of the alternatives, obstacles, and time.

(iii) Awareness of Consequences Test (Temptation Stories). This test assesses the ability to consider the consequences of one's actions by weighing the various pros and cons of an interpersonal act. Responses reflect one's ability to consider how his actions affect himself and other people (see Appendix 7). The test is scored by way of questions regarding the subject's response that reflect an awareness of the consequences of committing a transgression, and whether they do in fact commit the transgression.

(3) Quick Test (QT): As a measure of general intelligence, the Quick Test was administered to all subjects. The QT is a brief, easily administered test of individual intelligence developed by Ammons and Ammons (1962a, 1962b). It requires the subject to match words with the pictorial representation which best represents the meaning of the word, presented verbally by the examiner. Previous research (Davis & Dizzone,

1970; Libb & Coleman, 1971; Maloney, Steger, & Ward, 1973; Watson & Klett, 1975) has shown this test to correlate highly ($r = .74$ to $.84$) with the Wechsler Adult Intelligence Scale (WAIS) Full Scale IQ, and particularly with the WAIS Verbal I.Q. ($r = .80$ to $.88$). In a review of the QT for use with delinquent populations, Gendreau et al. (1975) concluded that the QT has sufficient concurrent validity with several other established measures of intellectual ability. Certainly, the psychometric properties of the QT appear to be adequate for use as a rough estimate of general intelligence.

In addition, data pertaining to personal history, criminal history, current convictions, and current sentence were obtained for each subject from computerized records ("Client Profiles") compiled by the Ministry of Correctional Services. Criminal offences were categorized according to type of offence as follows: "personal offences", defined as crimes involving direct confrontation of a victim (e.g., assault, robbery, etc.); "property offences", where no direct confrontation of a victim occurred (e.g., theft,

break and enter, fraud, etc.); or "drug-alcohol related offences", defined as crimes directly ensuing from the use or sale of alcohol or drugs (e.g., possession of narcotics, trafficking in narcotics, impaired driving, etc.). Institutional records were consulted for each subject to determine the number of institutional "misconducts" (breaches of institutional rules), "speeders" (notices of unsatisfactory performance which serve as official warnings), and "brownies" (notices of outstanding effort) that occurred during each of 3 observation periods: (1) pretest: a variable period of time between admission and testing; (2) followup: a fixed 3-month period following testing; and (3) posttest: a variable period of time between completion of testing and release from the institution.

Misconducts were categorized as "aggressive misconducts" (e.g., assault, gross insult), "security misconducts" (e.g., inciting a disturbance, attempted escape), or "rule violations" (e.g., contraband, being in a forbidden location of the institution, refusing to work), according to the criteria in Appendix 8.

Those inmates who actually committed a misconduct during the followup period were administered the Specific Deterrence sections (Sections III & IV) of the Deterrence Questionnaire to assess their current perceptions of the aversiveness of the punishment they received, its future deterrent impact, and their estimates of the number of future misconducts they expected to incur. Subjects who received no misconducts during the followup period were administered Section V of the Deterrence Questionnaire. Those subjects who remained incarcerated after the 3-month followup period continued to be monitored for institutional conduct until discharge.

Finally, post-release criminal activity was monitored for a period of 1 year following discharge for as many subjects as possible using Ministry of Correctional Services computerized records; such records were obtained for 65 of the 71 subjects.

Chapter 3

Results

Descriptive Statistics for the Total Sample

Demographic Data and Criminal History. Table 1 summarizes the personal and criminal history data. The mean age at testing was 23.7 (range 18 to 52 years), the average level of education was grade 10 (range grade 7 to 2nd year university), and the mean Quick Test IQ was 94.21 (range 75 to 125). The majority of offences for which subjects had been convicted, both currently and in their past records, were property offences. They had an average of 6.09 previous convictions (range 0 to 21) and 2.01 previous incarcerations (range 0 to 10). The average total number of convictions in the current incarceration was 4.6 (range 1 to 13) and the average aggregate sentence was 428.4 days (range 149 to 750 days). These data are comparable to those presented in the Ministry of Correctional Services offender statistics (Annual Report, 1987). Thus, the present sample is not atypical in terms of the major characteristics of

Table 1.

Descriptive statistics for the Demographic and Criminal
History Variables.

	<u>Mean</u>	<u>S.D.</u>	<u>Median</u>
Age	23.69	6.37	22
Education	10.30	1.47	10
Age Left School	16.94	2.15	16
IQ (Quick Test)	94.21	8.56	94

Percent

Marital Status

Married	7.0
Common Law	8.5
Single	84.5

Dependents

None	80.3
One	7.0
Two	7.0
Three	2.8
Four	2.8

Table 1 (cont.).

Descriptive statistics for the Demographic and Criminal
History Variables.

	<u>Percent</u>
<u>Race</u>	
Caucasian	94.4
Native Canadian	2.8
Other	2.8
<u>Language</u>	
English	90.1
English-French Bilingual	9.9
<u>Religion</u>	
Unknown	11.3
Roman Catholic	32.4
Protestant	33.8
Other	4.2
None	18.3

Table 1 (cont.).

Descriptive statistics for the Demographic and Criminal
History Variables.

	<u>Percent</u>
<u>Employment</u>	
Employed	52.1
Unemployed	47.9
<u>Occupation</u>	
Unknown	1.4
Managerial	1.4
Professional/Technical	1.4
Clerical/Sales	1.4
Craftsman	9.9
Personal Service	1.4
Labourer	77.5
Student	5.6

Table 1 (cont.).

Descriptive statistics for the Demographic and Criminal
History Variables.

	<u>Mean</u>	<u>S.D.</u>	<u>Median</u>
<u>Current Convictions</u>			
Personal Offences	0.549	0.907	0
Non-Personal Offences	4.028	2.923	4
Total Offences	4.592	2.713	4
Aggregate Sentence (dys)	428.4	171.9	375
<u>Previous Convictions</u>			
Personal Offences	0.478	1.064	0
Non-Personal Offences	5.681	4.621	5
Total Offences	6.087	4.816	6
Total Incarcerations	2.014	1.960	2

incarcerated male offenders within the Ontario correctional system.

Institutional Conduct. Table 2 presents descriptive statistics for various measures of institutional conduct. As may be seen, there was considerable individual variability for each of these variables. Subjects averaged 2 to 3 misconducts each over the total period of incarceration (range = 0 to 14). The majority of misconducts were in the "rule violation" category, followed closely by "aggressive" misconducts; there were very few "security" misconducts (see Appendix 8 for a description of the misconduct categories).

In addition, subjects averaged approximately 3 "speeders" (notices of unsatisfactory behaviour) over the total period of incarceration, with most of these occurring during the pretest period. The average number of "brownies" (notices of outstanding effort) during the posttest period was about 3 (data for pretest "brownies" was not readily available).

Table 2.

Descriptive Statistics for Institutional Conduct Variables.

	<u>Mean</u>	<u>S.D.</u>	<u>Median</u>
Total Misconducts	2.49	3.35	1
Pretest Misconducts	0.73	1.41	0
Posttest Misconducts	1.93	2.78	1
Followup Misconducts	1.18	1.87	0
Aggressive Misc., Posttest	0.79	1.70	0
Aggressive Misc., Followup	0.48	1.05	0
Rule Violations, Posttest	0.99	1.37	0
Rule Violations, Followup	0.59	1.10	0
Security Misc., Posttest	0.20	0.58	0
Security Misc., Followup	0.13	0.41	0
"Speeders", Total	3.10	5.16	2
"Speeders", Posttest	2.26	4.18	1
"Speeders", Followup	1.59	3.92	0
"Brownies", Posttest	3.03	4.48	2
"Brownies", Followup	2.23	3.44	1
% Sentence Served	0.57	0.19	0.64

Table 2 (cont.).

Descriptive Statistics for Institutional Conduct Variables.

<u>Mode of Discharge</u>	<u>Frequency</u>	<u>%</u>
Regular discharge	25	35.2
Discharged at warrant expiry	17	23.9
Released on parole	12	16.9
CRC placement	3	4.2
Escaped	3	4.2
Transferred	11	15.5

Finally, subjects served an average of 57% of their aggregate sentences prior to release (actual time of institutional incarceration may be reduced from the aggregate sentence by earned remission, parole, or placement in a Community Residential Centre or "halfway house"). The mode of release (e.g., parole, expiry, etc.) for subjects in this sample is also summarized in Table 2.

Recidivism. Recidivism data over the one year followup period was successfully obtained for 65 of the 71 subjects. Of these, 37 of the subjects incurred no further charges during this time, while the remaining 28 subjects accumulated from 1 to 9 charges each (see Table 3). The majority of the new charges were for property offences. Probably because of the relatively short followup period and generally slow progress of the courts, only 5 of the 65 had been convicted for new offences by the end of the followup period.

Measures of Problem-Solving Skill. Table 4 shows the mean scores and standard deviations for the basic measures derived from the problem-solving skills tests

Table 3.

Number of Post-Release Charges and Convictions During
the One-Year Followup Period.

	<u>Frequencies</u>					
	Number of Charges					
	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5+</u>
Total Charges	37	9	4	8	3	4
Property Offences	43	8	6	4	0	4
Drug/Alcohol Offences	54	7	3	1	0	0
Total Convictions	60	3	1	1	0	0

Table 4.

Descriptive Statistics for the Interpersonal Problem-Solving Skills Battery.

	<u>Mean</u>	<u>S.D.</u>	<u>Median</u>
<u>Means-Ends Problem Solving Test</u>			
Total Means	20.28	6.05	20
Enumerations	7.34	3.60	7
Obstacles	0.14	0.59	0
Time	0.34	0.68	0
Relevancy Ratio	.931	.097	.957
<u>Optional Thinking Test</u>			
Number of Alternatives	12.21	4.73	12
Enumerations	2.41	1.89	2
Obstacles	0.06	0.48	0
Time	0.00	0.00	0
<u>Composite Measures</u>			
TOTCOG ¹	42.24	11.98	42
ALLCOG ²	42.78	12.24	42

Table 4 (cont.).

Descriptive Statistics for the Interpersonal Problem-
Solving Skills Battery.

	<u>Mean</u>	<u>S.D.</u>	<u>Median</u>
<u>Awareness of Consequences Test</u>			
Considers Transgressing	99.65	2.97	100
Considers Consequences	84.51	23.67	100
Transgresses	39.09	30.39	25

¹ TOTCOG = MEPS Means + Enumerations plus Alternatives
and Enumerations

² ALLCOG = MEPS means + Enumerations + Obstacles + Time
plus Alternatives + Enumerations + Obstacles
+ Time

(means-ends thinking, alternative thinking, and consequential thinking). It is noteworthy that these scores approximate the published norms for higher functioning subjects (e.g., university students: Higgins & Thies, 1982; Platt & Spivack, 1985: see Table 5).

Statistics for two composite measures of problem-solving ability are also shown in Table 4. The first, TOTCOG, was defined as the sum of Total Means and Enumerations from the MEPS and Total Alternatives and Enumerations from the Optional Thinking Test. The second, ALLCOG, was defined as TOTCOG plus Obstacles and Time for the two tests.

Finally, Table 4 includes descriptive statistics for questions 1 (considers transgressing), 2 (considers consequences), and 4 (transgresses) of the Awareness of Consequences Test.

Table 5.

Normative Data for Measures of Interpersonal Problem-Solving.

	<u>Mean</u>	<u>S.D.</u>
<u>Total Means</u>		
University students, n=38 ^{1,2}	24.9	---- ⁶
Penitentiary inmates, n=54 ^{1,2}	10.8	---
Reformatory inmates, n=329 ^{1,2}	13.2	---
"Good" inmates, n=20 ⁵	18.1	3.64
Disciplinary problem inmates, n=20 ⁵	14.9	4.01
"Misfit" inmates, n=20 ⁵	8.3	3.52
<u>Relevancy scores</u>		
University students, n=38 ^{1,2,3}	0.95	---
Penitentiary inmates, n=54 ^{1,2,3}	0.82	---
Reformatory inmates, n=36 ^{1,2,3}	0.86	---
"Good" inmates, n=20 ⁵	0.91	0.18
Disciplinary problem inmates, n=20 ⁵	0.89	0.17
"Misfit" inmates, n=20 ⁵	0.60	0.22

Table 5 (cont.).

Normative Data for Measures of Interpersonal Problem-
Solving.

Correlations between MEPS & Other Measures

	<u>Pearson r^{1,4}</u>
Alternatives	.14
Consequences	.04
Quick Test IQ	.34

¹ From Platt & Spivack (1985)

² Based on 9 stories, prorated for 10 stories

³ Based on 9 stories

⁴ N = 47 normal adults

⁵ From Higgins & Thies (1982)

⁶ Standard deviations not reported

Subjective Aversiveness and Deterrence Ratings for
Institutional Sanctions

Table 6 summarizes the subjective ratings of aversiveness for 10 common institutional sanctions used in the correctional centre, in terms of the percentage of subjects who gave each of the 7 possible scores for this measure. Table 7 presents similar data for subjective ratings of deterrence for the same sanctions. Each of these sanctions is a common administrative response to institutional misbehaviour throughout the Ontario correctional system.

Overall, ratings of the threat of loss of earned remission ("good time") appeared to have the greatest deterrent effect (75% of sample not only rated this as aversive but felt it would act as a deterrent to breaches of institutional rules). The sample was divided in terms of their perceptions of the deterrent impact of receiving administration segregation ("cell time") as a punishment: 49% reported that they either wouldn't care or would actually enjoy cell time and only 50% rated cell time as sufficiently aversive to

Table 6.

Initial Ratings of Aversiveness of Individual Sanctions: Percentage of Subjects

	(Like)	1	2	3	4	5	6	7	(Dislike)
Loss of 3 days E.R. ¹	0	0	1.4	14.1	19.7	16.9	46.5		
Loss of 9 days E.R.	0	0	0	7.0	7.0	12.7	73.2		
Loss of 15 days E.R.	0	0	0	2.9	1.4	2.9	92.9		
"Speeders"	2.9	2.9	0	40.0	22.9	8.6	22.9		
Cells 2 days	8.5	1.4	8.5	25.4	16.9	14.1	25.4		
Cells 10 days	5.7	0	2.9	12.9	5.7	18.6	54.3		
Remain Incentive Allowance Level	4.2	2.8	1.4	25.4	19.7	16.9	29.6		
Downgrade Incentive Allowance	0	1.4	0	15.5	15.5	18.3	49.3		
Cells Beancake ² 2 days	2.8	1.4	1.4	12.7	18.3	11.3	52.1		
Cells Beancake 3-10 days	2.8	0	0	4.2	5.6	11.3	76.1		

¹ Earned Remission

² Segregation with restricted diet (beancake)

Table 7.

	<u>Initial Ratings of Deterrence of Individual Sanctions: Percentage of Subjects</u>							
	(Not Deterred)	1	2	3	4	5	6	7 (Deterred)
Loss of 3 days E.R.	18.3	4.2	8.5	5.6	11.3	19.7	32.4	
Loss of 9 days E.R.	9.9	8.5	2.8	1.4	12.7	12.7	52.1	
Loss of 15 days E.R.	9.9	1.4	2.8	4.2	4.2	11.3	66.2	
"Speeders"	39.4	12.7	9.9	8.5	11.3	9.9	8.5	
Cells 2 days	25.4	12.7	7.0	8.5	11.3	19.7	15.5	
Cells 10 days	16.9	4.2	4.2	14.1	5.6	16.9	38.0	
Remain Incentive Allowance Level	22.5	14.1	7.0	11.3	15.5	18.3	11.3	
Downgrade Incentive Allowance	15.5	8.5	9.9	7.0	11.3	25.4	22.5	
Cells Beancake 2 days	12.7	11.3	12.7	12.7	4.2	9.9	36.6	
Cells Beancake 3-10 days	8.5	4.2	2.8	9.9	9.9	16.9	47.9	

serve as a deterrent. A similar pattern was observed in subjects' ratings of being dropped one or more levels in incentive allowance (53.3% were either indifferent or felt the threat of this sanction would not be a deterrent, while 46.5% reported that it would be a deterrent). "Speeders" (notices of negative rating that function primarily as official warnings) were generally considered to have little deterrent impact (70.4% rated this sanction as nondeterrent).

Intercorrelations Among Problem-Solving Measures

All of the problem-solving measures were significantly intercorrelated, as summarized in Table 8. In most cases, the correlation coefficients are high (0.80 or greater). The correlation coefficients for the current sample are somewhat higher than published norms (cf. Table 5). For example, Platt & Spivack (1985) reported a correlation of 0.14 between the MEPS and alternatives for normal adults while in the present study the correlation was 0.37.

Table 8.

Intercorrelations among Measures of Problem-Solving Skill.

	<u>ALT</u>	<u>REL</u>	<u>TOTCOG</u>	<u>ALLCOG</u>	<u>CONS1</u>	<u>CONS2</u>
MEPS	.37**	.78**	.87**	.87**	.14	.37**
ALT		.32*	.67**	.67**	.33	.31*
REL			.68**	.68**	.15	.32*
TOTCOG				.99**	.25	.45**
ALLCOG					.26	.46**

Key: * p<.01 ** p<.001

MEPS Total Means on the MEPS

ALT Total Alternatives

REL Relevancy Ratio

TOTCOG Means+Enumerations+ALT+Enumerations

ALLCOG Means+Enumerations+Obstacles+Time
+ALT+Enumerations+Obstacles+Time

CONS1 Total score: Awareness of Consequences Test

CONS2 Question 2: Awareness of Consequences Test

Correlations between Problem-Solving Measures and Other
Dependent Measures

Demographic Data and Criminal History. In general, the problem-solving measures were not significantly related to any of the demographic or criminal history variables (see Table 9). The exceptions were for the Relevancy Ratio and either total number of previous convictions or number of previous convictions for property offences, where there were low positive correlations.

The correlations between problem-solving measures and education or IQ for the current sample are very small and in fact substantially lower than published norms (cf. Table 5; Spivack, Platt, & Shure, 1976). This is probably due to the restriction of range for these variables with the rather homogeneous sample used in this study.

Institutional Conduct. In general, correlations between problem-solving measures and measures of institutional conduct were negative and rather small

Table 9.

Correlations between Problem-Solving Measures and Demographic and CriminalHistory Variables.

	<u>AGE</u>	<u>EDUC</u>	<u>IQ</u>	<u>TOTCUR</u>	<u>CURPER</u>	<u>CURPRO</u>	<u>AGSENT</u>	<u>TOTPAST</u>	<u>PASTPRO</u>	<u>INCARC</u>
MEPS	.14	.11	.02	-.10	-.01	-.08	.02	.17	.19	.13
ALT	.00	.08	.06	.05	.06	.03	.08	.00	-.02	.15
REL	.14	.07	-.15	.00	-.03	.02	-.07	.21*	.21*	.07
TOTCOG	.09	.11	.13	-.07	-.05	-.04	.04	.09	.07	.13
ALLCOG	.10	.15	.13	-.08	-.06	-.06	.03	-.07	-.05	.12
CONS1	-.27	.16	-.06	.10	-.05	.11	-.02	.14	.12	.14
CONS2	.17	.02	.41**	-.20	-.21	-.12	-.19	.20	.16	.14

Table 9 (cont.).

Correlations between Problem-Solving Measures and Demographic and CriminalHistory Variables.

Key: * p<.05 ** p<.01

MEPS	Total Means on the MEPS Test
ALT	Total Alternatives
REL	Relevancy Ratio
TOTCOG	Means+Enum+ALT+Enum
ALLCOG	Means+Enum+Obst+Time+ALT+Enum+Obst+Time
CONS1	Total Score: Awareness of Consequences Test
CONS2	Question 2: Awareness of Consequences Test

TOTCUR	Total current offences
CURPER	Current personal offences
CURPRO	Current property offences
AGSENT	Aggregate sentence
TOTPAST	Previous convictions
PASTPRO	Previous property offences
INCARC	Total previous incarcerations

(see Table 10). There were significant negative correlations between total number of misconducts and each of the problem-solving measures except Total Alternatives and Total Means. However, number of followup misconducts was not significantly correlated with any of the problem-solving measures.

There were also significant negative correlations between number of aggressive misconducts and the Relevancy Ratio and TOTCOG (MEPS Means plus Enumerations plus Alternatives plus Enumerations). Rule violation misconducts (the most frequent category) were negatively correlated with the Relevancy Ratio only. Security misconducts were not significantly related to any of the problem-solving measures.

Total number of "speeders" and number of followup "speeders" were not significantly correlated with any of the problem-solving measures. In contrast, total number of "brownies" was significantly negatively correlated with all of the problem-solving measures except Total Alternatives, although again the coefficients were generally rather small. The

Table 10:
Correlations between Problem-Solving Measures and Institutional Conduct Variables.

	<u>TMISC</u>	<u>MISC1</u>	<u>MISC3</u>	<u>MISC5</u>	<u>FMISC</u>	<u>TSPED</u>	<u>FSPED</u>	<u>FBROWN</u>	<u>%SENT</u>
MEPS	-.18	-.16	-.15	-.07	.01	-.01	.01	-.21*	-.05
ALT	-.10	-.11	-.06	-.02	-.01	-.04	.08	-.08	-.02
REL	-.23*	-.25*	-.28**	-.07	-.05	-.02	.03	-.16	-.04
TOTCOG	-.22*	-.19*	-.17	-.08	-.02	-.04	.00	-.19*	-.10
ALLCOG	-.21*	-.18	-.17	-.09	-.01	-.06	-.01	-.17	-.10
CONSI	.05	-.06	.07	-.05	.12	.02	.00	-.07	.14
CONSI	-.20	-.33*	-.18	-.01	-.07	.03	.03	-.11	-.21

Key: * p<.05 ** p<.01

MEPS	Total Means (MEPS)
ALT	Total Alternatives
REL	Relevancy Ratio
TOTCOG	Means+Enum+ALT+Enum
ALLCOG	Means+Enum+Obst+Time+ALT+Enum+Obst+Time
CONSI	Total Score: Awareness of Consequences Test
CONSI	Question 2: Awareness of Consequences Test
TMISC	Total misconducts
MISC1	Aggressive misconducts
MISC3	Rule violation misconducts
MISC5	Security misconducts
FMISC	Followup misconducts (total)
TSPED	Total "speeders"
FSPED	Followup "speeders"
FBROWN	Followup "brownies"
%SENT	% of Sentence Served Prior to Discharge

relationship between number of followup "brownies" and problem-solving was not as clear. A low negative correlation was found between this measure and Total Means score. There was a similar correlation between followup "brownies" and the two composite measures which included Enumerations for the MEPS test and the Optional Thinking Test (TOTCOG) or Enumerations, Obstacles, and Time for both tests (ALLCOG).

Proportion of sentence served prior to discharge was not significantly related to any of the problem-solving measures.

Recidivism. Total number of criminal charges during the 1-year followup period after release was negatively correlated with all of the problem-solving measures except Total Alternatives and the Relevancy Ratio (see Table 11). There was a significant but low negative correlation between number of charges for property offences and TOTCOG (MEPS Means and Enumerations plus Alternatives and Enumerations).

Table 11.

Correlations between Problem-Solving Measures and
Recidivism Variables.

	<u>CHARGES</u>	<u>CONVICTIONS</u>	<u>PROPERTY</u>	<u>DRUG/ALC</u>
MEPS	-.20*	-.19	-.19	-.05
ALT	-.01	-.02	-.01	.01
REL	-.08	-.20*	-.04	-.04
TOTCOG	-.22*	-.18	-.20*	-.11
ALLCOG	-.22*	-.19	-.19	-.10
CONS1	-.01	.12	-.07	.10
CONS2	-.06	.10	-.10	-.04

Key: * p<.05 ** p<.01

MEPS Total Means (MEPS)
 ALT Total Alternatives
 REL Relevancy Ratio
 TOTCOG Means+Enumerations+ALT+Enumerations
 ALLCOG Means+Enum+Obst+Time+ALT+Enum+Obst+Time
 CONS1 Total score: Awareness of Consequences
 CONS2 Question 2: Awareness of Consequences

CHARGES Total followup charges
 CONVICTIONS Total followup convictions
 PROPERTY Followup charges: property offences
 DRUG/ALCOHOL Followup charges: drug/alcohol offences

Number of drug-alcohol charges was not significantly related to any of the problem-solving measures. Total number of convictions was not significantly related to any of the problem-solving measures except the Relevancy Ratio, where the correlation was negative and quite low.

Intercorrelations Among Aversiveness & Deterrence Measures

For the most part, subjective aversiveness ratings for the 10 institutional sanctions were significantly intercorrelated (see Table 12). The major exceptions occurred with ratings of the loss of 15 days earned remission, which virtually all of the subjects rated as aversive (97.1%), and remaining at the same level of incentive allowance. Deterrence ratings were also significantly intercorrelated and the correlation coefficients were generally higher than for the aversiveness ratings. Finally, as shown in Table 12, aversiveness ratings also tended to be significantly correlated with deterrence ratings for the same sanctions, with the exceptions of "speeders", remaining

Table 12 (cont).

Intercorrelations among Subjective Ratings of Aversiveness and
Deterrence of Institutional Sanctions.

	<u>DET1</u>	<u>DET2</u>	<u>DET3</u>	<u>DET4</u>	<u>DET5</u>	<u>DET6</u>	<u>DET7</u>	<u>DET8</u>	<u>DET9</u>	<u>DET10</u>
AV1	.48	.40	.27	.45	.39	.32	.32	.34	.24	.21
AV2	.41	.46	.33	.24	.31	.34	.17 ⁺	.25	.22	.30
AV3	.38	.42	.46	.23	.26	.33	.17 ⁺	.26	.30	.33
AV4	.16 ⁺	.09	-.02 ⁺	.45	.24	.09 ⁺	.18 ⁺	.20	.19 ⁺	.09 ⁺
AV5	.41	.29	.16 ⁺	.50	.64	.52	.28	.36	.43	.31
AV6	.23	.25	.17 ⁺	.31	.45	.57	.10 ⁺	.15	.31	.31
AV7	.08 ⁺	.08 ⁺	.02 ⁺	.22	.14 ⁺	.12 ⁺	.52	.29	.08 ⁺	.12 ⁺
AV8	.17 ⁺	.16 ⁺	.05 ⁺	.26	.33	.29	.40	.51	.30	.24
AV9	.37	.45	.30	.42	.49	.43	.31	.53	.54	.48
AV10	.28	.38	.27	.27	.31	.36	.21	.31	.34	.49

Note: All correlations significant at $p < .05$ except ⁺

Key:

- 1 Lose 3 days E.R.
- 2 Lose 9 days E.R.
- 3 Lose 15 days E.R.
- 4 "Speeders"
- 5 Cells 2 days
- 6 Cells 10 days
- 7 Remain same Incentive Allowance level
- 8 Downgrade a level in Incentive Allowance
- 9 Cells with beancake for 2 days
- 10 Cells with beancake for 3-10 days

at the same incentive allowance level, and 10 days cell time.

Correlations between Aversiveness and Deterrence
Ratings and Problem-Solving Measures

In general, subjective ratings of aversiveness or deterrence of the institutional sanctions were not highly correlated with any of the measures of problem-solving skill (Table 13). This was especially the case for deterrence ratings, where the only significant correlation was between Total Alternatives and 10 days cell time. The correlations between aversiveness ratings and problem-solving skill were somewhat higher on the whole and reached statistical significance levels in a number of cases.

Table 13.

Correlations between Subjective Ratings of Aversiveness and
Deterrence and Problem-Solving Measures.

	<u>MEANS</u>	<u>ALT</u>	<u>REL</u>	<u>TOTCOG</u>	<u>ALLCOG</u>
AV1	.18 [~]	.09	.18 [~]	.18 [~]	.19 [~]
AV2	.28**	.13	.25*	.28	.29
AV3	.20*	.00	.20*	.14	.15
AV4	-.06	-.13	-.04	-.11	-.09
AV5	.03	.11	.00	.07	.09
AV6	.13	.22*	.06	.21*	.22*
AV7	.00	.04	.00	.03	.04
AV8	.21*	.15	.29**	.23*	.24*
AV9	.01	.09	.07	.08	.09
AV10	.17	.16	.15	.26*	.29*
AVG	.13	.13	.14	.18	.20*
DET1	.03	.09	-.04	.08	.08
DET2	.08	.12	.00	.13	.13
DET3	.08	.09	-.02	.08	.09
DET4	.07	.07	.00	.04	.07
DET5	-.02	.12	-.04	.00	.02
DET6	.00	.20*	.00	.05	.06
DET7	-.11	.07	-.02	-.10	-.10
DET8	-.06	.02	.09	-.08	-.08
DET9	-.09	-.02	.00	-.12	-.12
DET10	-.03	.07	.02	-.03	-.03
AVG	-.01	.11	.00	.00	.02

Key: * $p < .05$ ** $p < .01$ [~] $p \leq .06$

-1	Lose 3 days	-6	Cells 10 days
-2	Lose 9 days	-7	Same Incentive Allowance level
-3	Lose 15 days	-8	Downgrade Incentive Allowance level
-4	Speeders	-9	Cells with beancake for 2 days
-5	Cells 2 days	-10	Cells with beancake for 3-10 days

MEANS	MEPS Total Means
ALT	Total Alternatives
REL	Relevancy Ratio
TOTCOG	MEPS Means+Enumerations + Alternatives+Enumerations
ALLCOG	MEPS Means+Enum+Obst+Time + ALT+Enum+Obst+Time

Correlations between Aversiveness and Deterrence
Ratings and Other Dependent Measures

Demographic Data and Criminal History. With a few exceptions, aversiveness ratings were not significantly correlated with age, education, or any of the criminal history variables. However, the correlations between IQ and aversiveness ratings were significant in a number of cases (see Table 14).

Similarly, deterrence ratings were not correlated with the majority of the demographic or criminal history variables. Again, however, there were significant correlations between ratings of some of the sanctions and IQ. In addition, age at testing was significantly correlated with deterrence ratings for several of the sanctions.

Institutional Conduct. Subjective aversiveness ratings for a number of the institutional sanctions were significantly and negatively correlated with many of the institutional conduct variables (see Table 15), including total misconducts, aggressive or rule

Table 14.

Correlations between Subjective Ratings of Aversiveness and Deterrence and Demographic and Criminal History Variables.

	<u>AGE</u>	<u>EDUC</u>	<u>IQ</u>	<u>TOTCUR</u>	<u>CURPER</u>	<u>CURPRO</u>	<u>AGSENT</u>	<u>TOTPAST</u>	<u>PASTPRO</u>	<u>INCARC</u>
AV1	.26*	.12	-.15	.01	-.01	.01	.09	-.00	-.05	-.06
AV2	.14	-.02	-.21*	.06	-.13	.09	.06	.06	-.01	.03
AV3	.14	-.00	-.11	-.01	-.04	.00	.09	.15	.14	.09
AV4	.07	.17	-.30*	-.08	.18	-.14	.05	-.13	-.15	-.11
AV5	.11	.14	-.15	-.02	-.02	-.02	.09	-.25*	-.23*	-.20*
AV6	.12	.18	.09	.04	-.07	.06	.04	-.13	-.12	-.13
AV7	.15	.04	-.21	.09	-.15	.12	.15	-.01	-.03	-.01
AV8	.10	.07	-.28*	.02	-.23*	.09	.18	.06	.03	-.04
AV9	.12	.05	-.25*	.01	-.08	.03	.08	-.11	-.14	-.12
AV10	.04	.02	-.12	.04	-.13	.07	-.10	.12	.06	.09
AVG	.18	.13	-.25*	.02	-.09	.04	.10	-.08	-.11	-.10
DEP1	.23*	.07	.09	-.14	-.16	-.08	.06	.07	.07	.17
DEP2	.20*	.02	.03	-.04	-.23*	.03	.03	.16	.13	.20*
DEP3	.17	.11	.05	-.09	-.17	-.03	.15	.19	.20*	.18
DEP4	.19	.13	-.24*	-.03	.02	-.04	.08	-.12	-.11	-.13
DEP5	.22*	.09	-.12	-.04	-.18	.01	.10	-.15	-.12	-.05

Table 14 (cont.).

Correlations between Subjective Ratings of Aversiveness and Deterrence and Demographic and Criminal History Variables.

	<u>AGE</u>	<u>EDUC</u>	<u>IQ</u>	<u>TOTCUR</u>	<u>CURPER</u>	<u>CURPRO</u>	<u>AGGSENT</u>	<u>TOTPAST</u>	<u>PASTPRO</u>	<u>INCARC</u>
DET6	.12	.12	-.11	.10	-.22*	.15	.09	.04	.07	.08
DET7	.11	-.00	-.32**	.03	.04	.01	.15	.06	.06	.09
DET8	.18	.00	-.29*	-.06	.01	-.07	.11	.07	.08	.07
DET9	.22*	-.02	-.18	-.01	-.07	.01	.11	-.01	.04	-.02
DET10	.09	.02	-.21*	.09	-.21*	.14	.07	.22*	.24*	.17
AVG	.23*	.07	-.18	-.03	-.15	.01	.12	.06	.08	.10

Key: * p<.05 ** p<.01 - p<.06

TOTCUR	Total current offences		
CURPER	Current personal offences		
CURPRO	Current property offences		
AGGSENT	Aggregate sentence		
TOTPAST	Previous convictions		
PASTPRO	Previous property offences		
INCARC	Total previous incarcerations		
-1	Lose 3 days	-6	Cells 10 days
-2	Lose 9 days	-7	Same Incentive Allowance level
-3	Lose 15 days	-8	Downgrade Incentive Allowance level
-4	Speeders	-9	Cells with beancake for 2 days
-5	Cells 2 dys	-10	Cells with beancake for 3-10 days

Table 15.
Correlations between Subjective Ratings of Aversiveness and Deterrence and Institutional Conduct Variables.

	<u>TMISC</u>	<u>MISCI</u>	<u>MISC3</u>	<u>MISC5</u>	<u>FMISC</u>	<u>TSPEED</u>	<u>FSPEED</u>	<u>FBROWN</u>	<u>\$SENT</u>
AV1	-.28*	-.16	-.24*	-.13	-.37**	-.25*	-.25*	.07	-.22*
AV2	-.16	-.21*	-.06	.02	-.09	-.08	-.04	.05	-.21*
AV3	-.22*	-.34**	-.09	.00	-.19	.04	.04	.12	-.22*
AV4	-.01	.22*	-.04	-.04	-.13	-.21*	-.20*	.16	-.04
AV5	-.17	-.02	-.20*	-.05	-.22*	-.34**	-.33**	.25*	-.21*
AV6	-.08	-.13	-.09	.03	-.08	-.09	-.08	.07	-.08
AV7	-.21*	-.10	-.14	-.13	-.18	-.15	-.12	.09	-.18
AV8	-.20*	-.08	-.22*	.09	-.15	-.27*	-.22*	.08	-.26*
AV9	-.36**	-.25*	-.24*	.00	-.34**	-.19	-.16	.23*	-.35**
AV10	-.24*	-.36**	-.08	.07	-.18	.05	.05	.13	-.25*
AVG	-.28**	-.18	-.22*	-.03	-.29**	-.25*	-.23*	.20*	-.29**
DET1	-.09	-.13	-.36*	.12	-.10	-.04	.02	.16	-.15
DET2	-.10	-.20*	-.05	.16	-.05	.10	.13	.12	-.21*
DET3	-.06	-.23*	.01	.12	-.07	.20*	.16	.13	-.23*
DET4	-.04	-.02	.06	-.00	-.19	-.11	-.12	.07	-.05
DET5	-.20*	-.18	.02	.04	-.25*	-.25*	-.23*	.22*	-.12
DET6	-.08	-.23*	-.02	.14	-.11	.02	-.01	.15	-.10
DET7	-.08	-.10	-.09	.17	-.17	-.07	-.05	.08	-.22*
DET8	-.15	-.11	-.18	.14	-.18	-.13	-.08	.17	-.33**
DET9	-.11	-.13	-.09	.10	-.18	-.10	-.08	.11	-.24*
DET10	-.03	-.21*	.09	.18	-.03	.14	.10	.10	-.24*
AVG	-.12	-.20*	-.06	.15	-.17	-.04	-.03	.18	-.24*

Table 15 (cont.):
Correlations between Subjective Ratings of Aversiveness and Deterrence and Institutional Conduct Variables.

Key: * p<.05 ** p<.01 p<.06

TMISC	Total misconducts
MISC1	Aggressive misconducts
MISC3	Rule violation misconducts
MISC5	Security misconducts
FMISC	Followup misconducts (total)
TSPEED	Total "speeders"
FSPED	Followup "speeders"
FBROWN	Followup "brownies"
%SENT	% Sentence Served Prior to Discharge
-1	Lose 3 days E.R.
-2	Lose 9 days E.R.
-3	Lose 15 days E.R.
-4	"Speeders"
-5	Cells 2 days
-6	Cells 10 days
-7	Same Incentive Allowance level
-8	Downgrade Incentive Allowance level
-9	Cells with beancake for 2 days
-10	Cells with beancake for 3-10 days

violation misconducts (but not security misconducts), followup misconducts, total "speeders" and followup "speeders", and percentage of sentence served prior to release. The major exceptions to this were for aversiveness ratings of loss of 9 days earned remission and for 10 days cell time, where the correlations were generally not significant.

The correlations for deterrence ratings and institutional conduct were smaller and less frequently significant, although again the majority of the deterrence ratings were significantly and negatively correlated with percentage of sentence served.

Recidivism. In general, subjective aversiveness or deterrence ratings were not highly correlated with new criminal charges or convictions during the 1-year followup period (see Table 16). In the small number of cases where significant correlations emerged, however, the relationship was an inverse one, with subjects who gave lower aversiveness or deterrence ratings incurring a greater number of followup charges or convictions.

Table 16.

Correlations between Subjective Ratings of Aversiveness
and Deterrence and Recidivism Variables.

	<u>CHARGES</u>	<u>CONVICT</u>	<u>PROPERTY</u>	<u>DRUG/ALC</u>
AV1	-.10	.07	-.09	-.18
AV2	-.04	.09	-.05	-.09
AV3	.01	.06	.03	-.09
AV4	.03	-.04	.08	-.10
AV5	.01	.11	.04	-.20 ⁻
AV6	.04	-.00	.07	-.07
AV7	-.06	-.19 ⁻	.00	-.10
AV8	-.28*	-.07	-.24*	-.27*
AV9	-.04	.13	.00	-.29**
AV10	.04	.11	.05	-.10
AVG	-.06	.03	-.01	-.23*
DET1	.00	.00	-.01	-.10
DET2	-.03	.14	-.07	-.10
DET3	-.07	.18	-.12	-.05
DET4	.01	.14	.00	-.02
DET5	-.08	-.01	-.09	-.17
DET6	-.05	.11	-.07	-.05
DET7	.06	.08	.09	-.08
DET8	-.13	.12	-.10	-.23*
DET9	-.09	.03	-.05	-.16
DET10	-.10	-.04	-.07	-.07
AVG	-.06	.12	-.06	-.13

Key: * p<.05 ** p<.01 - p≤.06

CHARGES Total followup charges
 CONVICT Total followup convictions
 PROPERTY Followup charges: property offences
 DRUG/ALC Followup charges: drug/alcohol offences

-1 Lose 3 days -6 Cells 10 days
 -2 Lose 9 days -7 Same Incent. Allowance level
 -3 Lose 15 days -8 Downgrade Incent. Allow. lev.
 -4 "Speeders" -9 Cells with beancake, 2 days
 -5 Cells 2 days -10 Cells with beancake, 3-10 dys

Correlations Between Institutional Conduct and
Recidivism Variables

There were low positive correlations between total number of charges during the 1-year followup period and total number of "speeders", number of followup "speeders", number of security misconducts, and proportion of sentence served (see Table 17). Number of charges for property offences was positively correlated with total number of "speeders", number of followup "speeders", and proportion of sentence served. Number of drug-alcohol charges showed low positive correlations with total number of misconducts, number of followup misconducts, number of rule violation misconducts, total number of "speeders", and number of followup "speeders"; in addition, the correlation with proportion of sentence served approached statistical significance levels ($p=.06$).

Total number of convictions was unrelated to any of the institutional conduct variables except number of followup "brownies". Given the small number of

Table 17.
Correlations between Institutional Conduct Variables
and Recidivism Variables.

	<u>CHARGES</u>	<u>CONVICTIONS</u>	<u>PROPERTY</u>	<u>DRUG/ALC</u>
TMISC	.08	.00	.00	.25*
MISC1	-.09	-.04	-.12	.03
MISC3	.10	-.11	.05	.26*
MISC5	.22*	.08	.19 ⁻	.16
FMISC	.11	-.09	.04	.31**
TSPEED	.41**	-.03	.31**	.54**
FSPEED	.49**	-.03	.39**	.61**
PBROWN	.03	.12	.04	-.08
FBROWN	.04	.22*	.06	-.17
%SENT	.23*	.01	.22*	.20 ⁻

Key: * $p < .05$ ** $p < .01$ ⁻ $p \leq .06$

TMISC	Total misconducts
MISC1	Aggressive misconducts
MISC3	Rule violation misconducts
MISC5	Security misconducts
FMISC	Followup misconducts (total)
TSPEED	Total "speeders"
FSPEED	Followup "speeders"
PBROWN	Posttest "brownies"
FBROWN	Followup "brownies"
%SENT	% sentence served prior to discharge
CHARGES	Total followup charges
CONVICTIONS	Total followup convictions
PROPERTY	Followup charges: property offences
DRUG/ALCOHOL	Followup charges: drug/alcohol offences

subjects who had been convicted for new offences, this is probably not surprising (cf. Table 3).

Poor vs. Good Problem-Solving Skill: Basic Measures

MEPS Total Means Score (MEPTOT). The first basic measure of problem-solving skill used was the total number of relevant means on the 10 items of the Means-Ends Problem-Solving (MEPS) Test. The 71 subjects were split into two groups: Poor Problem-Solvers ($N = 30$), defined as Total Means score less than the median for the total sample, vs. Good Problem-Solvers ($N = 41$), defined as Total Means score greater than or equal to the median. One-way analyses of variance were then conducted for each of the dependent measures.

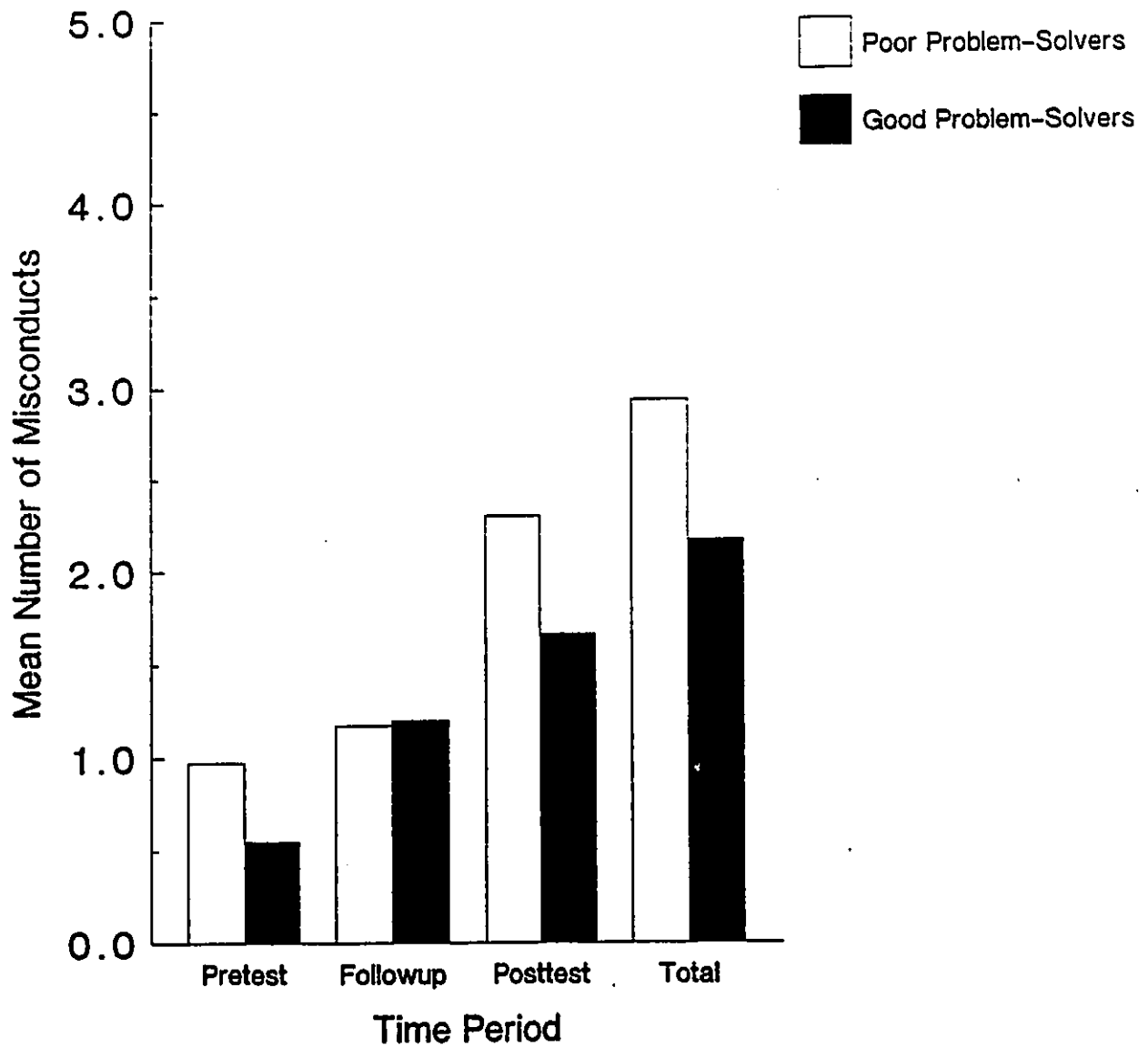
Demographic Data and Criminal History. There were no significant differences between Poor Problem-Solvers and Good Problem-Solvers in terms of age at testing, educational level, or IQ, or any of the criminal history variables such as previous convictions or incarcerations.

Institutional Conduct. Total means scores on the MEPS test significantly differentiated subjects with respect to certain of the institutional conduct variables. Poor Problem-Solvers received approximately twice as many pretest misconducts as Good Problem-Solvers and they also tended to receive a greater number of posttest misconducts and total misconducts, though these differences were not significant (see Figure 1). In addition, the rate of pretest misconducts (recalculated as number/100 days) was almost three times as large for Poor Problem-Solvers and this difference approached statistical significance levels, $F(1, 67) = 3.715, p=.058$ (see Figure 2). There was, however, no significant difference between the two groups for rate of misconducts during the posttest period.

Nevertheless, when specific types of misconducts were examined during the posttest period, Poor Problem-Solvers had significantly more rule violation misconducts than Good Problem-Solvers, $F(1, 69) = 4.209, p<.05$ (Figure 3). The groups did not differ with respect to security misconducts or aggressive

**Figure 1. Mean Number of Pretest, Followup, Posttest,
and Total Misconducts for Poor and Good Problem-
Solvers based on MEPS Total Means Score**

MEPS Total Means Score



**Figure 2. Mean Rate of Pretest, Posttest, and Total
Misconducts for Poor and Good Problem-Solvers
based on MEPS Total Means Score**

MEPS Total Means Score

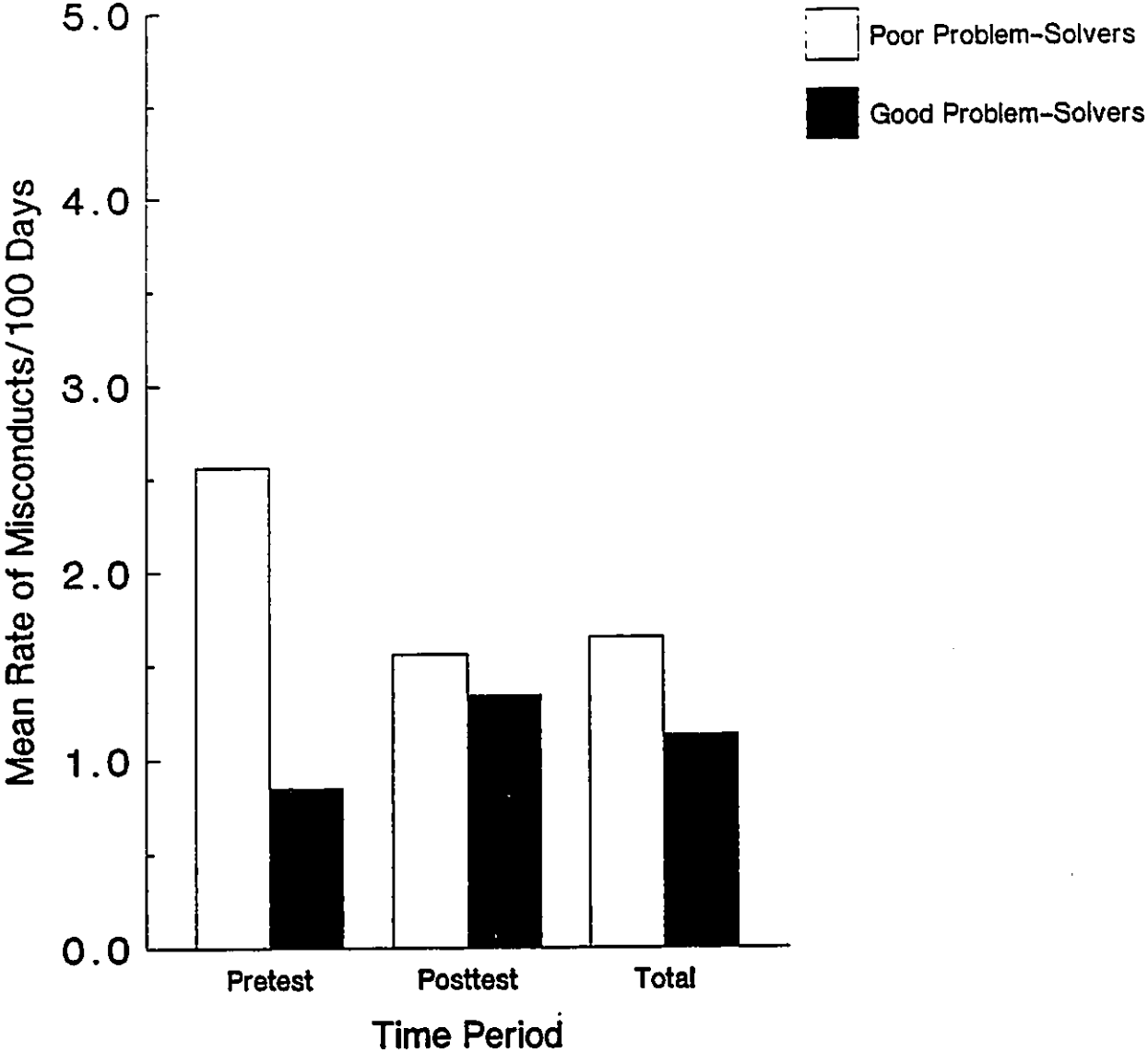
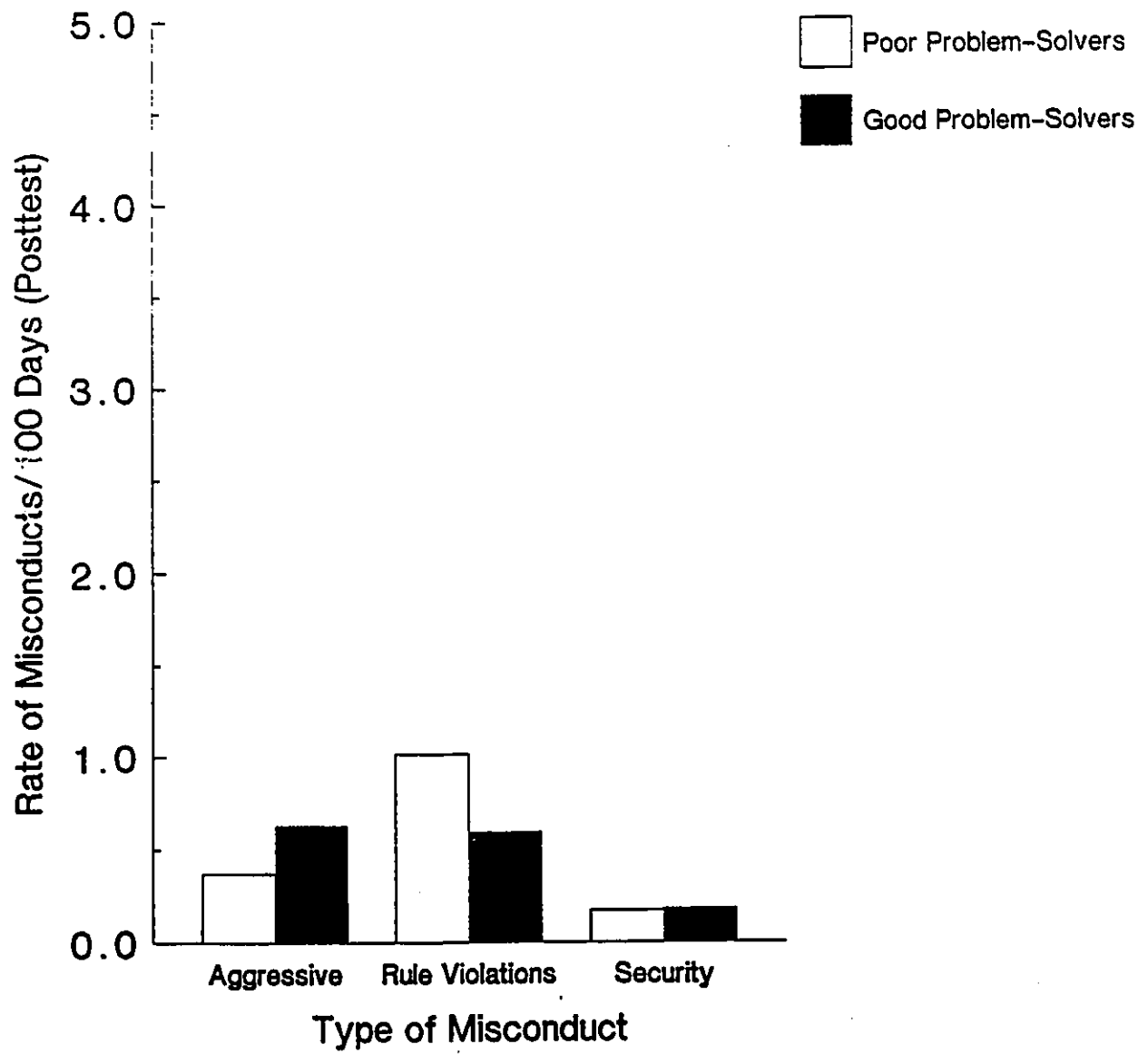


Figure 3. Mean Rate of Aggressive, Rule Violation, and Security Misconducts for Poor and Good Problem-Solvers based on MEPS Total Means Score

MEPS Total Means Score



misconducts.

There were no significant differences for number of "speeders", although Poor Problem-Solvers tended to receive a greater number during all time periods that were monitored (Figure 4). However, Poor Problem-Solvers received more followup "brownies" (although this was not statistically significant) and significantly more posttest "brownies" than Good Problem-Solvers, $F(1, 69) = 4.383, p < .05$ (Figure 5).

There were no differences between groups for percentage of sentence served prior to discharge ($M = 0.56$ for both groups). Poor Problem-Solvers indicated that they expected to receive a greater number of misconducts during the 3-month followup period ($M = 1.24$ vs. $M = 0.68$ for Good Problem-Solvers) but this difference was not statistically significant.

Finally, there were no significant differences between groups for average ratings of aversiveness or deterrence of the institutional sanctions, though Good Problem-Solvers tended to give slightly higher ratings

Figure 4. Mean Number of Followup, Posttest, and Total "Speeders" for Poor and Good Problem-Solvers based on MEPS Total Means Score

MEPS Total Means Score

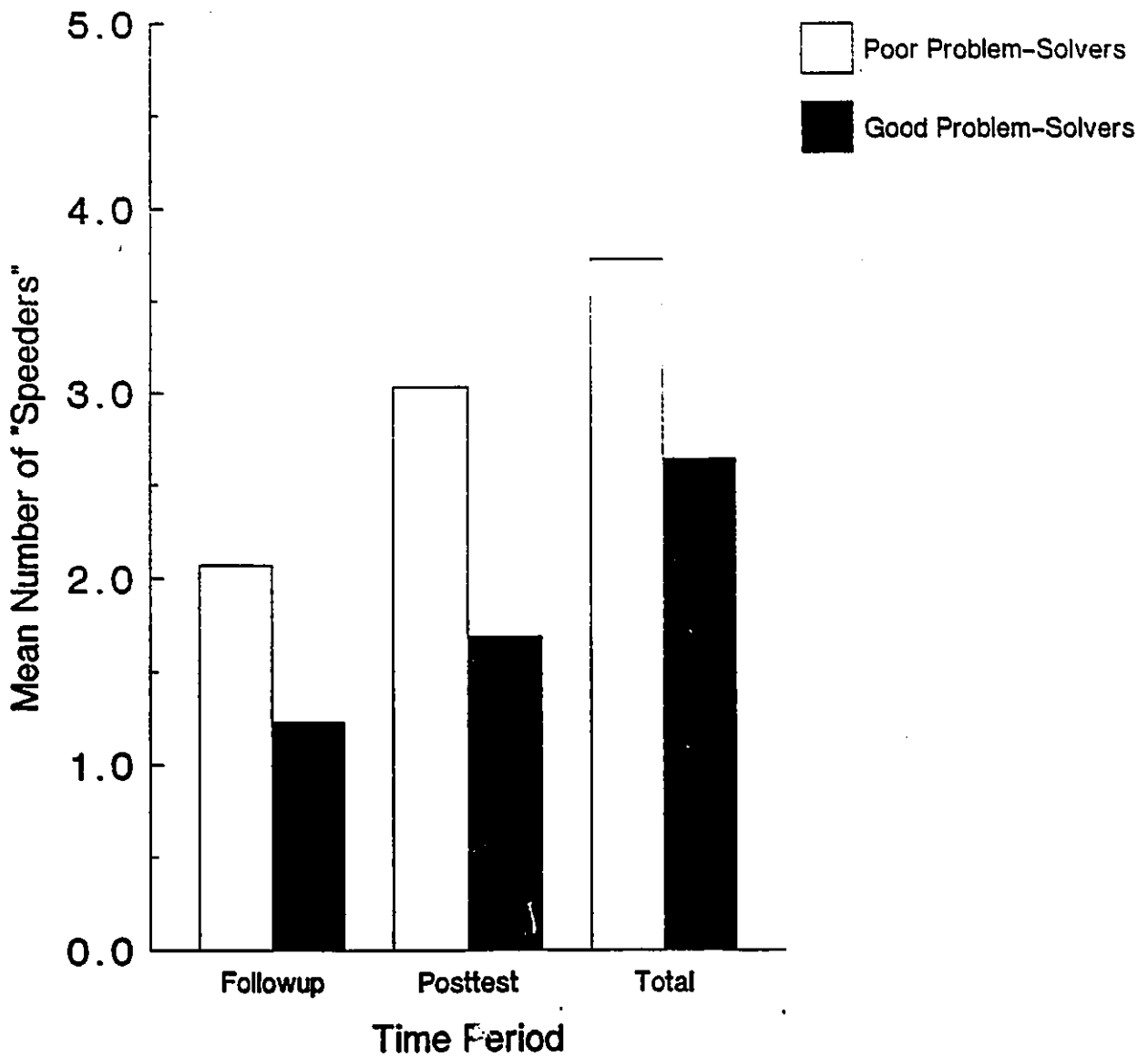
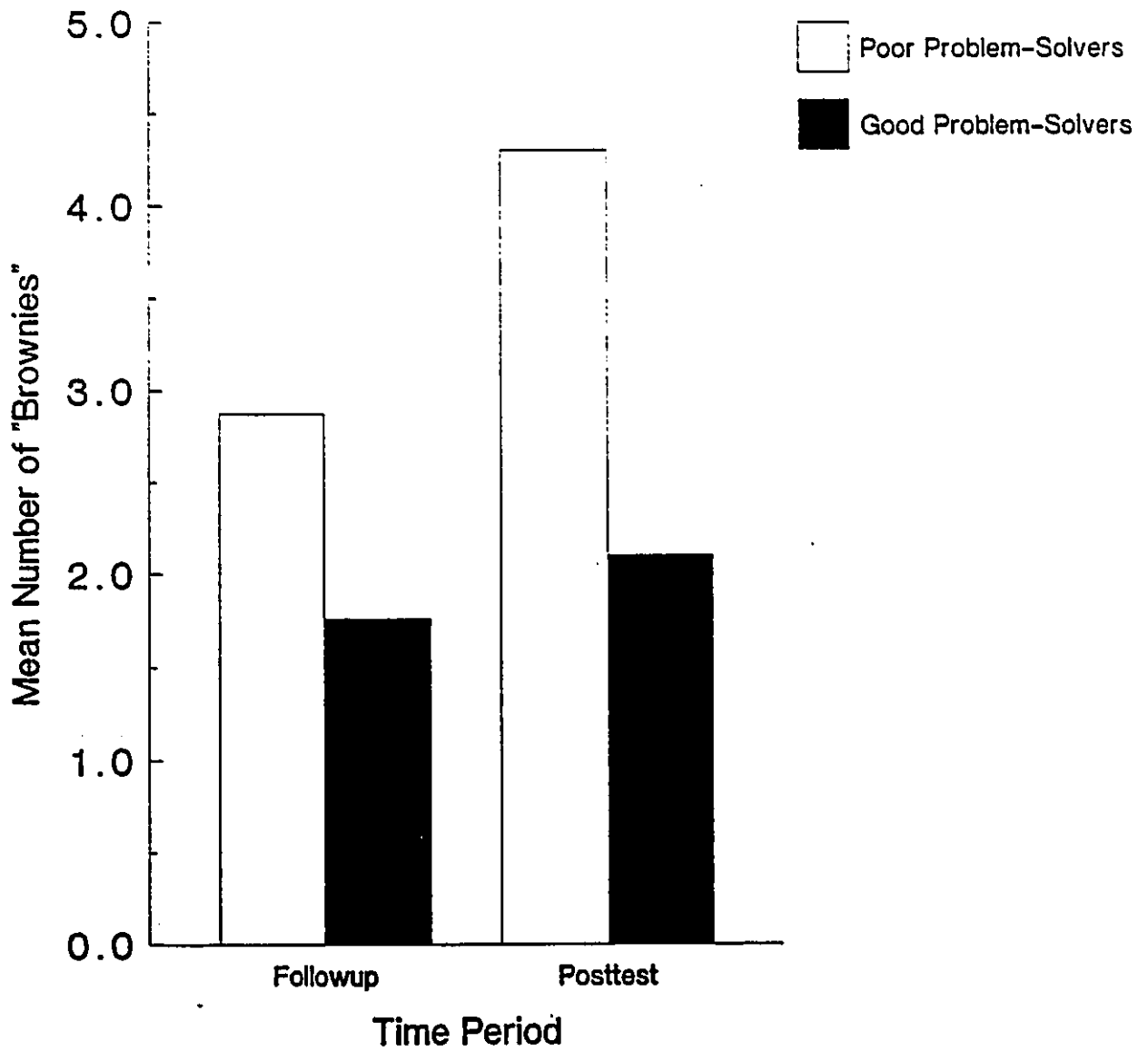


Figure 5. Mean Number of Followup and Posttest
"Brownies" for Poor and Good Problem-Solvers based
on MEPS Total Means Score

MEPS Total Means Score



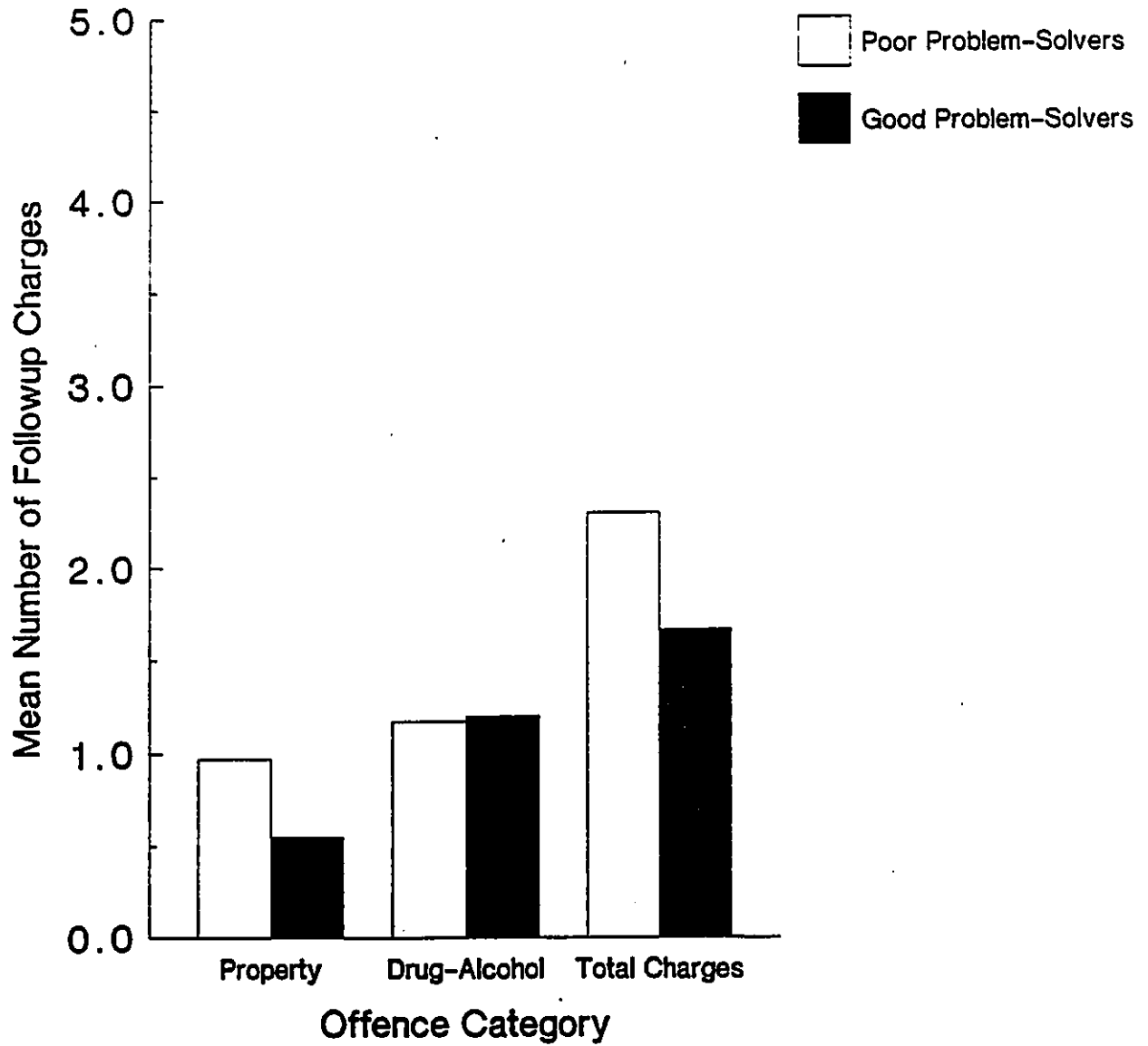
in both cases and the difference approached statistical significance levels in the case of aversiveness, $F(1, 69) = 2.24, p < .10$. Moreover, Poor Problem-Solvers were somewhat more likely than Good Problem-Solvers to rate the sanctions as Nonaversive (average rating < 5.0), $\chi^2(1, N = 70) = 2.65, p < .10$.

Recidivism. Over the 1 year followup period after discharge, Poor Problem-Solvers incurred significantly more new criminal charges than Good Problem-Solvers, $F(1, 63) = 3.995, p < .05$, as well as more charges for property offences, $F(1, 63) = 4.219, p < .05$ (see Figure 6). They did not differ with respect to number of drug-alcohol charges or number of convictions.

Total Alternatives (TOTALT). The second basic measure of problem-solving skill was derived from the Optional Thinking Test, based on the total number of Alternatives generated for the 4 situations comprising the test. Subjects were divided into two groups again based on a median split: Poor Problem-Solvers ($N = 33$), defined as Total Alternatives score less than the

**Figure 6. Mean Number of Post-Release Criminal Charges
for Property Offences or Drug-Alcohol Offences and
Total Charges for Poor and Good Problem-Solvers
based on MEPS Total Means Score**

MEPS Total Means Score



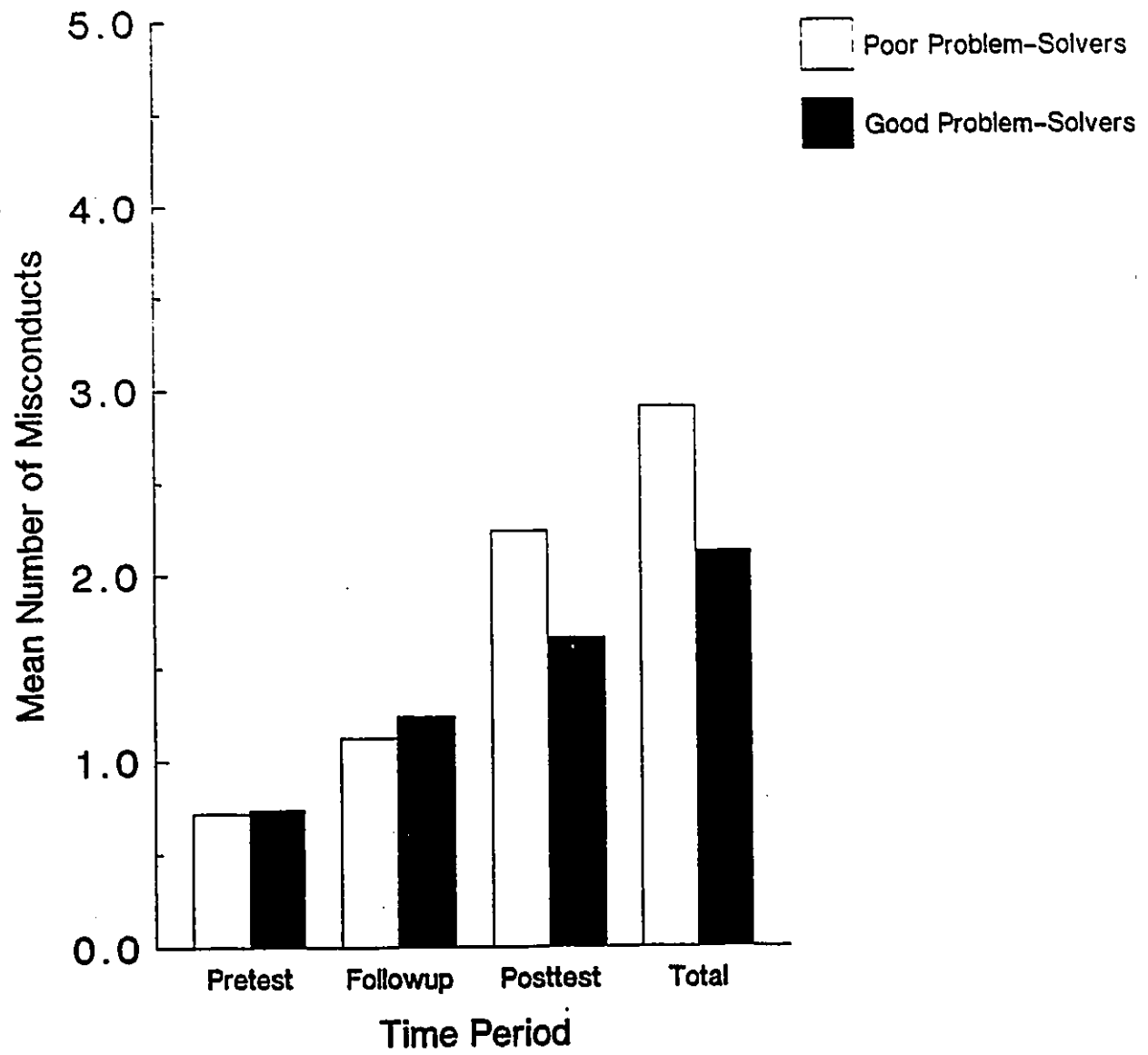
median for the total sample and Good Problem-Solvers ($N = 38$), defined as Total Alternatives score greater than or equal to the median. One way analyses of variance were then calculated for each of the dependent measures.

Demographic Data and Criminal History. There were no significant differences between groups with respect to age, educational level, IQ, or any of the criminal history variables.

Institutional Conduct. There were no significant differences between groups for total misconducts, pretest misconducts, followup misconducts, or posttest misconducts (Figure 7), though Poor Problem-Solvers tended to receive slightly more misconducts during the posttest period and in total. Similarly, there were no significant differences in terms of rates of misconducts, though Poor Problem-Solvers tended to have a higher rate of pretest misconducts (Figure 8). There were no differences in any of the misconduct categories (Figure 9), or in number of "speeders" (Figure 10). However, Poor Problem-Solvers earned significantly more

Figure 7. Mean Number of Pretest, Followup, Posttest,
and Total Misconducts for Poor and Good Problem-
Solvers based on Total Alternatives Score

Total Alternatives



**Figure 8. Mean Rate of Pretest, Posttest, and Total
Misconducts for Poor and Good Problem-Solvers
based on Total Alternatives Score**

Total Alternatives

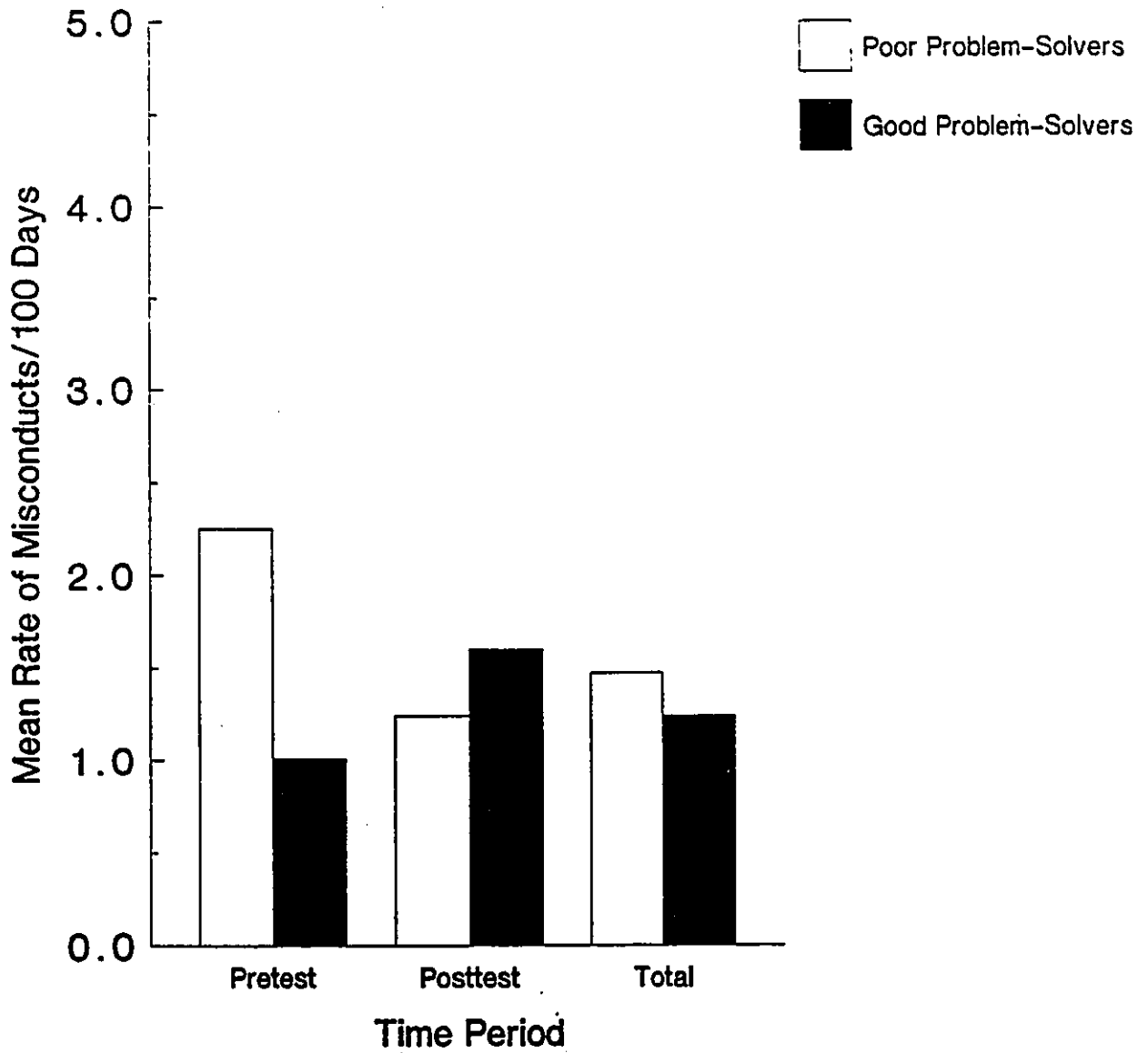


Figure 9. Mean Rate of Aggressive, Rule Violation, and Security Misconducts for Poor and Good Problem-Solvers based on Total Alternatives Score

Total Alternatives

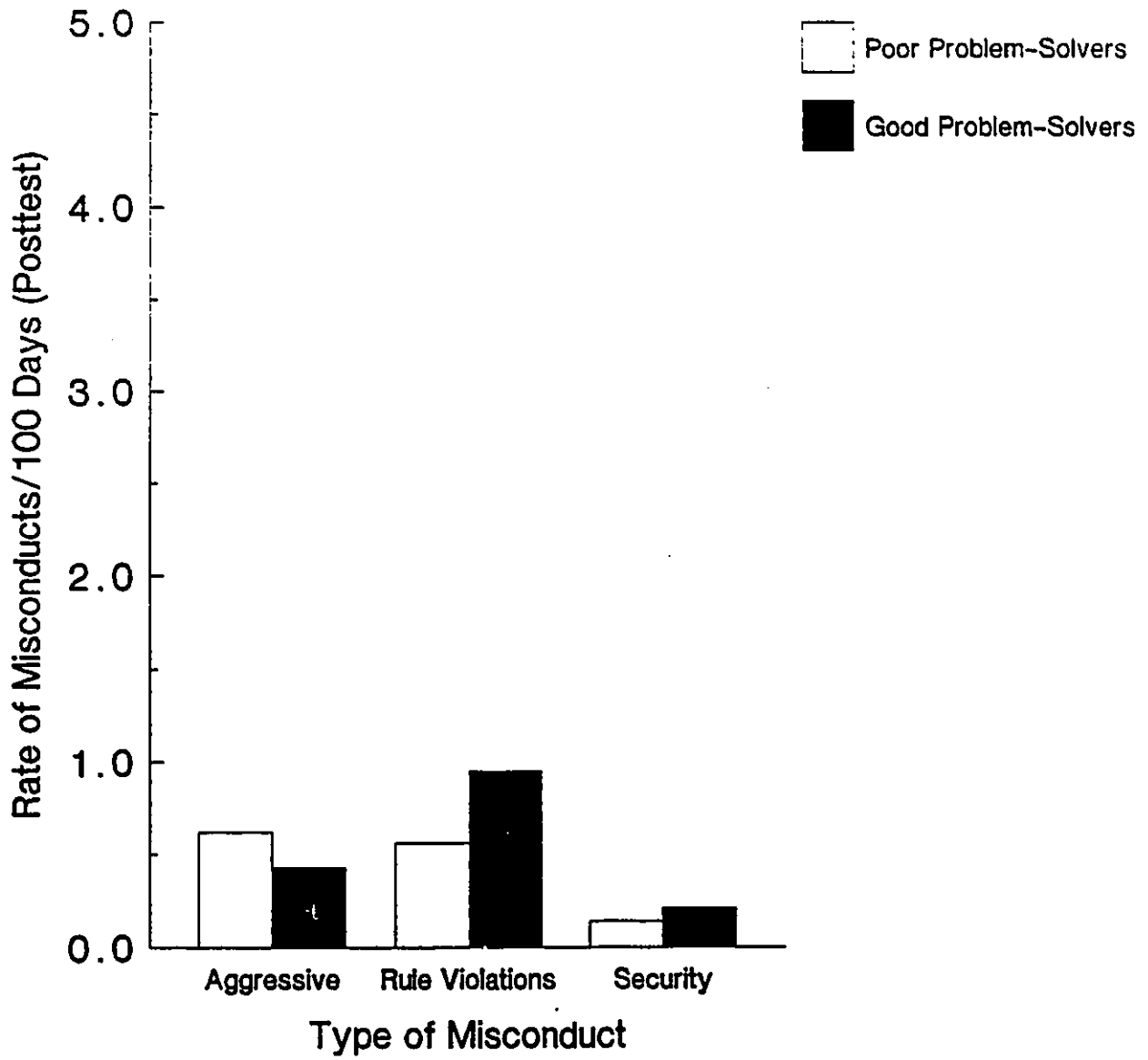
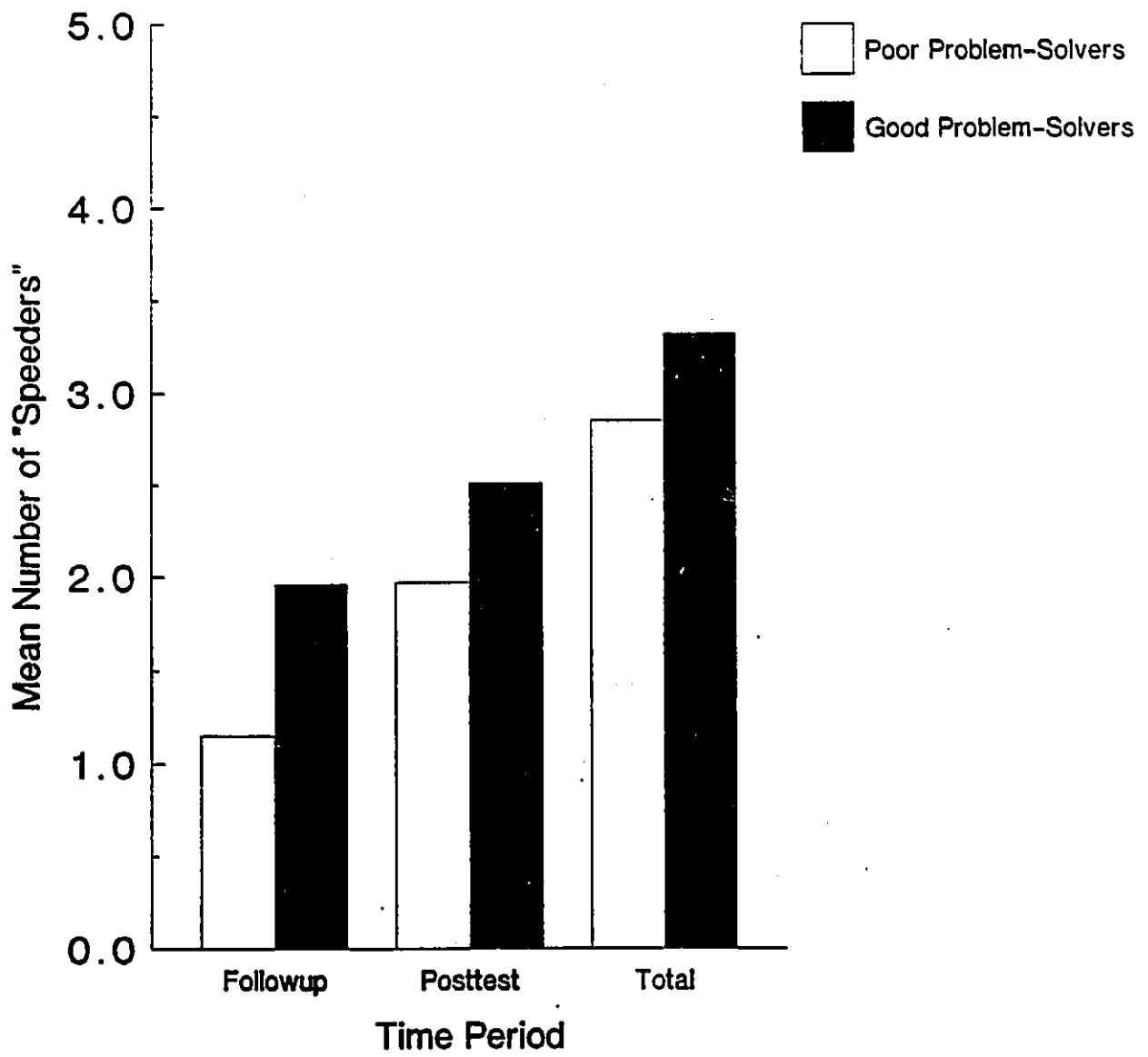


Figure 10. Mean Number of Followup, Posttest, and
Total "Speeders" for Poor and Good Problem-Solvers
based on Total Alternatives Score

Total Alternatives



"brownies" during the posttest period than Good Problem-Solvers, $F(1, 63) = 5.025, p < .05$ (Figure 11).

There were no significant differences between groups for percentage of sentence served prior to discharge or for estimated number of misconducts during the 3-month followup period.

Finally, there were no significant differences between groups for average ratings of aversiveness or deterrence of the institutional sanctions.

Recidivism. There were no significant differences between groups in terms of number of followup charges or convictions (see Figure 12). However, Good Problem-Solvers were somewhat more likely to be nonrecidivists (no new charges), $\chi^2(1, N = 65) = 3.34, p = .07$.

Relevancy Ratio

The Relevancy Ratio is calculated by taking the ratio of Relevant Means to Relevant Means plus

Figure 11. Mean Number of Followup and Posttest
"Brownies" for Poor and Good Problem-Solvers based
on Total Alternatives Score

Total Alternatives

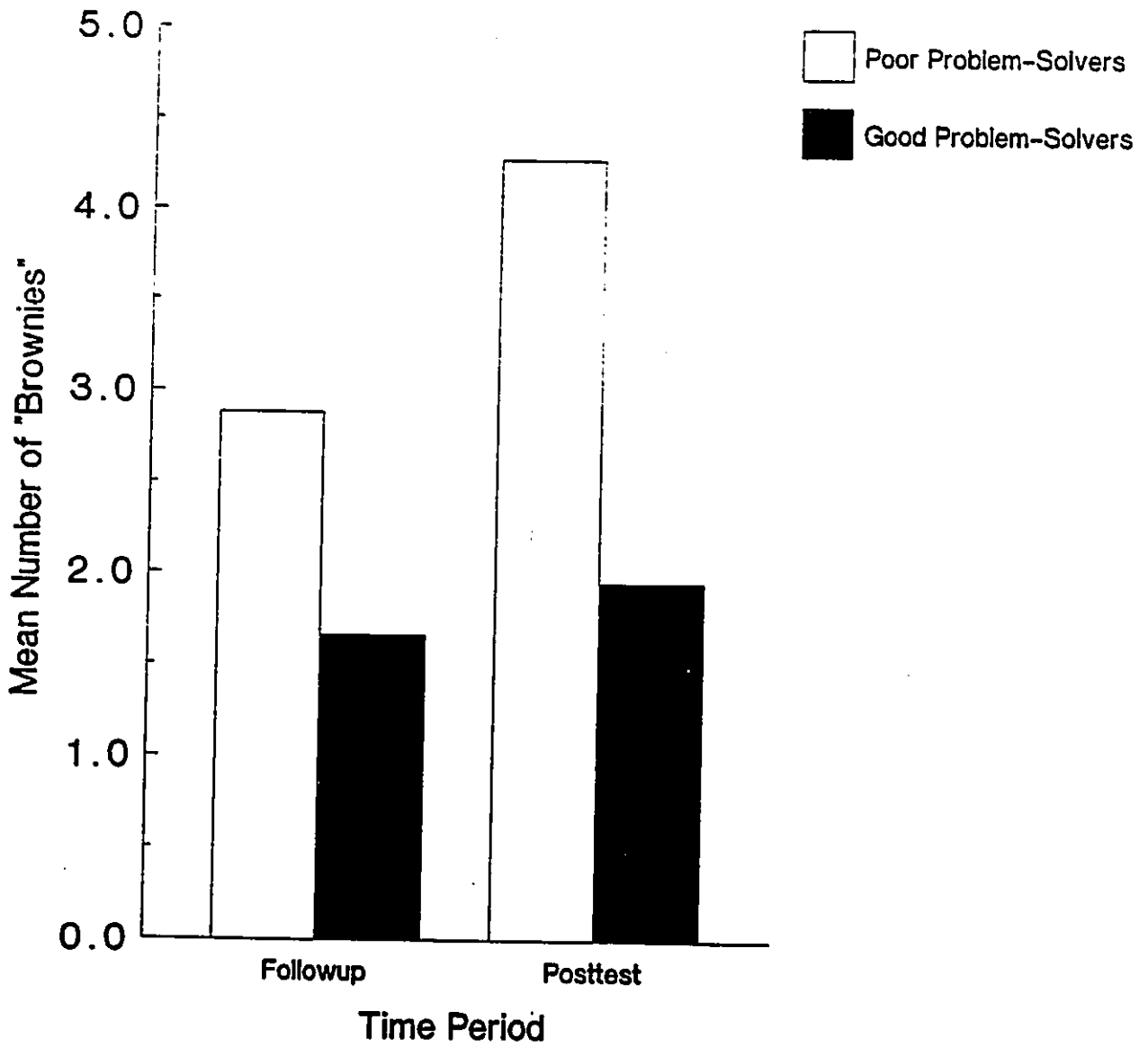
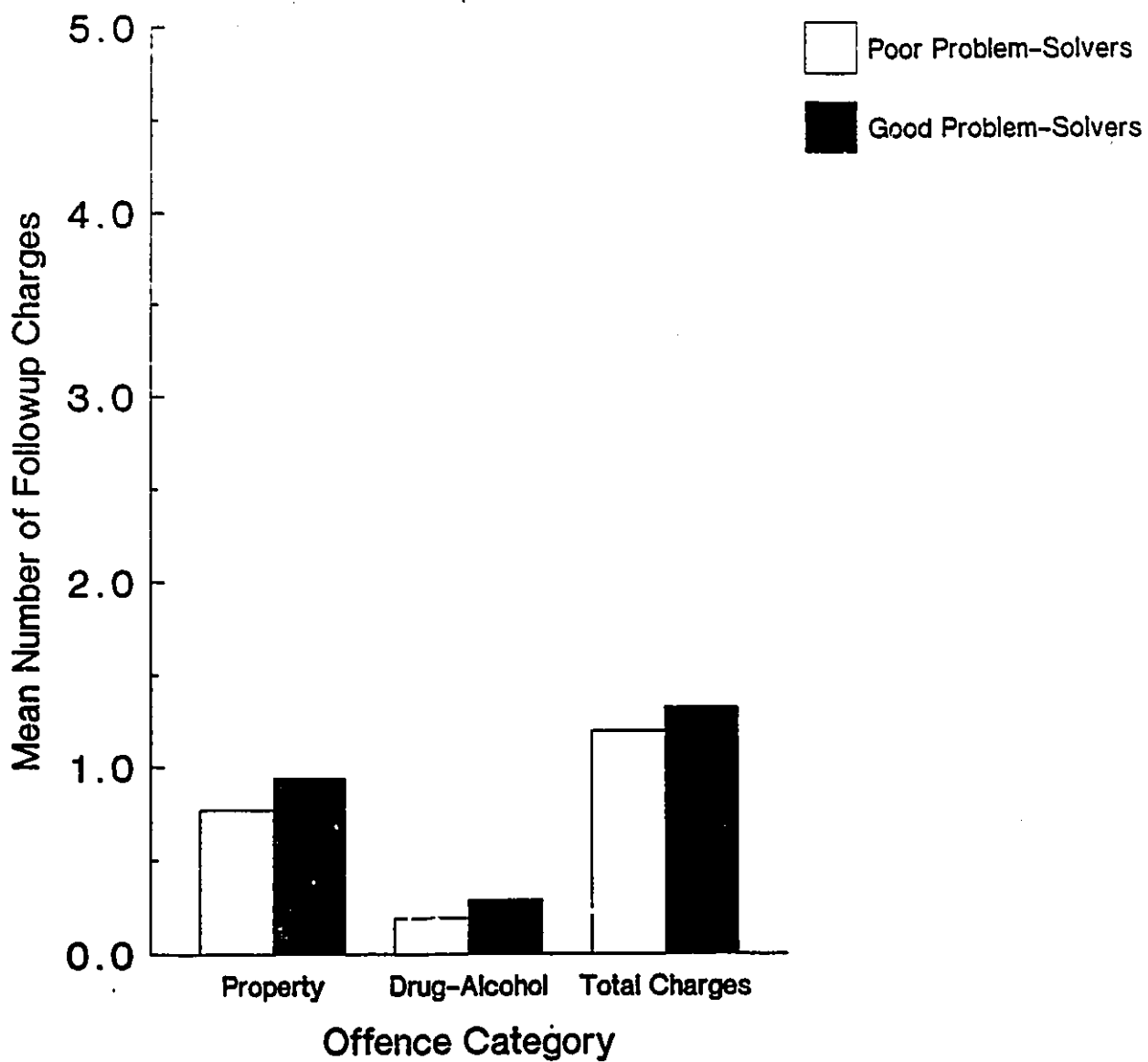


Figure 12. Mean Number of Post-Release Criminal Charges for Property Offences or Drug-Alcohol Offences and Total Charges for Poor and Good Problem-Solvers based on The Total Alternatives Score

Total Alternatives



Irrelevant Means. Although this measure is suggested by Spivack, Platt, & Shure (1976) as one of the basic and more meaningful measures of problem-solving skill, in the current sample it proved not to be very useful in differentiating subjects as poorer or better problem-solvers. The mean ratio for the total sample was 0.931 (maximum possible ratio is 1.00), with a median of 0.957 and a mode of 1.00, indicating that the majority of the means provided by the subjects were relevant means. These data are similar to those of higher functioning subjects in published norms (see Table 5). Because of the low frequency of Irrelevant Means, this measure was not used for further analyses of the relationships between problem-solving skill and any of the dependent variables.

Composite Measures of Problem-Solving Skill

MEPS Means and Enumerations plus Alternatives and Enumerations (TOTCOG). A composite score for problem-solving skill was computed for each subject by adding Total Relevant Means score and Enumerations score on

the MEPS and Total Alternatives score and Enumerations score on the Optional Thinking Test. Subjects were then divided into Poor and Good Problem-Solvers based on a median split of the composite score. Similar to previous analyses, Poor Problem-Solvers ($N = 34$) were defined as subjects with TOTCOG less than the median for the total sample, while Good Problem-Solvers ($N = 37$) were defined as subjects with TOTCOG greater than or equal to the median. One way analyses of variance were then calculated for each of the dependent measures.

Demographic Data and Criminal History. There were no significant differences between groups for age or IQ. However, Good Problem-Solvers remained in school longer ($M = 16.28$ for Poor Problem-Solvers; $M = 17.46$ for Good Problem-Solvers), $F(1, 69) = 4.693$, $p < .05$, and achieved slightly higher levels of education ($M = 10.59$ vs. $M = 9.97$ for Poor Problem-Solvers), $F(1, 69) = 3.263$, $p = .075$. There were no significant differences between groups for any of the criminal history variables.

Institutional Conduct. Poor Problem-Solvers received almost twice as many total misconducts as Good Problem-Solvers, $F(1, 69) = 3.895, p=.052$ (see Figure 13). The groups did not differ significantly in terms of number of pretest misconducts, followup misconducts, or posttest misconducts. However, recalculating the number of misconducts as a rate (number per 100 days) to equate for sentence length, Poor Problem-Solvers had a significantly higher rate of pretest misconducts than Good Problem-Solvers, $F(1, 67) = 4.310, p<.05$, as well as a higher rate of misconducts overall, $F(1, 67) = 4.343, p<.05$ (Figure 14). There were no significant differences between groups for the various types of misconducts (Figure 15).

The groups did not differ with respect to number of "speeders" (Figure 16). However, Poor Problem-Solvers received significantly more "brownies" during the posttest period than Good Problem-Solvers, $F(1, 69) = 6.414, p<.05$, and evidenced a similar though nonsignificant trend toward more "brownies" during the followup period, $F(1, 69) = 3.662, p=.06$ (Figure 17).

Figure 13. Mean Number of Pretest, Followup, Posttest,
and Total Misconducts for Poor and Good Problem-
Solvers based on MEPS Means and Enumerations plus
Alternatives and Enumerations (TOTCOG)

TOTCOG

(Means+Enumerations + Alternatives+Enumerations)

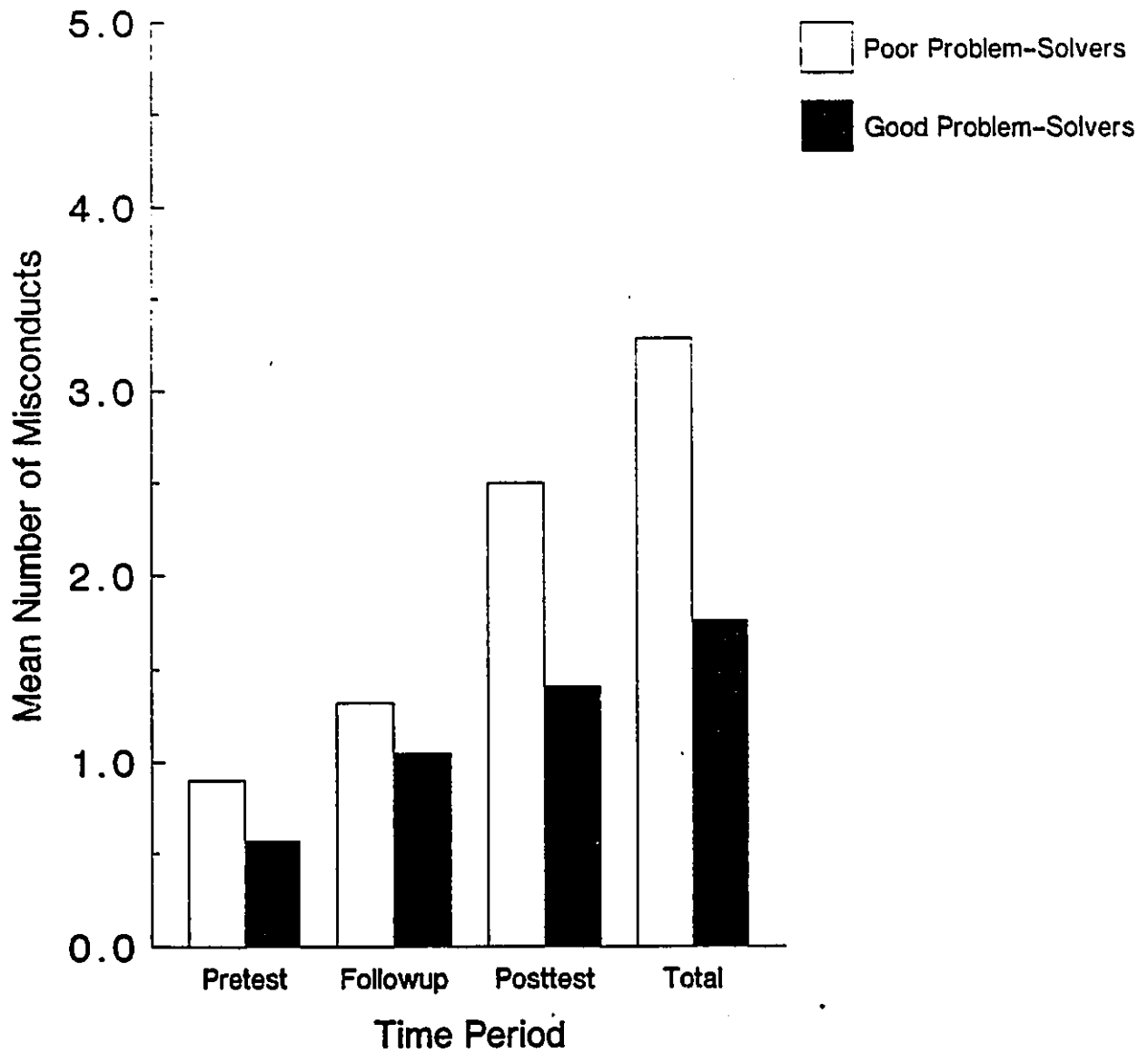


Figure 14. Mean Rate of Pretest, Posttest, and Total
Misconducts for Poor and Good Problem-Solvers
based on MEPS Means and Enumerations plus
Alternatives and Enumerations (TOTCOG)

TOTCOG

(Means+Enumerations + Alternatives+Enumerations)

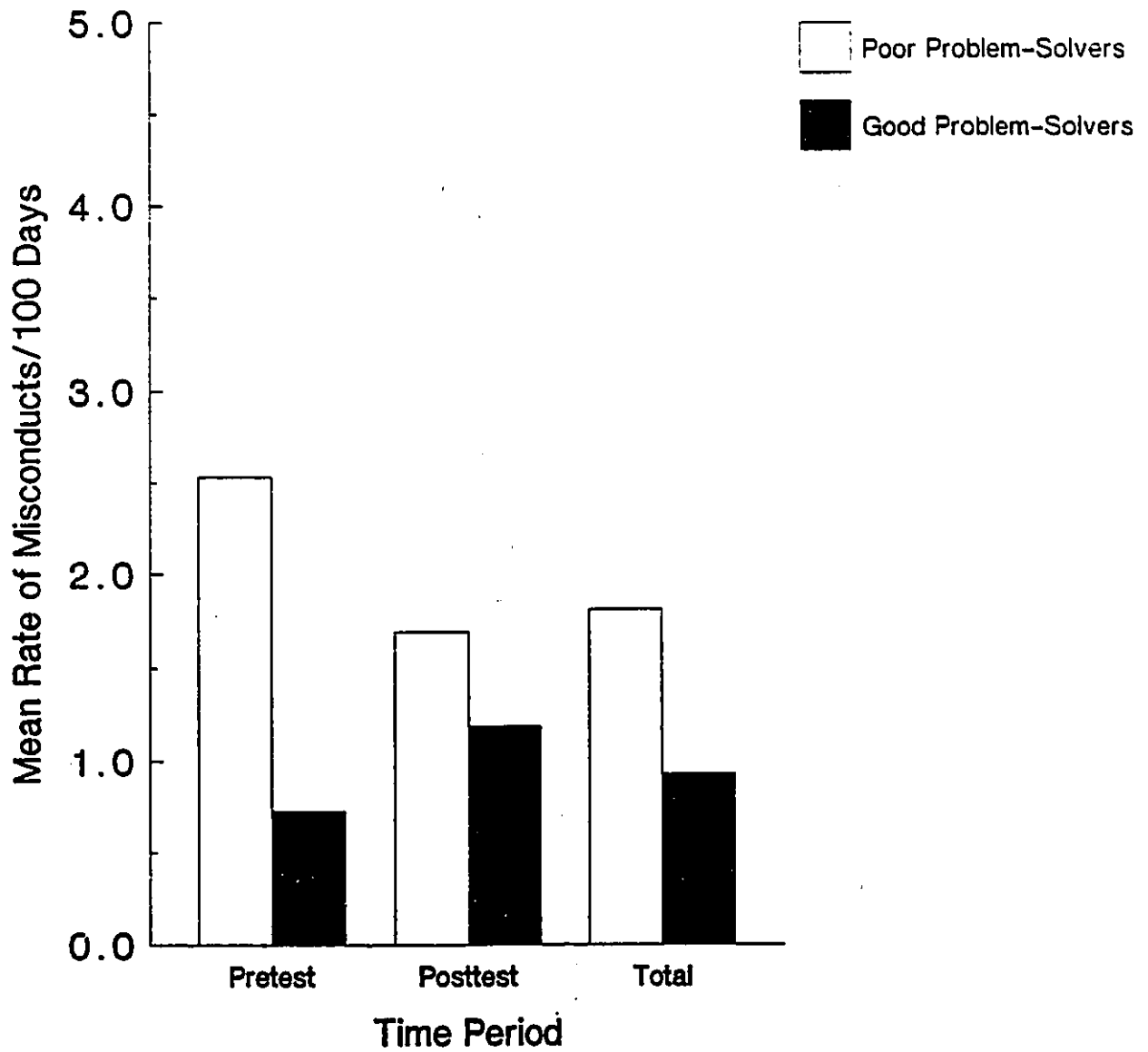


Figure 15. Mean Rate of Aggressive, Rule Violation,
and Security Misconducts for Poor and Good
Problem-Solvers based on MEPS Means and
Enumerations plus Alternatives and Enumerations
(TOTCOG)

TOTCOG

(Means+Enumerations + Alternatives+Enumerations)

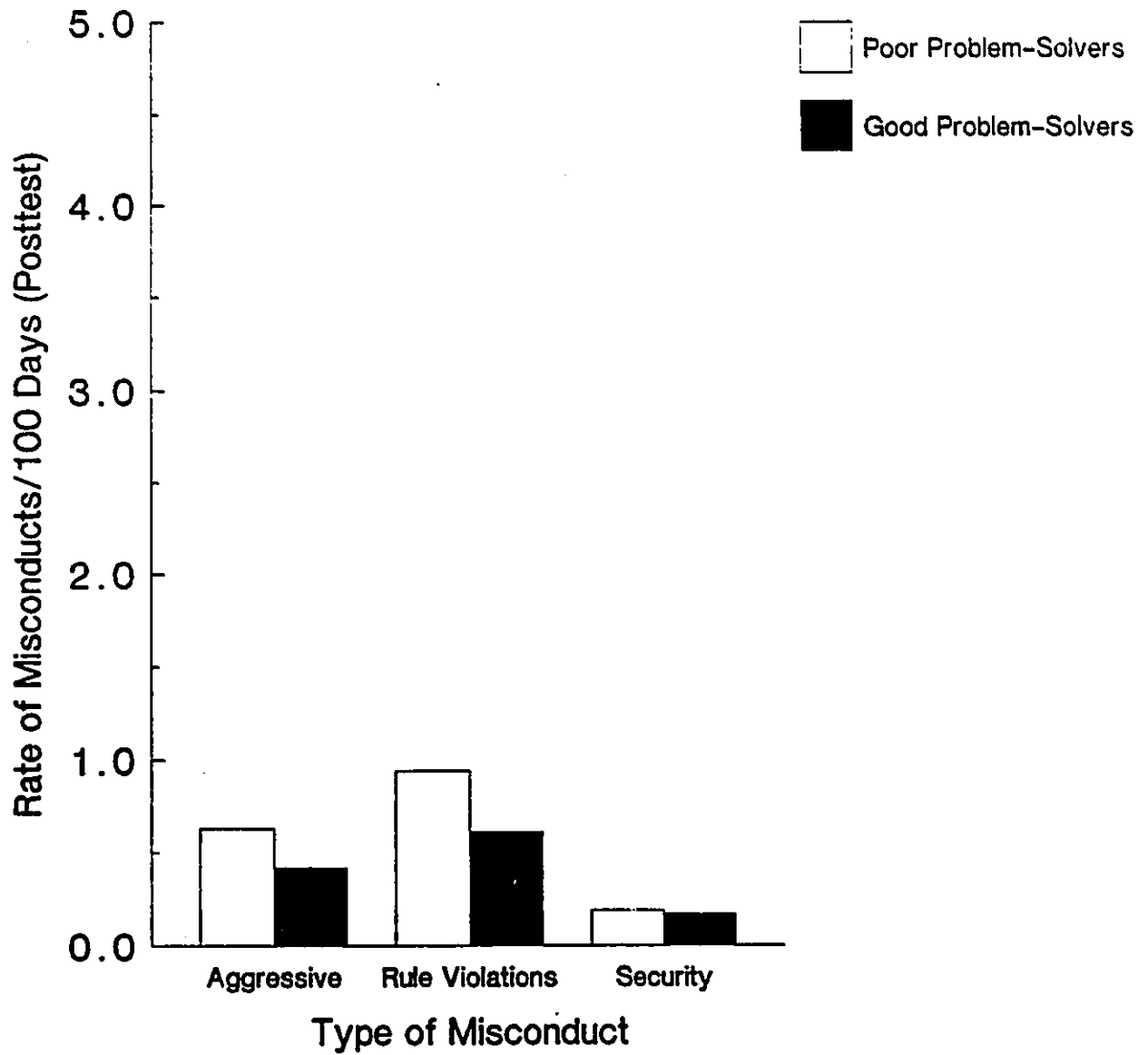


Figure 16. Mean Number of Followup, Posttest, and
Total "Speeders" for Poor and Good Problem-Solvers
based on MEPS Means and Enumerations plus
Alternatives and Enumerations (TOTCOG)

TOTCOG

(Means+Enumerations + Alternatives+Enumerations)

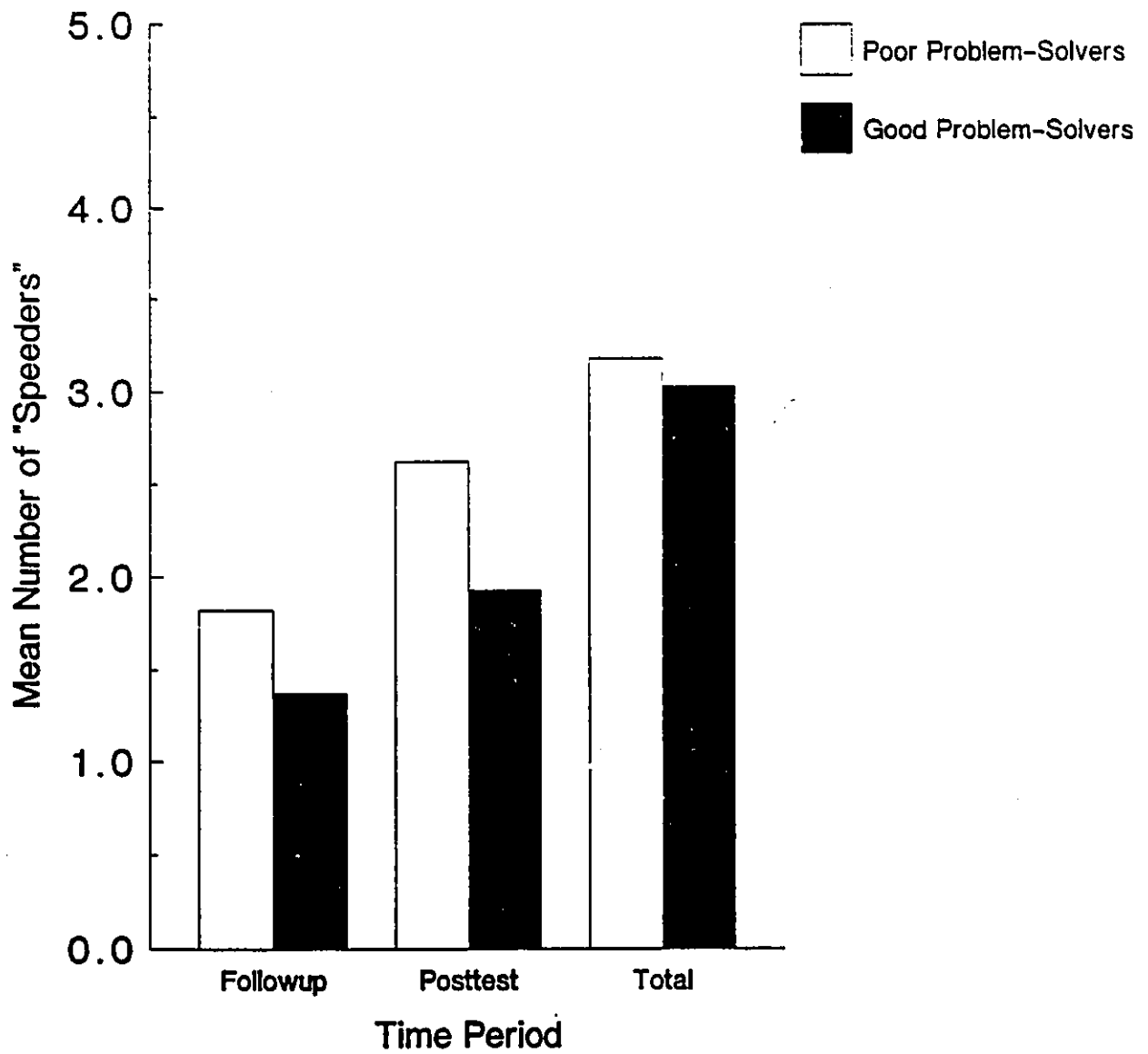
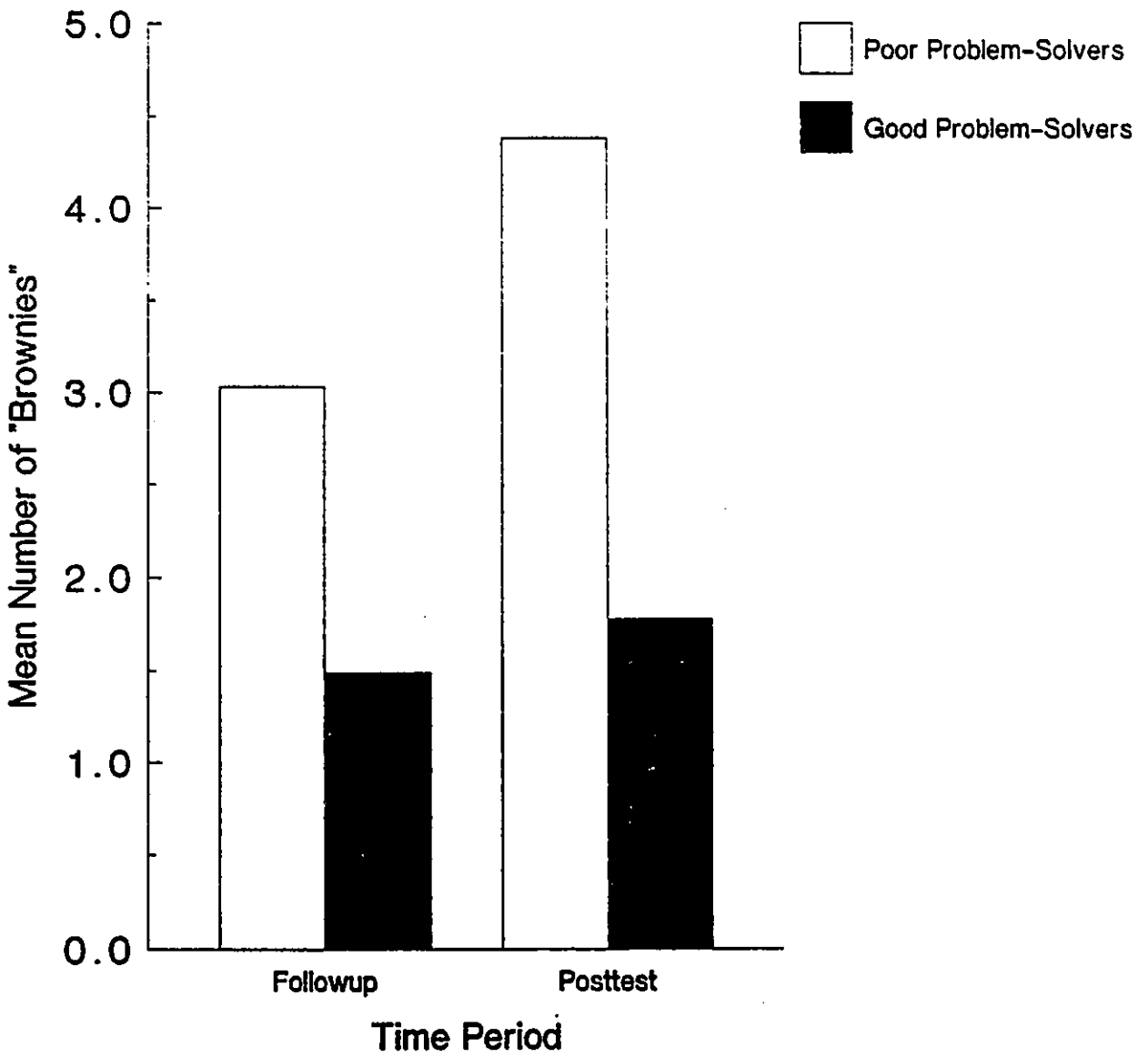


Figure 17. Mean Number of Followup and Posttest
"Brownies" for Poor and Good Problem-Solvers based
on MEPS Means and Enumerations plus Alternatives
and Enumerations (TOTCOG)

TOTCOG

(Means+Enumerations + Alternatives+Enumerations)



There were no differences between groups for percentage of sentence served prior to discharge or for estimated number of misconducts during the 3-month followup period.

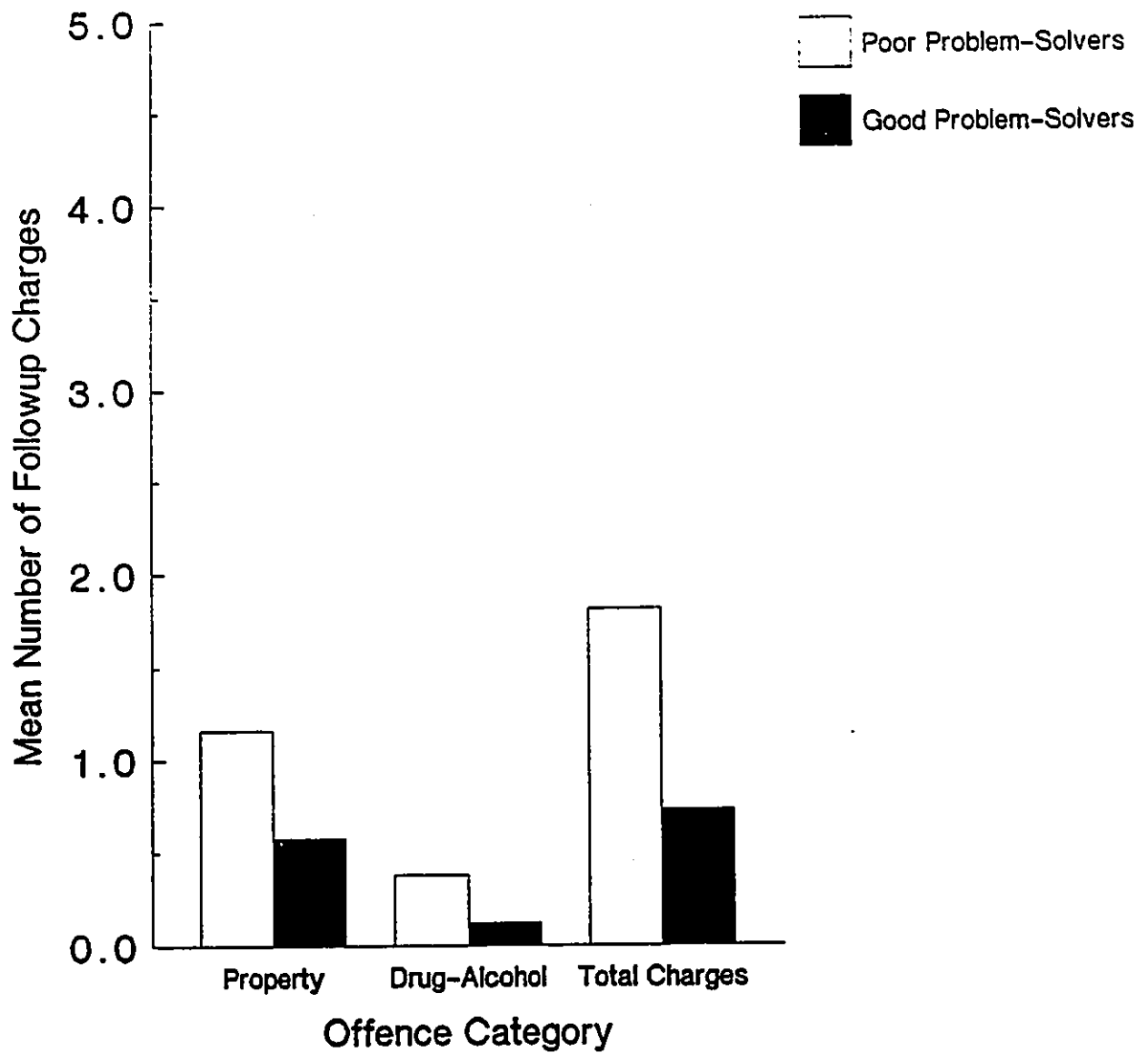
Finally, there were no significant differences between groups for average ratings of aversiveness or deterrence of the institutional sanctions. However, Poor Problem-Solvers were somewhat more likely to rate sanctions as Nonaversive (i.e., average aversiveness rating < 5.0), $\chi^2(1, N = 70) = 3.43, p = .06$.

Recidivism. Poor Problem-Solvers had more than twice as many criminal charges during the followup period than Good Problem-Solvers, $F(1, 63) = 5.035, p < .05$ (Figure 18), and significantly more convictions ($M = 0.25$ for Poor Problem-Solvers vs. $M = 0$ for Good Problem-Solvers), $F(1, 63) = 4.569, p < .05$. There was also a nonsignificant trend toward a greater number of drug/alcohol-related charges for Poor Problem-Solvers, $F(1, 63) = 2.864, p = .096$. In addition, Good Problem-Solvers were significantly more likely to be nonrecidivists, as defined by absence of followup

Figure 18. Mean Number of Post-Release Criminal Charges for Property Offences or Drug-Alcohol Offences and Total Charges for Poor and Good Problem-Solvers based on MEPS Means and Enumerations plus Alternatives and Enumerations (TOTCOG)

TOTCOG

(Means+Enumerations + Alternatives+Enumerations)



charges, $\chi^2(1, 65) = 4.46, p < .05$, or absence of followup convictions, $\chi^2(1, N = 65) = 5.59, p < .05$.

MEPS Means, Enumerations, Obstacles, and Time plus Alternatives, Enumerations, Obstacles, and Time (ALLCOG). A second composite problem-scoring score, including all of the scoring elements from both the MEPS and the Optional Thinking Test, was computed for each subject by adding Total Means, Enumerations, Obstacles, and Time scores for the MEPS and Total Alternatives, Enumerations, Obstacles, and Time scores for the Optional Thinking Test. The 71 subjects were then divided into Poor Problem-Solvers ($N = 33$) and Good Problem-Solvers ($N = 38$), based on the median split of the composite scores for the total sample, as described in previous analyses. One way analyses of variance were conducted for each of the dependent measures.

Demographic Data and Criminal History. There were no significant differences between groups with respect to age, IQ, or any of the criminal history variables.

There was a nonsignificant trend toward a slightly higher level of education for Good Problem-Solvers ($M = 10.58$ vs. $M = 9.97$ for Poor Problem-Solvers), $F(1, 69) = 3.093$, $p = .083$.

Institutional Conduct. There were no significant differences between groups in terms of total misconducts, pretest misconducts, followup misconducts, or posttest misconducts (see Figure 19). However, recalculating misconducts as rate per 100 days to equate for sentence length (Figure 20), the mean pretest rate for Poor Problem-Solvers was almost 3 times as high as the mean rate for Good Problem-Solvers; this difference approached statistical significance levels, $F(1, 67) = 3.01$, $p = .087$. There were no differences with respect to specific categories of misconducts (Figure 21).

There were no significant differences between groups for number of "speeders" (Figure 22). However, Poor Problem-Solvers received significantly more "brownies" during the posttest period than Good Problem-Solvers, $F(1, 69) = 6.143$, $p < .05$, and showed a

Figure 19. Mean Number of Pretest, Followup, Posttest, and Total Misconducts for Poor and Good Problem-Solvers based on MEPS Means, Enumerations, Obstacles, and Time plus Alternatives, Enumerations, Obstacles, and Time (ALLCOG)

ALLCOG

(Means+Enum+Obst+Time + Alt+Enum+Obst+Time)

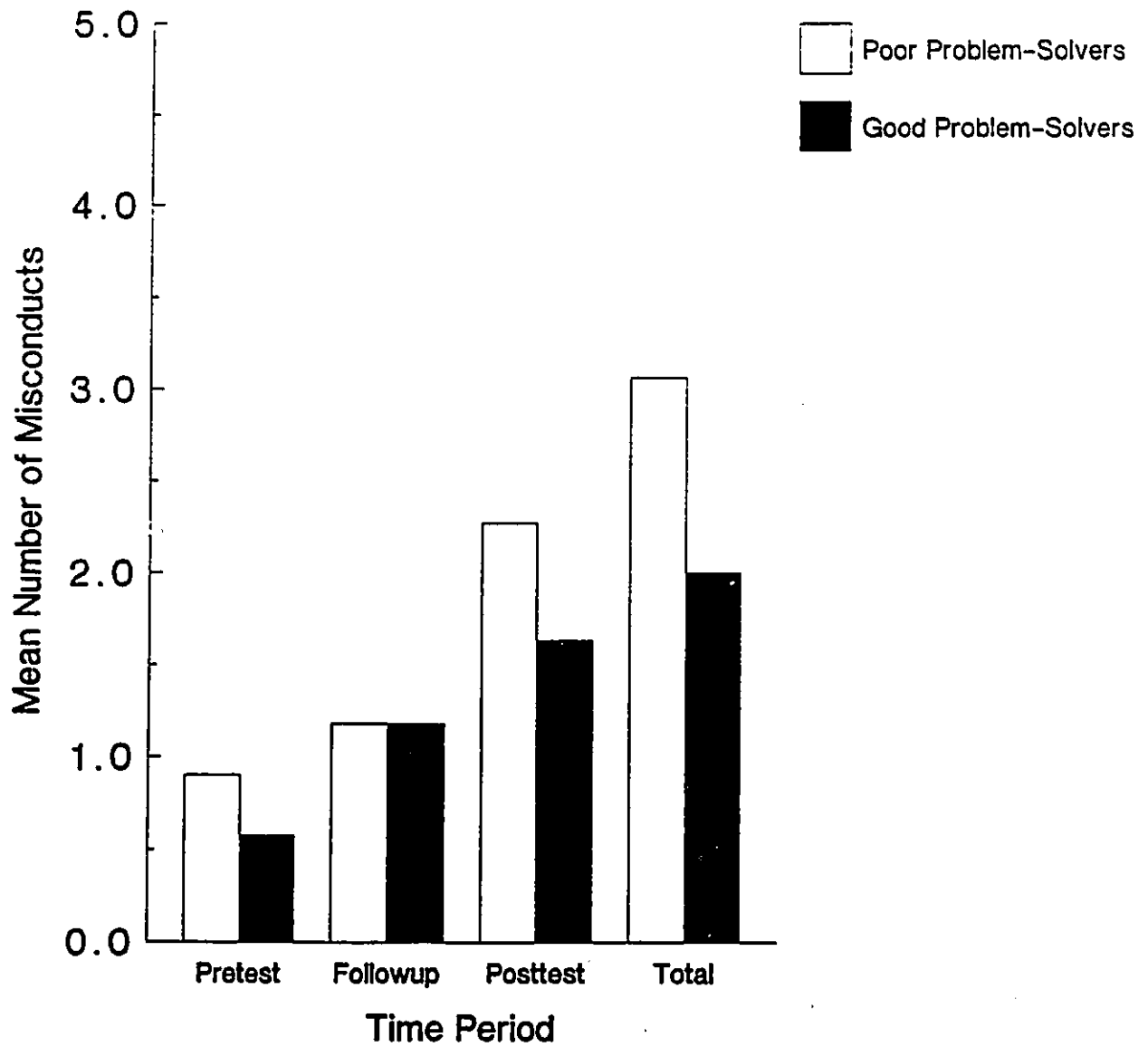


Figure 20. Mean Rate of Pretest, Posttest, and Total Misconducts for Poor and Good Problem-Solvers based on MEPS Means, Enumerations, Obstacles, and Time plus Alternatives, Enumerations, Obstacles, and Time (ALLCOG)

ALLCOG

(Means+Enum+Obst+Time + Alt+Enum+Obst+Time)

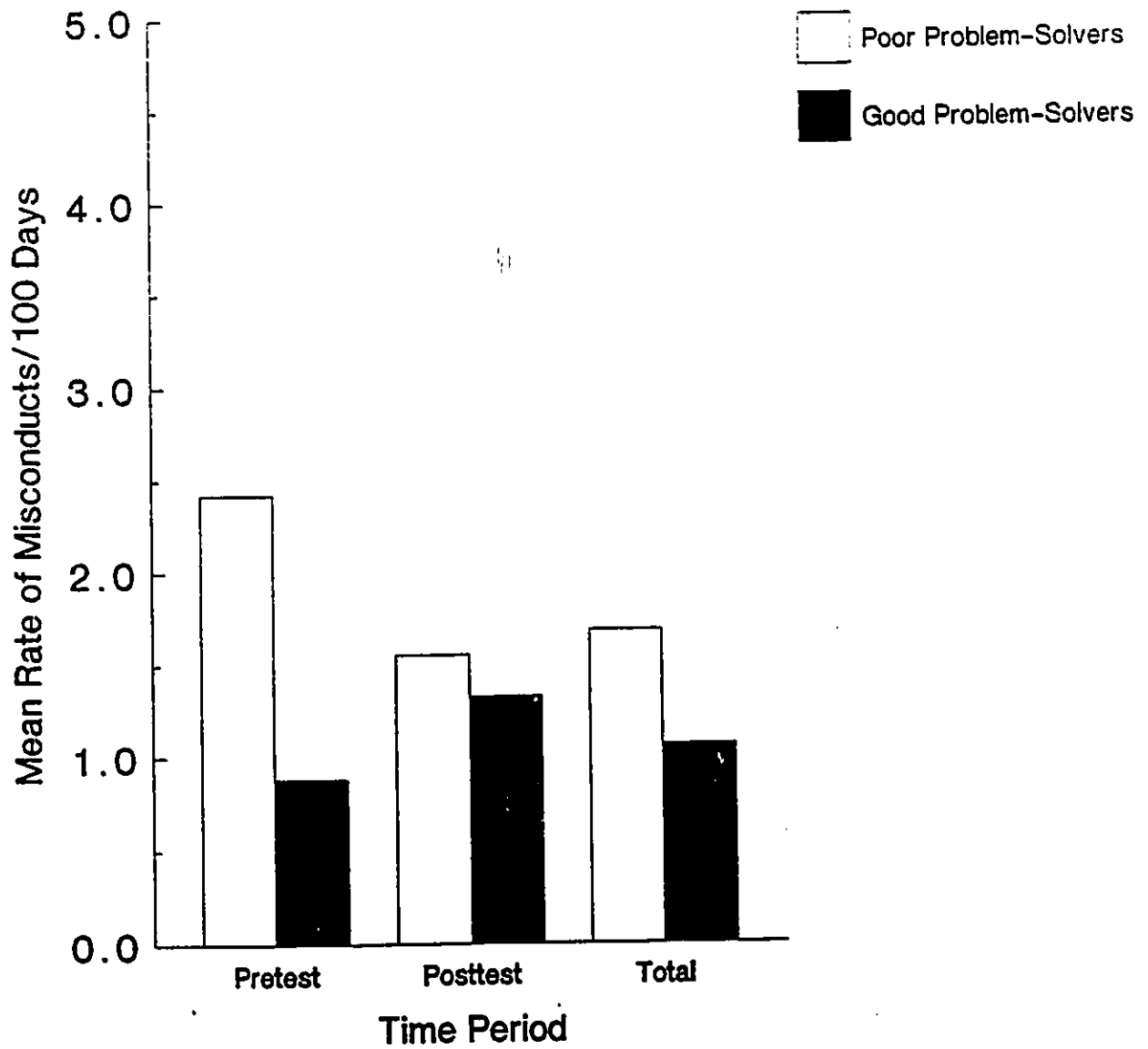


Figure 21. Mean Rate of Aggressive, Rule Violation,
and Security Misconducts for Poor and Good
Problem-Solvers based on MEPS Means, Enumerations,
Obstacles, and Time plus Alternatives,
Enumerations, Obstacles, and Time (ALLCOG)

ALLCOG

(Means+Enum+Obst+Time + Alt+Enum+Obst+Time)

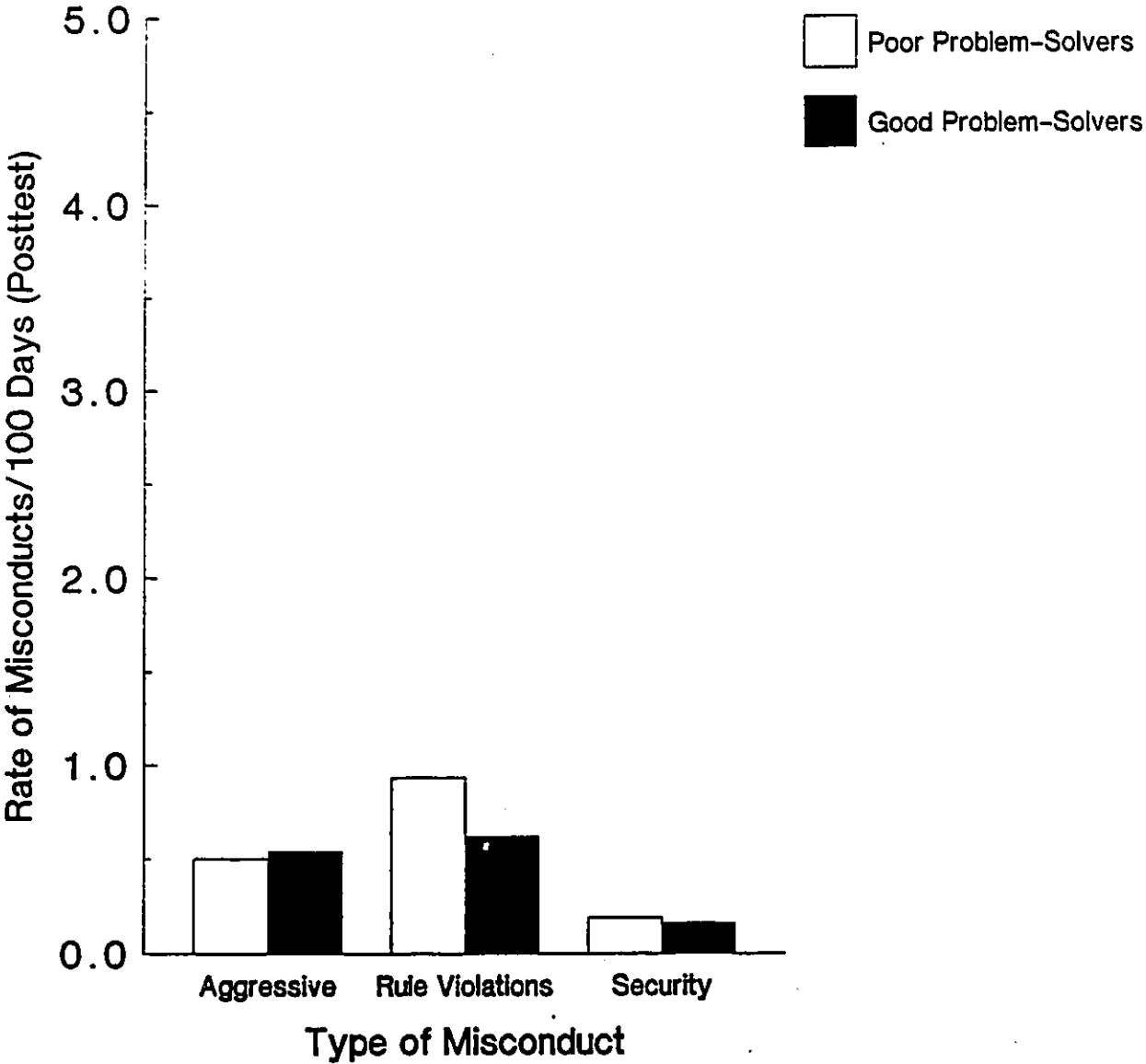
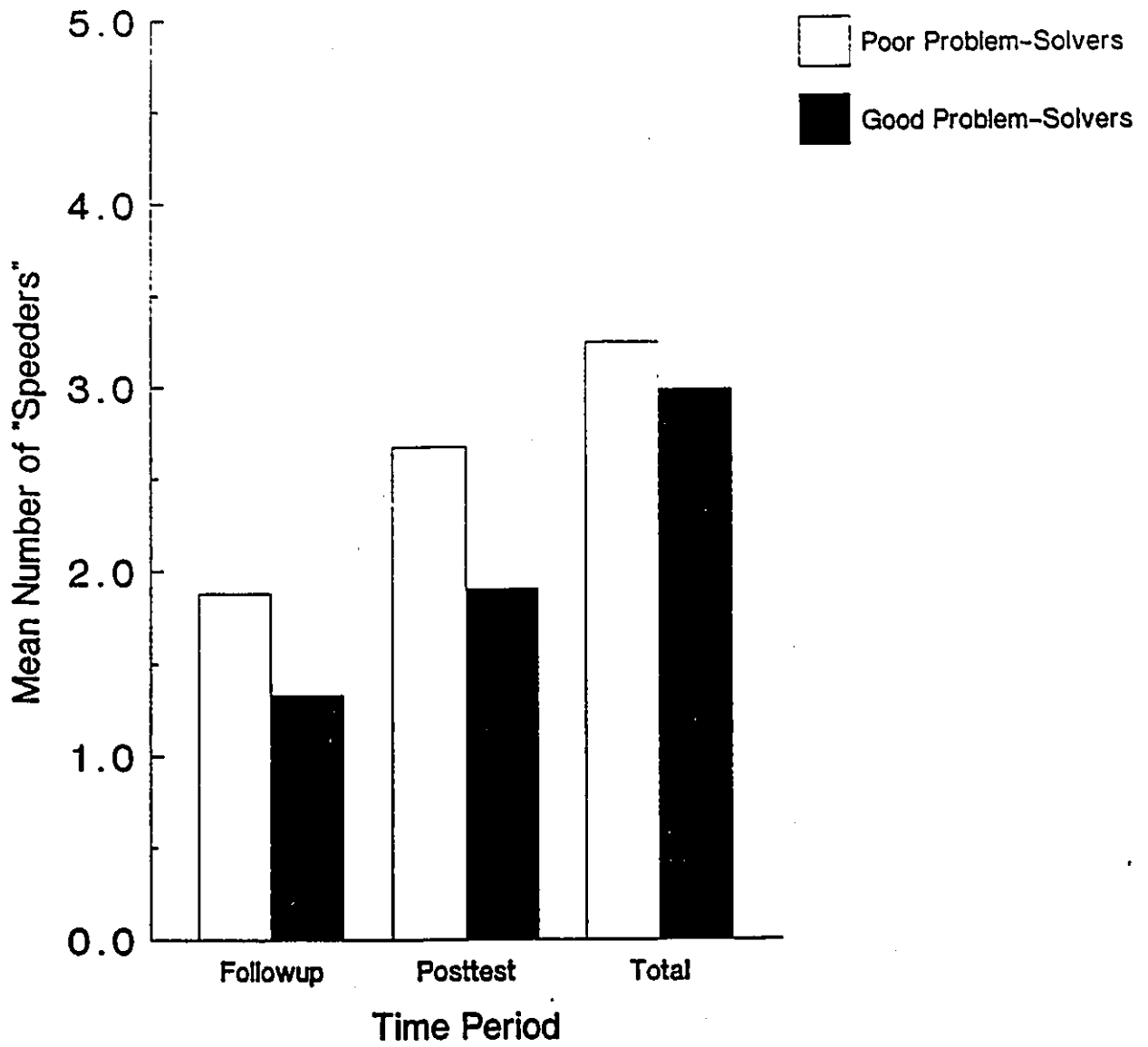


Figure 22. Mean Number of Followup, Posttest, and
Total "Speeders" for Poor and Good Problem-Solvers
based on MEPS Means, Enumerations, Obstacles, and
Time plus Alternatives, Enumerations, Obstacles,
and Time (ALLCOG)

ALLCOG

(Means+Enum+Obst+Time + Alt+Enum+Obst+Time)



similar though nonsignificant trend during the 3-month followup period, $F(1, 69) = 3.190, p=.078$ (Figure 23).

There were no differences between groups for percentage of sentence served prior to discharge or for estimated number of misconducts during the 3-month followup period.

Finally, there were no significant differences between groups for average ratings of aversiveness or deterrence of the institutional sanctions. However, Poor Problem-Solvers were significantly more likely to rate sanctions as Nonaversive (average rating < 5.0), $X^2(1, N = 70) = 3.84, p=.05$.

Recidivism. Poor Problem-Solvers received a significantly greater number of total charges during the one year followup period than Good Problem-Solvers, $F(1, 63) = 5.862, p<.05$ (Figure 24), as well as significantly more convictions ($M = 0.26$ for Poor Problem-Solvers vs. $M = 0$ for Good Problem-Solvers), $F(1, 63) = 4.882, p<.05$. There was also a nonsignificant trend toward more drug/alcohol-related

Figure 23. Mean Number of Followup and Posttest
"Brownies" for Poor and Good Problem-Solvers based
on MEPS Means, Enumerations, Obstacles, and Time
plus Alternatives, Enumerations, Obstacles, and
Time (ALLCOG)

ALLCOG

(Means+Enum+Obst+Time + Alt+Enum+Obst+Time)

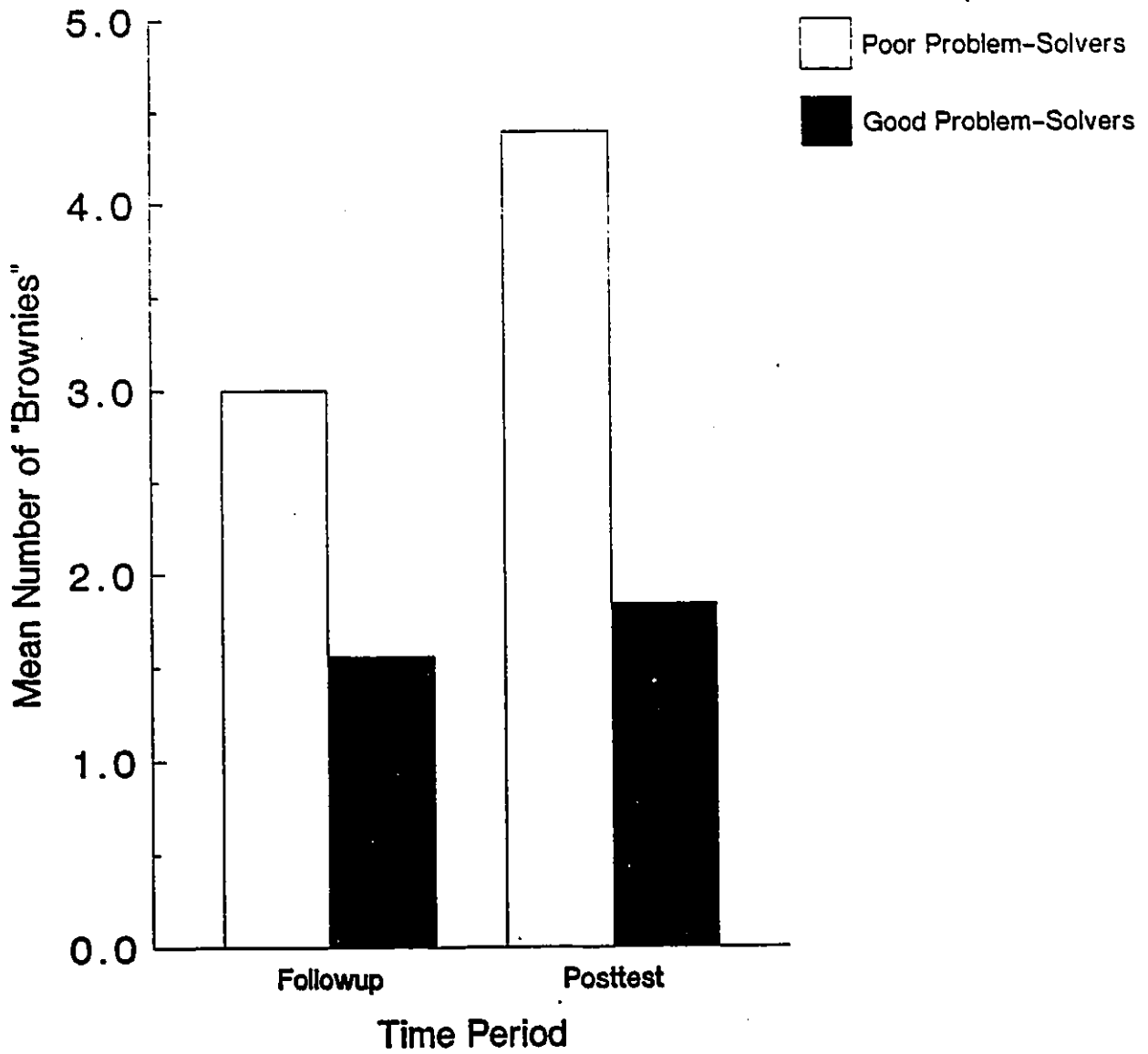
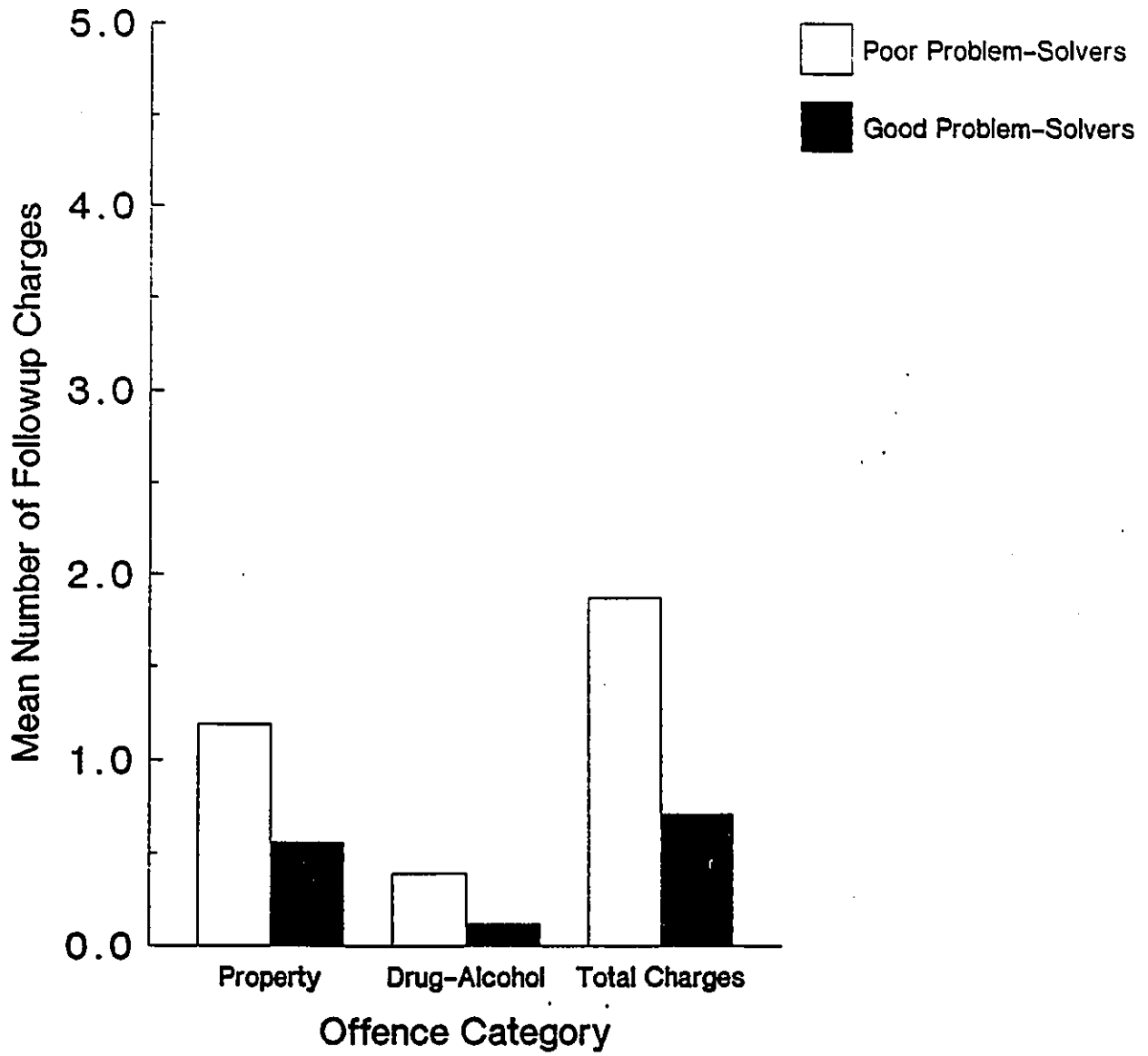


Figure 24. Mean Number of Post-Release Criminal Charges for Property Offences or Drug-Alcohol Offences and Total Charges for Poor and Good Problem-Solvers based on MEPS Means, Enumerations, Obstacles, and Time plus Alternatives, Enumerations, Obstacles, and Time (ALLCOG)

ALLCOG

(Means+Enum+Obst+Time + Alt+Enum+Obst+Time)



charges for Poor Problem-Solvers, $F(1, 63) = 3.241$, $p=.077$. In addition, Good Problem-Solvers were significantly more likely to be nonrecidivists, as defined by absence of followup charges, $\chi^2(1, N = 65) = 5.43$, $p<.05$, or absence of followup convictions, $\chi^2(1, N = 65) = 5.94$, $p<.05$.

Subjective Ratings of Aversiveness.

An average score for perceived aversiveness of institutional sanctions was calculated for each subject by averaging the subjective ratings for the 10 sanctions. As noted, individual sanctions were rated on a 7-point Likert scale where ratings from 1 to 4 indicate that the sanction was perceived as not aversive or "wouldn't care" while ratings from 5 to 7 indicate that the sanction was perceived as clearly aversive. Subjects were then assigned either to the Nonaversive group ($N = 11$), defined as those whose average of the 10 ratings was between 1.0 and 4.9, or to the Aversive group ($N = 59$), defined as those whose average rating fell between 5.0 and 7.0. One way

analyses of variance were calculated for each of the dependent variables.

Demographic Data and Criminal History. There were no significant differences between groups with respect to age, level of education, or IQ, or for any of the criminal history variables.

Institutional Conduct. Subjects in the Nonaversive group incurred a significantly greater number of total misconducts, $F(1, 68) = 15.159, p < .001$, a significantly greater number of posttest misconducts, $F(1, 68) = 12.152, p < .001$, and significantly more misconducts during the 3-month followup period than subjects in the Aversive group, $F(1, 68) = 12.620, p < .001$ (see Figure 25). Recalculating the misconduct data as rate per 100 days to control for differences in sentence length, Nonaversive subjects had significantly higher rates of total misconducts than Aversive subjects, $F(1, 67) = 16.436, p < .001$ (Figure 26). Rates of pretest and posttest misconducts also tended to be higher for Nonaversive subjects.

**Figure 25. Mean Number of Pretest, Followup, Posttest,
and Total Misconducts as a function of Average
Aversiveness Rating**

Average Aversiveness Rating

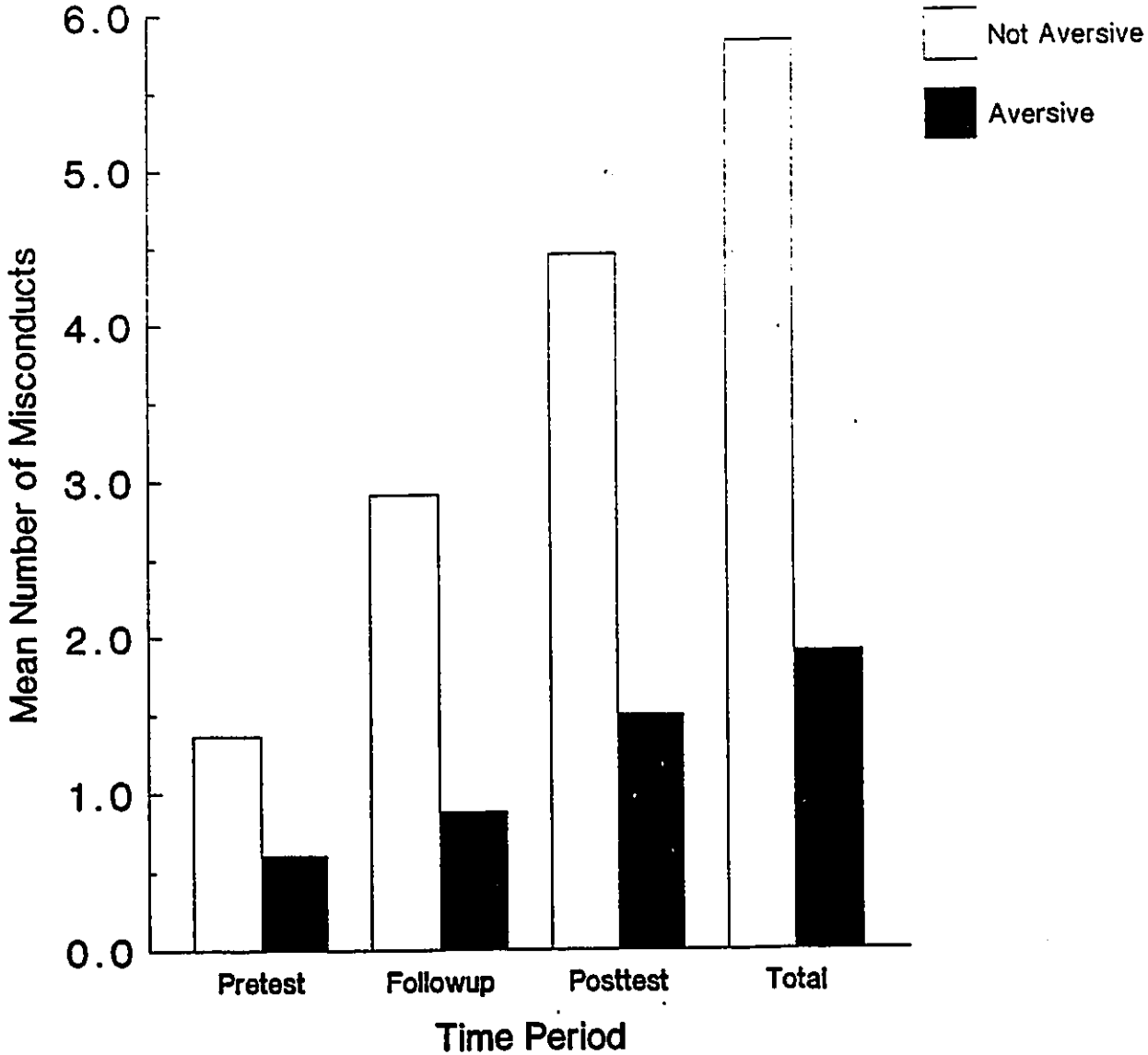
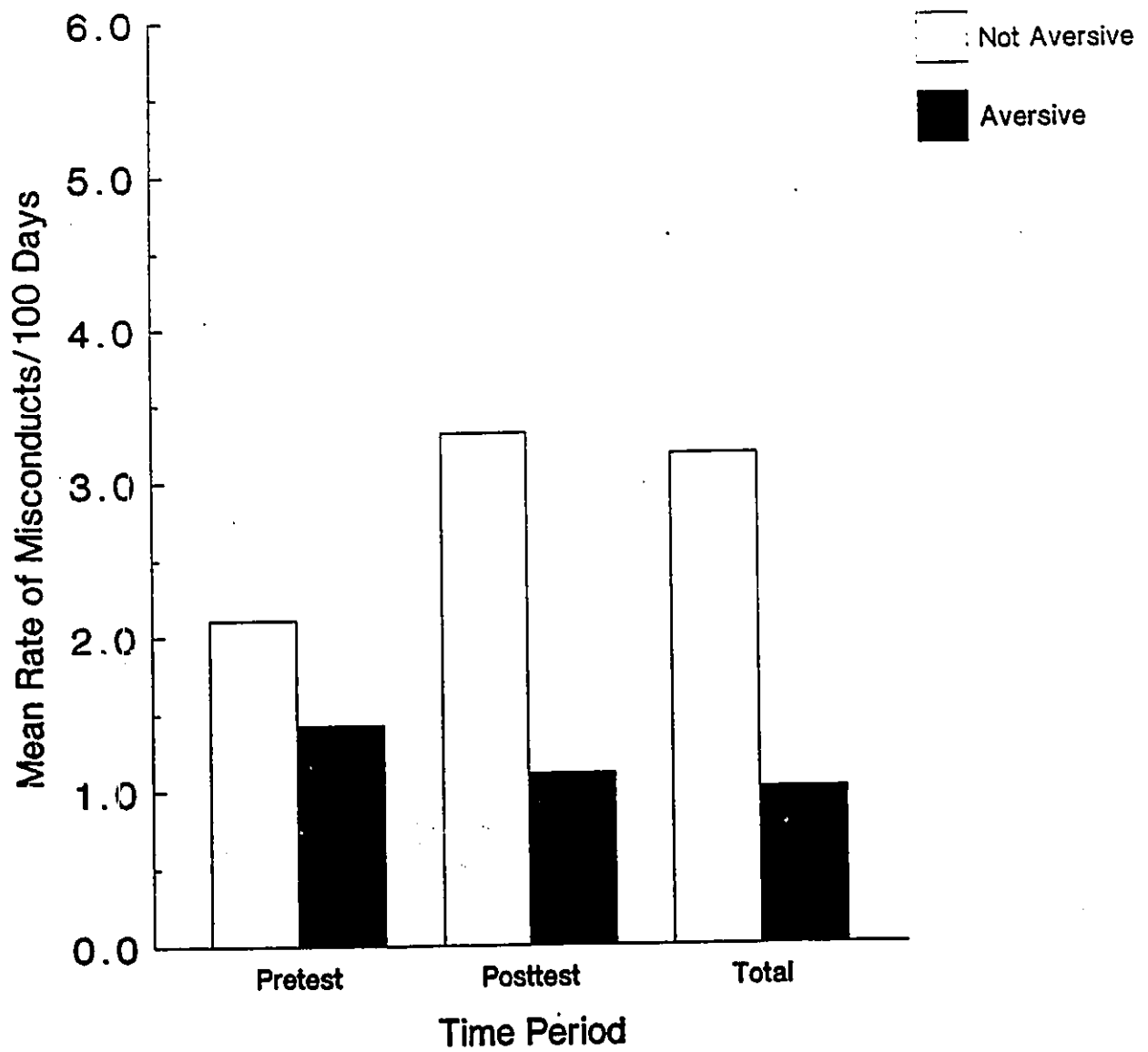


Figure 26. Mean Rate of Pretest, Posttest, and Total
Misconducts as a function of Average Aversiveness
Rating

Average Aversiveness Rating



Similar effects were seen for individual types of misconducts (see Figure 27). The Nonaversive group had significantly higher rates of aggressive misconducts, $F(1, 68) = 3.857, p=.054$, and rule violation misconducts, $F(1, 68) = 11.269, p<.001$, than the Aversive group.

In addition, the Nonaversive group had significantly more "speeders" during the 3-month followup than the Aversive group, $F(1, 68) = 10.371, p<.01$, and significantly more total "speeders", $F(1, 68) = 12.384, p<.001$ (see Figure 28). The groups did not differ with respect to number of "brownies" (Figure 29). The Nonaversive group also served a greater proportion of their sentences prior to discharge ($M = 0.71$ vs $M = 0.54$ for Aversive subjects), $F(1, 67) = 8.196, p<.01$.

Nonaversive and Aversive subjects also differed with respect to their ratings of deterrence of sanctions and the number of anticipated future misconducts. The Nonaversive subjects rated sanctions on average as having less of a deterrent effect (mean

**Figure 27. Mean Rate of Aggressive, Rule Violation,
and Security Misconducts as a function of Average
Aversiveness Rating**

Average Aversiveness Rating

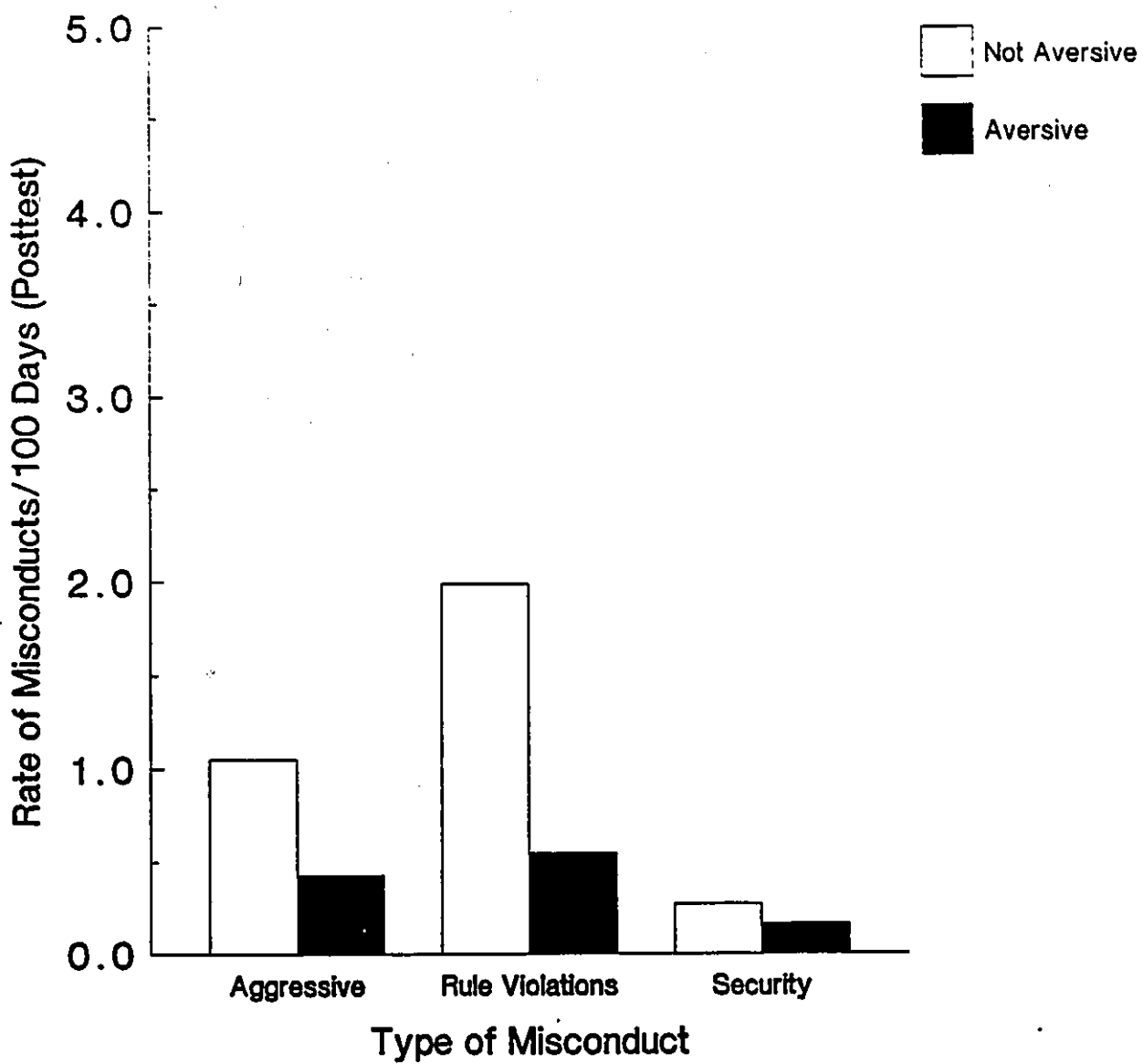


Figure 28. Mean Number of Followup, Posttest, and
Total "Speeders" as a function of Average
Aversiveness Rating

Average Aversiveness Rating

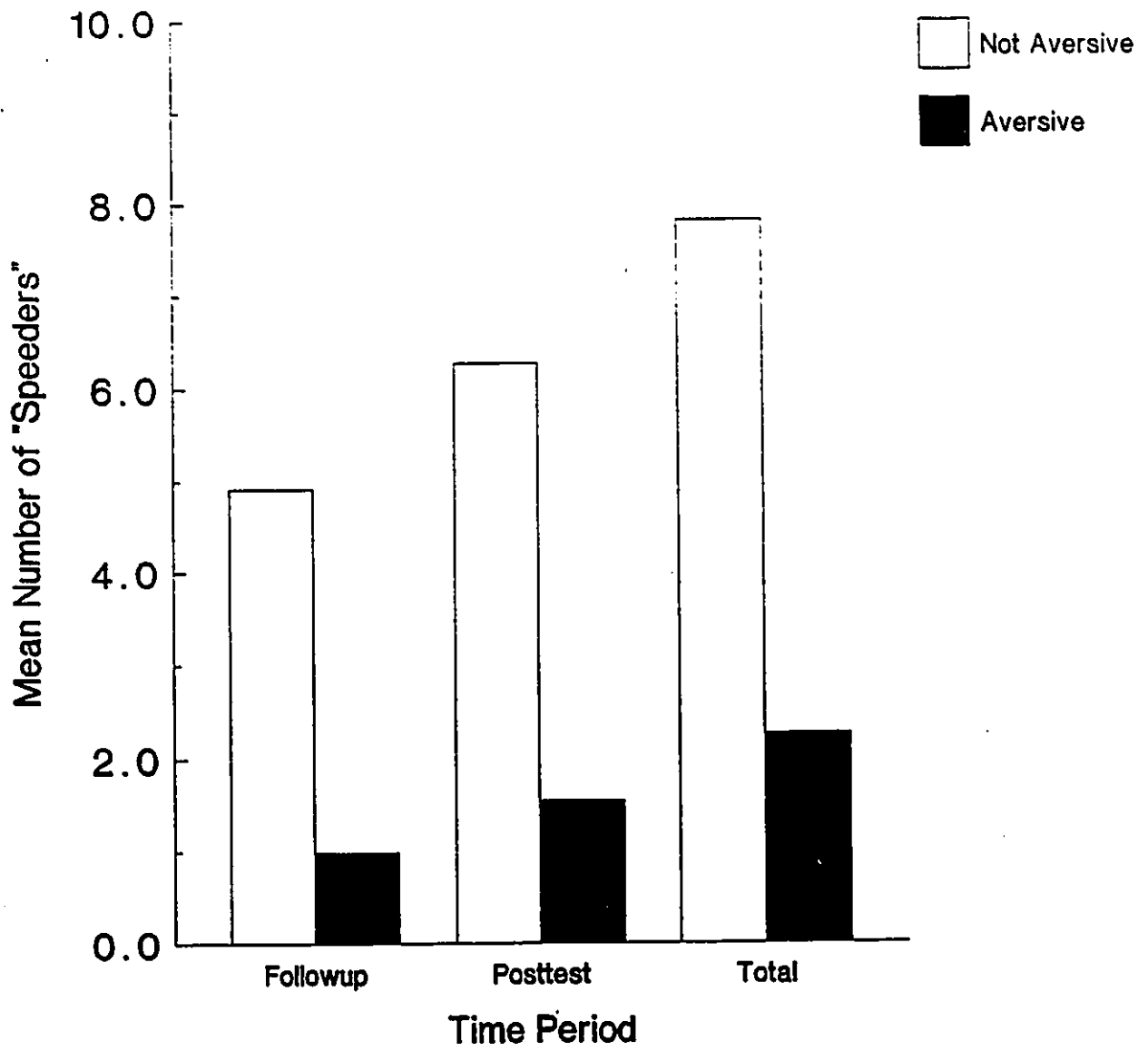
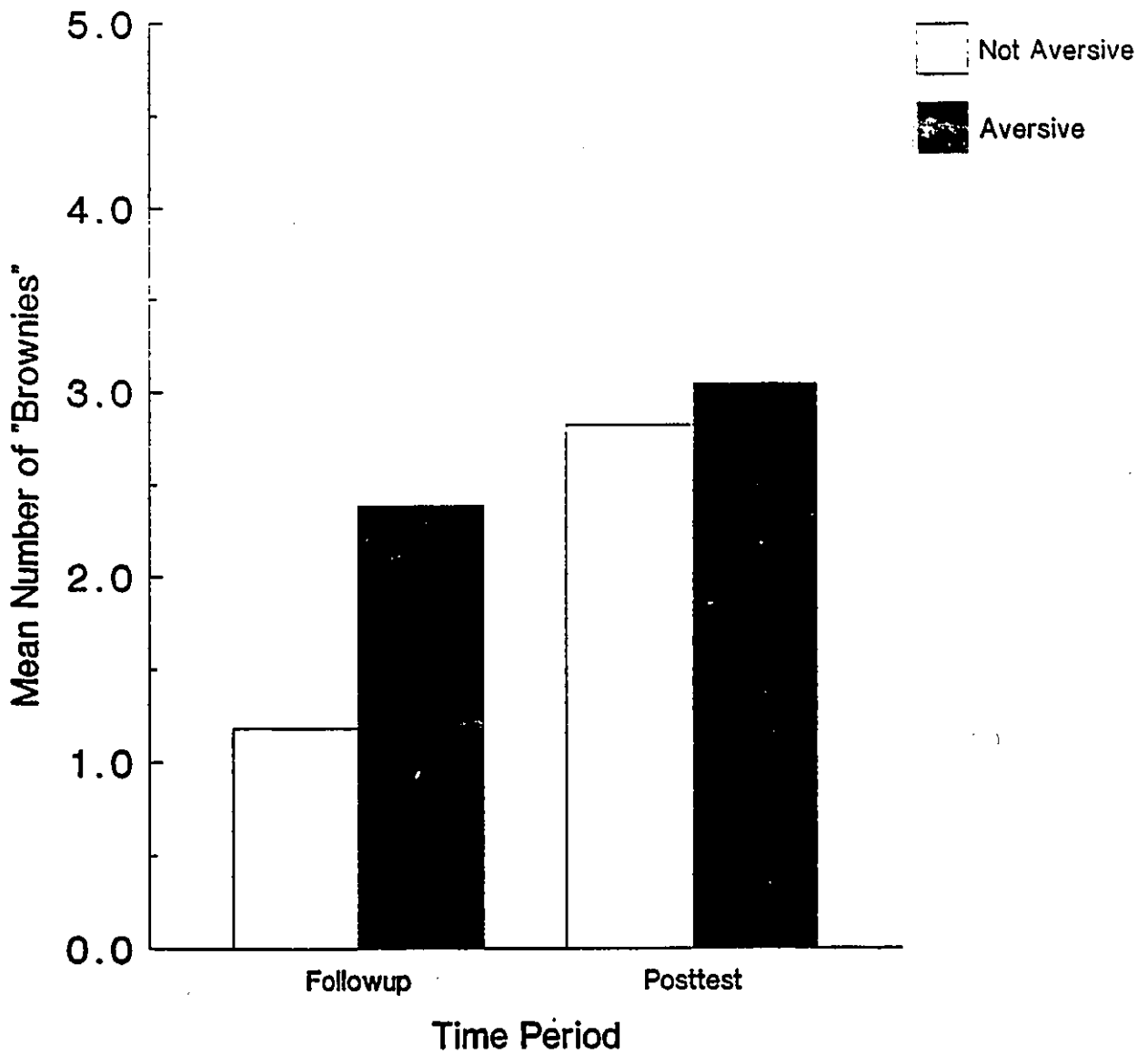


Figure 29. Mean Number of Followup and Posttest
"Brownies" as a function of Average Aversiveness
Rating

Average Aversiveness Rating



rating = 3.25 vs. mean rating = 4.88 for Aversive subjects), $F(1, 68) = 10.025, p < .01$, and they estimated that they would incur a significantly greater number of misconducts during the 3-month followup period ($M = 2.50$ vs $M = 0.59$ for Aversive subjects), $F(1, 67) = 12.492, p < .001$.

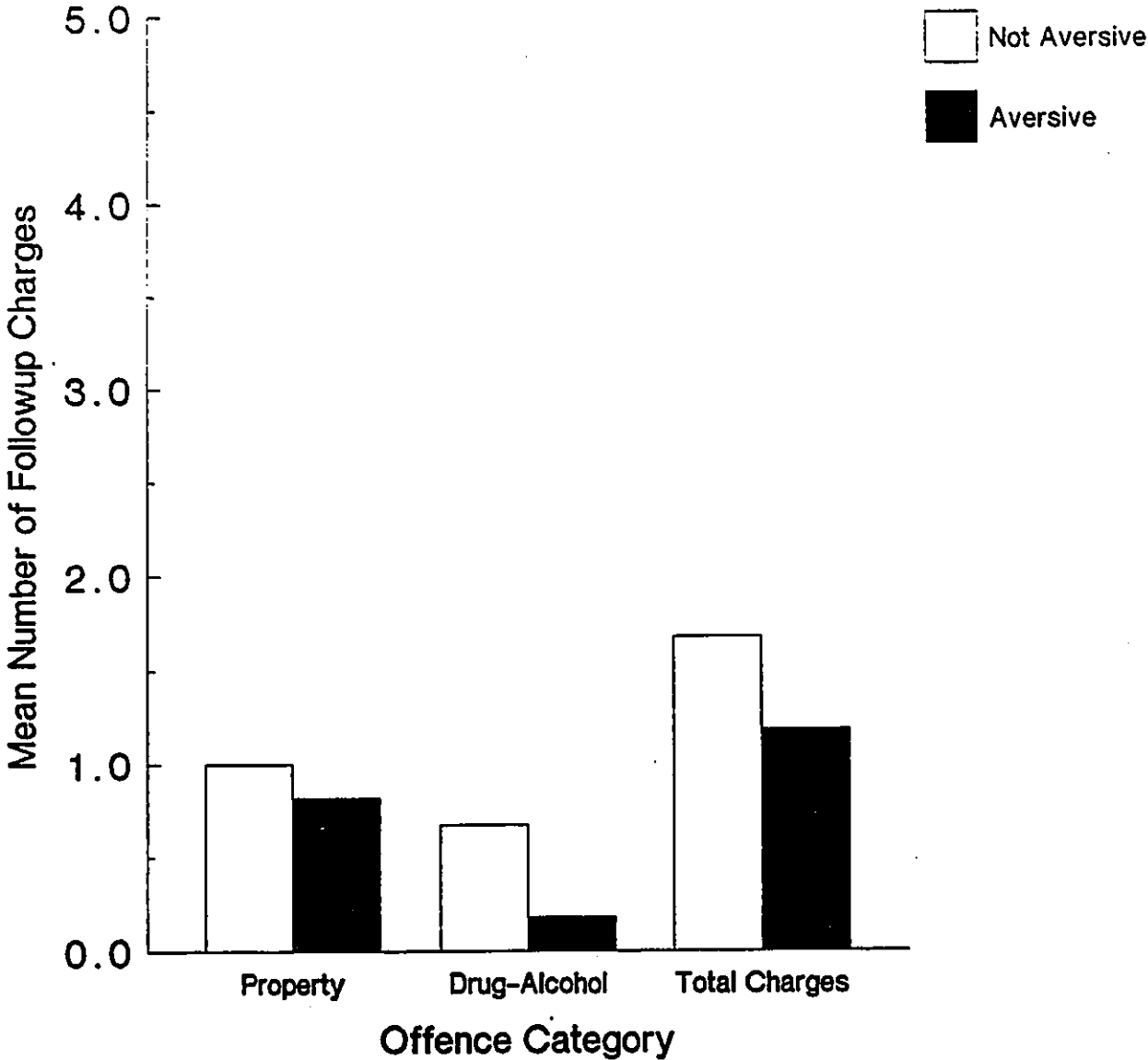
Recidivism. In general, there were no differences between groups for recidivism (Figure 30). The one exception was drug-alcohol charges, where the Nonaversive group received significantly more charges than the Aversive group, $F(1, 62) = 5.082, p < .05$.

Subjective Ratings of Deterrence.

As with the aversiveness ratings, an average score for perceived deterrence of institutional sanctions was obtained for each subject by averaging individual ratings for the 10 sanctions. Again, ratings were made on a 7-point Likert scale where ratings from 1 to 4 reflect the opinion that the sanction would not have a deterrent effect while ratings from 5 to 7 reflect the

Figure 30. Mean Number of Post-Release Criminal Charges for Property Offences or Drug-Alcohol Offences and Total Charges as a function of Average Aversiveness Rating

Average Aversiveness Rating



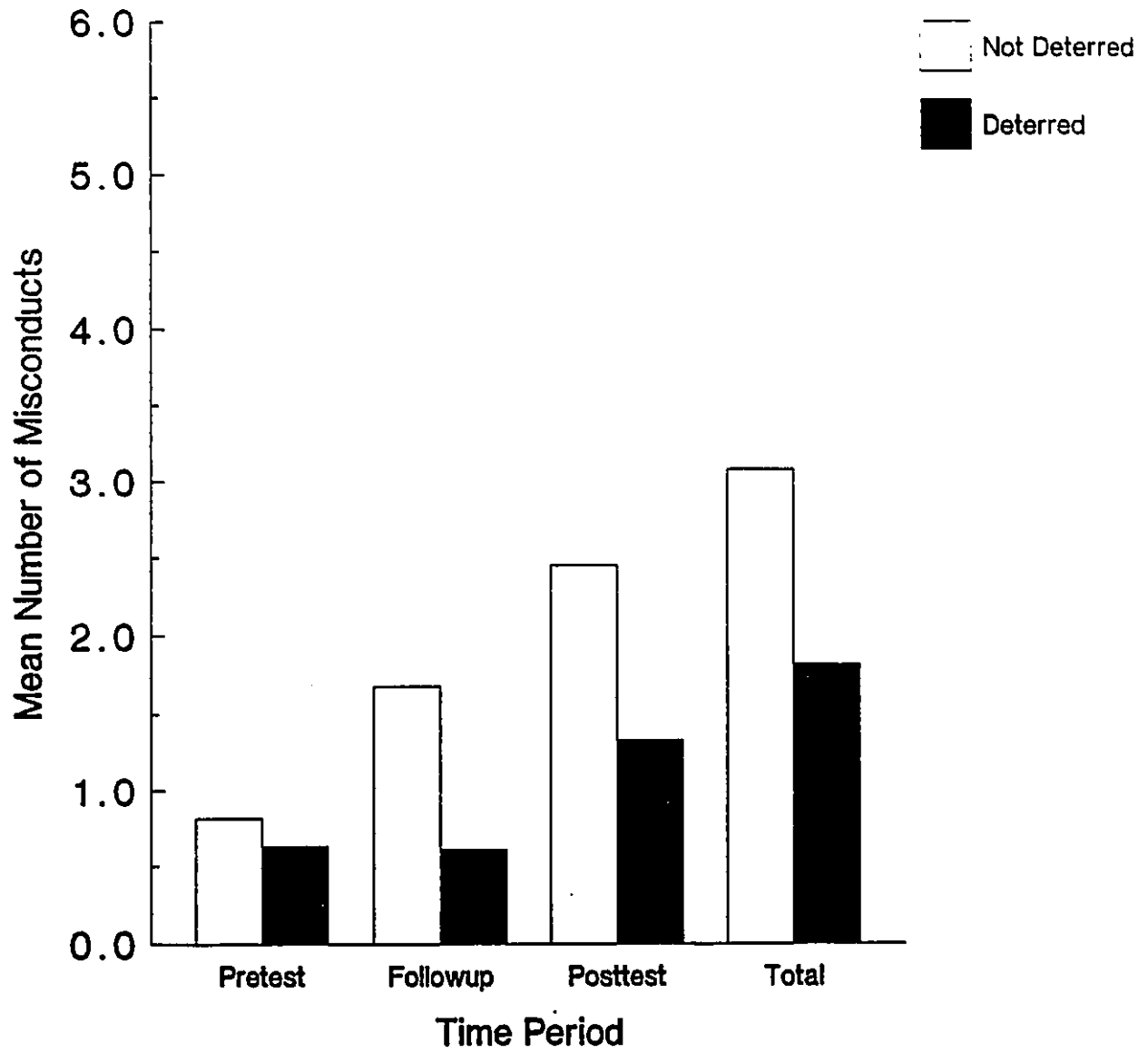
opinion that the sanction would have a deterrent effect. Subjects were then assigned to the Nondeterred group ($N = 38$), defined as those whose average rating was between 1.0 and 4.9, or to the Deterred group ($N = 33$), defined as those whose average rating fell between 5.0 and 7.0. One way analyses of variance were computed for each of the dependent variables.

Demographic Data and Criminal History. There were no significant differences between groups with respect to level of education, IQ, or any of the criminal history variables. However, the Nondeterred subjects were significantly younger ($M = 22.26$) than the Deterred subjects ($M = 25.33$), $F(1, 69) = 4.292$, $p < .05$.

Institutional Conduct. Nondeterred subjects had significantly more misconducts during the 3-month followup than Deterred subjects, $F(1, 69) = 6.332$, $p < .05$ (Figure 31) and they also tended to have more posttest misconducts and a greater total number of misconducts. However, the rates of misconducts did not differ significantly, though there was a nonsignificant trend toward a higher rate of total misconducts for the

Figure 31. Mean Number of Pretest, Followup, Posttest,
and Total Misconducts as a function of Average
Deterrence Rating

Average Deterrence Rating



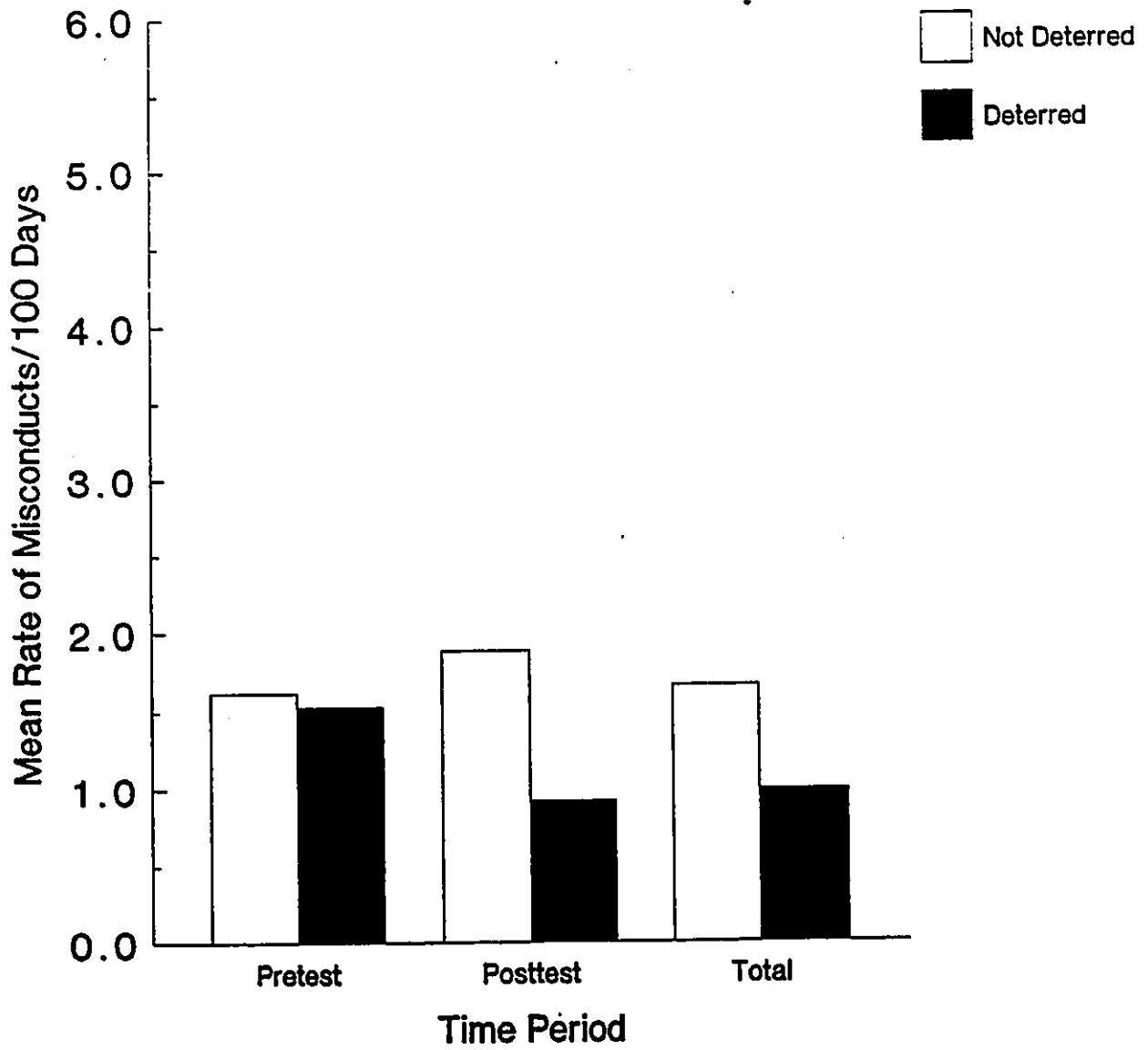
Nondeterred group, $F(1, 69) = 3.659, p=.06$ (Figure 32). The Nondeterred group also had significantly more rule violation misconducts during the 3-month followup period, $F(1, 69) = 6.679, p<.05$ (Figure 33), though the groups did not differ with respect to the other misconduct categories.

The Nondeterred group had a greater number of total "speeders" than the Deterred group, though this difference did not reach statistical significance levels, $F(1, 69) = 3.224, p=.077$ (Figure 34). Deterred subjects tended to receive more "brownies" (Figure 35), though again these differences were not significant. In addition, Nondeterred subjects gave higher estimates of the number of expected misconducts during the 3-month followup ($M = 1.35$ vs. $M = 0.42$ for Deterred subjects), $F(1, 68) = 5.296, p<.05$.

Finally, Nondeterred subjects perceived the sanctions as slightly but significantly less aversive (mean aversiveness rating = 5.41) than Deterred subjects (mean aversiveness rating = 6.39), $F(1, 68) = 30.123, p<.001$.

Figure 32. Mean Rate of Pretest, Posttest, and Total
Misconducts as a function of Average Deterrence
Rating

Average Deterrence Rating



**Figure 33. Mean Rate of Aggressive, Rule Violation,
and Security Misconducts as a function of Average
Deterrence Rating**

Average Deterrence Rating

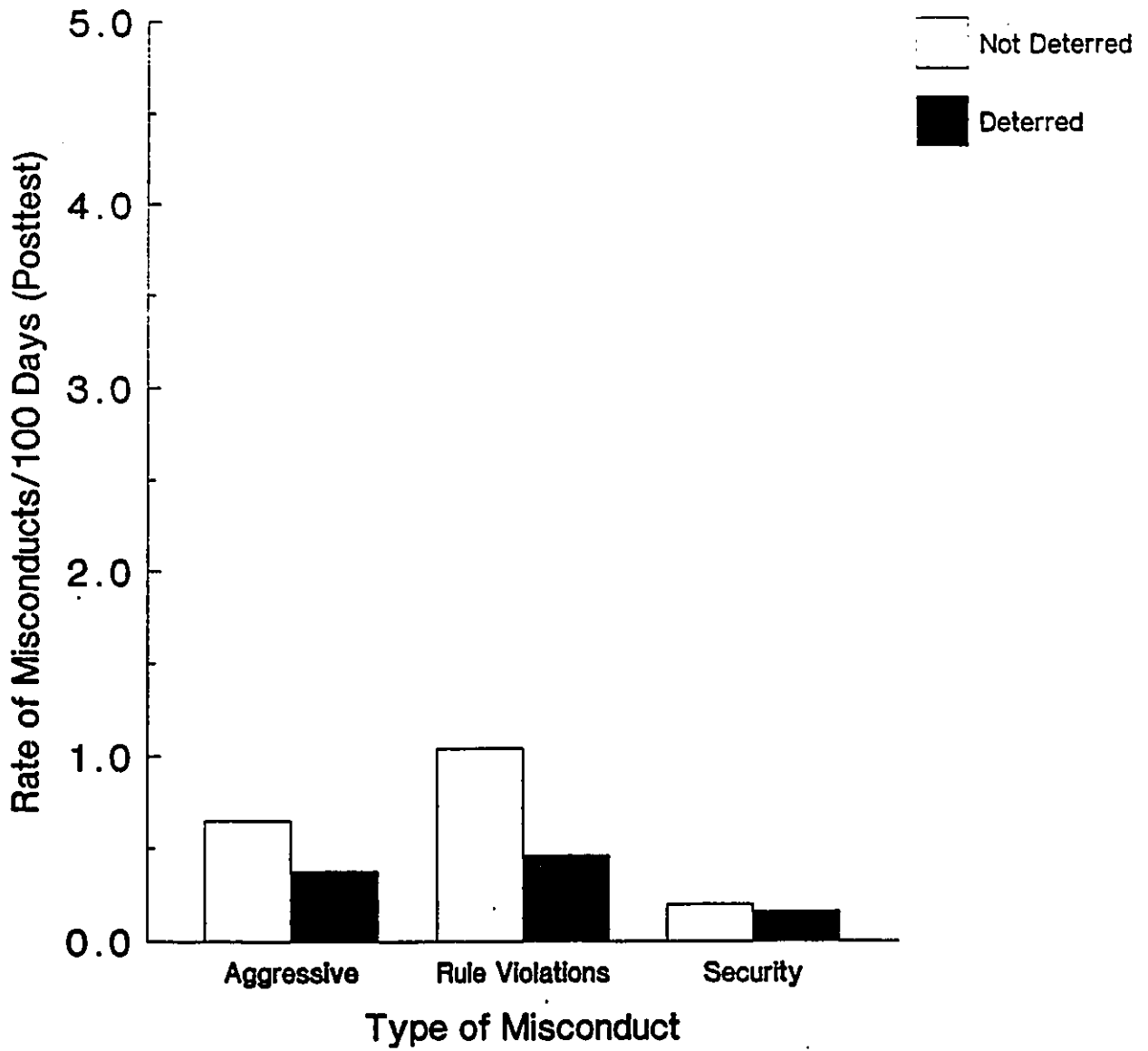


Figure 34. Mean Number of Followup, Posttest, and
Total "Speeders" as a function of Average
Deterrence Rating

Average Deterrence Rating

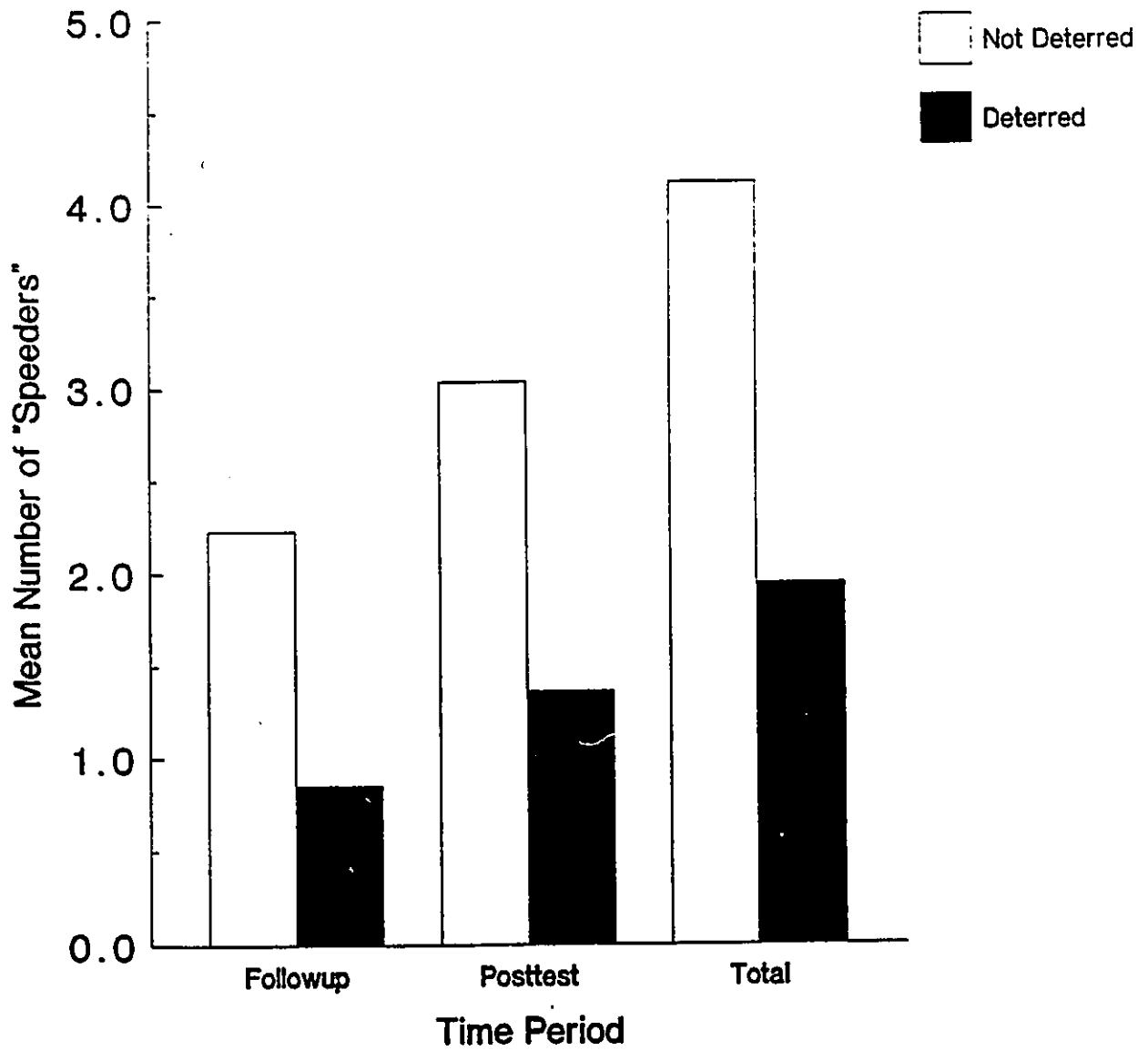
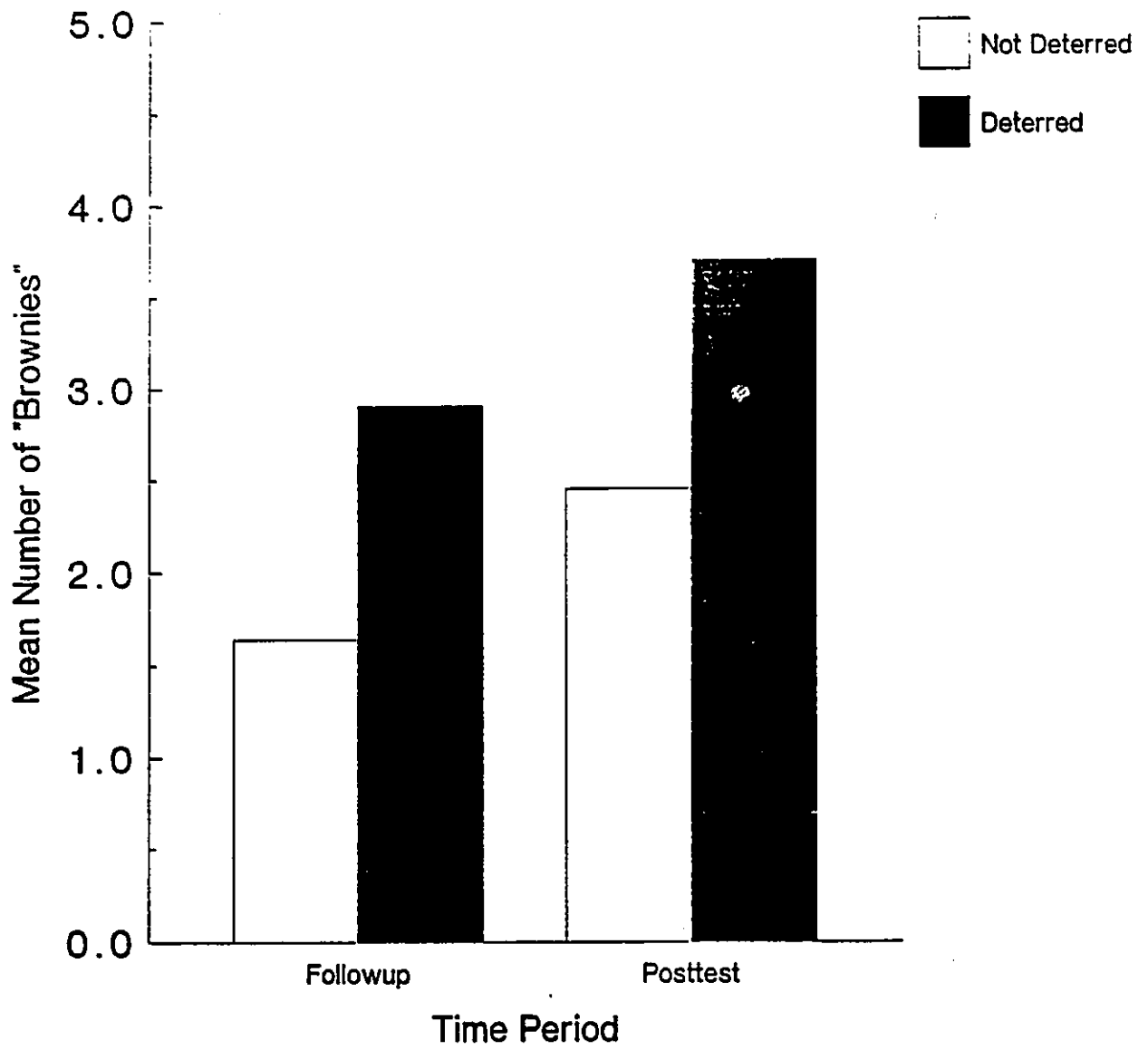


Figure 35. Mean Number of Followup and Posttest
"Brownies" as a function of Average Deterrence
Rating

Average Deterrence Rating



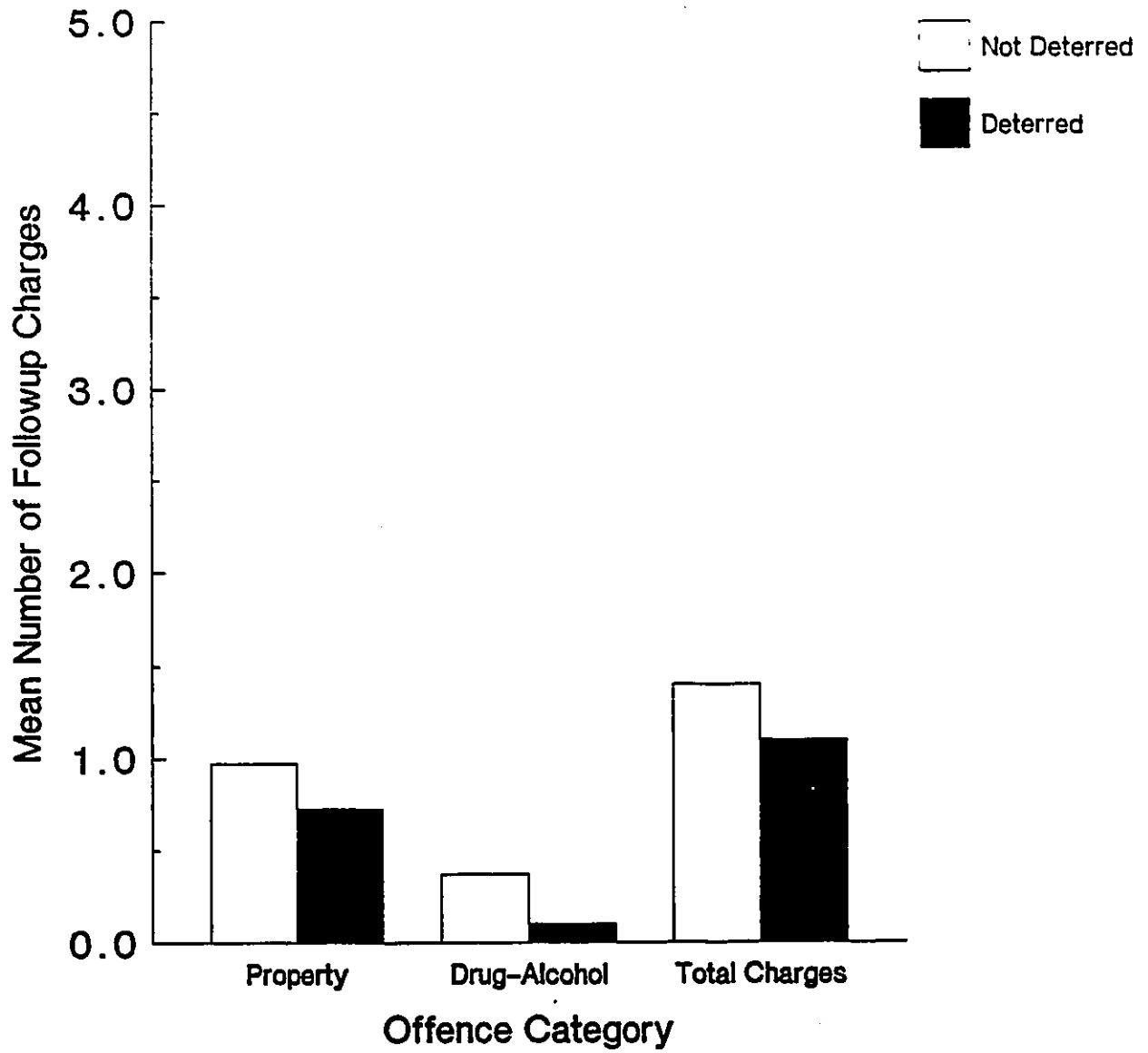
Recidivism. There were no significant differences between groups with respect to any of the recidivism measures (Figure 36).

Aversiveness and Deterrence Ratings Combined.

The total sample was divided into 3 groups based on the combined subjective ratings for aversiveness and deterrence. Subjects with average aversiveness ratings of less than 5.0 and average deterrence ratings of less than 5.0 were assigned to the Nonaversive/Nondeterred group (Group NA/ND, N = 12). Subjects with average aversiveness ratings of 5.0 or higher and average deterrence ratings of less than 5.0 were assigned to the Aversive/Nondeterred group (Group A/ND, N = 27). Finally, subjects with average aversiveness ratings of 5.0 or higher and average deterrence ratings of 5.0 or higher were assigned to the Aversive/Deterred group (Group A/D, N = 32). One way analyses of variance were then calculated for each of the dependent measures.

Figure 36. Mean Number of Post-Release Criminal Charges for Property Offences or Drug-Alcohol Offences and Total Charges as a function of Average Deterrence Rating

Average Deterrence Rating



Demographic Data and Criminal History. There were no significant differences among groups in terms of age, level of education, IQ, or any of the criminal history variables.

Institutional Conduct. Group NA/ND received more than twice as many total misconducts as Group A/ND or Group A/D, $F(2, 68) = 6.369, p < .01$ (see Figure 37). The groups also differed significantly with respect to misconducts during the 3-month followup period, $F(2, 68) = 5.940, p < .01$, with Group NA/ND receiving almost twice as many misconducts as Group A/ND, which in turn had about twice as many as Group A/D. Recalculating misconducts as rate per 100 days to equate for sentence length (Figure 38), Group NA/ND had more than twice the rate of total misconducts than either Group A/ND or Group A/D, $F(2, 66) = 5.831, p < .01$, as well as higher rates during the pretest and posttest periods.

Breaking misconducts down into type of misconduct revealed significant differences among groups for rule violations, the most frequently occurring type (Figure 39). Group NA/ND received almost twice as many rule

Figure 37. Mean Number of Pretest, Followup, Posttest,
and Total Misconducts as a function of
Aversiveness-Deterrence Combined

Aversiveness-Deterrence Combined

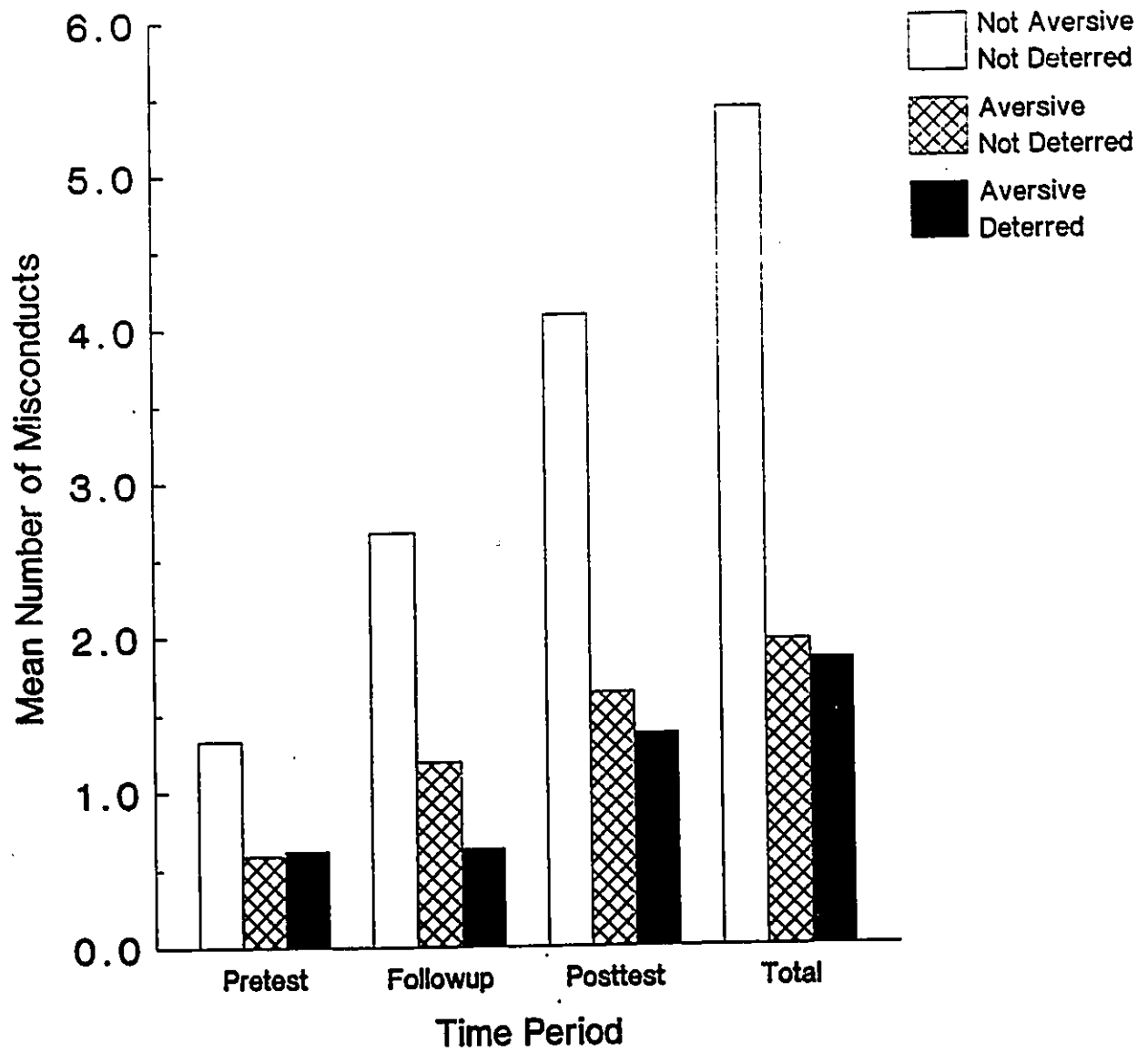
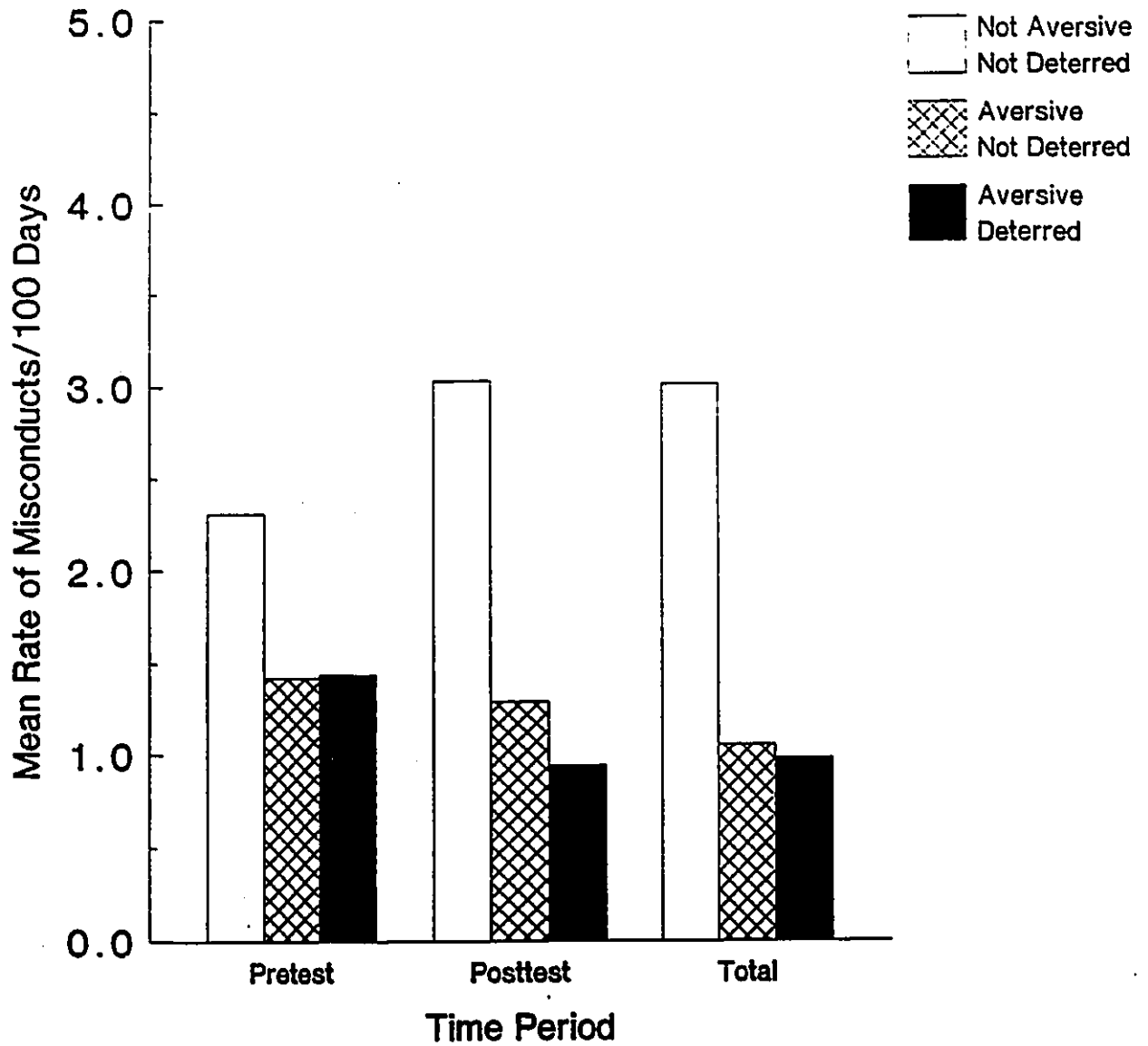


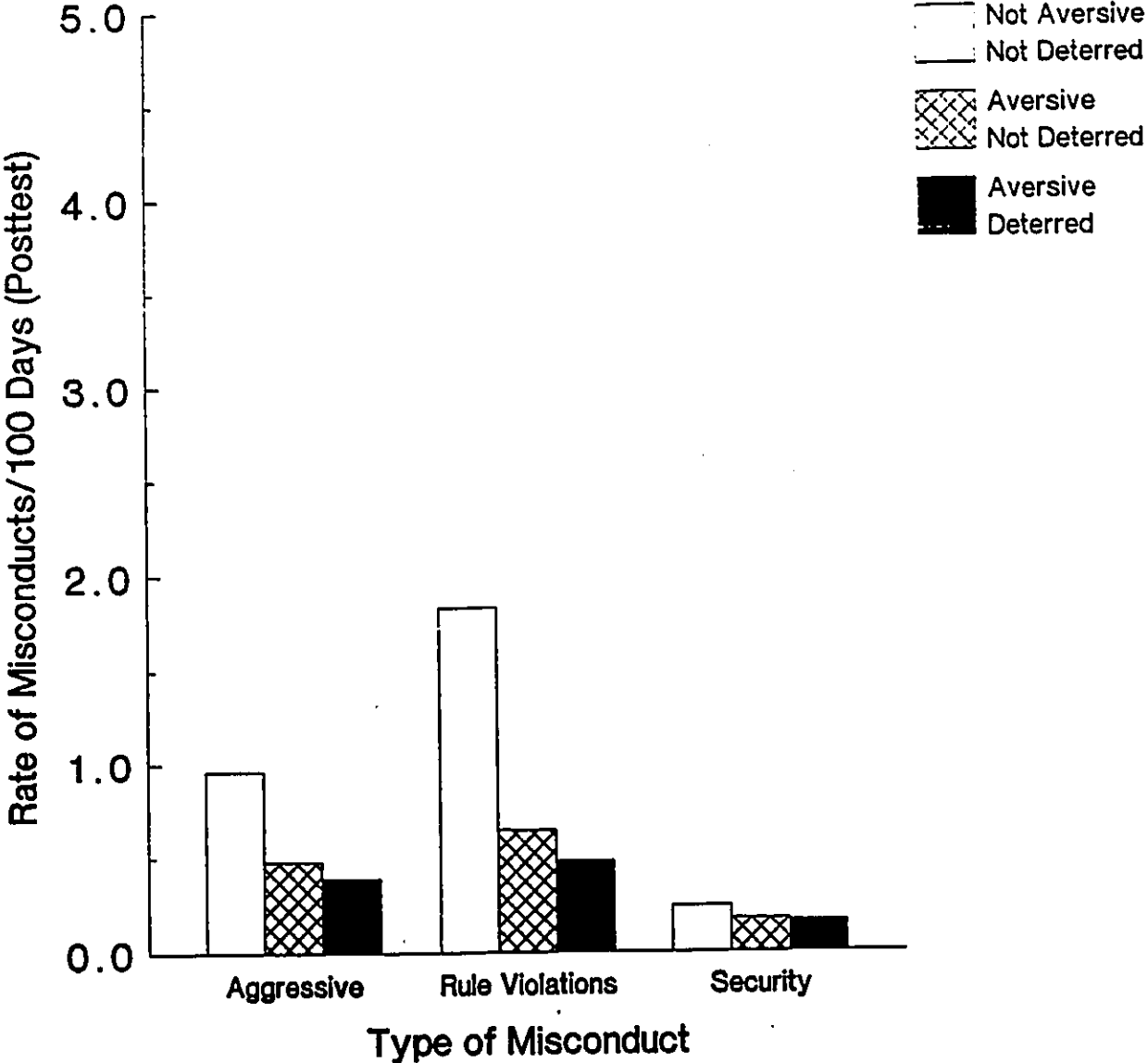
Figure 38. Mean Rate of Pretest, Posttest, and Total
Misconducts as a function of Aversiveness-
Deterrence Combined

Aversiveness-Deterrence Combined



**Figure 39. Mean Rate of Aggressive, Rule Violation,
and Security Misconducts as a function of
Aversiveness-Deterrence Combined**

Aversiveness-Deterrence Combined



violation misconducts during the 3-month followup period as Group A/ND, which in turn received more than twice as many as Group A/D, $F(2, 68) = 6.483, p < .01$. Similar differences were observed for rule violation misconducts recalculated as rate/100 days, $F(2, 68) = 4.733, p < .05$. There were no significant differences with respect to the other misconduct categories.

In addition, Group NA/ND received almost 4 times as many "speeders" during the 3-month followup as Group A/ND or Group A/D, $F(2, 68) = 4.409, p < .05$ (Figure 40). The same relationship was observed for total number of "speeders", $F(2, 68) = 5.133, p < .01$. The groups did not differ significantly with respect to number of "brownies" received (Figure 41).

Finally, subjects in Group NA/ND gave higher estimates of the number of misconducts they expected to receive during the 3-month followup period ($M = 2.64$) than subjects in Group A/ND ($M = 0.93$) or Group A/D ($M = 0.32$), $F(2, 68) = 8.791, p < .001$. Subjects in this group were also incarcerated for a greater proportion of their sentences prior to discharge ($M = 0.68$) than

Figure 40. Mean Number of Followup, Posttest, and
Total "Speeders" as a function of Aversiveness-
Deterrence Combined

Aversiveness-Deterrence Combined

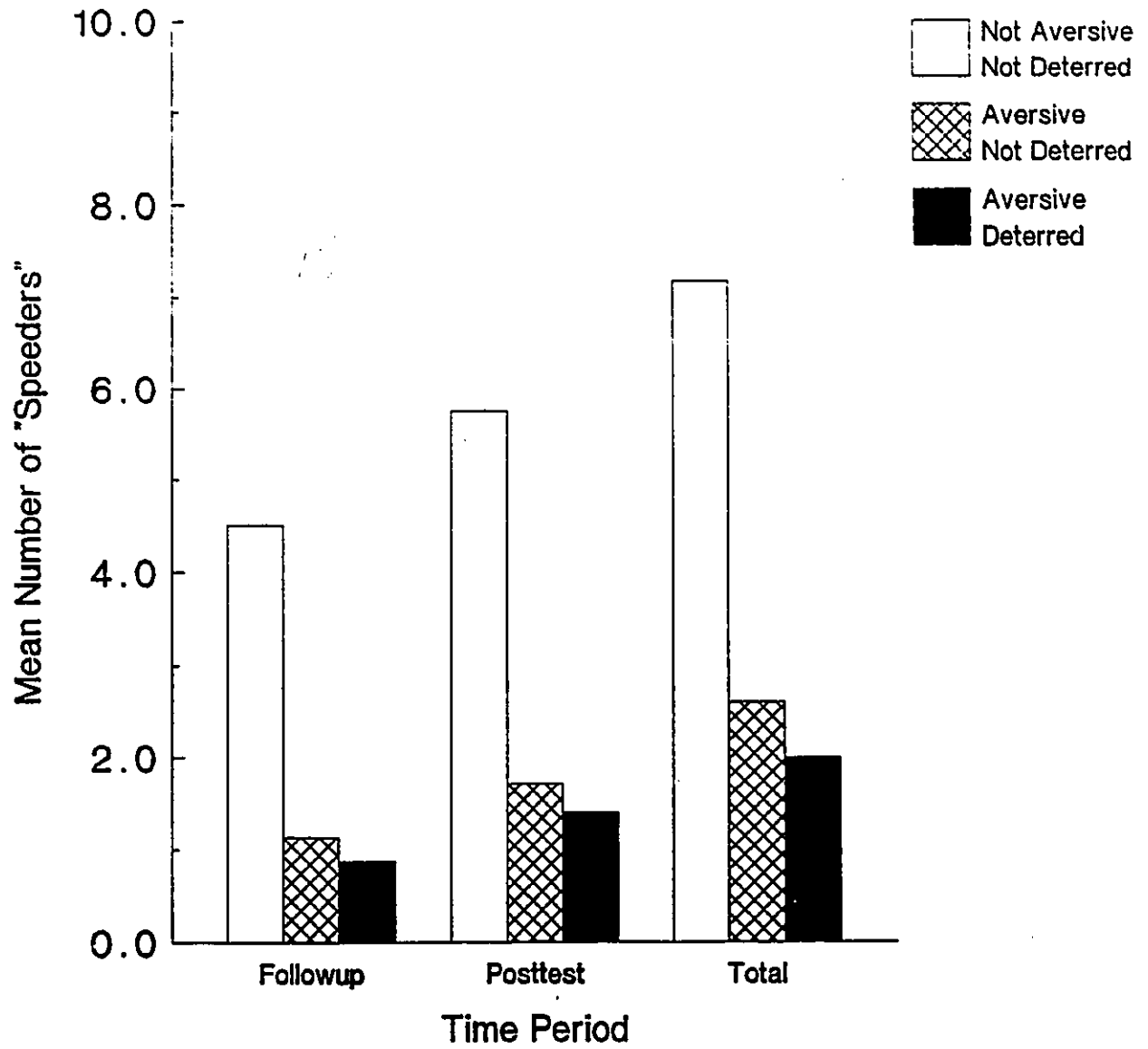
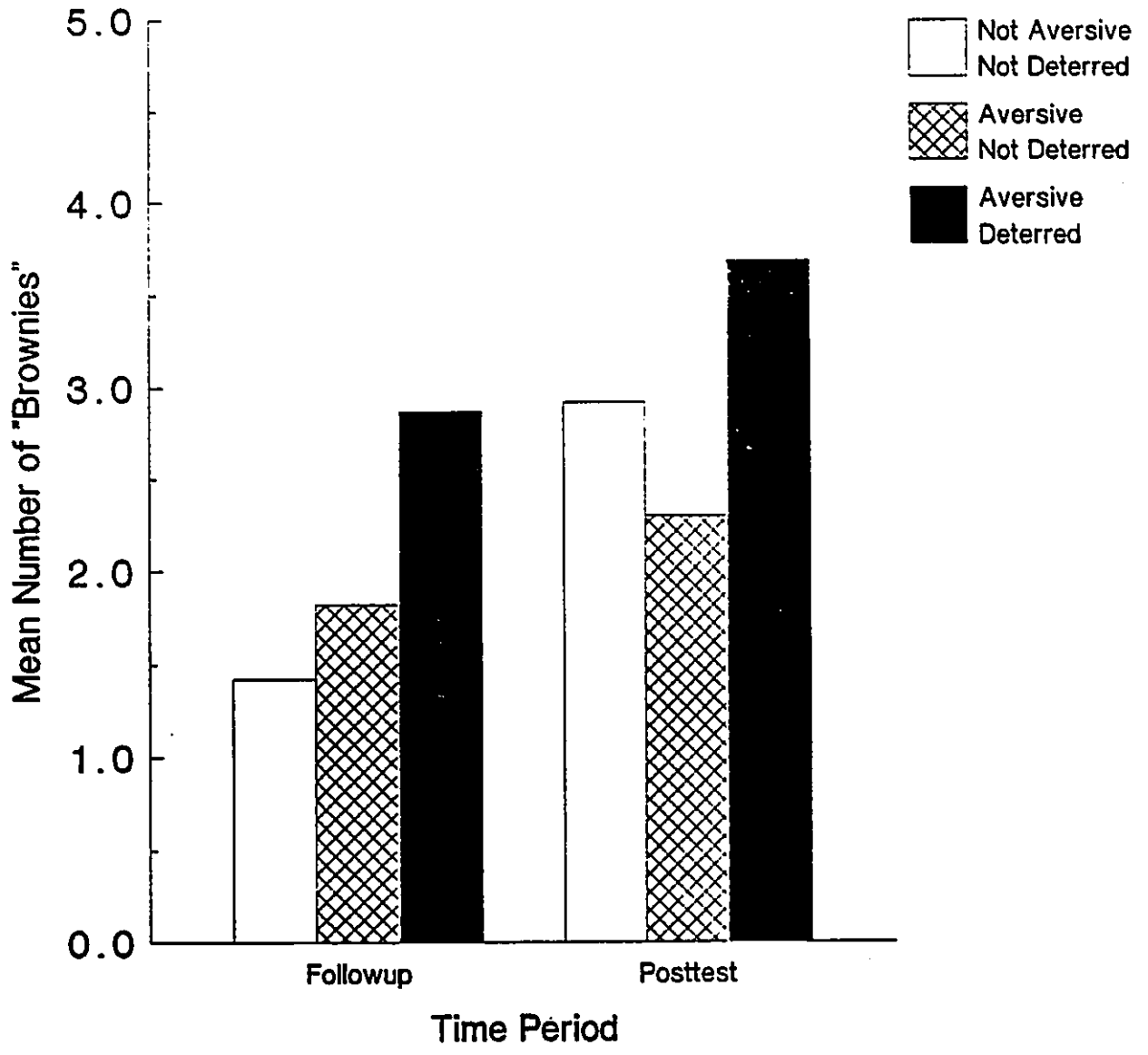


Figure 41. Mean Number of Followup and Posttest
"Brownies" as a function of Aversiveness-
Deterrence Combined

Aversiveness-Deterrence Combined



Group A/ND or Group A/D ($M = 0.54$ for both groups),
 $F(2, 66) = 2.949, p=.059$.

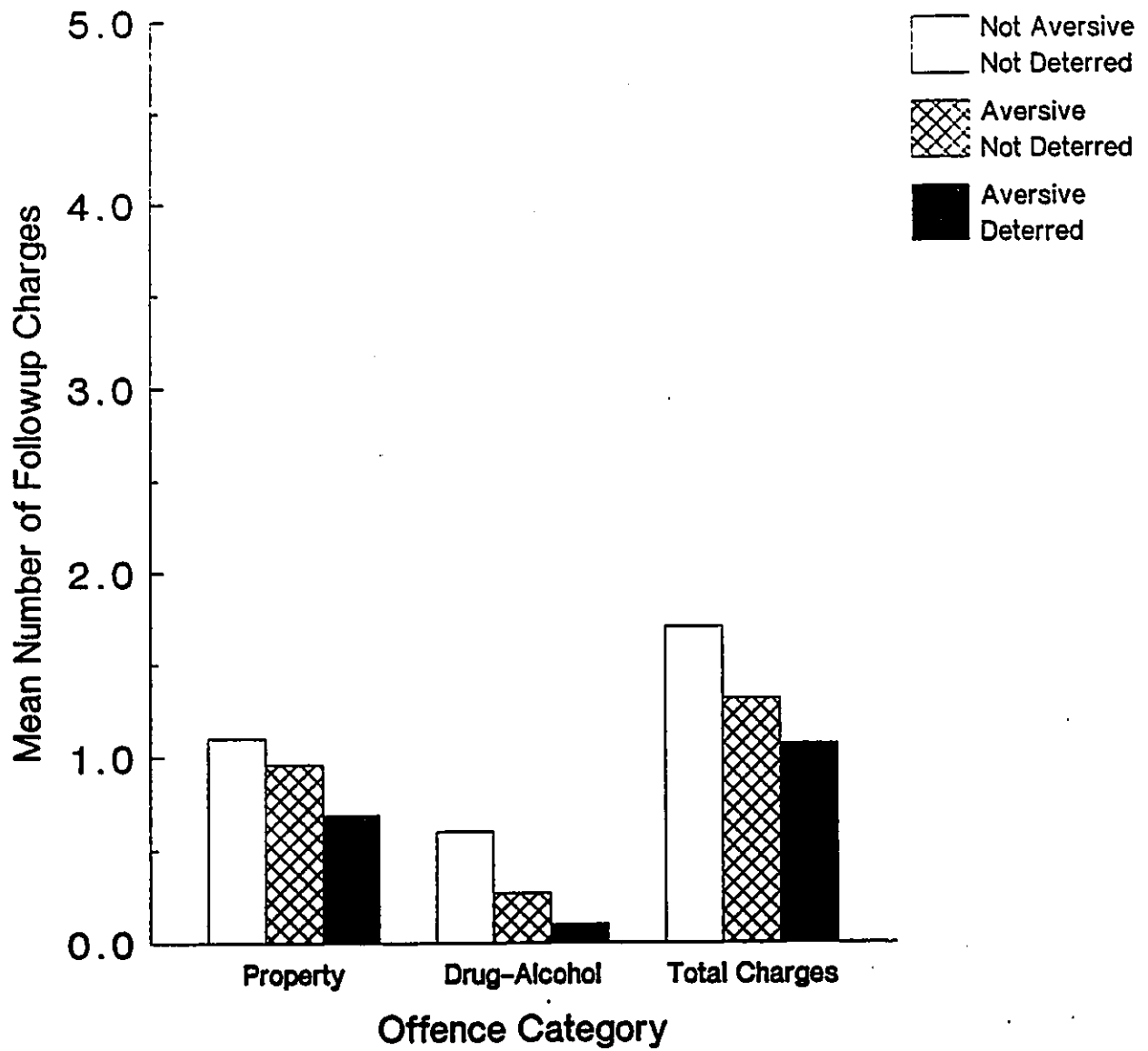
Recidivism. No significant differences were found among the groups for any of the recidivism measures (Figure 42). However, there was a nonsignificant trend for drug-alcohol charges during the 1-year followup, with Group NA/ND receiving the most charges followed by Group A/ND and Group A/D, $F(2, 62) = 2.592, p=.083$.

Problem-Solving Measures Compared

A comparison of the results of analyses of simple and composite measures of problem-solving skill described above (see Figures 1 to 24) as well as the correlations between problem-solving measures and measures of institutional adjustment or recidivism suggest somewhat greater sensitivity or predictive power for the two composite measures, TOTCOG (MEPS Means and Enumerations plus Alternatives and Enumerations) and ALLCOG (TOTCOG plus Obstacles and Time scores from each test). This impression was

**Figure 42. Mean Number of Post-Release Criminal
Charges for Property Offences or Drug-Alcohol
Offences and Total Charges as a function of
Aversiveness-Deterrence Combined**

Aversiveness-Deterrence Combined



supported by the results of some preliminary discriminant analyses and multiple regression analyses attempting to predict recidivism or institutional misconduct. Of the two, TOTCOG was selected for further analysis because of the low frequencies of scores for Obstacles and Time in either the MEPS test or the Optional Thinking Test (see Table 4: the median and mode were both 0 for both scores on both tests).

Problem-Solving and Aversiveness.

A composite score for problem-solving skill, the sum of Total Means and Enumerations from the MEPS and Total Alternatives and Enumerations from the Optional Thinking Test (TOTCOG), was calculated for each subject. Subjects were divided into Poor and Good Problem-Solvers based on a median split, as described above. A score for Aversiveness was also calculated for each subject, by averaging the subjective aversiveness ratings for each of the 10 sanctions. Subjects were then divided into a Nonaversive group, where the average rating was 1.0 to 4.9, and an

Aversive group, where the average rating was 5.0 to 7.0, as described above.

The resulting four groups were extremely unbalanced with respect to cell frequencies: $N = 8$ for Poor Problem-Solvers-Nonaversive; $N = 25$ for Poor Problem-Solvers-Aversive; $N = 3$ for Good Problem-Solvers-Nonaversive; and $N = 34$ for Good Problem-Solvers-Aversive. Thus, subjects who rated the sanctions as Nonaversive were somewhat more likely to be Poor Problem-Solvers than Good Problem-Solvers. This difference approached statistical significance levels, $\chi^2(1, N = 71) = 3.43, p=.06$.

With occasional missing data, some cells frequencies were as low as 1 or 2. Thus, the means for groups are subject to distortion by one or two extreme scores; the analyses of variance are therefore of doubtful validity and should be interpreted cautiously. Nonetheless, they are presented here for heuristic purposes.

Demographic Data and Criminal History. There were no significant differences among groups with respect to age, educational level, IQ, or any of the criminal history variables.

Institutional Conduct. There was a significant main effect of Aversiveness for total number of misconducts, $F(1, 66) = 12.193, p < .001$, number of followup misconducts, $F(1, 66) = 11.750, p < .001$, and number of posttest misconducts, $F(1, 66) = 9.89, p < .01$ (Figure 43). A similar pattern was observed for rate of total misconducts, $F(1, 66) = 10.477, p < .01$, and rate of posttest misconducts, $F(1, 64) = 8.30, p < .01$ (Figure 44), with Nonaversive subjects receiving more misconducts in all cases. For rate of pretest misconducts, the Problem-Solving main effect approached statistical significance, $F(1, 64) = 3.709, p = .059$ (Figure 44).

Breaking misconducts down into types of misconduct revealed a significant main effect of Aversiveness for rate of rule violation misconducts, $F(1, 66) = 17.227,$

**Figure 43. Mean Number of Pretest, Followup, Posttest,
and Total Misconducts as a function of Problem-
Solving Skill and Perceived Aversiveness**

Problem-Solving and Aversiveness

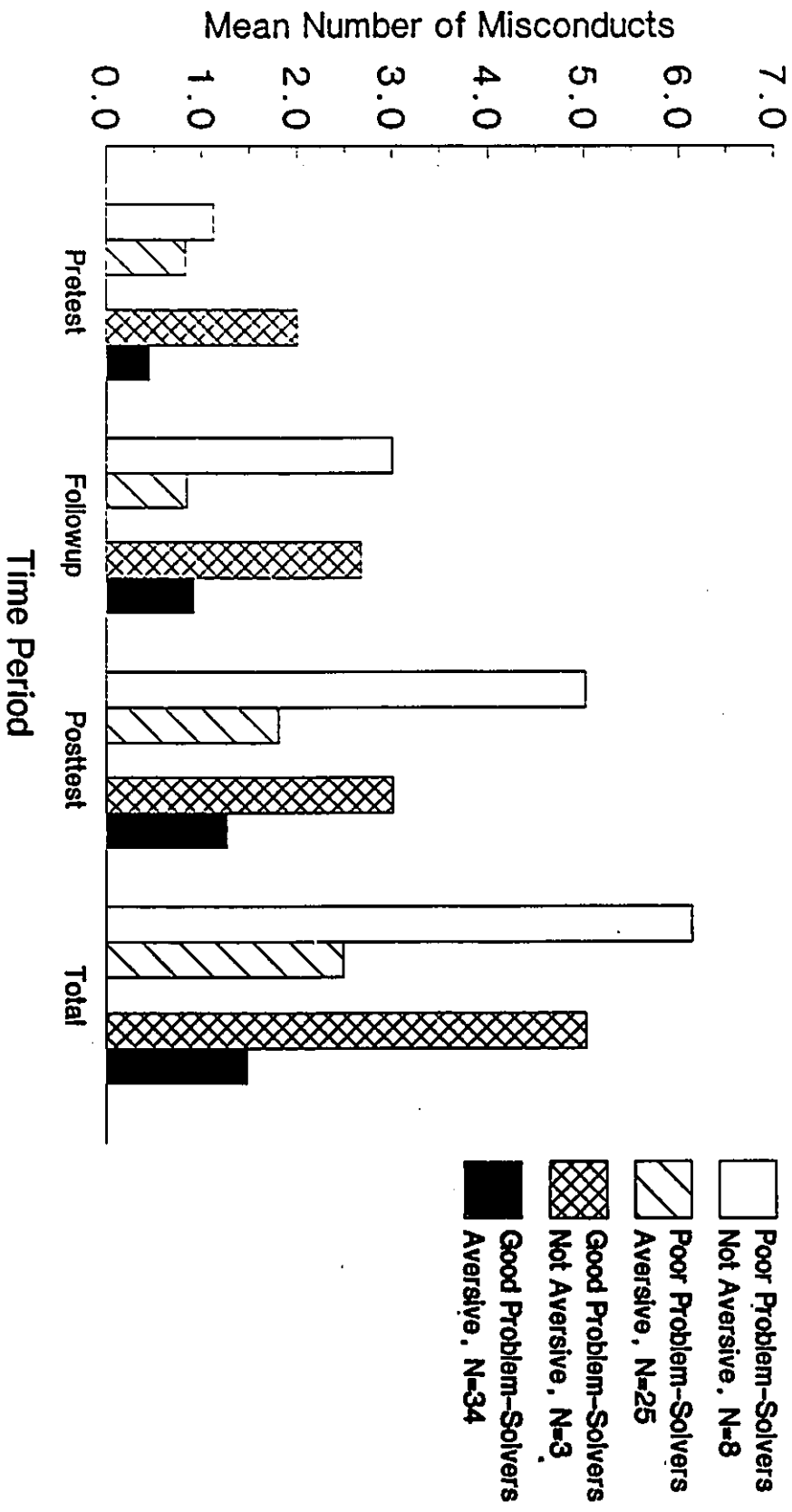
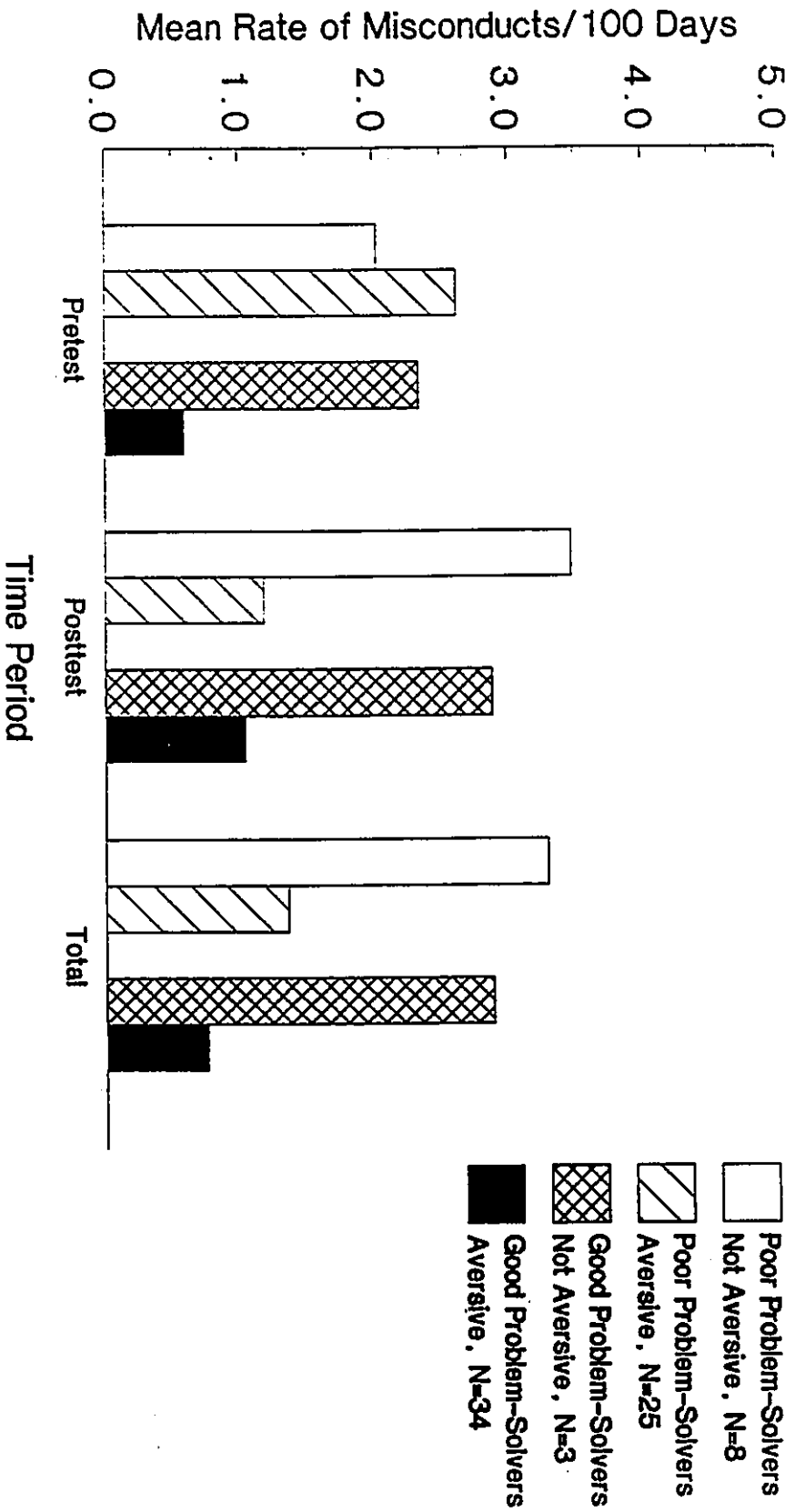


Figure 44. Mean Rate of Pretest, Posttest, and Total
Misconducts as a function of Problem-Solving Skill
and Perceived Aversiveness

Problem-Solving and Aversiveness



$p < .01$, while rate of aggressive misconducts approached statistical significance, $F(1, 66) = 2.933$, $p = .08$ (Figure 45).

There was also a significant main effect of Aversiveness for total number of "speeders", $F(1, 66) = 12.406$, $p < .001$, number of followup "speeders", $F(1, 66) = 9.787$, $p < .01$, and number of posttest "speeders", $F(1, 66) = 12.918$, $p < .001$, with Nonaversive subjects receiving more than 3 times as many "speeders" as Aversive subjects (Figure 46).

In contrast, there was a significant main effect of Problem-Solving for number of followup "brownies", $F(1, 66) = 4.750$, $p < .05$, and number of posttest "brownies", $F(1, 66) = 6.683$, $p < .05$, with Poor Problem-Solvers receiving the greater number in each case (Figure 47).

There was a significant effect of Aversiveness for estimates of anticipated misconducts during the 3-month followup period, with Nonaversive subjects anticipating significantly more misconducts ($M = 2.5$) than Aversive

**Figure 45. Mean Rate of Aggressive, Rule Violation,
and Security Misconducts as a function of Problem-
Solving Skill and Perceived Aversiveness**

Problem-Solving and Aversiveness

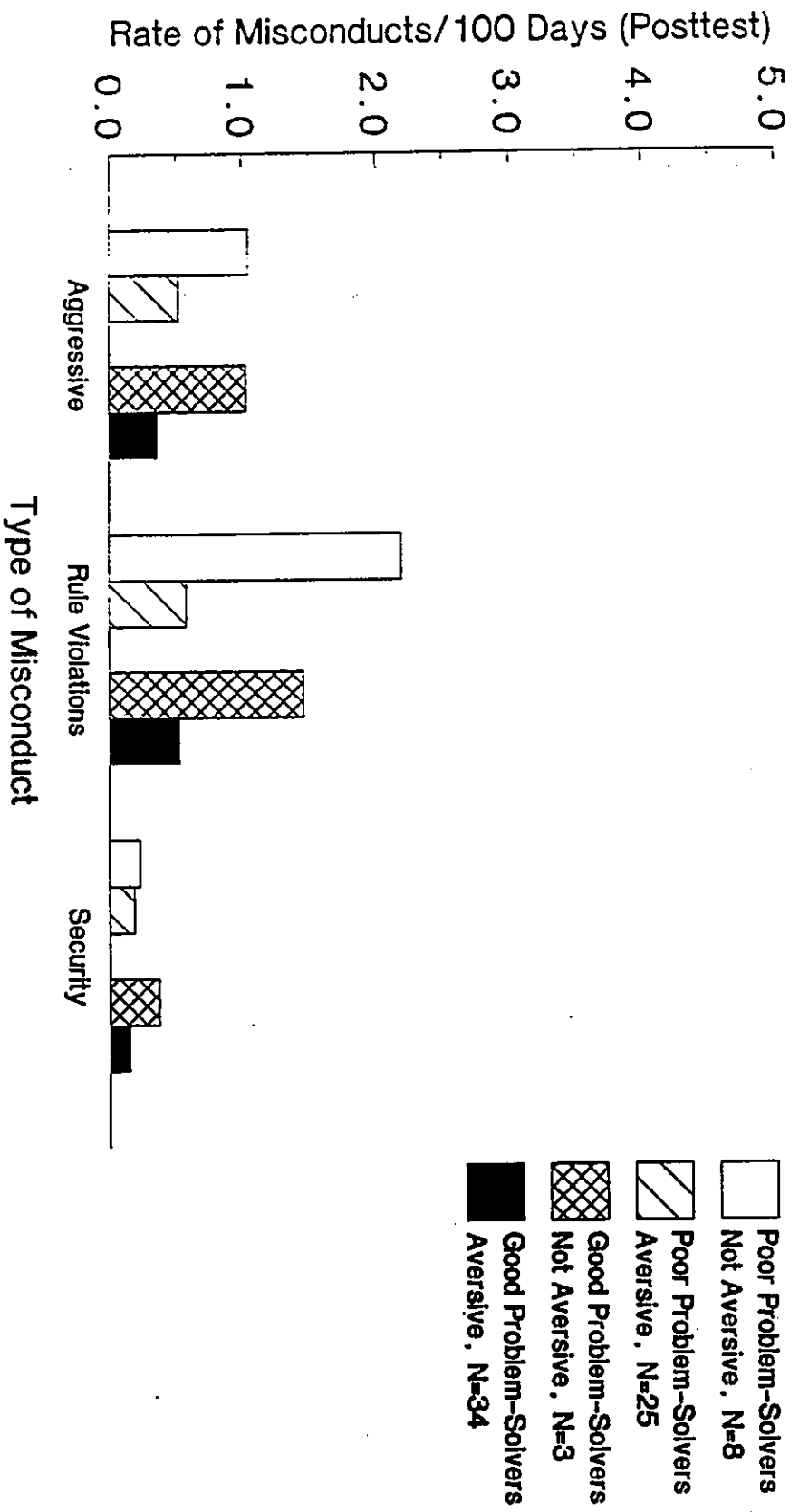


Figure 46. Mean Number of Followup, Posttest, and Total "Speeders" as a function of Problem-Solving Skill and Perceived Aversiveness

Problem-Solving and Aversiveness

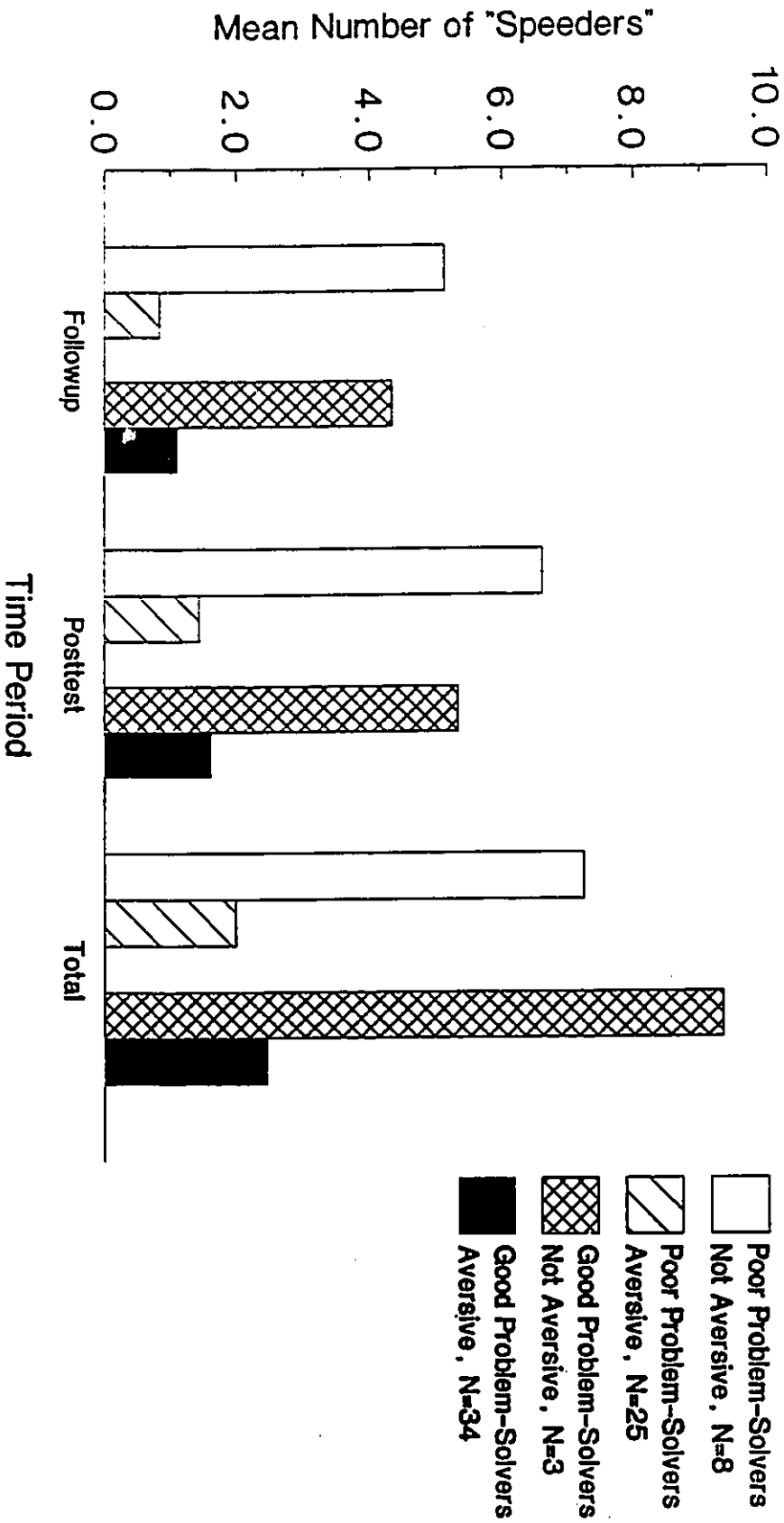
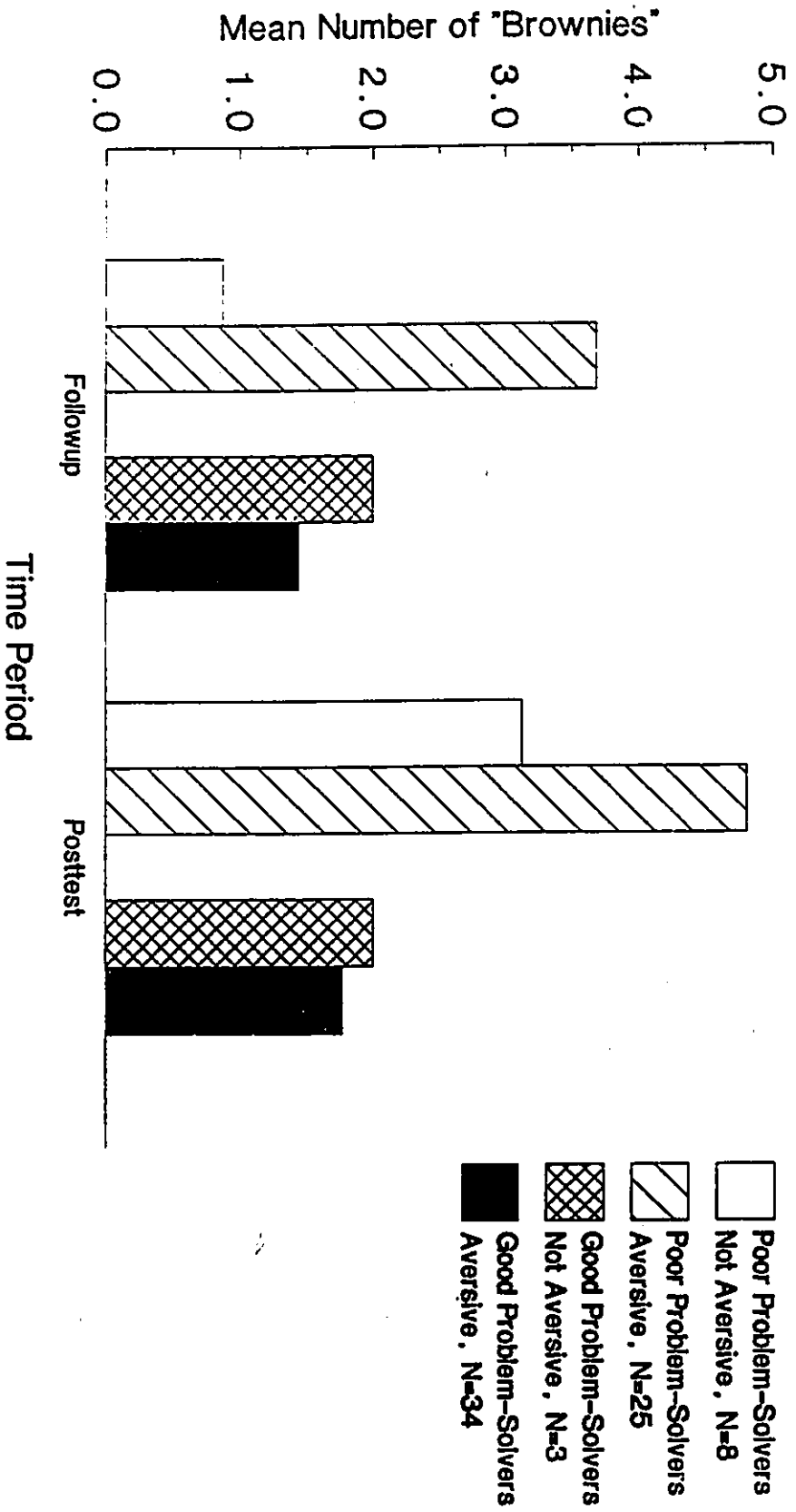


Figure 47. Mean Number of Followup and Posttest
"Brownies" as a function of Problem-Solving Skill
and Perceived Aversiveness

Problem-Solving and Aversiveness



subjects ($M = 0.6$), $F(1, 64) = 12.403$, $p < .001$.

Finally, there was a significant main effect of Aversiveness for proportion of sentence served prior to discharge, with Nonaversive subjects serving a greater proportion of the sentence ($M = 0.68$) than Aversive subjects ($M = 0.54$), $F(1, 64) = 4.702$, $p < .05$.

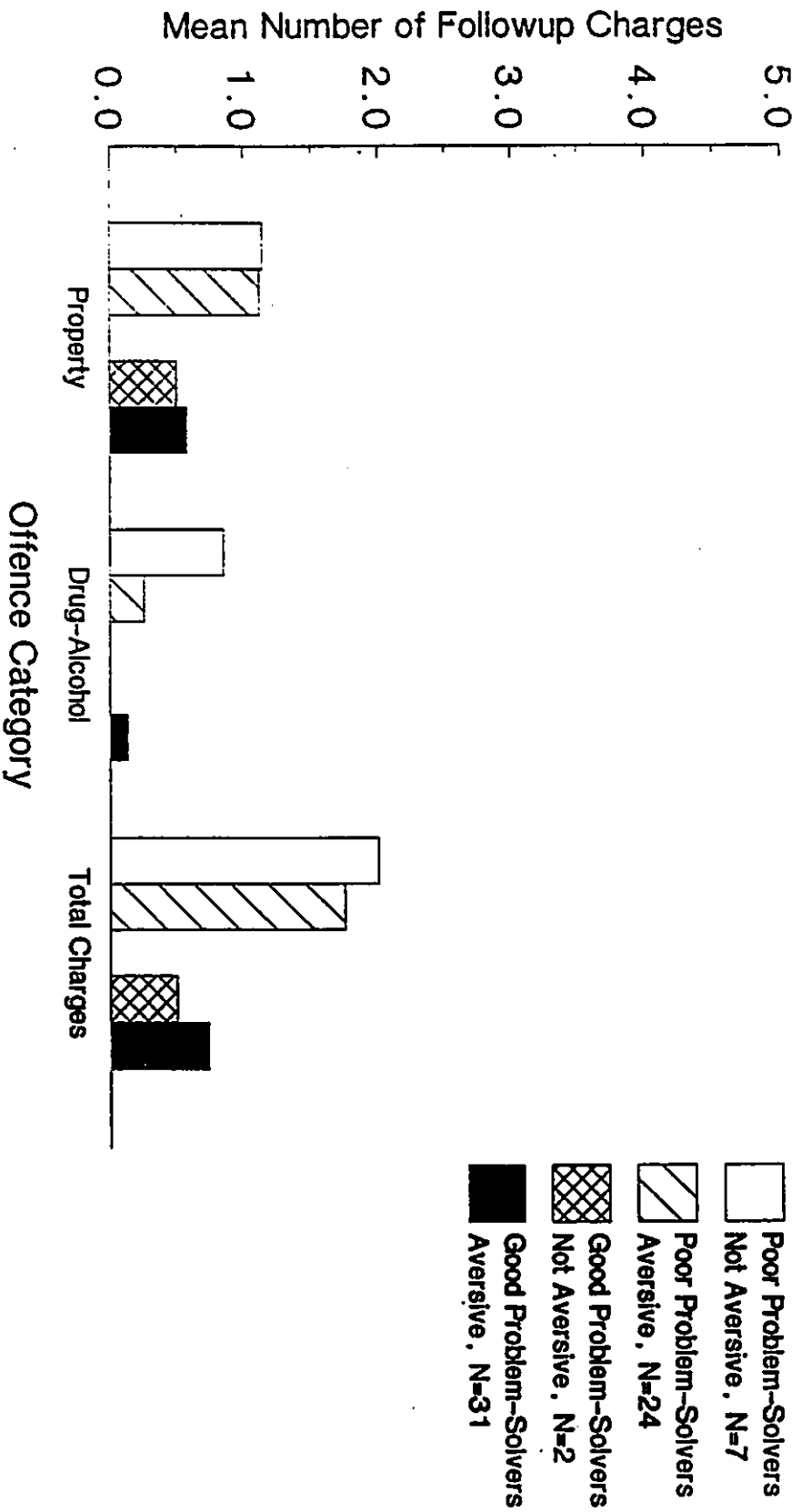
Recidivism. Significant main effects for Problem-Solving skill emerged for both number of charges and number of convictions during the 1-year followup period. Poor Problem-Solvers received significantly more criminal charges than Good Problem-Solvers, $F(1, 60) = 4.246$, $p < .05$ (see Figure 48), as well as a greater number of convictions ($M = 0.26$ for Poor Problem-Solvers vs. $M = 0$ for Good Problem-Solvers), $F(1, 60) = 6.066$, $p < .05$.

Problem-Solving and Deterrence.

A composite score for problem-solving skill, the sum of Total Means and Enumerations from the MEPS and

Figure 48. Mean Number of Post-Release Criminal Charges for Property Offences or Drug-Alcohol Offences and Total Charges as a function of Problem-Solving Skill and Perceived Aversiveness

Problem-Solving and Aversiveness



Total Alternatives and Enumerations from the Optional Thinking Test, was calculated for each subject. Subjects were divided into Poor and Good Problem-Solvers based on a median split, as described above. A score for Deterrence was also calculated for each subject, by averaging the subjective deterrence ratings for each of the 10 sanctions. Subjects were then divided into a Nondeterred group, where the average rating was 1.0 to 4.9, and a Deterred group, where the average rating was 5.0 to 7.0, as described above. This yielded 4 groups: Poor Problem-Solvers-Nondeterred, $N = 17$; Poor Problem-Solvers-Deterred, $N = 17$; Good Problem-Solvers-Nondeterred, $N = 21$; and Good Problem-Solvers-Deterred, $N = 16$. Two-way analyses of variance were computed for each of the dependent variables.

Demographic Data and Criminal History. Subjects in the Deterred group were significantly older ($M = 25.33$) than subjects in the Nondeterred group ($M = 22.60$), as evidenced by a significant main effect of Deterrence, $F(1, 67) = 4.183, p < .05$. There were no significant differences among groups in terms of

education, IQ, or any of the criminal history variables.

Institutional Conduct. There was a significant interaction between Problem-Solving and Deterrence for number of pretest misconducts, $F(1, 66) = 4.517, p < .05$ (Figure 49). For Poor Problem-Solvers, Deterred subjects received more pretest misconducts than Nondeterred subjects; for Good Problem-Solvers, Nondeterred subjects received a much greater number of pretest misconducts. However, when recalculated as rate per 100 days, the interaction for this variable was no longer significant; instead there was a significant main effect of problem-solving, $F(1, 66) = 4.808, p < .05$ (Figure 50).

Subjects in the Nondeterred group also received more than twice as many followup misconducts ($M = 1.68$) as subjects in the Deterred group ($M = 0.61$), as reflected in a significant main effect of deterrence, $F(1, 67) = 6.437, p < .05$ (Figure 49). A similar difference between the Deterred and Nondeterred groups was observed for rate of total misconducts, though this

**Figure 49. Mean Number of Pretest, Followup, Posttest,
and Total Misconducts as a function of Problem-
Solving Skill and Perceived Deterrence**

Problem-Solving and Deterrence

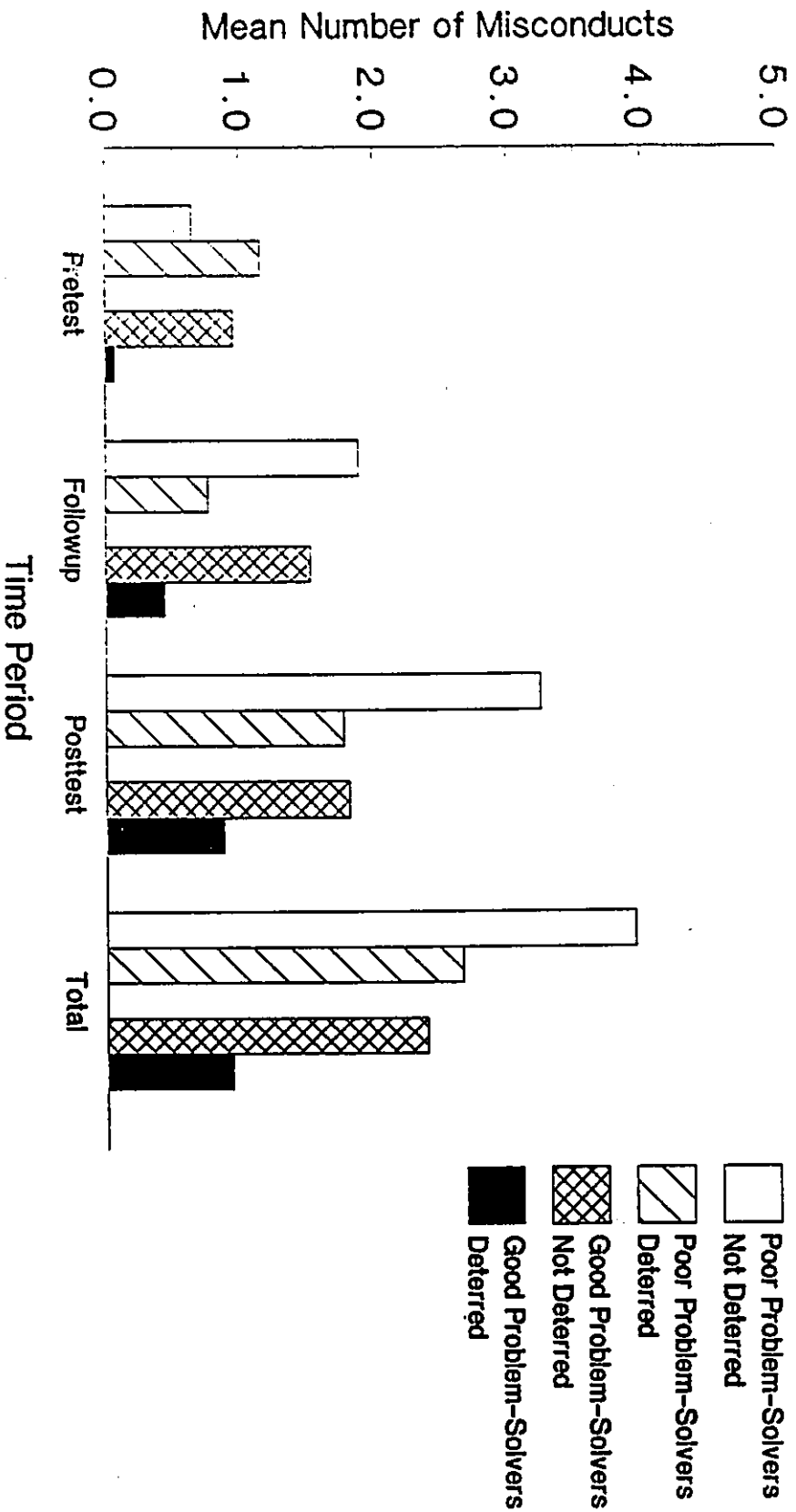
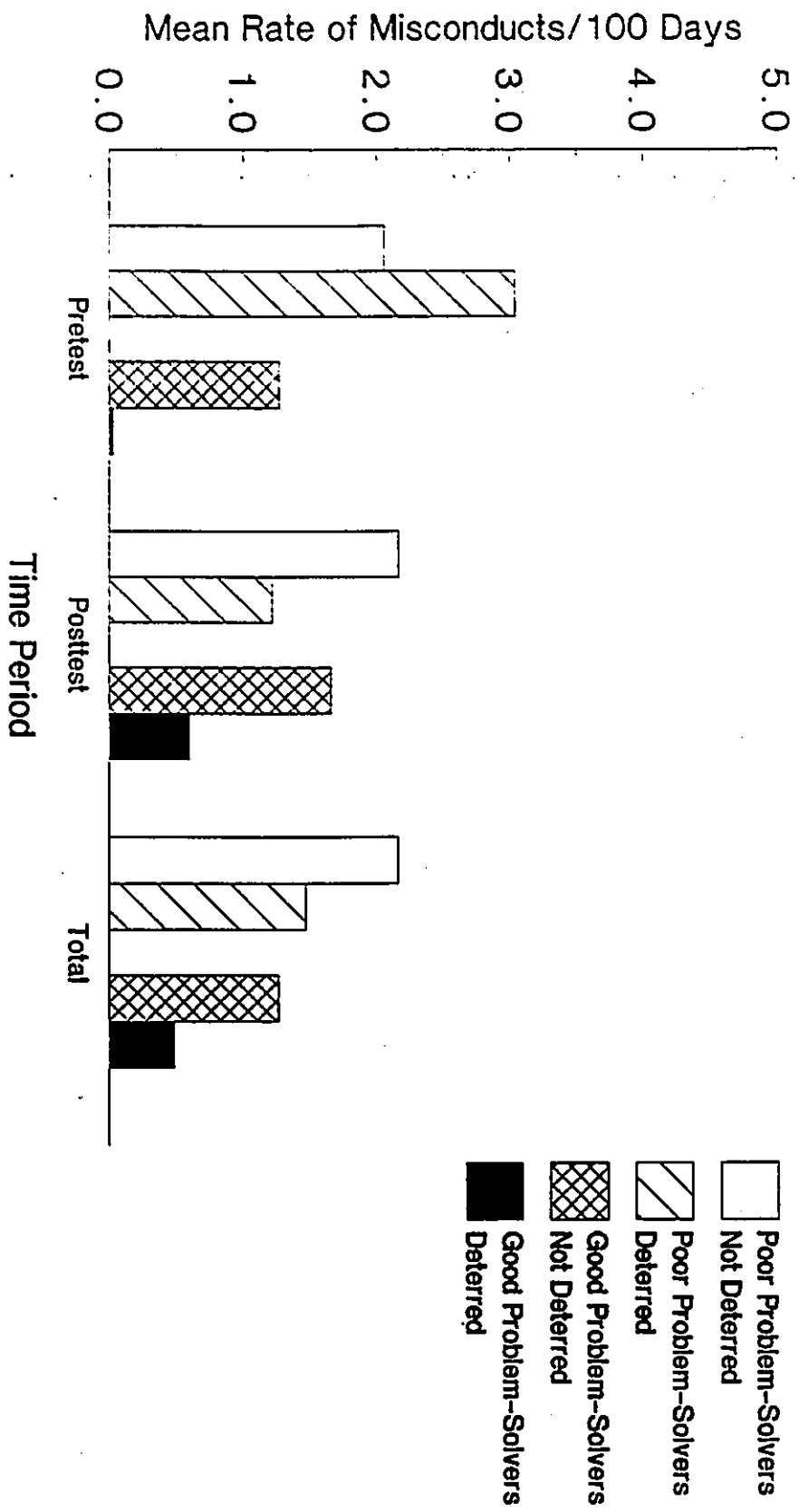


Figure 50. Mean Rate of Pretest, Posttest, and Total
Misconducts as a function of Problem-Solving Skill
and Perceived Deterrence

Problem-Solving and Deterrence



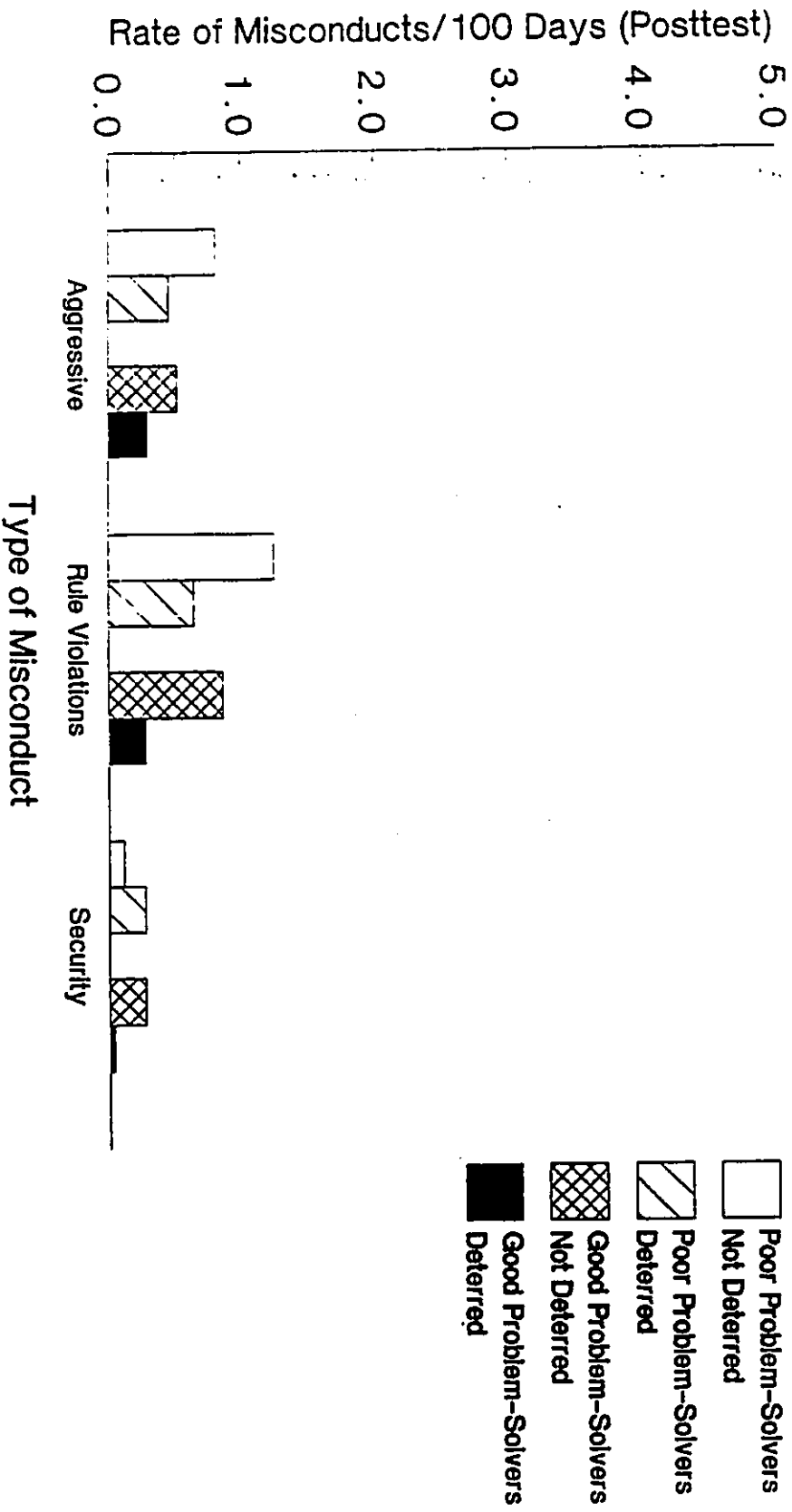
did not reach statistical significance levels (Figure 50). However, there was a significant difference between Poor and Good Problem-Solvers on this measure, $F(1, 66) = 5.715, p < .05$, with Poor Problem-Solvers receiving twice the rate of misconducts. The groups did not differ with respect to individual categories of misconducts (Figure 51), though Poor Problem-Solvers tended to receive more aggressive or rule violation misconducts.

Nondeterred subjects tended to receive more "speeders" overall than Deterred subjects (Figure 52), although this did not reach statistical significance levels, $F(1, 66) = 3.196, p = .078$. Poor Problem-Solvers received more "brownies" during the posttest period as evidenced by a significant main effect of problem-solving, $F(1, 67) = 5.959, p < .05$ (see Figure 53). A similar though nonsignificant trend emerged for followup "brownies", $F(1, 66) = 3.405, p = .069$.

The Nondeterred group also estimated that they would receive more than three times as many misconducts

**Figure 51. Mean Rate of Aggressive, Rule Violation,
and Security Misconducts as a function of Problem-
Solving Skill and Perceived Deterrence**

Problem-Solving and Deterrence



**Figure 52. Mean Number of Followup, Posttest, and
Total "Speeders" as a function of Problem-Solving
Skill and Perceived Deterrence**

Problem-Solving and Deterrence

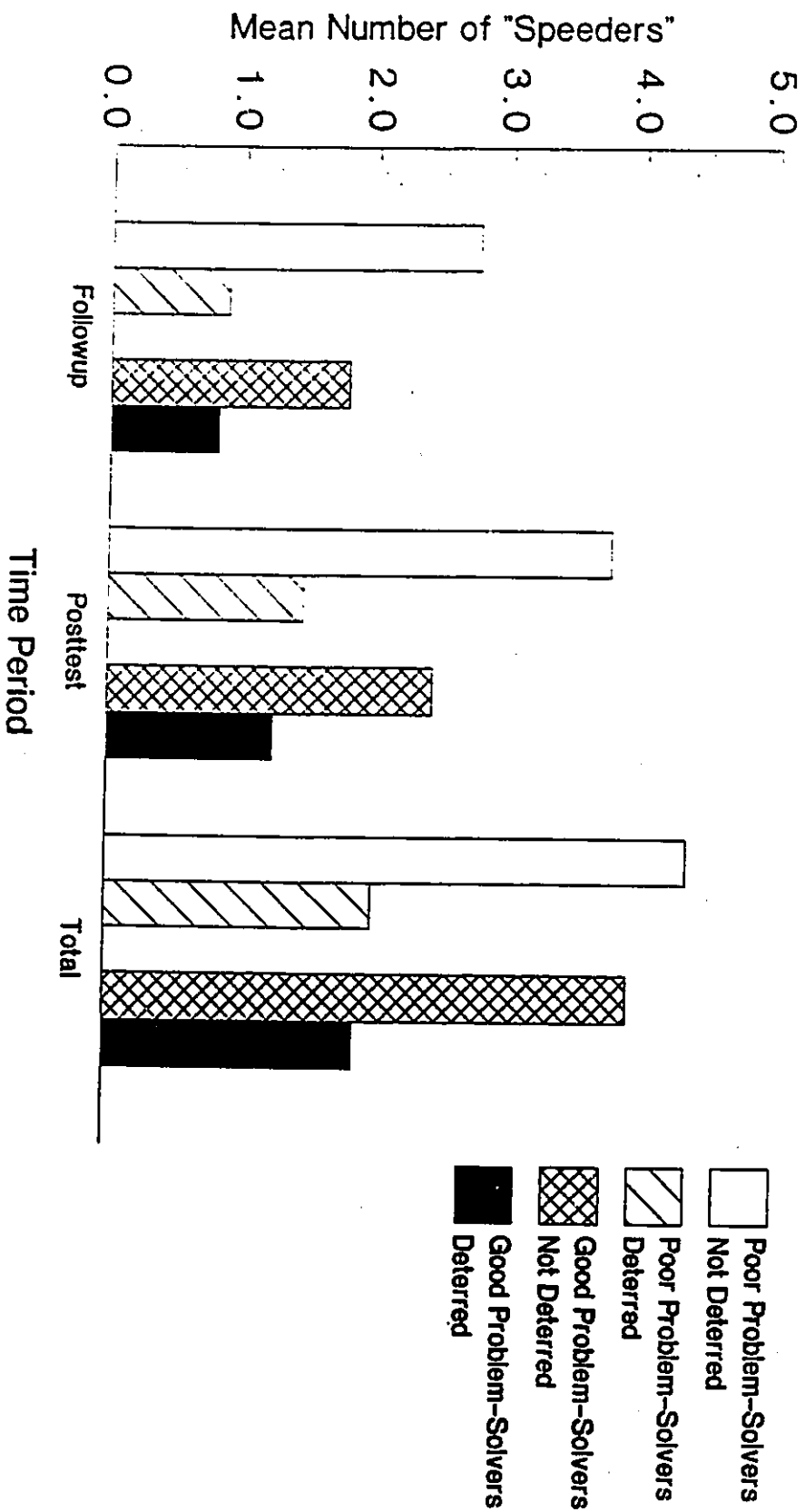
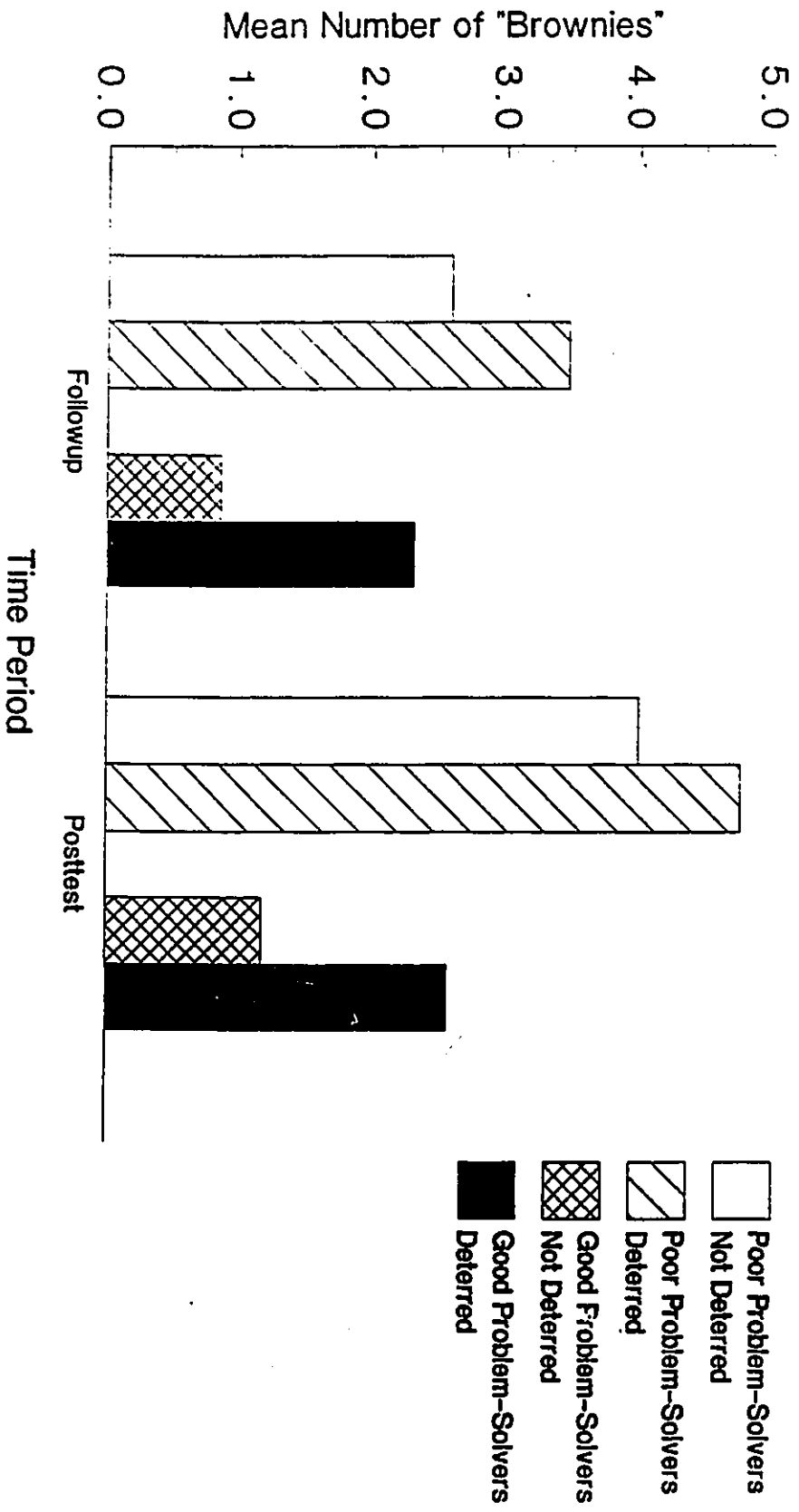


Figure 53. Mean Number of Followup and Posttest
"Brownies" as a function of Problem-Solving Skill
and Perceived Deterrence

Problem-Solving and Deterrence



during the followup period as the Deterred group ($M = 1.35$ for Nondeterred subjects vs. $M = 0.42$ for Deterred subjects), $F(1, 66) = 5.300, p < .05$.

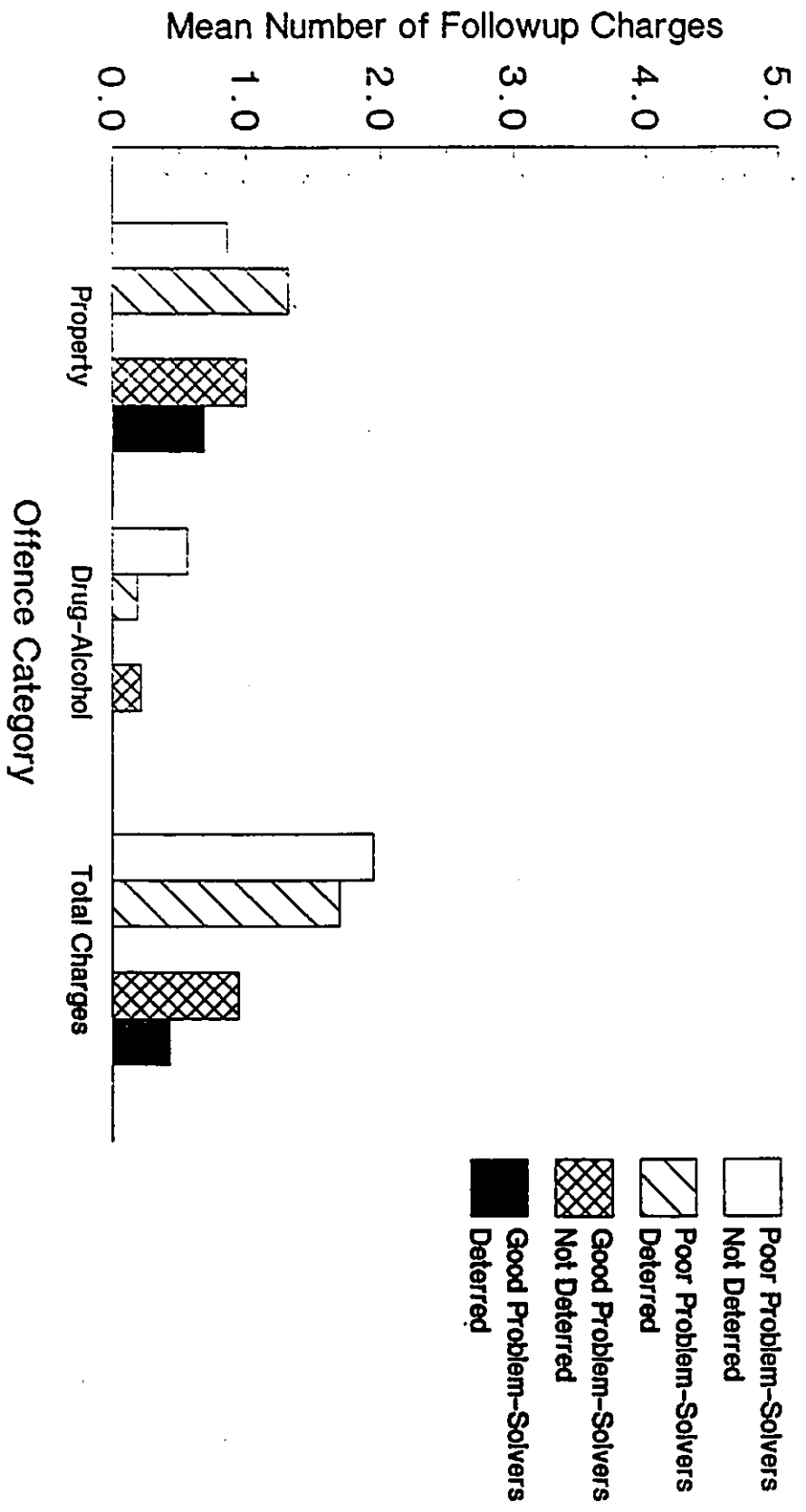
Recidivism. Significant main effects for Problem-Solving were found for both total charges (Figure 54) and total convictions. Poor Problem-Solvers received more charges, $F(1, 61) = 5.168, p < .05$, as well as more convictions ($M = 0.25$ vs $M = 0$ for Good Problem-Solvers), $F(1, 61) = 4.257, p < .05$. A similar though nonsignificant trend was observed for drug-alcohol charges, with Poor Problem-Solvers again receiving the greater number, $F(1, 61) = 3.484, p = .067$. However, for this latter measure there was also a main effect of Deterrence that approached statistical significance levels, with the Nondeterred group receiving more drug-alcohol charges, $F(1, 61) = 3.891, p = .053$.

Problem-Solving and Aversiveness-Deterrence Combined

As described earlier, the total sample was divided into 3 groups based on the combined subjective ratings

**Figure 54. Mean Number of Post-Release Criminal
Charges for Property Offences or Drug-Alcohol
Offences and Total Charges as a function of
Problem-Solving Skill and Perceived Deterrence**

Problem-Solving and Deterrence



for aversiveness and deterrence. Subjects with average aversiveness ratings of less than 5.0 and average deterrence ratings of less than 5.0 were assigned to the Nonaversive/Nondeterred group (Group NA/ND). Subjects with average aversiveness ratings of 5.0 or higher and average deterrence ratings of less than 5.0 were assigned to the Aversive/Nondeterred group (Group A/ND). Finally, subjects with average aversiveness ratings of 5.0 or higher and average deterrence ratings of 5.0 or higher were assigned to the Aversive/Deterred group (Group A/D). In addition, a composite score for problem-solving skill, the sum of Total Means and Enumerations from the MEPS and Total Alternatives and Enumerations from the Optional Thinking Test, was calculated for each subject. Subjects were then divided into Poor and Good Problem-Solvers based on a median split, as described for previous analyses.

This procedure yielded 6 groups: Poor Problem-Solvers-Nonaversive-Nondeterred, $N = 9$; Poor Problem-Solvers-Aversive-Nondeterred, $N = 9$; Poor Problem-Solvers-Aversive-Deterred, $N = 16$; Good Problem-Solvers-Nonaversive-Nondeterred, $N = 3$; Good Problem-

Solvers-Aversive-Nondeterred, $N = 18$; and Good Problem-Solvers-Aversive-Deterred, $N = 16$. Two-way analyses of variance using these groups were computed for each of the dependent variables. The major results are summarized in Table 18 and described in detail individually below.

It is worth noting that of the 12 subjects in the Nonaversive-Nondeterred group, 75% were Poor Problem-Solvers. The overall distribution of cell frequencies with this breakdown was significantly different from chance, $\chi^2(2, N = 71) = 5.884, p=.05$. Moreover, comparing groups NA/ND, A/ND, and A/D using an analysis of variance revealed that the groups differed significantly in terms of their problem-solving (TOTCOG) scores, $F(2, 68) = 3.26, p<.05$. Subsequent multiple range tests (using SPSS/PC+ ONEWAY LSD procedure) revealed that subjects in group NA/ND had lower problem-solving scores ($M = 34.92$) than either subjects in group A/ND or group A/D, and these differences approached statistical significance levels ($p=.058$). The problem-solving scores for groups A/ND and A/D did not differ. Thus, there is a clear

Table 18.

Summary of Findings Regarding Problem-Solving, Perceived Aversiveness, andPerceived Deterrence

	GROUPS (Means)					
	Poor Problem-Solvers		Good Problem-Solvers			
	NA/ND	A/ND	A/D	NA/ND	A/ND	A/D
PRE MISC	1.11	0.22	1.17	2.00	0.78	0.06
FU MISC ¹	2.67	0.89	0.81	2.67	1.33	0.44
TOTAL MISC ^{1,3}	5.56	2.00	2.75	5.00	1.94	0.94
RATE PRE MISC ²	2.30	2.08	2.94	2.33	1.09	0.02
RATE TOTAL MISC ¹	3.05	1.15	1.49	2.88	0.99	0.48
RATE AGGRESS MISC	0.94	0.59	0.48	1.04	0.43	0.29
RATE RV MISC ¹	1.95	0.40	0.68	1.46	0.77	0.27
RATE SEC MISC	0.20	0.00	0.29	0.37	0.25	0.03
FU SPEEDERS ¹	4.55	0.67	0.94	4.33	1.37	0.81
TOTAL SPEEDERS ¹	6.44	1.78	2.13	9.33	3.01	1.88
FU CHARGES ²	2.00	1.89	1.67	0.50	1.00	0.43
FU CONVICTIONS ²	0.00	0.11	0.47	0.00	0.00	0.00

Key:

- ¹ Main effect of Aversiveness-Deterrence
 - ² Main effect of Problem-Solving
 - ³ Interaction between Problem-Solving & Aversiveness-Deterrence
- All significance levels are $p < .05$ or better

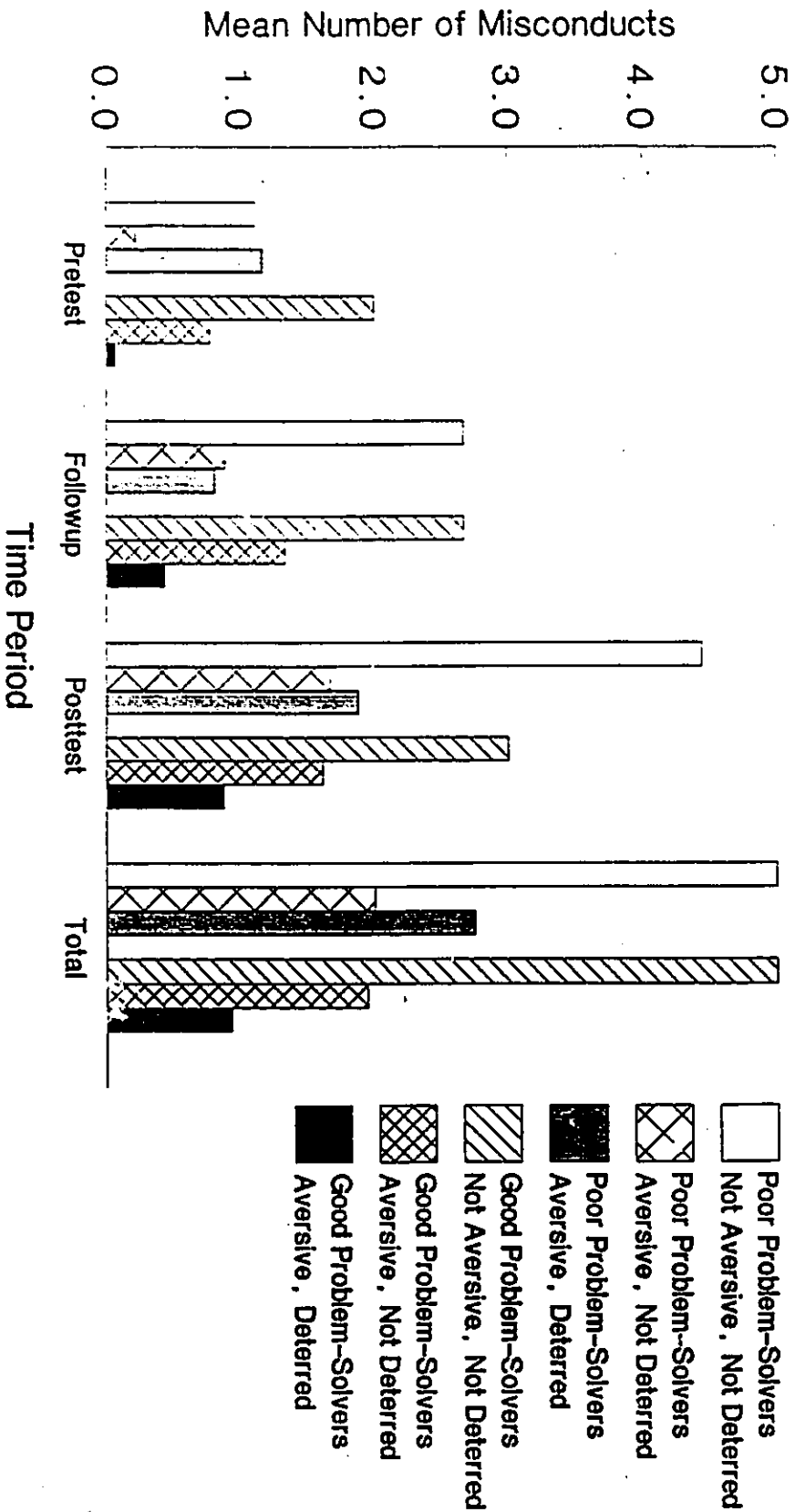
relationship between perceived aversiveness and problem-solving ability but apparently little relationship between perceived deterrence and problem-solving ability.

Demographic Data and Criminal History. There were no significant differences among the 6 groups described above in terms of age, IQ, or any of the criminal history variables as a function of Problem-Solving or Aversiveness-Deterrence. However, a non-significant trend towards higher educational levels for Good Problem-Solvers was observed.

Institutional Conduct. A main effect of Aversiveness-Deterrence with respect to number of followup misconducts was found, with Group NA/ND receiving the greatest number, followed by Group A/ND and Group A/D, $F(2, 65) = 5.539, p < .01$ (see Figure 55). There was also a main effect of Aversiveness-Deterrence for total misconducts, $F(2, 65) = 5.015, p < .01$, and for rate of total misconducts, $F(2, 63) = 4.567, p < .05$ (see Figure 56).

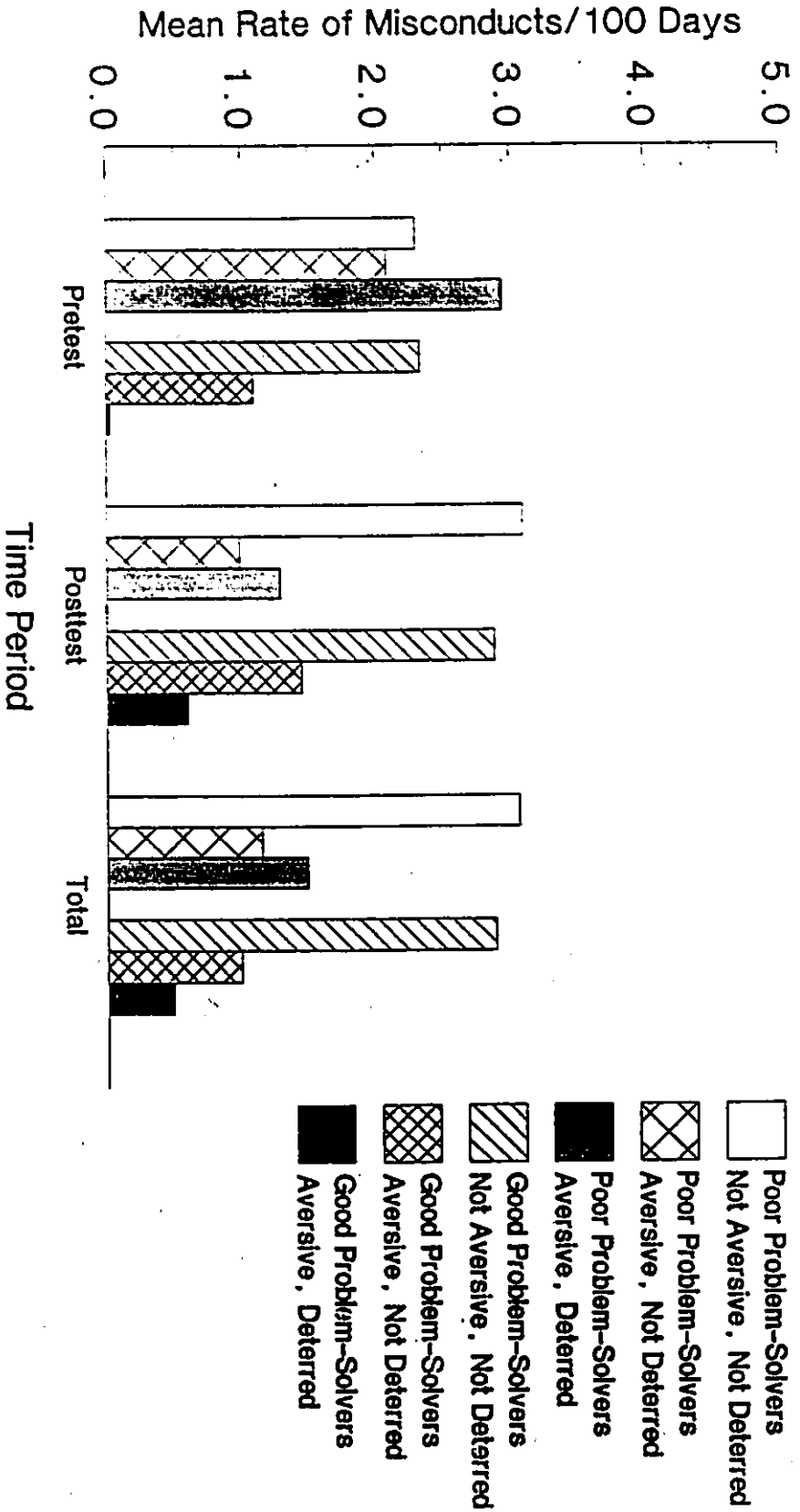
Figure 55. Mean Number of Pretest, Followup, Posttest,
and Total Misconducts as a function of Problem-
Solving Skill and Aversiveness-Deterrence
Combined

Problem-Solving and Aversiveness-Deterrence



**Figure 56. Mean Rate of Pretest, Posttest, and Total
Misconducts as a function of Problem-Solving Skill
and Aversiveness-Deterrence Combined**

Problem-Solving and Aversiveness-Deterrence



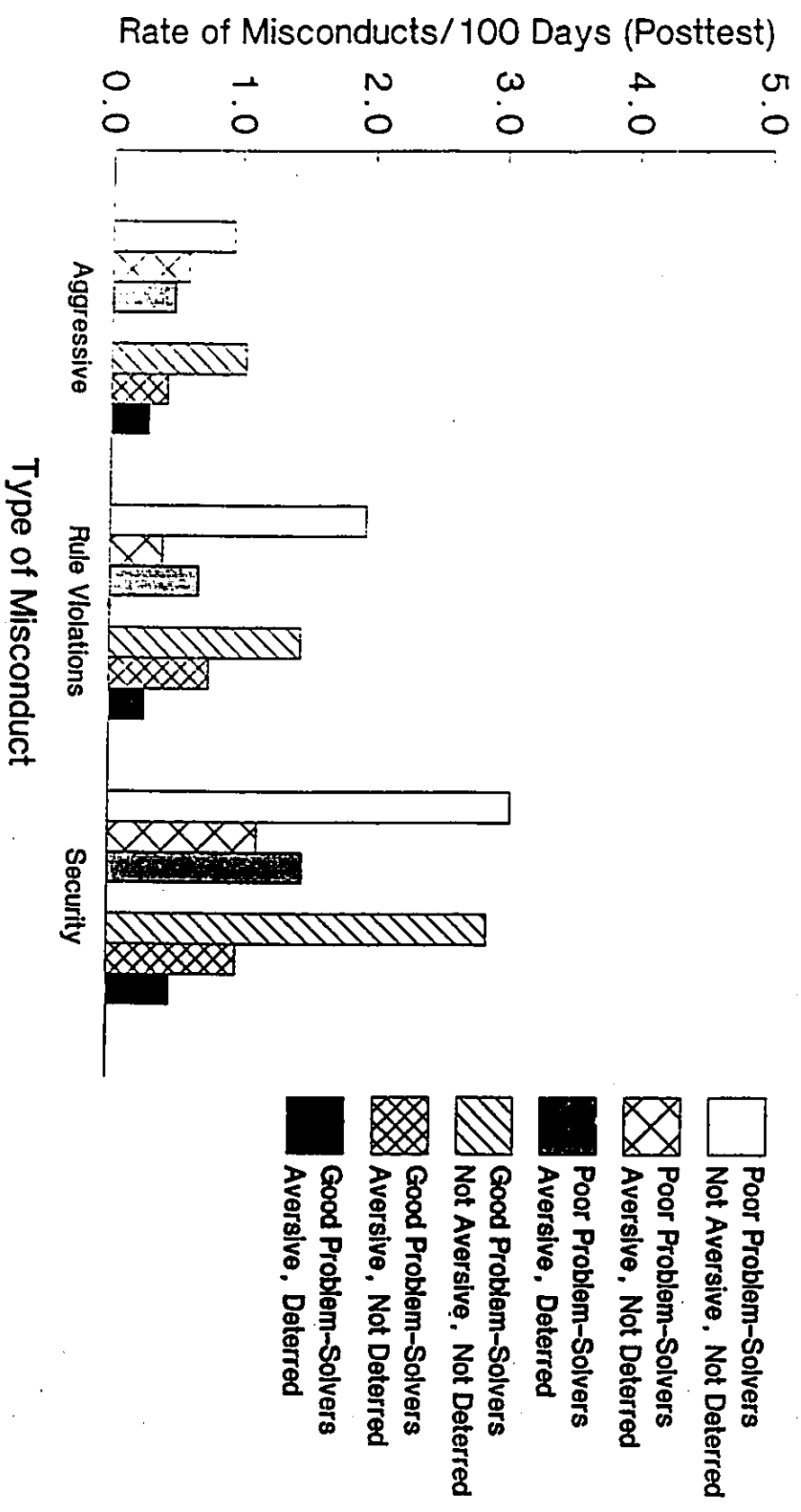
In contrast, there was a significant main effect of Problem-Solving for rate of pretest misconducts, with Poor Problem-Solvers having more than 3 times the rate, $F(1, 63) = 3.936, p=.052$ (Figure 56). For total number of pretest misconducts, there was a significant interaction between Problem-Solving and Aversiveness-Deterrence, $F(2, 65) = 3.404, p<.05$ (Figure 55): For Good Problem-Solvers, Group NA/ND received the greatest number of pretest misconducts and Group A/D received the fewest, while for Poor Problem-Solvers there was no consistent relationship between aversiveness-deterrence and number of pretest misconducts.

Examining types of misconducts separately (Figure 57), there was a significant main effect of Aversiveness-Deterrence for rate of rule violation misconducts, with Group NA/ND again having the highest rate followed by Group A/ND and Group A/D, $F(2, 65) = 4.157, p<.05$.

For both total number of "speeders" and number of followup "speeders", there were significant main effects of Aversiveness-Deterrence, with Group NA/ND

Figure 57. Mean Rate of Aggressive, Rule Violation,
and Security Misconducts as a function of Problem-
Solving Skill and Aversiveness-Deterrence
Combined

Problem-Solving and Aversiveness-Deterrence



receiving the greatest number and Group A/D receiving the fewest, $F(2, 65) = 5.614, p < .01$, and $F(2, 65) = 4.117, p < .05$ respectively (Figure 58). In contrast, for posttest "brownies" and followup "brownies", there was a significant main effect of Problem-Solving, with Poor Problem-Solvers receiving a greater number of "brownies" in each case, $F(1, 65) = 5.935, p < .05$, and $F(1, 65) = 4.291, p < .05$ respectively (see Figure 59).

There was a main effect of Aversiveness-Deterrence for estimated number of additional misconducts during the 3-month followup period, $F(2, 63) = 8.522, p < .001$, with Group NA/ND giving the largest estimates and Group A/D giving the lowest estimates.

There was a nonsignificant interaction between Problem-Solving and Aversiveness-deterrence for proportion of sentence served, $F(2, 63) = 2.891, p = .063$, with Poor and Good Problem-Solvers in Group NA/ND serving the greatest proportion, and Poor Problem-Solvers in Group A/ND or Good Problem-Solvers in Group A/D serving the smallest proportion of their sentences.

Figure 58. Mean Number of Followup, Posttest, and
Total "Speeders" as a function of Problem-Solving
Skill and Aversiveness-Deterrence Combined

Problem-Solving and Aversiveness-Deterrence

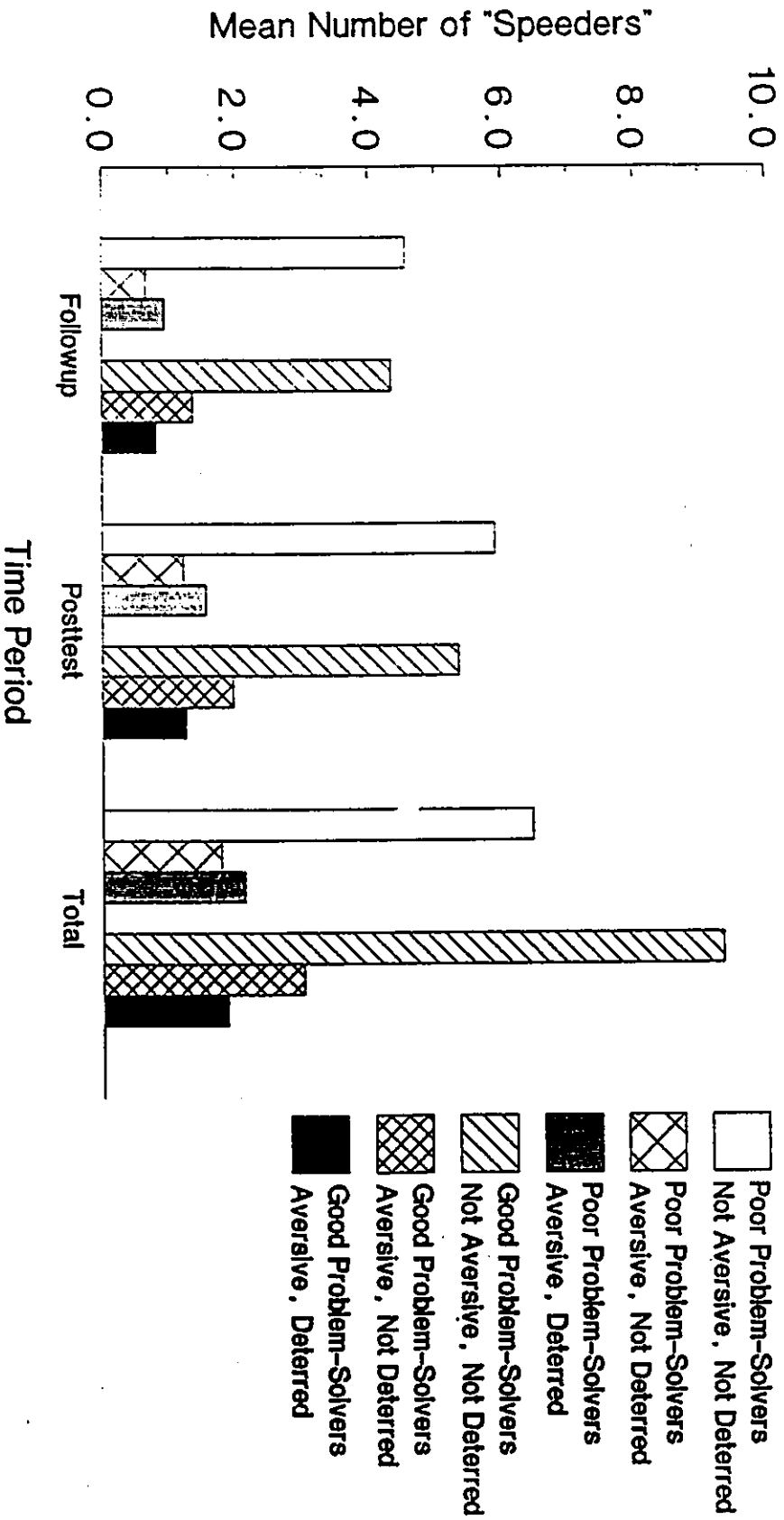
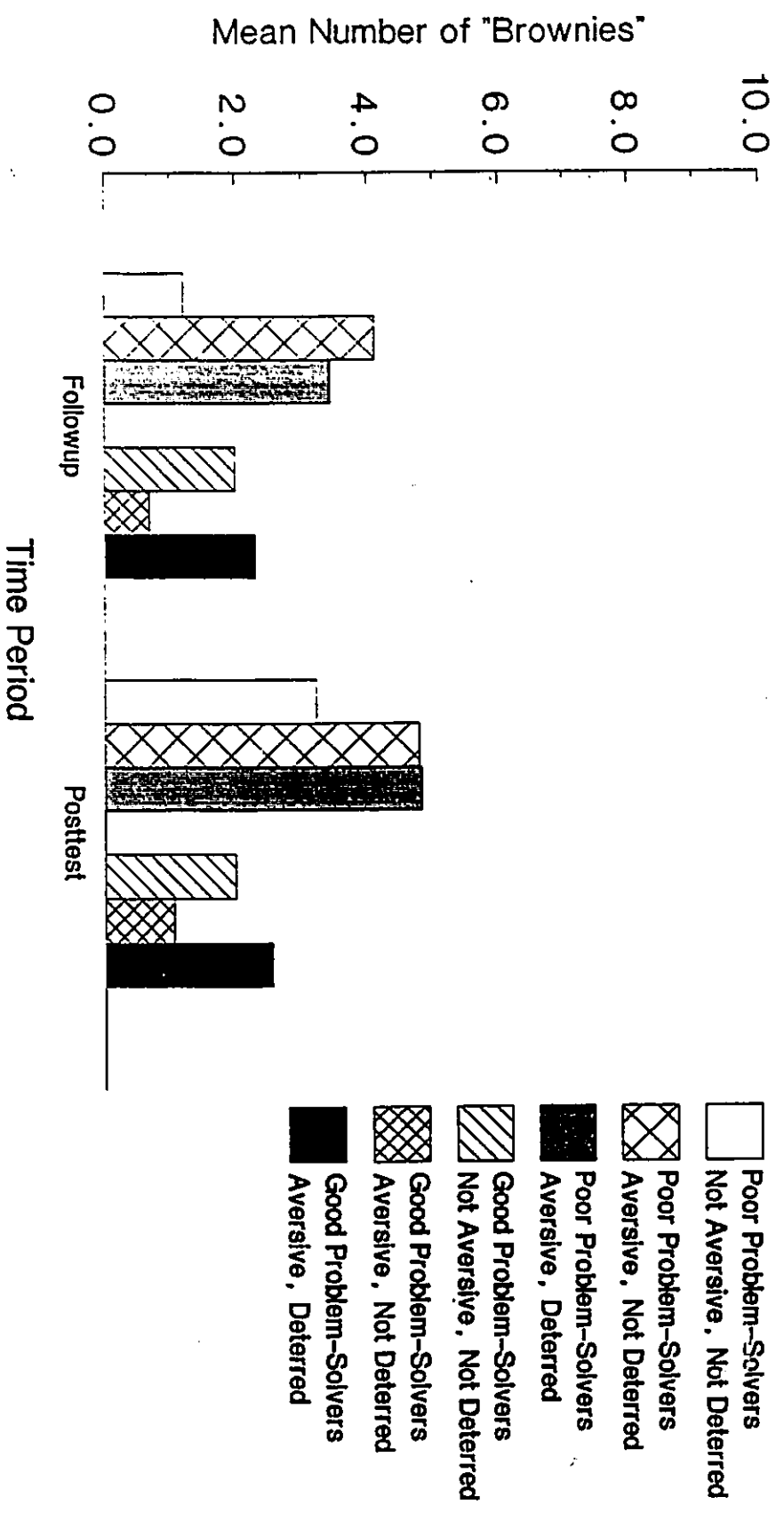


Figure 59. Mean Number of Followup and Posttest
"Brownies" as a function of Problem-Solving Skill
and Aversiveness-Deterrence Combined

Problem-Solving and Aversiveness-Deterrence



Recidivism. There was a significant main effect of Problem-Solving for both total number of charges (Figure 60) and number of convictions during the 1-year followup period, with Poor Problem-Solvers receiving more charges, $F(1, 59) = 4.673, p < .05$, and more convictions, $F(1, 59) = 5.163, p < .05$.

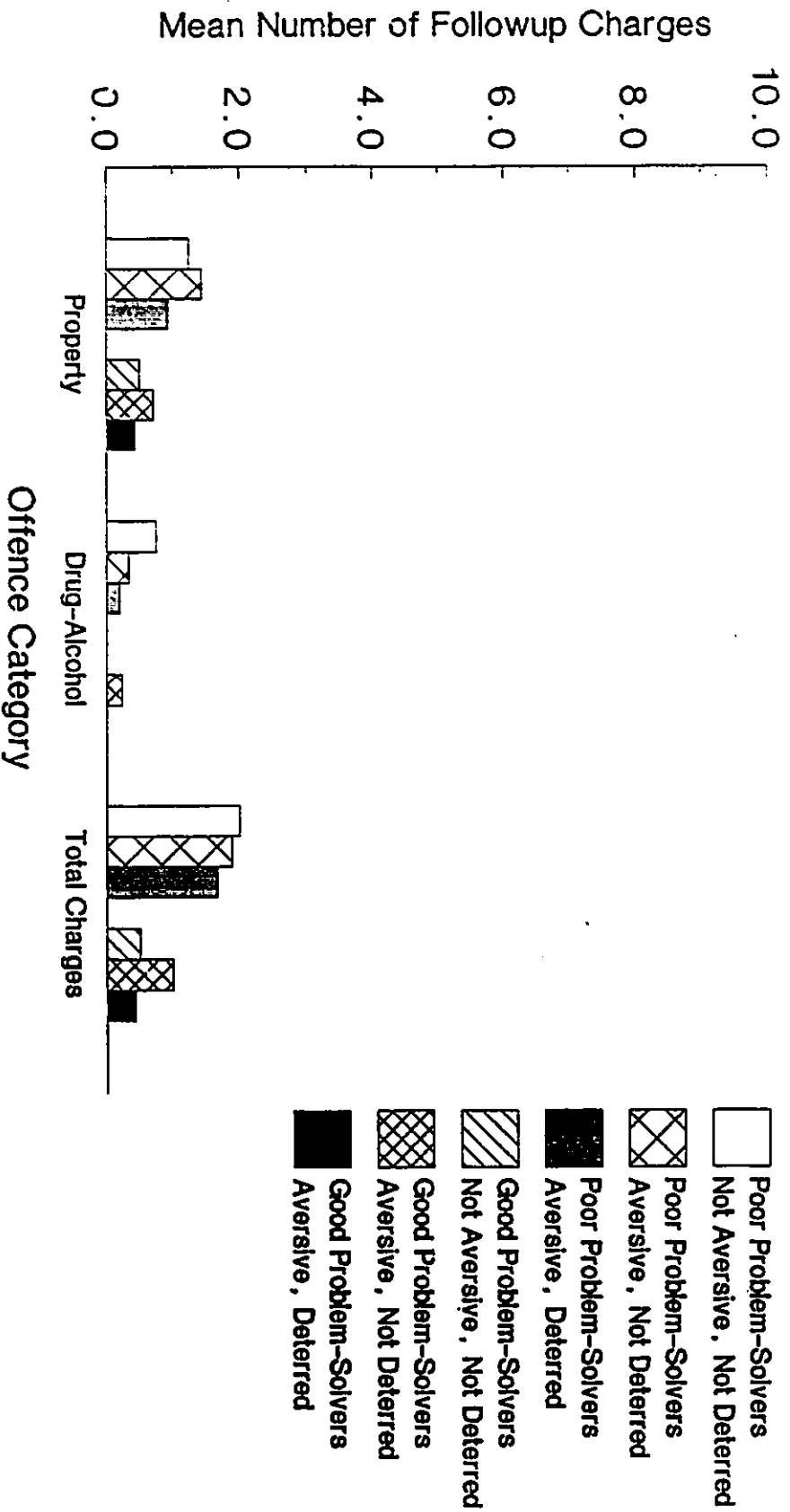
Relationships between Consequential Thinking, Other Problem-Solving Measures, and Aversiveness and Deterrence Ratings

Consequential Thinking and Problem-Solving Ability. Question 2 of the Awareness of Consequences Test (Temptations Stories) assesses the subject's awareness of possible consequences of a proposed course of action. Subjects receive a score of 0.25 for each of the 4 stories in which awareness of consequences is demonstrated. Thus, the total score for this question may be 0, 0.25, 0.50, 0.75, or 1.00.

Subjects were grouped into Poor Problem-Solvers and Good Problem-Solvers according to their scores on

Figure 60. Mean Number of Post-Release Criminal Charges for Property Offences or Drug-Alcohol Offences and Total Charges as a function of Problem-Solving Skill and Aversiveness-Deterrence Combined

Problem-Solving and Aversiveness-Deterrence



these problem-solving measures using median splits of each measure, as in previous analyses. The Consequences scores were then compared using 5 x 2 chi-square analyses (see Table 19).

Poor Problem-Solvers and Good Problem-Solvers based on the Total Alternatives score did not differ significantly in terms of Consequences scores. However, there were significant differences between Poor and Good Problem-Solvers using the composite scores based on MEPS Means and Enumerations plus Alternatives and Enumerations (TOTCOG), $X^2(4, N = 70) = 11.16, p < .05$. While 24% of the Poor Problem-Solvers scored 0.50 or less (indicating recognition of consequences only half of the time or less), all of the Good Problem-Solvers scored above 0.50. Conversely, 76% of the Good Problem-Solvers scored 1.00 (indicating awareness of consequences on all 4 stories), compared to only 41% of the Poor Problem-Solvers. Similar results were obtained using the other measures of problem-solving skill (for Total Means, $X^2(4, N = 70) = 15.60, p < .01$; for ALLCOG, $X^2(4, N = 71) = 12.40, p < .05$).

Table 19.

Relationship Between Awareness of Consequences and Other Measures of Problem-Solving Skill.

<u>CONS2</u>	<u>MEPTOT</u>		<u>ALF</u>		<u>TOTCOG</u>		<u>ALLCOG</u>	
	<u>PPS</u>	<u>GPS</u>	<u>PPS</u>	<u>GPS</u>	<u>PPS</u>	<u>GPS</u>	<u>PPS</u>	<u>GPS</u>
0	1	1	2	0	2	0	2	0
25	2	0	1	1	2	0	2	0
50	3	2	3	2	4	1	4	1
75	14	6	10	10	12	8	12	8
100	10	32	17	25	14	28	13	29
χ^2	15.59**		3.39		11.16*		12.40*	

Key: $\chi^2(4, N = 71)$ * $p < .05$ ** $p < .01$

PPS/GPS Poor Problem-Solvers/Good Problem-Solvers
 CONS2 Total score for Question 2, Awareness of Consequences Test (%)
 MEPTOT MEPS Total Means score
 ALF Total Alternatives (Optional Thinking Test)
 TOTCOG MEPS Means and Enumerations + Alternatives and Enumerations
 ALLCOG TOTCOG + Obstacles+Time for both tests

Consequential Thinking and Aversiveness. Subjects were categorized as Nonaversive or Aversive according to their average ratings of aversiveness for the 10 sanctions, as described for previous analyses. Consequences scores were then examined using 5 x 2 chi-square analyses, as described above (see Table 20). While 27% of the Nonaversive group demonstrated awareness of consequences only 50% of the time or less; only 10% of the Aversive group obtained scores of 0.50 or less. Conversely, only 46% of the Nonaversive group demonstrated awareness of consequences on all 4 stories, while 63% of the Aversive group were able to do so. These differences were significant, $X^2(4, N = 70) = 11.63, p < .05$.

Consequential Thinking and Deterrence. Using similar procedures for the deterrence ratings, 19% of the Nondeterred group obtained Consequences scores of 0.50 or less, this was true for only 6% of the Deterred group (see Table 21). Only 45% of the Nondeterred subjects demonstrated awareness of consequences on all 4 stories compared to 76% of the Deterred subjects.

Table 20.

Relationship Between Awareness of Consequences and Subjective Ratings of Aversiveness of Institutional Sanctions.

<u>CONS2</u>	<u>Frequencies</u>	
	<u>Nonaversive</u>	<u>Aversive</u>
0	2	0
25	0	2
50	1	4
75	3	16
100	5	37
χ^2	11.63*	

Key: $\chi^2(4, N = 70)$ * $p < .05$ ** $p < .01$

CONS2 Total score for Question 2, Awareness of Consequences Test (%)

Table 21.

Relationship Between Awareness of Consequences and
Subjective Ratings of Deterrence of Institutional
Sanctions.

<u>CONS2</u>	<u>Frequencies</u>	
	<u>Nondeterred</u>	<u>Deterred</u>
0	2	0
25	2	0
50	3	2
75	14	6
100	17	25
χ^2	8.61 [~]	

Key: $\chi^2(4, N = 70)$ * $p < .05$ ** $p < .01$ [~] $p < .10$

CONS2 Total score for Question 2, Awareness of
Consequences Test (%)

These differences approached statistical significance, $\chi^2(4, N = 71) = 8.61, p = .07$.

Consequential Thinking and Aversiveness-Deterrence Combined. The same analyses were conducted for groups based on Aversiveness-Deterrence combined (see Table 22). While 25% of Group NA/ND scored 0.50 or less, only 15% of Group A/ND and 6% of Group A/D did so. Conversely, only 42% of Group NA/ND and 44% of Group A/ND scored 1.00, whereas 78% of Group A/D obtained this maximum score. These differences were also significant, $\chi^2(8, N = 71) = 20.13, p < .01$.

Consequential Thinking and Institutional Conduct. There were no significant differences with respect to any of the institutional conduct measures as a function of Awareness of Consequences score.

Consequential Thinking and Recidivism. There were no significant differences on any of the recidivism measures as a function of Awareness of Consequences score.

Table 22.

Relationship Between Awareness of Consequences and
Subjective Ratings of Aversiveness-Deterrence Combined.

<u>CONS2</u>	<u>Frequencies</u>		
	<u>NA/ND</u>	<u>A/ND</u>	<u>A/D</u>
0	2	0	0
25	0	2	0
50	1	2	2
75	4	11	5
100	5	12	25
χ^2		20.13**	

Key: $\chi^2(4, N = 70)$ * $p < .05$ ** $p < .01$ ~ $p < .10$

CONS2 Total score for Question 2, Awareness of
Consequences Test (%)

NA/ND Not Aversive/Not Deterred

A/ND Aversive/Not Deterred

A/D Aversive/Deterred

Estimated vs. Actual Misconducts During the 3-Month
Followup Period

At the time of testing each subject was asked to estimate the number of additional misconducts he expected to receive during the 3-month followup period. A measure of the accuracy of these estimates was then computed by subtracting the actual number of misconducts during this period from the estimated number of misconducts. Subjects were then categorized as Underestimators, Accurate Estimators, or Overestimators of the actual number of misconducts received. They were further grouped according to measures of Problem-Solving skill, using median splits of the various measures, or measures of Aversiveness, Deterrence, or Aversiveness-Deterrence combined, as described above. The accuracy data were then examined using 3 x 2 or 3 x 3 chi-square analyses.

Accuracy of estimates did not differ significantly for Poor and Good Problem-Solvers using any of the measures of problem-solving skill (see Table 23). Also, there were no significant differences between

Table 23.

Estimated vs. Actual Number of Misconducts during the 3-Month Followup Period as a Function of Problem-Solving Ability.

	<u>Frequencies</u>							
	<u>MEPTOT</u>		<u>ALT</u>		<u>TOTCOG</u>		<u>ALICOG</u>	
<u>Accuracy</u>	<u>PPS</u>	<u>GPS</u>	<u>PPS</u>	<u>GPS</u>	<u>PPS</u>	<u>GPS</u>	<u>PPS</u>	<u>GPS</u>
Underestimated	10	15	10	15	12	13	11	14
Accurate	10	19	13	16	13	16	13	16
Overestimated	9	7	9	7	8	8	8	8
χ^2	2.05		1.05		0.12		0.16	

Key: $\chi^2(4, N = 71)$ * $p < .05$ ** $p < .01$

PPS/GPS Poor Problem-Solvers/Good Problem-Solvers

MEPTOT MEPS Total Means score
 ALT Total Alternatives (Optional Thinking Test)
 TOTCOG MEPS Means and Enumerations + Alternatives and Enumerations
 ALICOG TOTCOG + Obstacles+Time for both tests

accuracy of estimates for Aversive and Nonaversive subjects (Table 24), between Deterred and Nondeterred subjects (Table 25), or among groups based on combined aversiveness-deterrence ratings, i.e., Groups NA/ND, A/ND, and A/D (Table 26).

Those subjects who did receive at least one misconduct during the 3-month followup period were also asked to provide further estimates of how many additional misconducts they expected to receive during the remainder of the followup period. A measure of the accuracy of these additional estimates was then computed and analyzed as described above.

Again, accuracy of the estimates did not differ significantly for Poor vs. Good problem-Solvers using any of the problem-solving measures or for Aversive vs. Nonaversive subjects. However, there was a nonsignificant trend for Deterrence, $X^2(2, N = 70) = 4.551, p=.10$. A larger percentage of the Nondeterred subjects underestimated the number of additional misconducts (57% vs. 30% for the Deterred group), while a larger percentage of the Deterred subjects provided

Table 24.

Estimated vs. Actual Number of Misconducts during the
3-Month Followup Period as a Function of Perceived
Aversiveness of Institutional Sanctions.

<u>Accuracy</u>	<u>Frequencies</u>	
	<u>Nonaversive</u>	<u>Aversive</u>
Underestimated	4	21
Accurate	2	27
Overestimated	4	11
χ^2	3.19	

Key: $\chi^2(4, N = 71)$ * $p < .05$ ** $p < .01$

Table 25.

Estimated vs. Actual Number of Misconducts during the
3-Month Followup Period as a Function of Perceived
Deterrence of Institutional Sanctions.

<u>Accuracy</u>	<u>Frequencies</u>	
	<u>Nondeterred</u>	<u>Deterred</u>
Underestimated	14	11
Accurate	12	17
Overestimated	11	5
χ^2		3.25

Key: $\chi^2(4, N = 71)$ * $p < .05$ ** $p < .01$

Table 26.

Estimated vs. Actual Number of Misconducts during the
3-Month Followup Period as a Function of Perceived
Aversiveness-Deterrence Combined.

<u>Accuracy</u>	<u>Frequencies</u>		
	<u>NA/ND</u>	<u>A/ND</u>	<u>A/D</u>
Underestimated	4	10	11
Accurate	2	10	17
Overestimated	5	7	4
χ^2		6.72	

Key: $\chi^2(4, N = 71)$ * $p < .05$ ** $p < .01$

NA/ND Nonaversive/Nondeterred

A/ND Aversive/Nondeterred

A/D Aversive/Deterred

accurate estimates (70% vs. 28% of Nondeterred subjects) and none of the Deterred subjects overestimated the number of misconducts compared to 14% of Nondeterred subjects who overestimated. There were no significant differences in accuracy among groups based on the combined aversiveness-deterrence ratings.

Characteristics of Initial Misconduct and Sanction during the Followup Period

The 33 subjects who received at least one misconduct during the 3-month followup period were asked to answer a series of questions about the first followup misconduct and the sanction imposed. These data are summarized in Table 27.

The majority of these misconducts were either aggressive misconducts (see Appendix 8) or rule violation misconducts, and 75% of the subjects indicated that the act leading to the misconduct was unplanned (i.e., impulsive). Interestingly, while 80.8% of subjects acknowledged that they were aware the

Table 27.

Characteristics of Initial Misconduct and Sanction
During the 3-Month Followup Period.

	<u>Frequency</u>	<u>Percent</u>
Aware offence punishable	21	80.8
Offence planned	6	25.0
Expected punishment	10	41.7
Severity of sanction		
Fair	5	20.8
Too Severe	19	79.1
Type of Misconduct:		
Aggressive	16	48.5
Rule Violation	14	42.4
Security	3	9.1
Sanction received:		
Loss of Earned Remission	20	66.7
Cells, restricted diet	5	16.7
Segregation cells	3	10.0
Downgrade Incent. Allow.	2	6.7

offence was punishable, less than half expected to be apprehended and punished for the offence.

The vast majority (66.7%) of the sanctions imposed involved loss of earned remission, followed by administrative segregation with or without restricted diet (26.7%).

Attributions of Deterrence Effects for Subjects

Receiving No Misconducts during the Followup Period

Subjects who avoided getting any misconducts during the 3-month followup period were asked to indicate on a questionnaire whether they believed that this was attributable to one or more of 7 factors (Table 28). The majority of subjects endorsed job satisfaction, getting along with correctional officers or other inmates, dormitory placement within the institution, and "other" (primarily having a cooperative and responsible attitude toward incarceration and institutional rules) as significant factors. They were split approximately 50-50 as to the

Table 28.

Attributions for the absence of institutional
misconducts in subjects who incurred no misconducts
during the 3-month followup period.

<u>Reason</u>	<u>No</u>	<u>Yes</u>
Job Satisfaction	22.7%	77.3%
Got Along With CO's	9.1%	90.9%
Got Along With Peers	13.6%	86.4%
Visits from friends/family	45.5%	54.5%
Counselling	54.5%	45.5%
Dormitory Placement	22.7%	77.3%
Programs	50.0%	50.0%
Other ¹	13.6%	86.4%

¹ Most common reason specified for this category was "because of a good (cooperative) attitude".

importance of visits from friends or family, counselling, or institutional programs. This is not surprising since many inmates in the Correctional Centre did not receive regular visits (because of lack of family or distance away from home) and did not participate in counselling or other institutional programs.

Changes in Subjective Aversiveness and Deterrence

Ratings over Time

Subjects who received no misconducts during the 3-month followup period were asked to provide subjective ratings of the deterrence value of each of the 10 sanctions, as for the pretest. These data are summarized in Table 29. Almost half of the subjects (47.5%) increased their deterrence ratings 3 months later, despite having had no additional experience with the sanction in the interim. Of the remaining subjects, the majority showed no change in ratings, with only 16.5% giving lower deterrence ratings at the end of the followup period.

Table 29.

Changes in Subjective Aversiveness and Deterrence
Ratings Over Time.

	<u>Cases</u>	<u>Percent</u>
<u>No followup misconducts</u>		
<u>Deterrence Ratings:</u>		
Ratings Decreased	34	16.5
No Change	74	35.9
Ratings Increased	98	47.5
<u>One or more followup misconducts</u>		
<u>Deterrence Ratings:</u>		
Ratings Decreased	4	19.0
No Change	7	33.3
Ratings Increased	10	47.6
<u>Aversiveness Ratings:</u>		
Ratings Decreased	3	14.2
No Change	9	42.8
Ratings Increased	9	42.8

Those subjects who did receive at least one misconduct during the followup period were asked to provide new ratings of their perceptions of both aversiveness and deterrence of the sanction actually imposed for the misconduct. These data are also summarized in Table 29. For deterrence, almost half (47.6%) of the subjects rated the sanction as more deterrent after recent experience with the sanction than previously, while one-third showed no change and less than 20% decreased their ratings. Similar results were seen for aversiveness ratings, with 42.8% showing no change and 42.8% perceiving the sanction as more aversive.

Chapter 4

Discussion

The major purpose of this study was to explore the mediating or moderating role of individual perceptions and cognitive problem-solving skills in responsiveness to punishment. The results indicate that the relationship is a rather complex one.

General Findings Regarding Demographic and Criminal History Variables

None of the basic measures of problem-solving skill revealed any significant differences between poor and good problem-solvers with respect to age, education, IQ, or criminal history. However, using the composite measures, it appeared that good problem-solvers remained in school longer and had slightly more education than poor problem-solvers. These findings are generally consistent with previous research showing that problem-solving skill is for the most part independent of intelligence (cf. Spivack, Platt, & Shure, 1976). However, the absence of any significant

relationships between problem-solving skill and criminal history appears to be in contrast to previous reports that more criminally active individuals frequently exhibit deficits in problem-solving skills (e.g., Ross & Fabiano, 1981, 1985). However, this apparent contradiction in the current data exists only for previous criminal history; as with earlier research (cf. Ross et al., 1988), the poorer problem-solvers did indeed show a greater propensity to recidivate.

Groups based on aversiveness ratings alone or aversiveness-deterrence combined also did not differ with respect to these variables. However, Deterred subjects were significantly older than Nondeterred subjects. This finding, that age is related to perceived deterrence but not to perceived aversiveness, suggests that the influence of sanctions on behaviour may be more readily recognized or at least more readily acknowledged by older individuals, possibly reflecting greater experience with the sanction and/or a general trend towards greater cooperation or compliance with increasing age and maturity.

General Findings Regarding Institutional Conduct
Measures

Problem-Solving. Poor and good problem-solvers, particularly for groups based on composite measures of problem-solving skill, differed significantly in terms of many of the measures of institutional adjustment. Overall, poor problem-solvers incurred significantly more misconducts and "speeders" than good problem-solvers in all of the observation periods. However, for the sample as a whole, the highest rates of misconducts occurred during the early phase of incarceration (pretest). During this phase, poor problem-solvers received about three times as many as misconducts as good problem-solvers; this difference decreased during the latter phases of incarceration to about twice the number of misconducts. These findings suggest that poor problem-solvers do eventually adjust their behaviour towards more appropriate or socially approved behaviours but these adjustments may occur more slowly than for better problem-solvers. Perhaps, poorer problem-solvers, lacking the cognitive skills or strategies of better problem-solvers that would allow

them to imagine consequences and alternative courses of action, may have to rely more on trial-and-error learning and actual experience with consequences to adapt to a novel environment, which can be a much slower process.

Interestingly, poor problem-solvers consistently received more "brownies" (official positive reinforcers for good behaviour) than good problem-solvers. This may be because poor problem-solvers, who tend to be more concrete and to lack the skills necessary to manipulate the system in more sophisticated ways, may tend to behave in ways which curry favour in a more obvious and compliant fashion. Alternatively, it may be that correctional officers, the prime agents of reward and punishment, are more ready to reinforce positive behaviours in these inmates because they have lower expectations of them than of their more skilled and sophisticated peers.

Aversiveness. Subjects who rated the sanctions as less aversive incurred more misconducts and more "speeders" during all observation periods except the

pretest period. As already noted, it was during the pretest period that all subjects incurred the highest rates of misconducts and it was also during this period that the effects of problem-solving skill on institutional behaviour were most apparent. This suggests that institutional adjustment during the early phases of incarceration may be more influenced by problem-solving ability than by perceived aversiveness of potential sanctions while the reverse is true for misconducts committed in later phases.

In addition, subjects who rated the sanctions as less aversive served a significantly greater proportion of their aggregate sentences. This is not surprising since loss of earned remission was the most frequently applied of the sanctions (accounting for two-thirds of all sanctions in the current sample).

Deterrence. There was less differentiation between subjects on the basis of deterrence ratings in terms of their institutional conduct. Subjects rating the sanctions as less deterrent incurred significantly more misconducts during the followup period, and

although similar trends for misconducts and "speeders" during the other observation periods were evident, these were not statistically significant. Nondeterred and deterred subjects did not differ in proportion of sentence served prior to discharge.

The differences between the aversiveness and deterrence factors suggests that perceived deterrence alone has less predictive power than perceived aversiveness for actual (sanctionable) behaviour within the institution.

Subjects tended to rate aversiveness of the sanctions in a more uniform fashion than they rated deterrence of the sanctions. Moreover, sanctions tended to be rated more negatively in terms of aversiveness than in terms of deterrence. The fact that sanctions were not rated uniformly in terms of aversiveness and deterrence suggests that these represent two separate and somewhat independent phenomena.

There was also an interaction between deterrence rating and problem-solving skill for number of pretest misconducts. For good problem-solvers, subjects rating the sanctions as more deterrent received fewer misconducts, while the reverse was true for poor problem-solvers. This interaction was not seen for number of misconducts during the other observation periods and, furthermore, when number of misconducts was converted to rate of misconducts, the interaction disappeared to be replaced by a main effect of deterrence. Thus, as was the case with aversiveness, it appears that institutional adjustment during the early phases of incarceration, where the highest rates of misconducts are observed, may be more influenced by problem-solving ability than by perceived deterrence of potential sanctions. Misconducts occurring in the later phases of incarceration are more influenced by either perceived aversiveness or perceived deterrence.

When aversiveness and deterrence ratings are combined, however, the relationship between these attitudinal variables and problem-solving ability becomes somewhat clearer. Although there were a number

of subjects who rated sanctions as aversive but not a deterrent, it appears that the perception of aversiveness tends to have the same influence on behaviour regardless of whether or not the individual also perceives the sanction as a deterrent. Subjects who rated the sanctions as low in aversiveness and low in deterrence value received twice the number of misconducts during the followup period as subjects who rated the sanctions as high in aversiveness but low in deterrence value. However, though the latter group also tended to receive more misconducts than subjects who rated the sanctions as high in both aversiveness and deterrence value, these differences were much smaller and frequently did not reach statistical significance levels. A similar pattern of results was seen for number of "speeders", estimated number of followup misconducts, and proportion of sentence served prior to discharge. These findings suggest that subjects who perceive sanctions to be less aversive differ in terms of their actual institutional behaviour from subjects who perceive the sanctions to be more aversive, regardless of their perceptions of deterrence value.

As with aversiveness ratings alone, an interaction between combined aversiveness-deterrence and problem-solving ability emerged for number of pretest misconducts. For good problem-solvers, number of misconducts decreased progressively with increases in ratings of both aversiveness and deterrence. For poor problem-solvers, there was no consistent relationship, suggesting that perceived aversiveness-deterrence is a less influential factor in determining institutional behaviour in this group.

General Findings Regarding Recidivism

Poor problem-solvers, based on total means score or either of the composite scores, received a significantly higher number of charges for criminal offences committed during the 1-year followup than good problem-solvers. Although very few of those charged with new offences had been convicted by the end of the followup period, significantly more of those convicted were poor problem-solvers. However, this may be at

least partially because the better problem-solvers are more adept at manipulating the criminal justice system and postponing trial dates.

There were generally no differences in recidivism rates as a function of either perceived aversiveness or perceived deterrence value of institutional sanctions. The one exception was for drug/alcohol-related charges, where subjects who rated the sanctions as either less aversive or less deterrent tended to be charged with such offences more frequently (though this was only statistically significant in the case of aversiveness). A similar pattern (though again not statistically significant) was observed for aversiveness-deterrence combined where nonaversive-nondeterred subjects received more drug-alcohol charges than aversive-nondeterred subjects who in turn received more such charges than aversive-deterred subjects. Exactly how drug/alcohol-related offences are different from other types of criminal offences is not immediately apparent. However, it may suggest that some types of criminal offences may be more influenced by perceived aversiveness and deterrence of potential sanctions and

less influenced by problem-solving ability than other (perhaps more rationally-motivated) crimes.

These findings suggest that, in contrast to institutional adjustment, problem-solving ability is generally a more influential factor in community adjustment and post-release criminal activity. In part, this may reflect differences in degree of structure between the institutional environment and the community. The differential weights of aversiveness-deterrence and problem-solving skill in institutional versus community adjustment may represent a generalization decrement in terms of skills or coping strategies acquired over the course of incarceration in the institution (see discussion below).

Relationships among Problem-Solving Ability,

Aversiveness, and Deterrence

Poor problem-solvers and good problem-solvers did not differ in terms of their subjective ratings of deterrence. However, there was a tendency for poor

problem-solvers to give lower aversiveness ratings for the sanctions and in comparison with good problem-solvers they were less likely to rate the sanctions as clearly aversive.

Subjects who rated sanctions as less aversive also rated sanctions as lower in deterrence value and their predictions of the number of misconducts that they would incur during the 3-month followup period were significantly higher. Similarly, subjects who rated sanctions as less deterrent also rated the sanctions as significantly less aversive and their predictions of number of followup misconducts were also significantly higher. For aversiveness-deterrence combined, nonaversive-nondeterred subjects gave significantly higher estimates of followup misconducts than either aversive-nondeterred or aversive-deterred subjects, with the aversive-deterred subjects giving the lowest estimates.

Problem-Solving Ability, Aversiveness, Deterrence, and
Estimates of Future Misconducts

There were no differences between poor problem-solvers and good problem-solvers, or between subjects rating the sanctions as more or less aversive, with respect to accuracy of their estimates of future misconducts. However, subjects rating the sanctions as lower in deterrence value tended to underestimate the number of future misconducts they would receive, though this trend did not reach statistical significance levels. Subjects in the Nonaversive-Nondeterred group estimated that they would receive a greater number of misconducts than other subjects and, indeed, their estimates were largely correct in the sense that they did receive substantially more misconducts. Subjects in the Aversive-Deterred group estimated that they would receive fewer misconducts, and this too was a realistic estimate of the number of misconducts they received relative to other groups.

Consequential Thinking

Poor problem-solvers, at least based on composite measures of problem-solving skill, had significantly lower scores for awareness of consequences than good problem-solvers. Similarly, subjects who rated the sanctions as either less aversive or less deterrent also had significantly lower awareness of consequences scores. Moreover, subjects who rated sanctions as both less aversive and less deterrent had significantly lower consequential thinking scores than subjects with high aversiveness-low deterrence or high aversiveness-high deterrence ratings.

The relationship between inability to imagine consequences and lowered perceptions of aversiveness and deterrence is consistent with the inverse relationship observed between other measures of problem-solving skill and these perceptions. The ability to imagine consequences may be more an extension or aspect of general problem-solving ability than a distinct skill in its own right, and the present findings suggest that deficits in the overall

constellation of problem-solving skills do exert some influence on subjective ratings of aversiveness and/or deterrence. It is significant that this relationship appears to be dynamic in nature; this is discussed at greater length below.

Aversiveness, Deterrence, Problem-Solving Skills, and Interpersonal Attitudes as Factors in Individual Responsiveness to the Threat of Punishment

As mentioned, the discrepancies between subjective ratings of aversiveness and deterrence value of sanctions suggest that the two are somewhat independent attitudinal factors. Although the two perceptions were found to be correlated and no doubt exert an interactive influence on behaviour, it is interesting to note that frequently the ratings indicate that sanctions were perceived to be more "aversive" than "deterrent". Two questions come to mind: First, why would a sanction be perceived as lower in deterrent value than aversiveness? And, second, how does the combined aversiveness-deterrence attitude influence

behaviour in terms of institutional adjustment? In answer to the first, one may speculate that other factors in addition to perceived aversiveness may determine the actual deterrence impact of the threat of a particular sanction. For example, subjects rating sanctions as more deterrent (but not any more aversive) tended to be somewhat older. This suggests that factors such as age and maturity-immaturity may play a role through the associated influences of compliance and cooperation versus rebelliousness or antiauthority sentiments. Less mature (or less experienced) individuals may be less inclined to admit that an official sanction would exert any influence on their behaviour.

Peer influences may be another factor, in essence presenting the individual with an avoidance-avoidance conflict. Engaging in the behaviours necessary to avoid institutional or societal punishment (viz. compliance with the rules) may elicit negative reactions from other inmates with direct and highly certain or predictable punitive consequences (frequently physical in nature). Conversely,

behaviours that adhere to the "inmate code" may result in institutional sanctions that may be seen as less aversive and possibly less certain than peer sanctions and in these situations the institutional sanctions will fail to deter misbehaviour.

In some cases, the threat of official sanctions that are considered aversive may merely provide motivation to seek alternative strategies which will enable the individual to misbehave and yet avoid detection. Bandura (1969a) notes that for offenders, who may often lack alternative behavioural strategies for achieving desired goals,

Punishment of antisocial behavior is likely to lead (them) either to adopt safer forms of illegitimate activities or to alter their techniques in order to avoid detection and punishment on future occasions ... To the extent that refinements in deviant behavior increase an individual's confidence that he can avoid detection and punishment on subsequent occasions

the behavior will most likely be repeated
(Bandura, 1969a, p. 315).

Moreover, the threat or application of punishment may elicit adverse emotional or attitudinal reactions that effectively counteract any potential deterrent effect and may even increase the probability of antisocial behaviours. When punishment is effective it is probably because it tends to elicit or induce responses (including emotional reactions) that are incompatible with the behaviours being punished and therefore the frequency or probability of the punished response necessarily declines (Bolles, 1967, 1970; Rescorla & Solomon, 1967; Solomon, 1964). However, punishment may be ineffective at times because it may act to strengthen the behaviour it is intended to suppress or it may encourage other undesirable behaviours because it elicits aggression and/or adverse emotional reactions, such as fear, anger, or helplessness, which feed into or facilitate the behaviour being punished (e.g., Azrin, Hutchinson, & Hake, 1967; Bolles, 1967, 1970; Hulse, Deese, & Egeth, 1975; Miller, Rosellini, & Seligman, 1977; Restle,

1975; Solomon, Kamin, & Wynne, 1953; Ulrich & Azrin, 1962). In such cases, punishment may well result in an overall increase in assaults and similar antisocial behaviours.

Alternatively, punishment may be overly effective in suppressing behaviour so that it induces behavioural or cognitive rigidity (e.g., obsessional or paranoid thinking) or other maladaptive behavioural consequences (Appel, 1961; Bandura, 1969a; Masserman, 1943). For example, a number of animal studies have demonstrated that punishment by electric shock may elicit aggression and attack against other animals in the vicinity (e.g., Bolles, 1975; Hulse, Deese, & Egeth, 1975; Restle, 1975; Solomon, Kamin, & Wynne, 1953; Ulrich & Azrin, 1962). In humans, particularly offenders, threat of punishment may arouse a characterological retaliatory or defensive attitude stemming from a history of distrust and hostility towards authority (which to the offender may often be viewed as synonymous with punishment). Restle (1975) gives the example of a criminal who is subjected to "the aggressive and dominating force of the law" in the application of

societal sanctions and, because he views himself as belonging to an entirely different social group than the policeman with different values and standards, reacts to the threat of punishment as if it were "an incursion or attack by an outsider" in a defensive or aggressive fashion, much the same as would be seen in various animal species (Restle, 1975, p. 186).

Such maladaptive cognitive-attitudinal reactions to punishment or threatened punishment may be corrected or even circumvented through the development of cognitive flexibility in the form of adequate problem-solving skills.

While these and similar factors may account for the finding that sanctions perceived to be aversive may in some cases not be perceived as a deterrent, it nonetheless appears that perceptions of aversiveness do carry considerable weight in determining behaviour, in spite of what individuals may say about the sanction's deterrent value. The results from analyses of the combined aversiveness-deterrence ratings indicate that perceptions of aversiveness hold substantially more

weight than perceptions of deterrence in terms of institutional behaviour. For example, subjects who rated sanctions as aversive but not deterrent had significantly fewer misconducts and "speeders" than those who rated sanctions as both nonaversive and nondeterrent. Moreover, the aversive-nondeterred subjects more closely approximated the comparatively "good" behaviour of the aversive-deterred subjects in terms of institutional conduct. Thus, although the individual may say that a sanction he perceives as aversive has no deterrent value for him, his behaviour indicates otherwise. When he perceives the sanction to be aversive, he acts as if it is a deterrent.

To return to an earlier point, in this study the density of pretest misconducts was related primarily to problem-solving ability rather than perceived deterrence or aversiveness. In contrast, the density of misconducts during later periods (followup and posttest) was primarily related to aversiveness and/or aversiveness-deterrence combined. The overall rate of misconducts was, however, influenced by both problem-solving and aversiveness-deterrence.

These findings suggest that adjustment to the institutional environment may be slower and less complete for poor problem-solvers compared to good problem-solvers. However, attitude plays an important role in overall adequate adjustment. Problem-solving ability is less of a factor in later adjustment; if the individual doesn't care about the punishment or doesn't find it aversive, he will still act out.

The "Hidden Intermediary" in Deterrence

Henschel & Carey (1975) suggest that much of the early deterrence research is invalid because of its failure to examine the "hidden intermediary" of individual subjective perceptions of certainty and severity of sanctions in relation to behaviour. However, if the current findings can be taken as a representative breakdown of some of the links between perceptions, attitudes, and behaviour, then it would appear that perceptions of aversiveness play a more direct role in the inhibition of prohibited behaviour

than do perceptions of deterrence itself. Perceptual research that has restricted its efforts to tying subjective reports of a deterrent effect to subsequent behaviour may have missed the perception that is linked, in a more influential and consistent way, to subsequent behaviour (i.e., aversiveness) and thus overlooked the more potent deterrence intermediary.

This conclusion is further supported by the finding that it was the nonaversive subjects rather than necessarily the poor problem-solvers who were responsible for the greatest number of minor infractions as reflected in a substantially greater number of warnings for misbehaviour ("speeders"). It may be that better problem-solvers who don't perceive the sanctions to be aversive may be just a little more adept at not crossing the line that would result in an official sanction (misconduct). Nonetheless, it is the nonaversive attitude that seems to influence overall misbehaviour as evidenced in the significant differences between nonaversive and aversive subjects in followup misconducts, followup "speeders", and total misconducts and "speeders", as well as in the end

result of serving a greater proportion of their sentences; these effects were not evident in the comparisons of problem-solving skill.

On the other hand, the finding that problem-solving ability and perceived aversiveness appear to influence some of the same measures of institutional conduct (e.g., total misconducts) suggests that there may be an interactive effect. This is supported by the finding that poor problem-solvers tend to give lower ratings of aversiveness and are more likely to rate sanctions as nonaversive than good problem-solvers. This finding in itself is noteworthy in that perceptions of greater aversiveness appear, at least to some extent, to be a function of ability to formulate step-by-step plans to resolve a problem and to imagine the alternative consequences of these plans. Conversely, it is quite possible that if something is seen as inevitable because of inadequate thinking skills for conceptualizing a way around it, then it may be perceived as not so aversive.

It may be that with insufficient skills in his repertoire to conceive of alternative solutions to a problem situation or to conceptualize appropriate steps for achieving alternate goals, the poor problem-solver may have a sense of being locked in to habitual and consistent modes of responding to his environment, in spite of the negative consequences that result from this style of responding. Thus, the lack of perceived aversiveness for these punishments may reflect a process akin to learned helplessness (e.g., Miller, Rosellini, & Seligman, 1977) in that the subject can perceive no escape from or control over the negative consequences. As a result, he may merely resign himself to his fate and accept it as inevitable.

In addition, since the negative consequences are perceived as normal or natural and no alternative courses of action or outcomes are seen as possible, he underrates the negative or aversive qualities of the consequences in comparison with individuals who are able to conceive of alternative outcomes. And because of this, the behaviour of such an individual is less likely to be deterred by punishment or by the threat of

punishment, since, as Hulse, Deese, and Egeth (1975) note, "punishment does an exemplary job of telling the organism what not to do, but it carries no information by itself which tells an organism what particular alternative course of action should be followed" (p. 191). The better problem-solvers, who can conceive of alternative responses and have in their repertoires the skills to conceptualize the steps involved in their enactment, are more likely to feel a sense of influence or control over the immediate environment, precisely because they have at their disposal a choice of alternative responses that can directly influence the nature of the consequences of their actions.

Similar findings have been reported in research specifically examining perceptions of control in relation to prisoner adjustment:

There is evidence that small increases in control may be associated with attitudes more favourable to institutional goals and decreased stress (MacKenzie & Goodstein, 1987 in press; McEwen, 1978; Moos, 1975; Osgoode et al., 1985)...One

important determinant of the mode of adjustment in individual inmates to a control-limited environment may be the individual's degree of personal control over events within that environment (Goodstein, MacKenzie, & Shotland, 1984)...Regardless of whether the perceived ability to control events reflects differences in actual control or only the perceived ability to control events, the perception itself may be the important factor in determining prison adjustment (Mackenzie, Goodstein, & Blouin, 1987, p. 50).

It is clear that an explanation based on a learned helplessness/problem-solving deficits explanation cannot account for all of the subjects who rated sanctions as nonaversive, since some of these subjects were, in fact, good problem-solvers. The nonaversive-nondeterrent attitude in these subjects must have other antecedents. Possibly, this attitude stems from a sense of emotional helplessness, based on a history which has led the individual to perceive the environment as something hostile, something to be distrusted, and therefore something towards which he

experiences reciprocal hostility. Consequently, he will react against the environment in an aggressive, retaliatory, or defensive way. For such individuals, appropriate treatment solutions would involve not the fostering of problem-solving skills per se but interventions focusing on resolving emotional conflicts and cognitive-emotional distortions.

Related to this is the current finding that the majority of institutional misbehaviours were impulsive (expressive) rather than instrumental (goal-directed) in nature (cf. Chambliss, 1967). As suggested earlier, impulsive-expressive acts may be less readily deterred by the threat of legal sanctions. Interventions relying on training problem-solving skills alone may or may not be sufficient to address this type of behaviour as well: the relationship between problem-solving skill and impulsivity is as yet unclear. In this light, it would seem important to determine the reasons for inadequate impulse controls, e.g., inadequate (mediating) thinking skills, characterological hostile reactions, automatic defensive behaviours, etc.

In addition, factors such as interpersonal ties to the delinquent (inmate) subculture may also mediate subjective perceptions of sanction severity-aversiveness (cf. Moore, 1978).

If the strength and structure of interpersonal relations are the best predictors of crime in etiological studies, there is reason to believe that the same factors should be of central importance in determining the impact of sanctions...(and to consider) the relative importance of (sanctions in the) disruption of normative beliefs, patterns of exchange, emotional attachments, and the frequency and pattern of involvement (with the inmate subculture)... (Ekland-Olson, Kelly, & Supancic, 1983, p. 158; cf. Andrews, 1980; Hirchi, 1969).

Institutional sanctions may be administered to an individual for misbehaviours which may be lauded amongst some segments of the inmate's criminal peer network. These formal sanctions may be perceived by the individual as relatively minor in comparison with

the aversiveness of a disrupted social (peer) network that could result from a refusal to engage in the misbehaviour.

Plasticity of Factors Involved in Deterrence

A further conclusion that can be drawn from the present study is that the three main factors - problem-solving, aversiveness, and the aversiveness-deterrence relationship - are all dynamic factors in the sense that all three can change or be changed over time. In addition, they are all dynamic in the sense that the factors, although interrelated, can have greater or lesser predominant influence on behaviour at different times (e.g., different phases of incarceration) and in different situations (e.g., institutional vs. community environments).

Problem-solving ability appears to play a more dominant role during the early phases of incarceration and thus should be considered an important factor in adjustment to institutional living. In some cases, the

more concrete inmates (i.e., poor problem-solvers with less cognitive flexibility) may initially need a higher level of structure to enable them to adapt to the prison environment. However, given the apparent importance of problem-solving ability in community adjustment, it can be argued that the period of incarceration should include a process of decreasing structure (akin to the principle of "cascading" or progressively decreasing security levels in the Canadian federal correctional system) coupled with greater opportunities for individual choice and responsibility, as well as treatment interventions (formal or informal) that foster the development of the problem-solving skills relevant to the individual's successful transition to the community.

Attitudes such as perceptions of aversiveness, the aversiveness-deterrence relationship, and, potentially, emotional factors such as general defiance seem to play a more predominant role in determining later or continued institutional adjustment. However, as the current results demonstrate, these perceptions may not be very stable over time. Much of the previous

perceptual deterrence research has rested on the assumption that such perceptions are stable, or, as Paternoster et al. (1982) and Saltzman et al. (1982) suggested, where instability exists, it is due, at least to some extent, to the individual's experience with a particular sanction. Alterations in perceptions would thus reflect an experiential effect. However, in reviewing panel studies of perceptual deterrence, Lundman (1986) concluded that "perceptual change is not (unequivocally) associated with the commission of illegal actions" (p. 375). The results of the present study support Lundman's conclusion that the instability and plasticity of perceptions is not due solely to experiential factors in that changes in rated aversiveness or deterrence over time occurred both for those who experienced a sanction and for those who didn't.

The Relationship between Problem-Solving Skills and
Environmental Structure

Problem-solving skills appear to more closely related than perceptions of aversiveness or deterrence to community or societal adjustment. The behaviours that are targeted for control in the correctional setting and the specifics of the environment in which such behaviours occur are often quite different from their counterparts in the environment into which the offender is released. The prison environment is characterized by higher structure, predictability, and certainty with fewer alternatives or choices for the individual. There is therefore much less of a need for personal direction and control in such a setting. With fewer alternatives available, it may be that problem-solving is not as critical to adjustment in an institution. However, the environment in which the offender is eventually released is much lower in structure, has less predictability and certainty, and the consequences of behaviour are often less consistent and/or more delayed. Without adequate cognitive flexibility and problem-solving ability, the individual

may be more at risk for lapsing back into old habits under stress or limited to responding automatically to the stimulus control influences in the immediate environment.

In this light, individual choice, personal directedness, and problem-solving skills are much more requisite in societal adjustment than in institutional adjustment. This is exemplified in the current finding that poor problem-solvers received significantly more criminal charges in the year following release than did good problem-solvers. Perceived aversiveness or deterrence was largely unrelated to recidivism. Thus, problem-solving ability appears to be more predictive of recidivism than the attitudinal factors examined in this study (aversiveness-deterrence), which seem to be of greater influence in institutional adjustment.

As those who work in correctional facilities have often observed, it is sometimes the most persistent criminals who are the easiest to manage in prison: these are the so-called "good inmates" who appear to adapt readily to the established structure and

contingencies of the correctional setting and yet return to their habitual modes of behaviour almost immediately upon release. This problem is, of course, not unique to correctional settings. It is a problem for behaviour modification in any institutional setting which is more-or-less isolated from the rest of society. Rachlin (1976) addresses this issue for the case of a psychiatric facility:

"It is easy to obtain desired behavior in an institutional setting with the use of tokens. The trick is to phase the tokens out and phase the societal rewards in without disrupting the behavior. This is a trick that behavior therapists are finding difficult to do. Patients often fail to transfer desired behavior from institutional settings to everyday life ... It has long been observed that bad habits come back when the environment in which they were first generated is restored." (Rachlin, 1976, p. 460)

It could be argued that at least some of the problem-solving skills highlighted in the present study may be required for effective generalization.

Therefore, although such skills may be less relevant for institutional adjustment, they may be essential for generalization of any therapeutic or rehabilitative gains acquired during the period of incarceration.

Implications of the Differential Sensitivity of the Problem-Solving Measures

The results show that the ability to merely identify alternative responses to a situation or problem is in itself not sufficient to enable the person to avoid repeated misbehaviours and their associated negative consequences. Instead, it appears that in terms of real problem-solving skill the person must also have the ability to conceptualize the means or steps inherent in enacting each of the alternatives. This conclusion has been noted elsewhere: "One of the most surprising findings in the studies of interpersonal problem-solving in adults (as opposed to

adolescents) is that alternative thinking, or the simple generation of solutions, seems to take on a less significant role in the adjustment process" (Spivack, Platt, & Shure, 1976, p. 122). Conversely, being able to conceptualize a step-by-step plan for achieving a particular goal, although a necessary prerequisite for exerting a significant influence on the environment, is apparently not as powerful as being able to both recognize alternative behaviours (choices) and to know how to enact them (means-ends thinking) with some degree of specification of the details of each alternative response (enumerations).

Moreover, in the case of the current sample, being able to detail the actual steps involved in a behaviour or in achieving an outcome seemed more influential than being able to recognize potential obstacles or delays in achieving the goal and conceptualizing ways to circumvent them. There was little recognition of potential obstacles in any of the subjects. This in itself may represent a major social-cognitive deficit in offender populations. Nonetheless, those individuals who were more adept at the other components

of problem-solving skill (means-ends thinking, alternative thinking, and enumerations) were still able to influence their environments to the extent that they incurred fewer negative consequences, at least within the institution.

It may be that the component of problem-solving ability which enables the individual to anticipate potential obstacles to his plan and generate ways to circumvent these obstacles is a skill that has more relevance to the increased environmental variations (and inherent obstacles) of the street. Therefore, while the apparent absence of this specific skill did not seem to interfere with the institutional adjustment of otherwise good problem-solvers, it may be very important in terms of successful post-release adjustment. That is, the process of generalizing basic problem-solving skills and/or any other therapeutic gains acquired in the prison setting to day-to-day life on the street may be impaired by an inability to deal with routine obstacles.

Limitations of the Present Study and Directions for
Future Research

The present study should perhaps be seen as essentially exploratory in nature. In some cases, conclusions were limited by sample size and short followup periods. In addition, given the paucity of published normative, validity, and reliability data for some of the psychometric instruments, there is a need for further research to examine the extent to which they adequately assess the characteristics of skills central to interpersonal problem-solving. In this regard, the Awareness of Consequences test seems particularly problematic: the test evaluates whether the individual stops to consider the consequences of his actions but it does not evaluate how appropriate or realistic is the perceived consequence.

Future studies should include measures of offender characteristics that tap other areas such as risk level (e.g., Andrews, 1982; Andrews, Kiessling, et al., 1986; Andrews & Robinson, 1984; Andrews, Robinson, & Balla, 1986; Bonta, 1989; Bonta & Motiuk, 1985, 1987; Motiuk,

Bonta, & Andrews, 1986), criminological attitudes (e.g., Andrews & Wormith, 1984; Andrews, Wormith, & Kiessling, 1985; Roy & Wormith, 1985), psychopathy (e.g., Hare, 1980, 1985; Schroeder, Schroeder, & Hare, 1983); and other traits or features that may be relevant to individual responsiveness to punishment and to criminal recidivism. The psychopathy literature in particular may be relevant to an individual's inability to foresee consequences and to elucidate the "I don't care" attitude of the nonaversive-nondeterred or the aversive-nondeterred subject (cf. Rabin, 1979). These attitudes may play an important role in risk evaluation and as such these individuals should be targeted for more intensive intervention (cf. Andrews, Kiessling, et al., 1986; Andrews, Robinson, & Balla, 1986), rather than given low priority for treatment efforts based on judgements of "a bad attitude".

The present study was unable to discern a clear relationship between perceived aversiveness or deterrence of institutional sanctions and subsequent criminal recidivism. Future studies should consider perceptions of aversiveness and deterrence of legal

sanctions imposed in the community since they are likely to be more relevant to criminal acts which occur in that context. In addition, the influence of these perceptions on recidivism and community adjustment should be monitored over a longer post-release followup period to compensate for the low base-rates of some types of offences and the sluggishness of the adjudication process. A longer followup period would also allow for the evaluation of the relative weights of the various factors (e.g., problem-solving, perceived aversiveness or deterrence) in short-term and long-term community adjustment.

Conclusions

The major findings of this study are:

- (1) Problem-solving ability is more influential in early as opposed to later adjustment to incarceration.
- (2) Perceptions of aversiveness and deterrence of institutional sanctions are more influential than

problem-solving ability in longer-term institutional adjustment.

(3) An individual who perceives a sanction to be aversive behaves as if the sanction were a deterrent, regardless of whether or not he perceives the sanction to be a deterrent.

(4) To some degree, perceptions of aversiveness and deterrence of sanctions are influenced by problem-solving ability. It appears that individuals with better problem-solving skills tend to perceive sanctions as more aversive. Individuals who are deficient in these skills perceive potential sanctions as less aversive and are apparently less responsive to them.

(5) Problem-solving ability, among other attitudinal and interpersonal factors, is an important determinant of community adjustment or recidivism. Individuals who are deficient in problem-solving skills recidivate more rapidly and/or more frequently, probably because they are less able to formulate noncriminal alternatives.

Implications of the Study

More frequent punishment or more severe sanctions are clearly not the answer to the problem of rehabilitation. The majority of offenders already have vast experience with punishment and their capacity to tolerate punishment with minimal effects on their behaviour appears to be almost unlimited. As the present results demonstrate, the factors important in determining individual responses to punishment are dynamic, not fixed, and as such are appropriate targets for treatment interventions. Punishment systems are already inherent in the way society reacts to criminals and in the way correctional facilities attempt to control and suppress antisocial behaviour. What is needed is continued and perhaps more consistent attempts at actual correction, i.e., rehabilitation and treatment. The present results suggest that one way to enhance individual responsiveness to punishment and at the same time to increase the likelihood of successful community adjustment is to increase overall cognitive flexibility by way of problem-solving skill development. This is not to suggest that problem-

solving ability is a solution to criminality or that there are not other critical determinants of criminal recidivism but it can serve as an important foundation for core behavioural and attitudinal changes that may begin to foster a prosocial lifestyle.

(The) cumulative evidence points directly and overwhelmingly to the importance of combining rehabilitation with punishment. Our correctional system(s) must provide offenders alternative routes and skills to obtain the rewards they formerly obtained only, or much more easily, through crime (Singer, 1970, p. 429).

It is clear that we cannot depend on or expect the impetus for change to come from the offender: in many cases, his reactions will be much too habitual and too strongly entrenched for this to occur easily or spontaneously. Rather, it must be the responsibility of the criminal justice system to intervene in a way that maximizes the individual's ability to respond to punishment (and his opportunities for change) rather than simply maximizing the system's ability to punish,

which ultimately seems to be fruitless.

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Appendices

Appendix 1
Consent Form

Appendix 1

Rideau Correctional Centre
Consent Form

I agree to participate in a study being conducted by Moira Tweeddale at Rideau Correctional Centre.

I understand that my identity and responses will be kept strictly confidential and will not be used for anything other than the purposes of this study.

Print Name

Signature

Date

Appendix 2
General Questionnaire

f) cells for 10 days
strongly dislike

7	6	5	4	3	2	1	
	6	5	4	3	2	1	strongly like

don't care

g) kept at same level Incentive Allowance
strongly dislike

7	6	5	4	3	2	1	
	6	5	4	3	2	1	strongly like

don't care

h) down grade Incentive Allowance
strongly dislike

7	6	5	4	3	2	1	
	6	5	4	3	2	1	strongly like

don't care

i) cells on beancake for 2 days
strongly dislike

7	6	5	4	3	2	1	
	6	5	4	3	2	1	strongly like

don't care

j) cells on beancake for 3-10 days
strongly dislike

7	6	5	4	3	2	1	
	6	5	4	3	2	1	strongly like

don't care

k) loss of privileges
strongly dislike

7	6	5	4	3	2	1	
	6	5	4	3	2	1	strongly like

don't care

g) kept at same level Incentive Allowance
definitely yes 7 ___ 6 ___ 5 ___ 4 ___ 3 ___ 2 ___ 1
definitely no

h) down grade Incentive Allowance
definitely yes 7 ___ 6 ___ 5 ___ 4 ___ 3 ___ 2 ___ 1
definitely no

i) cells on beancake for 2 days
definitely yes 7 ___ 6 ___ 5 ___ 4 ___ 3 ___ 2 ___ 1
definitely no

j) cells on beancake for 3-10 days
definitely yes 7 ___ 6 ___ 5 ___ 4 ___ 3 ___ 2 ___ 1
definitely no

k) loss of privileges
definitely yes 7 ___ 6 ___ 5 ___ 4 ___ 3 ___ 2 ___ 1
definitely no

3. In the next 3 months, how many misconducts do you think you'll have on your record?

Appendix 3
Misconduct Questionnaire

APPENDIX 3
SECONDARY QUESTIONNAIRE
MISCONDUCT INFORMATION

Offence _____
Punishment _____

II-1

1. Were you aware that the above was a punishable offence?

Yes _____ No _____

2. Was the above offence a) planned _____

b) unplanned _____

c) other _____

Explain _____

3. Did you expect to be punished when you committed this offence?

Yes _____ No _____

III-A

1. How did you feel about the punishment you received?

Dislike strongly 7 ___ 6 ___ 5 ___ 4 ___ 3 ___ 2 ___ 1 ___ Liked strongly
didn't care

2. Do you think this punishment "fits the crime"?

Too severe 7 ___ 6 ___ 5 ___ 4 ___ 3 ___ 2 ___ 1 ___ too light
fair

3. How do you rate this punishment?

Very unpleasant 7 ___ 6 ___ 5 ___ 4 ___ 3 ___ 2 ___ 1 ___ pleasant
didn't bother me

IV-D

1. Having experienced this punishment, do you think it would prevent you from committing similar misconducts in the near future?

definitely yes 7 6 5 4 3 2 1 definitely no

2. Do you expect you will receive another misconduct over the next 3 months?

definitely no 7 6 5 4 3 2 1 definitely yes

3. In the next 3 months, how many more misconducts do you think you'll have on your record?

COMMENTS:

Appendix 4
Questionnaire for Subjects
Receiving No Further Misconducts

APPENDIX 4
THIRD QUESTIONNAIRE

over this follow-up period you have received no misconduct charges.

1) Do you think that any of the following punishments prevented you from committing a misconduct over this period?

- a) lose 3 days good time
strongly agree 7 6 5 4 3 2 1 strongly disagree
- b) lose 9 days good time
strongly agree 7 6 5 4 3 2 1 strongly disagree
- c) lose 15 days good time
strongly agree 7 6 5 4 3 2 1 strongly disagree
- d) speeder
strongly agree 7 6 5 4 3 2 1 strongly disagree
- e) cells for 2 days
strongly agree 7 6 5 4 3 2 1 strongly disagree

- f) cells for 10 days
strongly agree 7 6 5 4 3 2 1 strongly disagree
- g) kept at same level of Incentive Allowance
strongly agree 7 6 5 4 3 2 1 strongly disagree
- h) down-graded Incentive Allowance
strongly agree 7 6 5 4 3 2 1 strongly disagree
- i) cells on beancake for 2 days
strongly agree 7 6 5 4 3 2 1 strongly disagree
- j) cells on beancake for 3-10 days
strongly agree 7 6 5 4 3 2 1 strongly disagree
- k) loss of privileges
strongly agree 7 6 5 4 3 2 1 strongly disagree

Appendix 5
Means-Ends Problem-Solving Test

Appendix 5

Means-Ends Problem Solving Test

INSTRUCTIONS

In this procedure we are interested in your imagination. You are to make up some stories. For each story you will be given the beginning of the story and how the story ends. Your job is to make up a story that connects the beginning that is given you with the ending given you. In other words, you will make up the middle of the story. Write at least one paragraph for each story.

1. Mr. A. was listening to the people speak at a meeting about how to make things better in his neighbourhood. He wanted to say something important and have a chance to be a leader too. The story ends with him being elected leader and presenting a speech. You begin the story at the meeting where he wanted to have a chance to be a leader.

2. H. loved his girlfriend very much, but they had many arguments. One day she left him. H. wanted things to be better. The story ends with everything fine between him and his girlfriend. You begin the story with his girlfriend leaving him after an argument.

3. Mr. P. came home after shopping and found that he had lost his new watch. He was very upset about it. The story ends with Mr. P. finding his watch and feeling good about it. You begin the story where Mr. P. found that he had lost his watch.

4. Mr. C. had just moved in that day and didn't know anyone. Mr. C. wanted to have friends in the

neighbourhood. The story ends with Mr. C. having many good friends and feeling at home in the neighbourhood. You begin the story with Mr. C. in his room immediately after arriving in the neighbourhood.

5. During the Nazi occupation a man's wife and children were viciously tortured and killed by an SS trooper, and the man swore revenge. The story begins one day after the war, when the man enters a restaurant and sees the ex-SS trooper. You begin when he sees the SS trooper.

6. One day Al saw a beautiful girl he had never seen before while eating in a restaurant. He was immediately attracted to her. The story ends when they get married. You begin when Al first notices the girl in the restaurant.

7. Bob needed money badly. The story begins one day when he notices a valuable diamond in a shop window. Bob decides to steal it. The story ends when he succeeds in stealing the diamond. You begin when he sees the diamond.

8. John noticed that his friends seemed to be avoiding him. John wanted to have friends and be liked. The story ends when John's friends like him again. You begin where he first notices his friends avoiding him.

9. One day George was standing around with some other people when one of them said something very nasty to George. George got very mad. George got so mad he decided to get even with the other person. The story ends with George happy because he got even. You begin the story when George decided to get even.

10. Joe is having trouble getting along with the foreman on his job. Joe is very unhappy about this. The story ends with Joe's foreman liking him. You begin the story where Joe isn't getting along with his foreman.

Appendix 6
Optional Thinking Test (Alternatives)

Appendix 6

Optional Thinking Test (Alternatives)

INSTRUCTIONS

I am going to tell you some things that happen to a person, and I want you to think of all the things that he could do about it. Tell me everything that comes into your head. And don't worry about being right or wrong because there are no right or wrong answers.

O.K.?

1. John wants to watch his favourite TV program but his friend is watching another program. What can John do so he can have a turn watching TV? ---- What else do you think he might do? ---- (For all situations, when Subject is finished but has only given 1 or 2 answers, Examiner says "Can you think of anything else?")

2. Victor wants people to listen to him but no one ever does. What can Victor do to get listened to? ---- What else can he do? ---- What else?

3. Jack wants his friend to go to the movies with him this evening, but his friend doesn't want to go. What can Jack do to get his friend to go to the movies this weekend? ---- What else can he do? ---- What else?

4. Steve broke his wife's favourite flower pot and he's afraid his wife will be mad at him. What can Steve do so his wife won't be mad? ---- What else can he do? ---- What else?

Appendix 7

Awareness of Consequences Test (Temptations)

Appendix 7

Awareness of Consequences Test (Temptations)

INSTRUCTIONS

Complete the following stories by telling everything that goes on in the mind of the main character, and then tell what happens in the story.

1. Joe has been on a diet for several weeks now. He is at a party and they are serving a lot of his favourite food. He is tempted to go off his diet.

TELL EVERYTHING THAT GOES ON IN JOE'S MIND,
AND THEN TELL WHAT HAPPENS.

2. John finds a watch on the floor of a hallway at work. When he picks it up, he looks around and notices that there is no one else in the hallway. It is a nice watch and he could really use one. He is tempted to keep it.

TELL EVERYTHING THAT GOES ON IN JOHN'S MIND,
AND THEN TELL WHAT HAPPENS.

3. Bill loves to go hunting but his doctor told him he can't go. One weekend, his next door neighbour is planning to go. Bill looks out the window at his neighbour getting into his car and is tempted to go out hunting with him.

TELL EVERYTHING THAT GOES ON IN BILL'S MIND,
AND THEN TELL WHAT HAPPENS.

4. Jack cashes his check at the bank and when he counts his money, he finds that he was given too much. He looks at the teller and sees that she has not noticed anything. He could sure use the extra money.

TELL EVERYTHING THAT GOES ON IN JACK'S MIND,
AND THEN TELL WHAT HAPPENS.

Awareness of Consequences Test (Temptations)

Scoring Questions

1. Does subject indicate the possibility of transgressing?
2. Does subject think of the consequences of transgressing?
3. If subject does think of consequences, are they internal or external?
4. Does subject transgress?
5. If subject does transgress, are the consequences internal or external?

Appendix 8
Categories for Institutional Misconducts

Appendix 8

Categories for Institutional Misconducts

Aggressive Misconducts

- commits or threatens to commit an assault upon another person
- makes a gross insult, by gesture, use of abusive language, or other act, directed at any person
- wilfully damages any property that is not owned by the inmate

Rule Violation Misconducts

- wilfully disobeys a lawful order of an officer
- takes or converts to the inmate's own use or to the use of another person any property without the consent of the rightful owner of the property
- has contraband in his possession or attempts to or participates in an attempt to bring contraband in or take contraband out of the institution
- leaves a cell, place of work or other appointed place without proper authority

- refuses to pay a fee or charge established by this regulation
- wilfully breaches or attempts to breach any other regulation or a written rule, of which the inmate has received notice, governing the conduct of inmates

Security Misconducts

- creates or incites a disturbance likely to endanger the security of the institution
- escapes, attempts to escape or is unlawfully at large from the institution
- gives or offers a bribe or reward to an employee of the institution
- counsels, aids or abets another inmate to do an act in contravention of the Act and regulations
- obstructs an investigation conducted or authorized by the Superintendent
- wilfully breaches or attempts to breach any term or condition of a temporary absence

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