OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE

Examination of the Adjudicative Guidelines

Appendix B Part 4
Adjudicative Guidelines Literature Review: the "Criminal Behavior" Cluster

LEADING INTELLIGENCE INTEGRATION

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EXECUTIVE SUMMARY

Purpose

A review of current social science research was undertaken to provide evidence about the meaning and effectiveness of the Adjudicative Guidelines for making security clearance decisions. This White Paper reviews that evidence for three Guidelines, D. (Criminal) Sexual Behavior, J. Criminal Conduct, and M. Use of Information Technology Systems. These three Guidelines focus on different types of evidence of criminal and counter-normative behavior that may manifest personal attributes predictive of future security violation behavior.

Approach

The literature review covered a wide range of social science literatures including counterproductive work behavior, workplace safety behavior, white collar crime, and studies of espionage cases. Given the almost complete lack of research on national security behavior itself, the primary strategy of this review was to review research in other work behavior domains similar to security behavior to draw inferences about the Guidelines as measures of antecedents of security behavior.

Key Findings

- ♦ Evidence across a range of types of workplace behavior shows that past criminal behavior is a predictor of future counter-normative behavior. There is no direct experimental evidence, however, showing the magnitude of this effect on security violation behavior.
- ♦ Considerable evidence shows that criminal behavior is a function of, among other things, a core set of psychological attributes, the most important of which appear to be Self-Control, Excitement-Seeking, Neuroticism, Conscientiousness and Agreeableness.
- ♦ Evidence suggests that people high in Neuroticism (especially Aggressive Hostility), low in Self-Control, and low in Conscientiousness and Agreeableness are most likely to engage in criminal behavior and analogs to security violation behaviors such as counterproductive work behavior.
- ♦ Considerable recidivism data about criminal behavior has been gathered indicating that demographics and lifestyle of the offender, associations with others, and characteristics of the offenses influence the likelihood that offenders will repeat. For example, recency of last offense and number of previous offenses both predict future offenses. But these influences are complex and interactive.
- ♦ Generally, adjudicators are trained to decrease the weight placed on criminal history to the extent there is companion evidence indicating decrease likelihood of repeat offenses. The apparent underlying assumption is that those less likely to reoffend are also less

likely to commit future security violations. No direct evidence was found that evaluated this assumption.

THE CRIMINAL BEHAVIOR CLUSTER

D. Sexual Behavior (Criminal)
J. Criminal Conduct
M. Use of Information Technology Systems

Introduction

This paper evaluates the social science research literature relevant to the effectiveness of the three Adjudicative Guidelines focusing on criminal behavior. This evaluation describes the extent to which research evidence provides rationales supporting or questioning the current meaning and use of these Guidelines. In addition, potential modifications and alternatives are described where the research evidence points to such adjustments.

For the purposes of this White Paper, Guidelines D, J and M are clustered into a group described as criminal behavior. Two acknowledgements are important. First, we recognize that only a portion of the evidence associated with Guideline D, Sexual Behavior, represents criminal behavior. Guideline D also includes non-criminal behavior that is of interest in the adjudication process because it may reflect disordered thinking or unreliable, poor judgment, even if not criminal. This White paper only considers social science evidence relating to that portion of Guideline D behavior that is criminal. Second, Guideline M, Use of IT Systems, includes a wide range of counter-normative behavior relating to the misuse of IT systems in a wide range of settings. This range of IT behavior includes criminal behavior as well as non-criminal behavior that may "only" be unauthorized or represent violations of organizational policies or rules. The full range of behaviors captured by Guideline M is covered by this White Paper.

The social science evidence evaluated here focuses on understanding, explaining and predicting individual human behavior relating to US national interests and, more specifically, the protection of classified information. The purpose of this project is to evaluate social science evidence about the meaning and use of the Guidelines. That is, are the Guidelines effective tools for minimizing security violations and maximizing pro-security behavior? The questions being answered by this project are (a) "Does social science evidence support the current meaning and use of the Adjudicative Guidelines?" and (b) "What changes does the evidence suggest to improve the meaning and use of the Guidelines?"

This project is not intended to evaluate support for the Guidelines based on policy considerations. This is a moderately important point for the criminal behavior Guidelines because policy arguments alone may provide strong support for some of the risk conditions captured by these three Guidelines. For example, evidence that an individual has committed certain types of crimes might, itself, be a sufficient basis for disqualification. The policy-based justification of such a Guideline condition may have no need for social science evidence about the predictive value of previous criminal behavior for future security violations. Nevertheless,

this White Paper will take note where apparent rationales for the Guidelines are grounded in policy considerations and where social science evidence is also relevant.

The Criminal Behavior Guidelines

The three Guidelines clustered in this white paper are referred to as the criminal behavior cluster for the purposes of this project. This label stems from the commonality among these three Guidelines that all address evidence about individuals' history of criminal behavior, or criminal-like behavior, for example unauthorized uses of an organization's IT systems. Social science evidence is directly relevant to the weight given to such evidence of criminal behavior because the personal history evidence covered by these Guidelines is not typically a direct manifestation action against US national interests. Rather, this personal history evidence is better viewed as providing signs of underlying beliefs, motives, attitudes, dispositions and temperaments that may be predictive of future security violation behavior if the individual is granted or retains a clearance for access to protected information. Relevant social science evidence provides the best information about the prediction value such evidence has for future security risk.

In an effort to capture the extent to which social science evidence is relevant to each of these criminal behavior Guidelines, a table is presented below for each Guideline. Each table lists the conditions (evidence) within that Guideline that could raise security concerns as described in the Adjudicative Guidelines for Determining Eligibility for Access to Classified Information (Adjudicative Guidelines, 2005). For each condition, the table also indicates whether the presumed supporting rationale for that condition rests primarily on social science evidence or primarily on an apparent underlying policy position or both. The judgment about the supporting rationale was made by the authors based on a review of the social science evidence and the nature of the condition. These judgments were not made by national security clearance officials / experts.

In each of these tables, a policy-based supporting rationale is judged to be important where the personal history events constitute a criminal or unauthorized act demonstrating a history of behavior that violates the individual's legal/contractual/moral responsibilities toward the US or employers or other organizations. Policy alone may be sufficient to establish that clearances should not be granted especially where the action is comparable in intent and severity to security violation behavior. Such policy rationales may be based on the principle that a history of such criminal/unauthorized action constitutes an unacceptable risk due to the evident violation of trust. Policy rationales may also be based on other principles having to do with the US government's responsibility to provide a safe, non-threatening workplace. Admittedly, this latter principle relates more closely to employment decisions; but it may also carry some weight in security clearance decisions.

In contrast, many conditions imply risk for security violation behavior on the assumption that the psychological and/or situational factors that gave rise to the condition will also increase the likelihood of security violations. The weight given to such conditions should depend to a great extent on the social science evidence supporting the assumed relationships between psychological and situations factors and security violation behavior. These science-dependent conditions associated with Guidelines D, J and M are the primary focus of this White Paper.

It should also be noted that policy and evidence-based rationales are not mutually exclusive. The weight given to some conditions may be influenced by both the policy rationale as well as the social science evidence rationale.

Table 1 shows that all the potentially disqualifying risk conditions associated with Guideline D, Sexual Behavior. The table shows the authors' judgment about the relevance of evidence-based and policy-based rationales in support of the use of each condition. However, for Guideline D only Condition (a) refers to criminal behavior. Conditions (b) – (d) refer to non-criminal sexual behavior and are not within the scope of this White Paper. Condition (a) is quite broad, encompassing all sexual behavior of a criminal nature, regardless of prosecution. Clearly, the US government, like private sector employers, has a strong policy interest in excluding many types of sex criminals from its workplace in the interest of safe, non-threatening work environments. However, the rationale for Condition (a) may also depend on social science evidence. The risk associated with criminal sexual behavior would increase to the extent evidence showed that sex criminals have the same dispositions of impulsivity and lack of self control that are associated with security violators.

Table 1. Supporting Rationales for Guideline D. Sexual Behavior (Criminal)

Condition triggering security concern	Important Supporting Rationale	
	Evidence-based	Policy-based
(a) Sexual behavior of a criminal nature, whether or not the individual has been prosecuted	X	X
(b) A pattern of compulsive, self-destructive, or high risk sexual behavior that the person is unable to stop or that may be symptomatic of a personality disorder	NA	NA
(c) Sexual behavior that causes an individual to be vulnerable to coercion, exploitation, or duress	NA	NA
(d) Sexual behavior of a public nature and/or that reflects lack of discretion or judgment	NA	NA

Table 2 shows that 4 of the 5 conditions of concern for Guideline J, Criminal Conduct, depend on assumed psychological/situational factors that require social science evidence to be confirmed. For example, Condition (e) refers to parole or probation violations. Evidence showing that parole violators are more likely to be repeat offenders increases the assessment of risk associated with the individual criminal history. Certainly, evidence showing that security violators have disproportionate histories of parole violation would provide even more direct evidence of increased risk. An underlying assumption of the adjudicative guidelines process is that the degree to which such indicators predict future security violations depends, at least in part, on personal attributes and situational factors underlying the personal history evidence produced by the investigations. Social science evidence is necessary to identify the critical personal and situational factors that are likely to be antecedents of security violation behavior.

Table 2. Important Supporting Rationales for Guideline J, Criminal Conduct

Condition triggering security concern	Important Supporting Rationale	
	Evidence-based	Policy-based
(a) a single serious crime or multiple lesser offenses	X	X
(b) discharge or dismissal from the Armed Forces under dishonorable conditions	--	X
(c) allegation or admission of criminal conduct, regardless of whether the person was formally charged, formally prosecuted or convicted	X	--
(d) individual is currently on parole or probation	X	X
(e) violation of parole or probation, or failure to complete a court-mandated rehabilitation program	X	X

Table 3 shows that 6 of the 8 distinct conditions for Guideline M, Use of IT Systems, have an assumed rationale based, at least in part, on social science evidence.

Table 3. Important Supporting Rationales for Guideline M. Use of Information Technology Systems

Condition triggering security concern	Important Supporting Rationale	
	Evidence-base	Policy-based
(a) illegal or unauthorized entry into any IT system or component thereof	X	X
(b) illegal or unauthorized modification, destruction, manipulation or denial of access to information, software, firmware, or hardware in an IT system	X	X
(c) use of any IT system to gain unauthorized access to another system …within the same system	X	--
(d) downloading, storing, or transmitting classified information on or to any unauthorized software, hardware, or IT system	--	X
(e) unauthorized use of a government or other IT system	X	X
(f) introduction, removal, or duplication of hardware, firmware, software, or media to or from any IT system without authorization, when prohibited by rules, procedures, guidelines or regulations	X	X
(g) negligence or lax security habits in handling IT that persist despite counseling by management	X	--
(h) any misuse of IT, whether deliberate or negligent, that results in damage to the national security	--	X

All eight conditions share the common features that they reflect a violation of trust in some fashion and that this violation involves the misuse of protected information. Two of these conditions, (d) and (h), are specific to classified information or information that damages national security. In effect, these conditions are themselves US-related security violations. Clearly, a personal history of the very security violations clearances are intended to minimize could, by policy, be treated as a disqualifier. The remaining six conditions represent information-based violations of trust but not in the context of US security. The weight attached

to these six conditions should depend to some extent on the evidence that such IT behaviors reflect personal attributes associated with security violations.

The Approach Used in This Literature Review

As noted above, the overall purpose of this literature review is to describe and evaluate the extent to which the social science literature supports the current meaning and use of the criminal behavior Guidelines. The approach taken to accomplish this purpose is defined by six features.

1. All Three Guidelines as a Group

Except for the reviews of scarce Levels 1 and 2 evidence, the literature review is integrated across all three Guidelines as a group. Because each Guideline describes a specific category of behavior representing some form of criminality or unauthorized behavior, much of the relevant Level 3 social science literature has similar implications for all three Guidelines. As a result, a more coherent summary can be provided by focusing on all three Guidelines collectively rather than independently reviewing literatures for each Guideline separately.

2. Prediction Perspective

This literature review adopts the prediction perspective of social science. A Guideline is viewed as related to security behavior to the extent there is evidence that the behaviors targeted by a Guideline predict future security behavior. This prediction perspective underlies the large majority of behavioral, social science research investigating relationships between psychological attributes and outcomes. Evidence of prediction is the primary type of evidence used to infer or conclude that a particular psychological attribute leads to or causes a subsequent outcome. However, evidence of prediction does not require empirical evidence. Prediction may be demonstrated by both empirical data as well as compelling, plausible conceptual arguments. Since there is virtually no direct empirical evidence about the predictive relationship between these Guidelines and subsequent security behavior, this review will focus primarily on indirect evidence of prediction that is sometimes empirical and sometimes conceptual or theoretical.

3. Scope of Security Behavior

As with all the White Papers produced in this project, a critical consideration is the scope of security behavior to be targeted by the literature search and review. The guidance surrounding the use of the criminal behavior Guidelines clearly identifies two forms of security behavior the criminal behavior Guidelines are intended to impact. First, as with all 13 Adjudicative Guidelines, the criminal behavior Guidelines are designed to identify individuals who pose too great a risk for security violations if given responsibility for classified information or technology. The criminal behavior Guidelines should operate to "select out" individuals who are too risky. However, the criminal behavior Guidelines, like all other Guidelines, also are applied with the intention of awarding clearances to people who are reliable, trustworthy and having good judgment.

Negative Security Behavior Only

In general, the guidance surrounding the meaning and use of these Guidelines (Adjudicative Guidelines, 2005) appears to view these two forms of security behavior – (a) security violations and (b) reliability, trustworthiness and good judgment – as opposite ends of the same continuum of security-related behavior. This view implies that by disqualifying those who are too risky, the remainder who are awarded clearances will be reliable, trustworthy and of good judgment. The assumption underlying this perspective is that the same psychological and situational factors explain behavior at both ends of this continuum. For example, if lack of self-control contributes to security violations, then self-control contributes reliability, trustworthiness and good judgment. Or, more specifically, if criminal sexual behavior is a risk factor for security violations then the absence of criminal sexual behavior is an indicator of reliability, trustworthiness and good judgment. But substantial research in workplace behavior (e.g., Miles, et al, 2002; Dalal, 2005) shows that positive and negative workplace behaviors are not likely to be opposite ends of the same continuum. While some of the same psychological and situational factors drive both behaviors, other factors differ between the two types of behavior. This evidence indicates that one cannot assume the absence of extreme negative workplace behavior implies the presence of strongly positive behavior.

The general point that the absence of negative evidence does not predict positive outcomes is perhaps especially true for criminal behavior, which represents a relatively extreme form of negative behavior, particularly in an organizational context. The absence of such extreme negative behavior is not likely to be a reliable indicator of strongly positive behavior. In the context of national security, the absence of prior criminal behavior cannot be assumed to be a predictor of strongly positive future security behavior. Perhaps for this reason, the social science literature that addresses the relationships between past criminal behavior and future behavior virtually always focuses on negative future behaviors. As a result, in the domain of criminal behavior, we have found virtually no research on criminal behavior that addresses its relationship to future positive security behavior. For this practical reason, this White Paper addresses research only about negative forms of security behavior and analogs to security violations.

Analogs to Security Behavior

Little social science research addresses national security behavior directly. But significantly more research investigates other workplace behaviors that are similar to security behavior in certain important ways. This White Paper reports social science research about workplace behaviors that are analogous to security behaviors so that insights about security behavior may be gained from these "neighboring" domains of work behavior.

All four White Papers in this project report evidence about work behaviors that are analogs to security behavior. For the purposes of these White Papers, a domain of work behavior is regarded as an analog to security behavior if it is: (a) in an organization context; (b) counter-normative in its negative form; (c) intentional (voluntary); and (d) directed toward a person or

entity for harm or for good. It should be noted that, for this project, "betrayal of trust" is not a necessary feature of an analog to security behavior. There is one primary reason for this. As a practical matter, relatively few other work behaviors share a "public trust" obligation similar to that of national security behavior. Perhaps only public service, public safety and some categories of health care work share a "public trust" obligation similar to that of national security behavior where the public's national safety may be at stake.

Research about analogs to security behavior is reviewed below in the sections reporting Level 2 and Level 3 Evidence. Two analogs manifest themselves in Level 2 evidence, counterproductive work behavior and Insider Threat behavior. Three analogs were located for Level 3 evidence, counterproductive work behavior, white collar crime and workplace safety behavior. Evidence about workplace safety behavior is reported even though it fails two of the analog requirements. Unsafe work behavior often is not intentionally unsafe and it is typically not directed at an individual or organization. Nevertheless, it is included here because research on the antecedents of unsafe work behavior contributes to a broad conclusion that "deviance proneness" is a general syndrome that is predictive of a wide range of counter-normative behavior and it likely to be a predictive antecedent of many forms of security violation behavior.

4. Three Levels of Evidence

As with the other White Papers produced in this project, this review and evaluation of social science research related to the criminal behavior Guidelines will review three levels of evidence. These three levels of evidence are described in detail in the Foundations paper that accompanies the four White Papers in this project.

Level 1 Evidence

Level 1 evidence addresses direct relationships between Guidelines-based behaviors such as criminal conduct and the security-related behavior targeted by the Guidelines. For example, Thompson (2003) compared caught spies to non-spies on past criminal record. Although this is not a true experiment, it does evaluate the extent to which spies differed from non-spies on Guidelines-based behaviors. Very little Level 1 evidence is available for the criminal behavior Guidelines. The primary Level 1 source is Thompson (2003).

Level 2 Evidence

Level 2 evidence addresses relationships between Guidelines-based criminal behavior and outcome behaviors that are not themselves security behaviors but are workplace behaviors analogous to security behaviors in important ways. While Level 2 evidence does not provide direct evidence about security behavior, it does have implications for security behavior to the extent that the analog behavior has important features in common with security behavior. Two forms of analog behavior, counterproductive work behavior and insider threat behavior have

been linked to past criminal behavior. Somewhat more Level 2 evidence is available than Level 1 evidence.

Level 3 Evidence

Level 3 evidence addresses relationships between psychological factors that underlie Guidelines-based criminal behaviors and outcome behaviors that are analogs to security behavior. For example, evidence showing that lack of self-control (a psychological antecedent of criminal sexual behavior) is associated with workplace theft (an analog to security violation behavior) is Level 3 evidence. Two analogs, counterproductive behavior and white collar crime have been investigated in Level 3 evidence and one quasi-analog, workplace safety behavior, is also reported because of the insight about the likely role of "deviance proneness" in the prediction of security violation behavior. Considerably more Level 3 evidence is available than either Level 1 or 2 evidence.

In spite of the apparent distinctiveness between the three levels of evidence, not all studies clearly belong to one category or another or, for that matter, any of the three categories. For example, if white collar crime is regarded solely as a Criminal Conduct behavior, then studies investigating antecedents to white collar crime would not satisfy the definition of any of Level 1, 2 or 3 evidence. However, by regarding white collar crime as an analog to security violation behavior, studies of its antecedents may be considered Level 2 or Level 3 evidence depending on the nature of the antecedents in the study. For the purposes of this White Paper, white collar crime is considered to be an analog to security violation behavior.

5. Mitigator Evidence

Following the Level 1, 2 and 3 evidence sections a significant amount of evidence is reported related to potential mitigators of criminal history. A long tradition of large-scale research on criminal behavior itself provides a source of considerable information about factors that may mitigate for or against the weight adjudicators should give to evidence of criminal history. Far more evidence about potential mitigators is available for this Criminal Behavior cluster of Guidelines than for any of the other Guidelines clusters. Indeed the sheer volume of evidence allows detailed analyses of interacting factors which, in turn, increases the difficulty with which clear, unambiguous conclusions can be drawn about possible mitigators of individual factors such as age of first offense.

6. Effect Size Measures

Where possible and meaningful, this White paper reports statistical estimates of the size of important effects relating to the magnitude of an antecedent's effect on a security violation behavior or an analog of the same. Unfortunately, empirical studies can vary considerably in the statistics used to describe the size of an effect. Such statistics may include effect size measures

such as frequencies, percentages, mean differences, correlation coefficients, d-values, and several others. Also, many studies provide very little information about effect size at all.

This can become a burden in any review of the literature, especially to the person unfamiliar with a variety of statistical techniques. To reduce reader burden and facilitate understanding, the results of individual studies were translated, wherever possible, into a common statistic—Pearson's r—using the formulas provided by Rosenthal and Rosnow (1991). Pearson's r provides a measure of the strength and direction of a relationship between two variables. It can range from -1.00 to 1.00. A negative Pearson r value indicates that an increase in one variable is associated with a decrease in another, while a positive Pearson r value indicates that an increase in one variable is associated with an increase in the other. It is important to remember that a significant relationship between two variables does not mean that one variable causes change in another. Association can be an important precondition of causality but such inferences must be made cautiously, tempered by the reasonable, alternative explanations for the relationship.

In addition to the direction of a relationship between two variables, Pearson's r provides an indication of the strength of the relationship (i.e., how much a variable varies along with changes in another variable). The relationship between two variables gets stronger as it approaches the *absolute* value of 1.00. A value of -1.00 is indicative of a perfect negative relationship, while a value of +1.00 indicates a perfect positive relationship. In either case, as a Pearson r gets closer to 0, the relationship gets weaker. For the social sciences, Cohen (1992) proposed *absolute* Pearson r values of .10-.23, .24-.36, and .37 or larger as "weak," "moderate" and "strong" relationships, respectively.

This White paper on Criminal Behavior Guidelines identified a substantial number of meta-analytic studies which routinely reported results not only for Pearson's r values but also for confidence intervals (CI) around those r values. Confidence intervals provide evidence about the precision of each coefficient. The 95% CI is a range of values which has a 95% probability of including the true population coefficient. The 95% CI draws attention to the fact that the Pearson r of any given study is a sample-based estimate of the size and direction of the relationship between two variables in the larger population. It also draws attention to the relationship between precision and sample size, with Pearson r's based on larger samples being more precise than those based on smaller samples. The precision of an estimate is reflected in the range of CI values, with narrower ranges reflecting more precise estimates. Pearson r's based larger samples have narrower CI than those based on smaller samples. Because this White Pare reviewed a substantial number of meta-analytic studies, confidence intervals are reported here for those studies that reported them and for similar studies where confidence intervals could be estimated from other statistical information reported in the study.

This White Paper about criminal behavior has the advantage that many meta-analysis studies have been completed about criminal behavior, its antecedents and its consequences. The advantage for this White paper is that virtually all meta-analyses in this research domain rely on the Pearson's r as the measure of effect size that is aggregated across studies. Meta-analysis is a

statistical procedure that involves compiling and statistically aggregating the results of several individual studies. Meta-analyses can provide more precise estimates of the relationship between variables than individual studies by accounting for and reducing methodological factors (e.g., sample characteristics, study design, measurement reliability) that introduce error and imprecision in individual studies. For each meta-analysis presented, several statistics are provided. These include ρ (rho), k, N, and the 95% confidence interval. ρ (rho) is the sample-weighted mean effect size. As with Pearson's r, ρ (rho) describes the direction and strength of the relationship between two variables. It is calculated by weighting the results of several empirical studies according to sample size and averaging them. ρ (rho) is also adjusted for the measurement error (i.e., the unreliability in variable measurement that reduces observed relationships). k refers to the number of studies used to calculate ρ (rho), and N is the aggregate sample size. As with the Pearson r, the 95% confidence interval of ρ (rho) is also presented to reflect its precision.

Some studies do not provide sufficient information to provide any effect size measure. This is relatively uncommon in this White paper but is considerably more common in the White paper on Financial Considerations and the White paper on Psychosocial Considerations. The effect sizes reported in the vast majority of studies reviewed in this White Paper can be expressed as Pearson's r. A smaller number can only be expressed as mean differences, frequencies, percentages, odds ratios, or in some other form.

Setting the Stage: Incidents of Criminal Behavior Issues in SSBI Investigations

Castelda (2009) and the Foundations Paper (2009) submitted as a precursor to these White Papers presented and analyzed issues identified in two samples of Single Scope Background Investigations (SSBI) that were open in 2008. The larger Sample A (N = 4,247) included issues sourced from electronic data providers but not self-report issues from polygraph exams. Conversely, Sample B (N = 1,437) included issues sourced from self-report polygraph exams but not from electronic data providers. Both samples included issues derived from interview sources and the usual range of background records such as police and employment records.

Two main points are summarized here about SSBI issues associated with the criminal behavior Guidelines. The first point is that Guideline J produces dramatically more investigative issues than do either Guideline D or Guideline M. In Sample A, Guideline J yielded 707 issues (fourth among all Guidelines) whereas Guidelines D and M yielded 16 and 19 issues, respectively. Only Guidelines A and L yielded fewer issues at 1 each. A similar patter was observed in Sample 2. Guideline J yielded 549 issues (more than any other Guideline) and Guidelines D and M yielded 33 and 8 issues, respectively, which were among the least frequent Guidelines. The second point is that less than 2% of the individuals with at least one issue among these three Guidelines produced issues in more than one of these three Guidelines. In effect, these Guidelines yielded issues that were virtually mutually exclusive of one another.

The net result of this pattern of SSBI issues among the three criminal behavior Guidelines is that, as a practical matter, this White Paper has its implications for the adjudicative process via the high volume Guideline J, Criminal Conduct. Conclusions from this White Paper about criminal sexual behavior or about IT misuse will impact only a very small percentage of clearance decisions.

LEVEL 1 EVIDENCE

A review of the literature found virtually no empirical studies that investigated whether criminal behavior (sexual or non-sexual) or the misuse of information technology is predictive of later security violation behavior. The sole exception was the doctoral dissertation of Thompson (2003) who provided evidence suggesting that past criminal conduct is associated with espionage. Thompson (2003) compared forty admitted spies with forty nonspies on five factors outlined by the Director of Central Intelligence Directive 6/4--criminal history, illicit drug use, alcohol abuse, financial issues, and emotional issues. Information on spies was taken from Project Slammer, an intelligence community research project involving structured interviews with 40 known spies. The non-spy information was collected from members of the intelligence community presumed to be non-spies. Analyses of the data indicated that there was a positive relationship between criminal behavior and espionage. Thompson found that 35% (14/40) of admitted spies had a pre-espionage arrest history compared to 5% (2/40) of the non-spies, indicating that spies were seven times more likely to have an arrest history than non-spies ($r = .38$, $p < .001$; 95% CI $= .18$ to $.56$).

Thompson's (2003) quasi-experimental study provided evidence suggesting that those with a criminal history are more likely to engage in espionage—arguably the most serious form of security violation behavior. However, the sample used in this study was relatively small, so the estimate for this relationship is not particularly precise. The 95% confidence interval indicates that this relationship could be small to moderately large. While informative, Thompson's study has two major limitations. First, he measured the criminal history of non-spies by simply asking them to indicate whether or not they had committed an offense in the past for which they could have been arrests (i.e., "Yes" or "No"). This provides for a very limited understanding of the relationship between espionage and past criminal behavior. If, and the extent to which, this relationship varies according to different characteristics of the offense, such as seriousness (felony vs. misdemeanor) and type, is unclear. This relationship may be stronger for some offenses than others. Secondly, this study does not provide evidence for the relationship between criminal conduct and more minor security violation infractions. These results make it impossible to determine if the relationship between criminal conduct is constant or varied across the range of security violation behavior.

LEVEL 2 EVIDENCE

As with Level 1, a review of the literature indicated that there were very few studies providing evidence that criminal conduct or the misuse of information technology were associated with, or predictive of, security violation behavior. Of the studies that were available, the majority provided evidence for a link between criminal conduct and analogs of security violation behavior. Only one study was identified that provided evidence for IT misuse as a predictor of analogs of security violation behavior.

Criminal Conduct and Counterproductive Work Behavior

Two studies have provided evidence for a relationship between criminal conduct and CWB. Sarchione, Cuttler, Muchinsky, and Nelson-Gray (1998) examined the predictability of dysfunctional job behaviors using a personality inventory and three life history scales. Among the life history scales was an index of past criminal behaviors. This index consisted of several criminal behaviors which were sorted and weighted by subject matter experts for offense severity, It is presented in Table 4. The authors used this index to discriminate between two groups of police officers from 13 law enforcement agencies. The first group (N = 109) included officers that had been disciplined for a variety of behaviors including substance abuse, insubordination, theft, fraud, and sexual misconduct, use of excessive force, and responsibility violations. The second group (N = 109) included officers that had never been disciplined for such behavior. The groups were matched on age, gender, and ethnicity. Comparing these groups indicated that the disciplined group of officers reported greater involvement in criminal activity in the past than the undisciplined group (r = .24, p < .01; 95% CI = .11 to .37). The 95% confidence interval suggests that the relationship between criminal history and CWB is small to moderate in magnitude.

Table 4. Sarchione et al.'s (1998) Offense Severity Index

Expert Weighting	Criminal Behavior
4 (Most Severe)	DUI conviction in past 2 years More than 1 DUI arrest in past two years More than 1 DUI arrest in past 5 years More than 1 domestic-related arrest in past 2 years One domestic-related arrest in past 12 months
3	Any domestic-related arrest Any DUI conviction Any domestic-related conviction
2	Significant juvenile arrest record for anyone who is under 25 years of age (focus on larceny, drugs, or assault) More than 1 nontraffic-related arrest More than 3 moving violations
1 (Least Severe)	More than 3 automobile accidents Nontraffic-related arrest

Roberts, Harms, Caspi, and Moffit (2007) tested a series of hypotheses proposing that childhood and adolescent factors are predictive of counterproductive workplace behavior in young adulthood. To test these hypotheses, the authors analyzed the data of 930 participants from the Dunedin study—a longitudinal investigation of the health and behavior of a cohort born between 1972 and 1973 in Dunedin, New Zealand. This information was collected on this cohort up to the age of 26. To measure CWB, the participants were interviewed at age 26 and asked 11 questions pertaining to their work behavior. Criminal behavior was measured by collecting official conviction data for each participant up to the age of 18. Zero-order correlations indicated that past criminal behavior was unrelated to CWB ($r = -.01$, 95% CI = -.05 to .07). However, when the scale was broken down (See Table 5), convictions were negatively related to several counterproductive behaviors, including using things at work without permission ($r = -.08$, $p < .05$, 95% CI = -.14 to -.02), stealing things from work ($r = -.07$, 95% CI = -.13 to -.01), and being under the influence of alcohol or drugs at work ($r = -.08$, 95% CI = -.14 to -.02). This suggests that the more convictions a person had up to age 18, the less likely they were to engage in these counterproductive behaviors at age 26.

Roberts et al.'s (2007) findings are clearly at odds with those of Sarchione et al. (1998). This could be explained by a number of factors, such as differences in the measurement of criminal behavior. Robert's et al. relied on a measure of convictions for various offenses up to age 18, while Sarchione et al. (1998) included both arrests and convictions at different time periods, such as 12 months prior, 2 years prior, and adolescence.

Table 5. Roberts et al.'s (2007) Counterproductive Work Behavior and Correlations with Adolescent Convictions

Counterproductive Work Behaviors	Correlation with Adolescent Convictions
How many times in the past year . . .	
1…..have you been late to work?	-.02
2…..have you pretended you were sick or injured, or gave another false excuse so you could get time off work?	.01
3…..have you used things at work without permission (like using the telephone, Xerox machine, computer, tools or a company car without permission)?	-.08*
4…..have you had a conflict with your boss or supervisor (like refusing to carry out an assignment, told them a lie, or some other trouble with the boss)?	.01
5…..have you lost your temper, had a fight, or got into an argument with someone at work?	.06
6…..have you done your job in a way that could cause you to lose it (like taking shortcuts, missing deadlines, breaking safety rules)?	.06
7…..did you steal money from the place where you worked?	-.04
8…..have you reported working hours or days (so that you could get paid) that you really did not work?	.01
9…..did you steal things from work, such as office supplies, tools, or merchandise?	-.07*
10…did you purposely damage or destroy property, equipment, tools or merchandise where you work?	-.01
11…have you been under the influence of alcohol or drugs while you were at work?	-.08*
Total CWBs	-.01

* $p < .05$

Criminal Conduct and Insider Threat

In 2002, Carnegie Mellon's Software Engineering Institute CERT program and the United States Secret Service's National Threat Assessment Center started a joint project—The Insider Threat Study (ITS). To date, the ITS has resulted in a series of reports intending to provide a clearer picture of the psychological and technical factors surrounding incidents where insiders—current or former employees or contractors—intentionally exceed or misuse an authorized level of network, system, or data access in a manner that affects the security of an organization's data, systems, or daily business operations. These reports have included case analysis of over 150 insider incidents occurring between 1996 and 2002. Several of these reports have suggested that that malicious insiders have a criminal history. In one of ITS's first reports, Randazzo, Keeney, Kowalski, Capelli, and Moore (2004) analyzed 23 insider incidents carried out in the Banking and Finance Sector. Analysis showed that twenty seven percent (27%) of these malicious insiders had a prior arrest. Unlike Randazzo et al. 2004, who focused on a particular industry, Keeney, Kowalski, Capelli, Moore, Shimeall, and Rogers (2005) focused on cases where a trusted insider intentionally sabotaged company systems, networks, or data across several industries. Their analyses indicated that in just under a third (31%) of the cases, the insider had a prior criminal arrest. These arrests included those for violent offenses (18%), alcohol or drug-related offenses (11%) and nonfinancial/fraud-related offenses. Kowalski, Cappelli, and Moore (2008) analyzed 52 cases of insider sabotage and theft in the Information Technology and Telecommunications Sector. In this analysis, 38% of the insiders had a history of arrest. These offenses included larceny and aggravated assault (39%), financial/fraud-related offenses (33%), and alcohol or drug-related offenses (28%). In addition, over half (56%) of insiders with an arrest history had multiple prior arrests or convictions. Kowalski, Conway, Keverline, Williams, Cappelli, Wilke, and Moore (2008) focused on 36 insider events occurring in the Government sector. The authors found that just under one-third (31%) of malicious insiders had prior arrest histories for financial/fraud-related offenses (14%), non-financial/fraud-related theft offenses (6%), alcohol or other drug-related offenses (3%), violent offenses (3%), and other offenses (3%).

Insider threat research indicates that somewhere between 27-38% of malicious insiders have criminal histories. Because malicious insider activity, such as theft of company property and acts of sabotage, closely resemble severe forms of security violation behavior, this research provides some support for the notion that individuals with a criminal past are more likely to engage in security violation behavior. However, unlike Thompson (2003), these studies do not include an appropriate comparison group against which to gauge the significance and strength of this relationship.

Misuse of Information Technology and Insider Threat

The available literature contained virtually no studies with evidence for an association between the misuse of IT systems and analogs of security violation behavior. The lone exception was Randazzo et al. (2004) who provided evidence suggesting that those with a history of IT violations are more likely to engage in insider sabotage. In their analysis of 23 cases of insider sabotage in the Banking and Finance industries, the authors found that in 9% (2) of the cases, the insider had a known history of electronic abuses or violations. Furthermore, in 13% (3) of the cases, there was evidence that the insider showed an interest in, possessed materials on, or engaged in hacking.

LEVEL 3 EVIDENCE

Because of the scarcity of Level 1 and Level 2 evidence, a literature review was conducted on personality traits underlying the behaviors encompassed by the Criminal Behavior Guidelines and analogs of security violations. Personality traits refer to characteristic ways of thinking, feeling, and behaving that account for consistency between past and future behavior (Costa & McCrae, 1995). The rationale for presenting this line of evidence was that shared personality traits provide indirect evidence for the predictability of security violation behavior from the behaviors encompassed by the Criminal Behavior Guidelines. If, for example, criminal behavior and counterproductive work behavior share a common underlying personality trait, then there is some basis for inferring that past criminal conduct is predictive of counterproductive work behavior. Compared to Levels 1 and 2, this is a weaker form of evidence, requiring more inferences and assumptions. Despite the relative weaknesses of this line of evidence, it provides some basis for the inference that the behaviors encompassed by the Criminal Behavior Guidelines are predictive of security violation behavior.

A review of the available research resulted in the identification of several personality traits associated with both criminal conduct and analogs of security violation behavior. However, there is relatively little research on personality traits associated with IT misuse. Much of the IT misuse research has focused on its prevention through computer security awareness training and deterrents, such as the implementation of sanctions (Lee & Lee, 2002; Lee, Yoon, & Kim, 2008). This research has included psychological variables, such as internet addiction, but these do not appear in the analog research, making it impossible to indirectly link IT misuse and security violation behavior. Based on this assessment of the literature, it was decided that the Level 3 section would deal with criminal behavior alone. Before proceeding into a review of this literature, however, an overview of personality traits is provided.

Personality Traits: An Overview

Personality traits have at least three important characteristics. First, they are continuous. Personality psychologists conceive of people as situated along a given trait in a relatively normal distribution, with a bulk of people falling toward the center and fewer lying at the extremes (McAdams, 2001). Traits are also bipolar. The poles of a trait continuum are marked by descriptors opposite in meaning. For example, the trait of sociability is characterized by adjectives such as outgoing or talkative on the high pole and reserved or shy on the low pole. As with other traits, most of the population falls toward the middle of this continuum, with very few people described as extremely outgoing or painfully shy.

A second important characteristic of personality traits is they describe, and are thought to explain or cause, stability in thoughts, feelings, and behavior. Personality researchers have found that individuals' personalities are remarkably stable over the course of their lives. This stability is due, at least in part, to the genetic basis of personality traits, which researchers have

estimated at around 40% (Dunn & Plomin, 1990). Heritability estimates do vary, however, with the trait under consideration. Estimates can range from 37% to 65% (Jang, Lively, & Vernon, 1996; Tellegen, Lykken, Bouchard, Wilcox, Segal, & Rich, 1988).

Though personality is consistent over the course of one's life, there is evidence for at least some change, with the greatest stability reached around age 30 (Costa & McCrae, 2006). For example, research has shown that people become more responsible and demonstrate higher levels of self-control as they get older (Helson & Moane, 1987). Such malleability is likely due to environmental influences which Dunn and Plomin (1990) estimate to be in the neighborhood of 40%. While a person's standing on a trait may change slightly over the course of his life, his ranking relative to others in his own age cohort is quite stable (McAdams, 2003). That is, a person high in responsibility will remain high relative to others in the cohort, even as the entire cohort population experiences change in this trait.

A third characteristic of traits is their structure or organization. Over the past few decades, personality researchers have sought to identify the most fundamental traits. This work shows that traits can be organized hierarchically, with the narrowest and most specific traits at the bottom of the hierarchy and the broadest and most general traits at the top (e.g., Costa & McCrae, 1992; Goldberg, 1990; Tellegen, 1985). To illustrate, the hierarchical organization of Extraversion is presented in Figure 1.
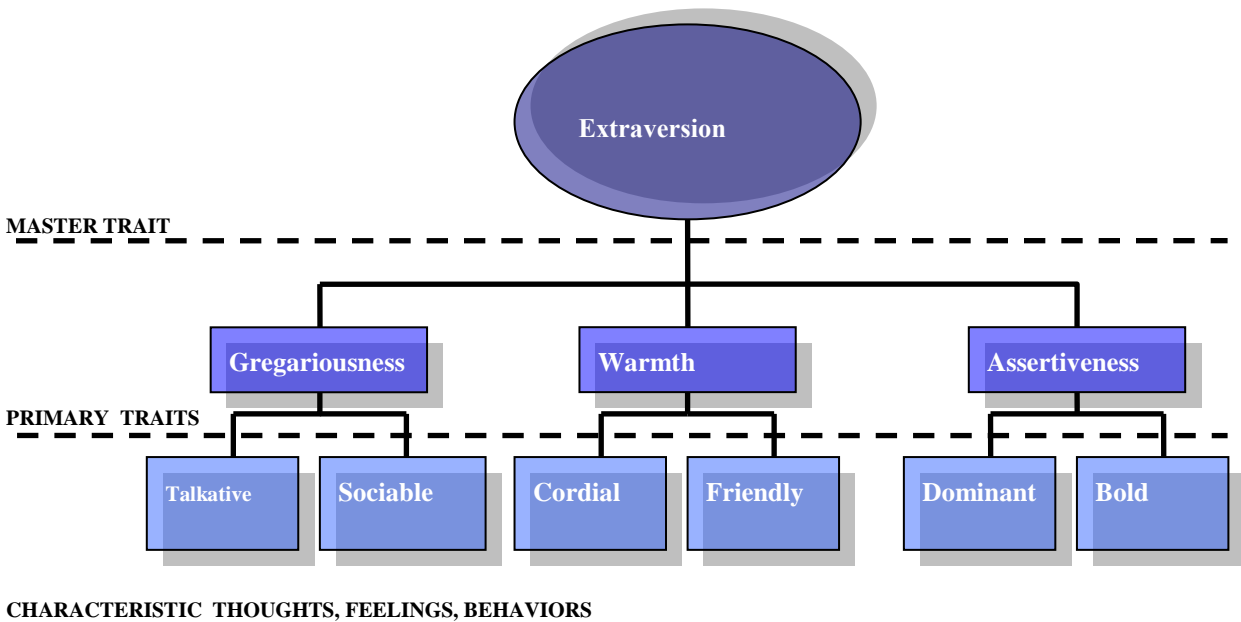

Figure 1. Structure of Personality Traits: The Example of Extraversion

At the bottom of this hierarchy are *Characteristic Thoughts, Feelings and Behaviors* such as talkative and dominant. Typically, characteristic thoughts, feelings, and behaviors are captured by items that a person uses to describe themselves or significant others. For example, a

person may be asked to respond to a survey item reading "I am happiest when I am alone" by indicating the extent to which it describes him or her. At the next level are *Primary Traits*. Primary Traits represent clusters of characteristic thoughts, feelings and behaviors. These clusters are based on underlying commonalities among characteristic thoughts, feelings, and behaviors. For example, a person describing himself as talkative is also likely to indicate that he prefers social interaction and that he does not like to be alone. At the next level are *Master Traits* which are clusters of primary traits. As with clusters of characteristic thoughts, feelings, and behaviors, these clusters are based on underlying commonalities. With Master Traits, however, these groupings are based on commonalities among primary traits. For example, a person that describes herself as high in the primary trait of Gregariousness is also likely to describe herself high in the primary traits of Warmth and Assertiveness.

While the hierarchical structure of personality has been replicated consistently across studies, the number and content of master and primary traits has been the subject of considerable debate. Some personality psychologists have found evidence for three master traits (e.g., Eysenck, 1967; Tellegen, 1985), while others have found evidence for five (Costa & McCrae, 1992). There has also been disagreement about the number of primary trait dimensions. Tellegen (1985) has found evidence for 10 primary trait dimensions, while Costa and McCrae (1992) have found evidence for 30. While there has been some controversy over the number and content of fundamental traits, empirical comparisons of alternative taxonomies have indicated that the differences are more apparent than real. Research indicates that major personality taxonomies overlap considerably, and differences are due primarily to measurement issues, such as differential emphasis on trait content or the blending of traits more clearly delineated in alternative taxonomies (Church, 1994; Costa & McCrae, 1995).

A review of the available literature indicates that there are five personality traits linked to both criminal behavior and one or more of the analogs of security violation behavior. The first trait—Self-Control—has its roots in the field of Criminology (Gottfredson & Hirschi, 1990). Self-Control has also appeared research involving analogs of security violation behavior. The remaining personality traits—Extraversion, Neuroticism, Conscientiousness, and Agree-ableness—have their roots in the field of Personality Psychology. These four traits belong to one of the most widely agreed-upon and empirically established personality taxonomies in the field—The Big Five (Costa & McCrae, 1992).[1] Each trait has also appeared in the field of Criminology, with several studies exploring their contributions to criminal and delinquent behavior.

In the following section, these traits are briefly described and evidence linking them to criminal behavior and analogs of security violation behavior is presented. Because each of these traits is a master trait, empirical evidence for associations between the primary traits subsumed

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[1] Openness to Experience is also a trait appearing in the Big Five. It is not included here, however, because research indicates that it's relationships with criminal behavior and analogs of security violations are trivial.

by them, criminal behavior, and analogs of security violation behavior is presented when it is available. This latter research provides a clearer picture of the character of individuals that engage in these types of behaviors and may ultimately inform the development and/or provision of better/additional indicators for risk assessment.

Personality Traits Associated with Criminal Conduct and Analogs of Security Violation Behavior

Self-Control

Self-control is a trait reflecting one's "ability to resist easy, immediate gratification" (Gottfredson & Hirschi, 1990). People with little self-control are described as impulsive, insensitive to others, easily frustrated, risk-taking, short-sighted, and self-centered. Table 6 describes a self-report measure of self-control developed by Grasmick, Tittle, Bursick, and Arneklev (1993). Grasmick et al.'s (1993) scale is one of the most widely used measures of Self-Control. Table 6 provides a description of the six primary traits subsumed by Self-Control and example items used to measure each trait.

Self-Control and Criminal Conduct

The General Theory of Crime posits that individual differences in Self-Control account for a majority of the variation in criminal and antisocial behavior (Gottfredson & Hirschi, 1990). Gottfredson and Hirschi drew on two consistent empirical observations in support their theory: (a) the generality of deviance and (b) the stability of criminal behavior. The generality of deviance refers to the positive relationships commonly found among different forms of crime and imprudent/risky behavior. In other words, people who engage in crimes tend to engage in a variety of different crimes as well as a variety of different forms of imprudent and risky behavior, such as excessive alcohol use, fighting, gambling, and sexual promiscuity (Paternoster & Brame, 1998, 1999; Tittle, Ward, & Grasmick, 2003). Gottfredson and Hirschi (1990) proposed that these behaviors co-occur because each provides for some form of immediate gratification. For example, a person might steal money because it will allow him or her to purchase something of value, drink because of the enjoyment of intoxication, and speed because of the rush of going 100 mph on the open road. In addition to the generality of deviance, Gottfredson and Hirschi noted the stability of criminal behavior—people who engage in crime at young ages also tend to do so throughout adolescence and adulthood. Gottfredson and Hirschi argued that the generality and stability of deviance is attributable to individual differences in Self-Control—the ability to resist immediate gratification. In other words, some people tend to engage in a variety of criminal and imprudent/risky behavior over the course of their lives because of a relative inability to resist the immediate gratification provided by these behaviors.

Over the past two decades, several studies have evaluated The General Theory of Crime. In general, the theory's major propositions have been supported. Empirical work has shown that Self-Control is positively related to various forms of criminal and imprudent, risky behavior.

While the individual studies provided support for the relationship between Self-Control and criminal and imprudent/risky behavior, differences in sampling, measurement, and research design made it difficult to obtain precise estimates of these relationships. Therefore, Pratt and Cullen (2000) conducted a meta-analysis of 21 studies on Self-Control. In total, the authors analyzed 126 correlations from a pooled sample of almost 50,000 participants. Their analyses

provided support for a positive relationship between Self-Control and both crime ($\rho = .24$, $k = 62$, $p < .05$) and analogous behavior ($\rho = .35$, $k = 20$, $p < .001$). In addition, the magnitude of these relationships did not vary by the demographic makeup of research samples. The relationship between Self-Control, crime, and imprudent/risky behavior was approximately equal in magnitude, whether the sample was male or female, racially homogenous or integrated, adult or juvenile. According to Pratt and Cullen (2000), this provided support for the generality of these relationships.

Self-Control and Analogs of Security Violation Behavior

Research has provided evidence that Self-Control is related to two analogs of security violation behavior—Counterproductive Work Behavior and White Collar Crime.

COUNTERPRODUCTIVE WORK BEHAVIOR (CWB*)*. Three studies have provided evidence suggesting that those low in Self-Control are more likely to engage in CWB. Marcus and Schuler (2004) tested the relationship between Self-Control and CWB in a sample of 170 employees from two organizations in Germany. After accounting for situational factors, the authors found a negative relationship between Self-Control and CWB ($r = -.49$, $p < .01$, 95% CI = -.61 to -.37). In addition, Self-Control was a much stronger predictor of CWB than situational variables, explaining approximately 10 times more variance in CWB. These results suggest that Self-Control is a more important predictor of CWB than situational variables. In fact, the authors concluded that promoting a work force high in self-control (presumably through recruitment and selection efforts) would be the most effective way to reduce CWB.

Table 6. Grasmick et al.'s (1993) Measure of Self-Control

Facets	Description	Items
1. Impulsivity	The tendency to focus on and be motivated by the here-and-now rather than the future.	♦ I often do whatever brings me pleasure here and now, even at the cost of some distant goal. ♦ I often act on the spur of the moment ♦ I don't devote much thought and effort to planning for the future.
2. Risk-Seeking	The tendency to seek out, take, and derive enjoyment from risk.	♦ Excitement and adventure are more important for me than security ♦ Sometimes I like to take a risk just for the fun of it. ♦ I like to test myself every now and again by doing something a little risky. ♦ I sometimes find it exciting to do things for which I might get in trouble.

Facets	Description	Items
3. Preference for Simple Tasks	The tendency to dislike expending great amounts of or sustained effort.	♦ I frequently avoid projects that I know will be difficult. ♦ I dislike hard tasks that stretch my abilities to the limit. ♦ The things in my life that are easiest to do bring me the most pleasure. ♦ When things get complicated, I tend to quit or withdraw.
4. Self-Centeredness	The tendency to place greater importance on one's own interests and disregard those of others.	♦ I will try to get the things I want, even when I know it is causing problems to other people. ♦ I try to look out for myself, even when it is making things difficult for other people. ♦ If things I do upset people, it is their problem not mine. ♦ I am not very sympathetic to other people when they are having problems.
5. Physicality	The tendency to prefer activities that require physical as opposed to mental effort.	♦ I almost always feel better when I am on the move rather than sitting and thinking. ♦ If I had a choice, I would rather do something physical than mental. ♦ I seem to have more energy and a greater need for activity than most people my age. ♦ I like to get out and do things more than I like to read books or contemplate.
6. Volatile Temper	The tendency to become frustrated and angry easily.	♦ I lose my temper pretty easily ♦ When I have a disagreement with someone, it is hard for me to talk calmly about it without getting upset. ♦ When I am really angry, other people better stay away from me. ♦ Often, when I am angry at people I feel more like hurting them than talking to them about why I am angry.

Marcus and Schuler's (2004) study used a global measure of CWB. However, CWB has been conceptualized as either organizationally- or interpersonally-targeted (Robinson & Bennett, 1995). Becholdt, Welk, Hartig, and Zapf (2007) provided evidence that Self-Control is negatively related to both organizational (r = - .50, p < .01, 95% CI = -.56 to -.44) and interpersonal CWB (r = - .27, p < .01, 95% CI = -.35 to -.19) in a sample of over 559 employees from organizations spanning several industries. These relationships account for perceptions of fairness in how the organization distributes rewards and organizational procedures. Bordia, Tang, and Restubog (2008) found evidence for a negative relationship between Self-Control and organizational (r = -.21, p < .01, 95% CI = -.34 to -.07) and interpersonal CWB (r = - .15, p < .05, 95% CI = -.29 to -.01) in sample of 200 employees from a commercial bank in the Philippines. These relationships account for revenge cognitions. Taken together, the results of Becholdt et al. (2007) and Bordia et al. (2008) suggest that those lower in Self-Control are more

likely to engage in counterproductive work behavior targeted toward the organization and individuals in the organization.

Marcus, Schuler, Quell, and Hümpfer (2002) provided evidence suggesting that individuals low in Self-Control are more likely to engage in organizationally- and interpersonally-targeted CWB in a sample of 98 retail employees and 76 manufacturing employees. As shown in Table 7, low Self-Control was positively related to organizational CWB in both samples but was only related to interpersonal CWB in the manufacturing sample. The authors also broke organizationally and interpersonally targeted CWB down into specific behaviors. Table 7 shows that low Self-Control was positively related to several of these behaviors, including absenteeism/withdrawal, substance abuse, and theft/property violations. Perhaps the most important of these relationships is the relationship between low Self-Control and theft/property violations. Theft/property violations are arguably most analogous to security violation behaviors, such as theft of classified information. In support of this argument, one theft item reads, "I have helped someone to steal company property" and another reads, "I took work materials home without permission." Scales items are provided in the appendix of this article. Low self-control was positively related to theft/property violations in the retail sample but not the manufacturing sample. The reason for this difference is unclear, but could be due to a number of factors, such as the personality makeup of the samples, and differential levels of organizational sanctions and controls.

Table 7. Relationships between low Self Control, Organizational and Interpersonal CWB, and Specific CWB Behaviors

Counterproductive Work Behavior	Retail Sample (N = 98)		Manufacturing Sample (N = 76)	
	r	95% CI	r	95% CI
Organizational CWB	.72**	.62 to .81	.55**	.38 to .70
Interpersonal CWB	.41**	.23 to .57	.22ns	-.01 to .43
Absenteeism/Withdrawal	.73**	.62 to .83	.52**	.34 to .67
Substance Abuse	.50**	.34 to .64	.55**	.38 to .70
Aggression	.41**	.23 to .57	.34**	.12 to .53
Theft/Property Violations	.33**	.14 to .50	.17ns	-.06 to .38

** $p < .01$ ns = Not statistically significant

WHITE COLLAR CRIME. Three studies provided evidence suggesting that white collar criminals are low in Self-Control. Collins and Schmidt (1993) conducted a construct validity study of a personality scale, a personality-based integrity test, and a biodata scale. The purpose of this study was to identify variables that discriminate between white collar offenders and nonoffenders. The sample was comprised of 329 white collar criminals convicted of a variety of white collar offenses (e.g., counterfeiting, fraud, forgery, embezzlement) and 320 white collar nonoffenders. The overall sample was broken down into validation and cross-validation subsamples. Comparison of the mean differences revealed that white collar offenders rated themselves significantly lower on a measure of Self-Control that white collar nonoffenders in the validation sample (r = - .18, p < .05, 95% CI = -.28 to -.09) but not the cross-validation sample (r = - .11,

ns, 95% CI = -.25 to .02). In her doctoral dissertation, Herbert (1997) tested the hypothesis that Self-Control is positively associated with white collar offending. To measure white collar offending, she asked over 1000 college students to indicate how frequently they engaged in several behaviors, including lying on a job application, stealing from an employer, lying to an employer about a job-related matter, filling out a time sheet for more hours than were worked, and lying on a tax application. Her analyses indicated that low Self-Control was positively associated with white collar offending (r = .46, p < .001, 95% CI = .42 to .51). Blickle, Schlegel, Fassbender, and Klein (2006) compared the personality characteristics of 76 inmates convicted of various white collar offenses (e.g., bribery, embezzlement, fraudulent bankruptcy) and 200 non-criminal managers. Among their findings, the non-criminal managers described themselves as significantly higher in self-control than the white collar criminals (r = .14, p < .05, 95% CI = .02 to .26). This relationship remained significant after accounting for several other personality traits.

Extraversion

Extraversion encompasses several primary traits, including warmth, gregariousness, assertiveness, activity, excitement-seeking and positive emotions. People high in Extraversion are described as talkative, friendly, enthusiastic, bold, assertive, and spontaneous, whereas people low in Extraversion (i.e., Introverts) tend to be described as reserved, aloof, quiet, inhibited, passive, and timid. Table 8 provides descriptions of the primary traits subsumed by Extraversion. Items representative of the high and low poles of each trait are also provided. These items are taken from the NEO-PI (Costa and McCrae, 1992)—one of the most widely used and validated personality assessments in the field of Psychology.

Extraversion and Criminal Conduct

Extraversion's association with criminal conduct was first proposed by personality psychologist Hans Eysenck. According to Eysenck (1996), abstinence from criminal or antisocial conduct is supported by the development of conscience. Conscience is a conditioned response molded by rewards and punishments over the course of one's life, particularly one's early life (Eysenck, 1970). When a person engages in socially appropriate and/or prosocial forms of behavior, s/he is rewarded by teachers, parents, and peers, whereas when s/he engages in socially inappropriate or antisocial forms of behavior, s/he is punished. These reinforcements and punishments ultimately contribute to the development of a sense of right and wrong (i.e., conscience) that deters a person from criminal behavior. According to Eysenck, this conditioning process is less effective in those high in Extraversion because they require a great deal of stimulation to learn.

Evidence for Eysenck's (1977) hypothesis has been reviewed by several researchers over the past few decades (Cale, 2006; Cochrane, 1974; Eysenck & Gudjonssen, 1989; Miller & Lynam, 2001; Passington, 1972). In one of the most recent and comprehensive of these efforts,

Cale (2006) conducted a meta-analysis of 52 published and unpublished studies. These studies differed in method, samples, and measurement, including comparisons of prisoners and nonprisoners, juvenile delinquents and nondelinquents. They also included assessments of conduct and antisocial personality disorder, and self-, peer-, teacher, and parent-reported delinquency. From these studies, Cale identified 71 empirical relationships between Extraversion and antisocial behavior. Statistical aggregation of this data indicated that there was a positive, albeit weak, relationship between Extraversion and criminal behavior (ρ = .09, k = 85, N = 14,992, 95% CI = .06 to .12).[2]

Table 8. Extraversion: Primary Traits and Example Items

Primary Traits	Description	Example Items	
		High	Low
1. Warmth	The capacity for affection, friendliness, and cordiality.	♦ I find it easy to smile and be outgoing with strangers ♦ I take a personal interest in people I work with.	♦ Many people think I am somewhat cold or distant. ♦ I do not get much pleasure from chatting with people.
2. Gregariousness	The preference for being around other people.	♦ I like to have a lot of people around me. ♦ I really feel the need for other people if I am by myself for a long period of time. ♦ I would rather vacation at a popular beach than an isolated cabin in the woods.	♦ I prefer jobs that let me work alone without being bothered by other people. ♦ I shy away from crowds of people.
3. Assertiveness	The tendency to express oneself forcefully and without reluctance	♦ I am dominant, forceful, and assertive. ♦ In conversations, I tend to do most of the talking. ♦ I have often been the leader of groups I have belonged to.	♦ I don't find it easy to take charge of a situation. ♦ In meetings, I usually let other people do the talking.
4. Activity	One's level of energy and tendency toward a fast-paced lifestyle.	♦ I often feel as though I am bursting with energy. ♦ I usually seem to be in a hurry. ♦ My life is fast-paced.	♦ I have a leisurely style in work and play. ♦ I am not as quick and lively as other people.
5. Excitement-Seeking	One's appetite for the thrills and excitement.	♦ I have sometimes done things just for "kicks" or "thrills." ♦ I like to be where the action is. ♦ I am attracted to bright colors and flashy styles.	♦ I tend to avoid movies that are shocking or scary. ♦ I wouldn't enjoy vacationing in Las Vegas.

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[2] ρ refers the estimated true effect size. It is calculated as the weighted average of corrected observed correlations, r, where each r is corrected for study artifacts such as unreliability and weighted by its sample size.

Primary Traits	Description	Example Items	
		High	Low
6. Positive Emotions	The capacity for laughter, joy, love, optimism, and happiness.	♦ I have sometimes experienced intense joy or ecstasy. ♦ I am a cheerful, high-spirited person. ♦ I laugh easily.	♦ I am not a cheerful optimist. ♦ I have never literally "jumped for joy."

Cale's (2006) findings are largely consistent with those preceding it—Extraversion is positively related to criminal behavior, although the strength of this relationship is weak. Several studies have provided evidence suggesting that stronger relationships are found at the primary trait level, particularly with Excitement-Seeking. Heaven (1996) asked 90 college students complete the NEO-PI and self-report measures of vandalism/theft and interpersonal violence. Analysis of the resulting data indicated that Excitement-Seeking positively related to vandalism/theft (r = .26, p < .05, 95% CI = .06 to .45) and interpersonal violence (r = .22, p < .05, 95% CI = .01 to .45), even after controlling for other personality traits. Levine and Jackson (2004) examined the relationship between Extraversion, as measured by Eysenck's EPQ-R (Eysenck & Eysenck, 1991), and self-reported crime in a sample of 101 college students. Their analyses indicated that Extraversion was unrelated to self-reported crime (r = .11, ns, 95% CI = -.09 to .31); however, Need for Stimulation—a primary trait largely redundant with Excitement-Seeking—was positively associated with self-reported crime (r = .20, p < .05, 95% CI = 0.01 to .38). Samuels, Bienvenu, Cullen, Costa, Eaton, and Nestadt (2004) examined the relationship between personality, personality disorders, substance and alcohol abuse, and arrest history in a sample of 611 individuals ranging in age from 30 to 87. Arrest histories were identified by searching through a criminal database spanning a period of 13 years. The authors' analyses indicated that those high Excitement-Seeking were more likely to report having history of arrest than those low in Excitement-Seeking (r = .19, p < .001, 95% CI = .11 to .27). None of the other primary traits subsumed by Extraversion were related to arrest history. Additional analysis indicated that the odds of reporting a history of criminal arrest increased by 7% for each unit increase in Excitement-Seeking. The magnitude of this relationship did not change appreciably when participant age, gender, race, alcohol/drug use disorders, and personality disorders were accounted for.

Extraversion and Analogs of Security Violation Behavior

Several studies have provided evidence suggesting that those higher in Extraversion or Excitement-Seeking are more likely to engage in counterproductive work behavior and white collar crime.

COUNTERPRODUCTIVE WORK BEHAVIOR. Salgado (2002) conducted a meta-analysis of 17 CWB studies appearing in the literature between 1990 and 1999. . The results showed that Extraversion was unrelated to a measure of CWB encompassing workplace theft, admissions of

workplace theft, disciplinary problems, substance abuse, property damage, and organizational rule-breaking (ρ = -.01, k = 17, N = 2383, 95% CI = -.05 to .03). Though Salgado's (2002) work suggests that Extraversion is unrelated to CWB, Berry, Sackett, and Ones (2007) found evidence suggesting that Salgado's use of a general measure of CWB may have masked Extraversion's differential relationships with interpersonal and organizational CWB. In particular, Berry et al. conducted a meta-analysis of 31 published and unpublished CWB studies and found evidence that Extraversion was negatively related to organizational CWB (ρ = -.09 k = 5, N = 1836, 95% CI = -.14 to -.04) but was unrelated to interpersonal CWB (ρ = .02, k = 8, N = 2360, 95% CI = -.02 to .06). Comparison of these confidence intervals indicates that Extraversion is more strongly related to organizational deviance than interpersonal deviance. Furthermore, the results indicate that highly Extraverted people are less likely to engage in organizational CWBs, such as intentionally withholding effort, stealing from the company, and sharing classified company information, than those lower in Extraversion.

Three studies have provided data on the relationship between the primary traits subsumed by Extraversion and CWB. Hastings and O'Neill (2009) asked 189 college students to complete a personality measure and indicate how often they engaged in a number of CWBs. Correlation analysis indicated that Extraversion was unrelated to CWB (r = .12, ns, 95% CI = 0.00 to .24). However, Excitement-Seeking was positively related to CWB (r = .17, p < .05, 95% CI = .06 to .29). Hastings and O'Neill also found evidence that Warmth was negatively related to CWB (r = -.15, p < .05, 95% CI = -.27 to -.04). That Excitement-Seeking and Warmth were related to CWB in opposing ways might explain why Extraversion is not consistently associated with CWB, as their effects may cancel each other out. Marcus and Schuler (2004) found evidence that Excitement-Seeking was positively related to a general measure of CWB (r = .27, p < .05, 95% CI = .11 to .39) in a sample of 174 employees from two organizations in Germany. Diefendorff and Mehta (2007) tested a series of hypotheses proposing that different motivational traits are related to counterproductive work behavior. Included among these traits was Behavioral Activation System (BAS) Sensitivity. The BAS is a physiologically-based system manifest in perceptual readiness for and strong emotional reactions to cues of nonpunishment or reward (Gray, 1982). Individuals high in BAS sensitivity are chronically under stimulated and seek novel activities that will increase their arousal (Carver & White, 1994). Activation of the BAS is associated with impulsivity, sensation seeking, a strong drive to attain goals, and the experience of positive emotions (Torrubia, Avila, Motto, & Caseras, 2001). BAS sensitivity overlaps both conceptually and empirically with the primary trait of Excitement-Seeking. Diefendorff and Mehta hypothesized that BAS sensitivity would be positively related to both interpersonal and organizational deviance because such behaviors, being risky in nature, increase arousal and can provide one with a sense of novelty. The results indicated that BAS sensitivity was positively related to both interpersonally- and organizationally-targeted CWB (r = .36, p < .05, 95% CI = .28 to .45 and r = .23, p < .05, 95% CI = .13 to .32) in a sample of 392 employed undergraduates. These relationships accounted for organizational frustrations and other motivational traits, such as feelings of personal mastery and competitiveness.

WHITE COLLAR CRIME. In their study of personality and behavioral differences of white collar criminals and noncriminals, Collins and Schmidt (1993) used a biodata scale to measure Extraversion. This scale asked participants to answer several questions about their past. Each question tapped behaviors characteristic of Extraversion, included friendships, popularity, and involvement in and leadership of groups. Analysis of the responses to this instrument indicated that white collar criminals were more Extraverted than white collar noncriminals in both the validation (r = .38 p < .0001, 95% CI =.31 to .46) and cross-validation samples (r = .21, p < .05, 95% CI = .08 to .24).

Alalehto (2003) set out to identify the personality differences among white collar offenders and nonoffenders by conducting in-depth structured interviews with 128 businessmen in the construction, engineering, and music industries in Sweden. Interviewees were asked to describe the behavior and personalities of colleagues that had engaged in white collar crimes and those that had not. The results indicated that the informants were more likely to describe colleagues that had committed white collar offenses as socially competent, talkative, spontaneous, and adventurous. Because each of these characteristics is indicative of Extraversion, Alalehto referred to these white collar criminals as Positive Extraverts.

Neuroticism

Neuroticism is a personality trait reflecting emotional stability and adjustment. People high in Neuroticism tend to be distressed and upset in many realms of their lives. They are chronically worried, nervous, insecure, hold a low opinion of themselves and view the world through a pessimistic lens. People who score low on Neuroticism, on the other hand, are generally calm, relaxed, secure, self-satisfied, and rather unemotional (McAdams, 2003). Neuroticism, as measured by the NEO Personality Inventory (Costa & McCrae, 1992), subsumes six primary traits—Anxiety, Angry Hostility, Depression, Self-Consciousness, Impulsiveness and Vulnerability. Table 9 provides a brief description of each primary trait and example items tapping the high and low poles of each trait.

Neuroticism and Criminal Conduct

Eysenck (1977) proposed that Neuroticism can contribute to criminal behavior by amplifying Extraversion's impact on the conditioning processes necessary to the development of conscience (Eysenck, 1970). Extraverted people may condition poorly, but those high in both Extraversion and Neuroticism condition most poorly of all and are thus most likely to engage in criminal behavior. More recently, Eysenck (1996) suggested the those high in Neuroticism are prone to criminal behavior because they are more likely to experience anger (Angry Hostility) and react in in impulsive ways (i.e., allowing emotion to overtake reason).

Table 9. Neuroticism: Primary Traits and Example Items

Primary Trait	Description	Example Items	
		High	**Low**
1. Anxiety	Worry and fear about how things will turn out	♦ I often worry about things that might go wrong. ♦ I am easily frightened.	♦ I am seldom apprehensive about the future. ♦ I have fewer fears than most people.
2. Angry Hostility	How quickly one comes to feel anger and bitterness	♦ I often get angry over the way people treat me. ♦ Even minor annoyances are frustrating to me.	♦ It takes a lot to get me mad. ♦ I am not considered a touchy or temperamental person.
3. Depression	The tendency to feel sad and hopeless	♦ Sometimes things look pretty bleak and hopeless to me. ♦ I blame myself when anything goes wrong.	♦ I rarely feel lonely or blue. ♦ I am seldom sad or depressed.
4. Self-Consciousness	Tendency to feel embarrassment or shame in awkward social situations	♦ In dealing with other people, I often dread making a social blunder. ♦ If I have said or done something wrong to someone I know, I can hardly bear to face them again.	♦ If doesn't embarrass me too much if people tease or ridicule me. ♦ I feel comfortable in the presence of my boss or other authority figures.
5. Impulsiveness	The tendency to yield to temptation (food, drink, tobacco, drugs, etc.)	♦ Sometimes I do things on impulse that I later regret. ♦ I have trouble resisting my cravings.	♦ I have little difficulty resisting temptation. ♦ I am always able to keep my feelings under control.
6. Vulnerability	The tendency to lose focus in emergency or stressful situations	♦ I often feel helpless and want someone else to solve my problems. ♦ When I am under a great deal of stress, sometimes I feel like I am going to pieces.	♦ I feel I am capable of coping with most of my problems. ♦ When everything seems to be going wrong, I can still make pretty good decisions.

Surprisingly, little research has tested the proposed Extraversion-Neuroticism interaction. There is a substantial amount of evidence, however, on the direct relationship between Neuroticism and criminal behavior. As with Extraversion, several reviews of the literature over the past few decades have addressed this relationship (Cale, 2006; Cochrane, 1974; Eysenck & Gudjonssen, 1989; Miller & Lynam, 2001; Passington, 1972). Eysenck and Gudjonssen's (1989) review indicated that Neuroticism was more strongly related to criminal behavior in older samples. They speculated that Neuroticism becomes more predictive at later ages because conditioned tendencies, those Neuroticism is thought to amplify, are more established at that time. Miller and Lynam (2001) conducted a meta-analysis of 48 studies published between 1963 and 2000. The authors defined criminal behavior rather broadly, including scales and questionnaires measuring antisocial personality disorder, conduct disorder, psychopathy, and

self-, peer-, parent- and teacher-reported delinquency. The results indicated that Neuroticism was positively associated with criminal behavior (ρ = .20, N = 19, 262, 95% CI = .19 to .22). Cale's (2006) meta-analysis also provided support for a positive relationship between Neuroticism and criminal behavior (ρ = .19, k = 82, N = 14, 468, 95% CI = .15 to .23).

Like Extraversion, a few studies have examined the relationship between the primary traits subsumed by Neuroticism and criminal behavior. Miller, Lynam, and Leukefeld (2003) asked 481 20 year-old men and women to complete measures of personality and indicate the frequency to which they engaged in different types of criminal and aggressive behaviors since the fifth grade. Accounting for gender and primary traits subsumed by Conscientiousness and Agreeableness (see below), the authors did not find a significant relationship between any of the primary traits subsumed by Neuroticism and the frequency of criminal behavior during this time. However, Angry Hostility was positively related to interpersonally aggressive behavior (r = .11, p < .05, 95% CI = .02 to .20). This suggests that people prone to anger are more likely to engage in acts of interpersonal aggression. Samuels et al. (2004) found Angry Hostility and Impulsiveness were related to arrest history. Those with a history of criminal arrest were higher in Angry Hostility (r = .19, p < .001, 95% CI = .11 to .27) and Impulsiveness (r = .13, p < .01, 95% CI = .05 to .21). Additional analyses showed that the odds of a person having been arrested increased by 6% and 4% with each unit increase in Angry Hostility and Impulsiveness, respectively. The magnitude of these relationships did not change appreciably when participant age, gender, race, alcohol/drug use disorders, and personality disorders were accounted for. None of Neuroticism's other primary traits were related to arrest history. This suggests that people prone to anger and who tend to act on the spur of the moment are more likely to engage in criminal behavior than those who are more calm and thoughtful—a finding consistent with Eysenck's most recent explanation for the relationship between Neuroticism and criminal behavior.

Neuroticism and Analogs of Security Violation Behavior

Neuroticism has been linked to three analogs of security violations—counterproductive work behavior, white collar crime, and workplace safety.

COUNTERPRODUCTIVE WORK BEHAVIOR. Research suggests that those high in Neuroticism, or one of the primary traits subsumed by it, are more likely to engage in CWB. Berry, Ones, and Sackett's (2007) meta-analysis indicated that Neuroticism was positively related to both interpersonally- and organizationally-targeted CWB (ρ = .24, k = 10, N = 2,842, 95% CI = .21 to .28 and ρ = .23, k = 7, N = 2,300, 95% CI = .19 to .28, respectively).

Two studies have provided evidence suggesting that those prone anger and hostility are more likely to engage in CWB. Hastings and O'Neill (2009) found that while Neuroticism was unrelated to CWB (r = .12, ns, 95% CI = -.02 to .26), Angry Hostility was positively related (r = .33, p < .05, 95% CI = .20 to .46) to it. Hershcovis, Turner, Barling, Arnold, Dupré, Inness, LeBlanc, and Sivanathan (2007) conducted a meta-analysis of 57 studies including data on

situational and personality correlates of CWB. Personality variables included Negative Affectivity and Trait Anger. Each of these variables overlaps both conceptually and empirically with Neuroticism. Negative Affectivity is the tendency to experience negative emotional states, such as hostility, anxiety, and fear (Watson & Clark, 1985). Watson and colleagues argue that Negative Affectivity is a central component of Neuroticism and have found a correlation of .58 between the two constructs (Watson, Wiese, Vaidya, & Tellegen, 1999). Negative Affectivity touches directly on several primary traits subsumed by Neuroticism, particularly Angry Hostility and Anxiety, but not others (i.e., Vulnerability), so it is narrower in scope than Neuroticism. Trait Anger is the predisposition to perceive situations as frustrating and respond with hostility (Spielberger, 1991). This personality trait overlaps with Angry Hostility but none of the other primary traits subsumed by Neuroticism (e.g., Stress Reaction, Anxiety), so it is narrower in scope than both Neuroticism and Negative Affectivity. Herschcovis et al.'s (2007) review indicated that Trait Anger was positively related to interpersonally- and organizationally-targeted CWB (ρ = .43, k = 10, N = 2,648, 95% CI = .40 to .46 and ρ = .33, k = 7, N = 2,032, 95% CI = .29 to .38, respectively). Negative Affectivity was also positively related to interpersonal and organizational CWB (ρ = .29, k = 5, N = 1,532, 95% CI = .25 to .32 and ρ = .28, k = 4, N = 1,168, 95% CI = .23 to .34, respectively). With this data in hand, the authors proceeded to conduct a meta-analytic path analysis including several personality and situational predictors of interpersonally- and organizationally-targeted CWB. Controlling for perceptions of organizational justice, interpersonal conflict, situational constraints, and gender, the authors found that Trait Anger was positively related to both interpersonally- and organizationally-targeted CWB (ρ = .29, p < .001, 95% CI = .26 to .43 and ρ = .16, p < .01, 95% CI = .12 to .20, respectively), whereas Negative Affectivity was not. One reason that Negative Affectivity may have failed to predict workplace deviance it is that it is broader in scope than Trait Anger and encompasses emotions, like anxiety and worry, unrelated to CWB.

WHITE COLLAR CRIME. Three studies have provided evidence for a relationship between Neuroticism and White Collar Crime. Alalehto's (2003) research indicated that white collar offenders were more likely to be described with Neurotic descriptors (e.g., anxious, nervous, unstable) than those that did not engage in such crimes. Alalehto described the Neurotic white collar criminal as self-critical, self-pitying, quick to take offense, and unbalanced in his/her behavior because of frequent mood swings. Informant reports indicated that this type was more likely to engage in white collar offenses because they are in search of the approval of others and are therefore more likely to be persuaded into conspiring in such crimes. Weisburd and Waring (2001) found that those high in Neuroticism were more likely to have multiple arrests for white collar offenses. Although not including a measure of Neuroticism, Collins and Schmidt (1993) did find that the Anxiety subscale of the California Psychological Inventory discriminated between white collar criminals and noncriminals. White collar criminals indicated that they experienced higher levels of anxiety than white collar noncriminals in both the validation and

cross-validation samples (r = .18, p < .001, 95% CI = .09 to .28 and r = .29, p < .001, 95% CI = .16 to .41, respectively).

WORKPLACE SAFETY. Eysenck (1970) proposed that people high in Neuroticism are more accident prone because they tend to be more preoccupied with their own worries and therefore are more likely to be distracted from the task at hand. The hypothesis has been supported in two meta-analyses of the workplace safety literature. The results of Clarke and Robertson's (2005) meta-analysis indicated that Neuroticism was positively associated with workplace accidents (ρ = .28, k = 13, N = 1,958, 95% CI = .24 to .32). A more recent meta-analysis conducted by Christian, Bradley, Wallace, and Burke (2009) also revealed a positive relationship between Neuroticism and workplace accidents. (ρ = .19, k = 12, N = 5,129, 95% CI = .16 to .22). In support of Eysenck's (1970) account of the relationship between Neuroticism and accident risk, Wallace and Chen (2005) found that Neuroticism was positively associated with a measure of Workplace Cognitive Failure (WCF). WCF is a cognitively-based error that occurs during the performance of a task that a person usually executes successfully (Martin, 1983). WCF failure encompasses lapses in memory (e.g., forgetting workplace procedures, forgetting where things are placed) and attention (e.g., not listening fully to instruction, not focusing attention on work activities, failing to notice postings or notices on bulletin boards). Research has found that WCF is positively related to occupational accidents and a variety of safety-related behaviors. Wallace and Chen found that Neuroticism was positively associated with both the memory and attention facets of WCF (r = .24, p < .05, 95% CI = .14 to .34 and r = .33, p < .05, 95% CI = .23 to .43, respectively) in a sample of 323 full-time employees in production, construction, and plant operations in the United States.

Conscientiousness

Conscientiousness subsumes several characteristics, including self-discipline, responsibility, reliability, dutifulness, organization, and perseverance (McAdams, 2001). People high in Conscientiousness approach tasks in a systematic and orderly fashion, analyze problems logically, are responsible and reliable in their dealings with other people and are self-disciplined. At the other end of the continuum are people who are disorganized, haphazard, negligent, and undependable. Those low in conscientiousness have little regard for serious standards of work or morality and are unable to stand by anyone or anything in the long-run (Goldberg, 1990). Costa and McCrae (1992) have found evidence that Conscientiousness subsumes six primary traits. These primary traits and example items reflecting the high and low poles of each trait are presented in Table 10.

Table 10. Conscientiousness: Primary Traits and Example Items

Primary Trait	Description	Example Items	
		High	Low
1. Competence	Feelings of preparedness and capability, level of self-esteem, and feelings of control	♦ I am known for my prudence and commonsense. ♦ I pride myself on my sound judgment.	♦ I often come to situations not completely prepared. ♦ I don't take civic duties like voting very seriously.
2. Order	The tendency to be well-organized and methodical	♦ I keep my belongings neat and clean. ♦ I like to keep everything in its place so I know just where it is.	♦ I never seem able to get organized. ♦ I spend a lot of time looking for things that I have misplaced.
3. Dutifulness	Strict adherence to one's conscience; reliability	♦ When I make a commitment, I can always be counted on to follow through. ♦ I pay my debts promptly and in full.	♦ Sometimes I am not as dependable or reliable as I should be. ♦ I don't always adhere to my ethical principles.
4. Achievement Striving	The tendency to set high goals and focus on them	♦ I am something of a "workaholic." ♦ I strive for excellence in everything I do.	♦ I am easy-going and lackadaisical. ♦ I don't feel like I am driven to get ahead.
5. Self-Discipline	The capacity to motivate oneself to get the job done and resist distractions	♦ I am pretty good about pacing myself so as to get things done on time. ♦ I am a productive person who always gets the job done.	♦ I have trouble making myself do what I should. ♦ When a project gets to difficult for me, I am inclined to start a new one.
6. Deliberation	The ability to think something through before acting on it.	♦ I always consider the consequences before I take action. ♦ I think things through before coming to a decision.	♦ Occasionally I act first and think later. ♦ I often do things on the spur of the moment.

Conscientiousness and Criminal Conduct

Miller and Lynam's (2001) meta-analysis indicated that Conscientiousness was negatively related to criminal behavior. (ρ = -.25, k = 14, N= 4,584, 95% CI = -.28 to -.23). This suggests that people who are hardworking, reliable, planful and self-disciplined are less likely to engage in criminal behavior.

Three studies have provided evidence suggesting that not all of the primary traits subsumed by Conscientiousness are related to criminal behavior. Accounting for primary traits subsumed by Agreeableness (described below) and Extraversion, Heaven (1996) found Self-Discipline was negatively related to self-reported vandalism/theft (r = -.25, p < .05, 95% CI = -.44 to -.05). None of the other five primary traits subsumed by Conscientiousness were related to vandalism/theft. Interestingly, none of the primary traits subsumed by Conscientiousness were

related to self-reported interpersonal violence, suggesting that Conscientiousness, and the primary traits comprising it, may be more important in crimes involving property than people.

Miller et al. (2003) found Deliberation was negatively related to the stability and variety of criminal behavior (r = - .16, p < .01, 95% CI = -.25 to -.07 and r = -.10, p < .05, 95% CI = -.19 to -.01, respectively). These relationships accounted for gender and primary traits subsumed by Neuroticism and Agreeableness. None of the other primary traits subsumed by Conscientiousness were significantly related to these criteria. This suggests that people who fail to think before acting are more likely to engage in a variety of criminal behavior and/or do so over a longer period of time. Samuels et al. (2004) found those scoring high in Deliberation and Dutifulness were less likely to have a criminal arrest history than those low in these traits (r = -.14, p <.001, 95% CI = -.22 to -.06 and r = -.16, p <.001, 95% CI = -.24 to -.08). Additional analyses indicated that a unit increase in Dutifulness and Deliberation both decreased the odds of having a previous arrest by 4%. The magnitude of these relationships did not change appreciably when age, gender, race, alcohol/drug use and personality disorders, and primary traits subsumed by other master traits were controlled.

Conscientiousness and Analogs of Security Violation Behavior

COUNTERPRODUCTIVE WORK BEHAVIOR. Three meta-analyses have provided evidence that Conscientiousness is negatively related to CWB. Salgado (2002) found that Conscientiousness was negatively related to a composite measure of workplace deviance encompassing theft, admissions of theft, disciplinary problems, substance abuse, property damage, organizational rule-breaking and other irresponsible behaviors (ρ = -.26, k = 13, N = 6,276, 95% CI = -.29 to -.24). Dalal (2005) conducted a meta-analysis of CWB studies published between 1995 and 2004. From this literature, he found 10 studies that provided data on the relationship between Conscientiousness and CWB. Aggregating the results of these studies indicated that Conscientiousness was negatively related to CWB (ρ = -.38, N = 3,280, 95% CI = -.41 to -.36). Berry, Ones, and Sackett's (2007) meta-analysis included studies spanning from the mid-1990s to 2006. Unlike Salgado (2002) and Dalal (2005), who each focused on Conscientiousness's relationship with a general CWB measure the authors looked at Conscientiousness's relationship with both interpersonally- and organizationally-targeted CWB. The analysis showed that Conscientiousness was negatively related to both interpersonally- and organizationally-targeted CWB (ρ = -.23, k = 11 N = 3458, 95% CI = -.27 to -.20 and ρ = -.42, k = 8 N = 2934 95% CI = -.45 to -.39, respectively). Comparison of these confidence intervals indicates that the Conscientiousness's relationship with organizationally-targeted CWB is stronger than interpersonally-targeted CWB.

WHITE COLLAR CRIME. Two studies provided data on the relationship between Conscientiousness and white collar crime, but the results are contradictory. Collins and Schmidt (1993) found that the Responsibility subscale of the California Psychological Inventory (CPI) and the Performance subscale of the Employment Inventory (EI) discriminated between white

collar offenders and nonoffenders. Both scales are conceptually similar to Conscientiousness. The Responsibility subscale of the CPI refers to dependability, reliability, and commitment to moral and civic values. Individuals that score high on the Performance subscale of the EI are described as dependable, reliable, responsible, motivated to high performance, rule-abiding, and conscientious in their work behavior (Paajanen, 1988). A comparison of the scale means between white collar criminals and noncriminals indicated that that white collar offenders rated themselves lower on the Responsibility scale than nonoffenders in both the validation and cross-validation samples ($r = -.40$, $p < .001$, 95% CI = -.48 to -.32 and $r = -.28$, $p < .05$, 95% CI = -.40 to -.15, respectively). Likewise, white collar criminals rated themselves lower on the Performance subscale of the EI in both the validation and cross-validation samples ($r = -.61$, $p < .001$, 95% CI = -.66 to -.55 and $r = -.57$, $p < .05$, 95% CI = -.67 to -.48, respectively). This suggests that workers who are reliable, dependable, and rule-abiding are less likely to engage in white collar crimes than those who are unreliable, undependable, and rule-breaking. Contrary to these findings, Blickle et al. (2006) found white collar criminals were higher in Conscientiousness than noncriminals ($r = .23$, $p < .01$, 95% CI = .10 to .36). Blickle et al. attributed these opposing results to differences in how white collar crime is defined in the United States and Germany. Blickle and his colleagues included white collar crime committed on behalf of the organization, which is consistent with the definition of white collar crime in Germany, whereas Collins and Schmidt (1993) include more self-serving types of white collar crime. Blickle et al. hypothesized that white collar criminals in their study were acting as reliable, dependable employees, conducting crime for the good of the organization, whereas those in Collins and Schmidt's study engaged in behaviors in their own self-interests. This suggests that Conscientiousness's relationship with white collar crime is complex and likely dependent on social psychological factors such as organizational norms.

WORKPLACE SAFETY. Research suggests Conscientious people are less likely to have accidents in the workplace. Clarke and Robertson's (2005) meta-analysis provided evidence that Conscientiousness was negatively related to workplace accidents ($\rho = -.30$, $k = 9$, $N = 1,105$, 95% CI = -.36 to -.25). Christian et al.'s (2009) meta-analytic path analysis of the safety literature suggested that Conscientiousness is associated with reduced workplace accidents because highly conscientious people are more likely to be motivated to comply with and actively promote rules and regulations pertaining to workplace safety. Wallace and Chen (2005) found Conscientiousness was negatively associated with the Memory and Attention facets of Workplace Cognitive Failure ($r = -.24$, $p < .05$, 95% CI = -.24 to -.14 and $r = -.33$, $p < .05$ 95% CI = -.43 to -.23, respectively). This suggests that Conscientious people are less likely to experience workplace accidents because they are more likely to remember and pay attention to important safety-related information (e.g., safety procedures) and are more highly focused on the task at hand.

Agreeableness

Agreeableness is a personality trait incorporating the expressive qualities of love and empathy, friendliness, cooperation, and care (McAdams, 2001). Individuals high in Agreeableness are described as interpersonally warm, cooperative, accommodating, helpful, patient, cordial, empathic, kind, understanding, natural, and sincere (Goldberg, 1990). They are also seen as honest, ethical, and selfless. Those low in Agreeableness are antagonistic, belligerent, harsh, untrustworthy, unsympathetic, manipulative, disingenuous, scornful, crude, and cruel (Goldberg, 1990). Costa and McCrae (1992) found that Agreeableness subsumes six primary traits including Trust, Straightforwardness, Altruism, Compliance, Modesty, and Tender-Mindedness. These primary traits and example items for the high and low poles of each trait are presented in Table 11.

Agreeableness and Criminal Conduct

Miller and Lynam's (2001) meta-analysis demonstrated that Agreeableness was negatively related to criminal behavior ($\rho = -.41$, k = 15, N = 4,673. 95% CI = -.43 to -.39). This suggests that those who are trusting of others, straightforward in their dealings with people, altruistic, cooperative, modest, and tenderminded are less likely to engage in criminal behavior. However, research that has focused on the relationship between Agreeableness and criminal behavior at the primary trait level indicates that not all of these traits are significantly related to criminal behavior. Heaven (1996) found Trust was negatively related to self-reported vandalism/theft and interpersonal violence (r = -.31, p < .05, 95% CI = -.49 to -.11 and r = - .34, p < .05, 95% CI = -.51 to -.41, respectively), after accounting for primary traits subsumed by Extraversion and Conscientiousness. None of the other primary traits subsumed by Agreeableness were significantly related to these outcomes. These results suggest that those who believe other people are well-intentioned and honest are less likely to engage in these acts than those that question or are suspicious of other people's motives.

Table 11. Agreeableness: Primary Traits and Example Items

Primary Traits	Description	Example Items	
		High	Low
1. Trust	The tendency to regard others as well-intentioned	♦ I think most of the people I deal with are honest and trustworthy. ♦ I have a good deal of faith in human nature.	♦ I tend to be cynical and skeptical of other peoples' intentions. ♦ I am suspicious when someone does something nice for me.
2. Straightforwardness	Lack of deception or manipulation	♦ I couldn't deceive someone even if I wanted to. ♦ I would hate to be thought of as a hypocrite.	♦ If necessary, I am willing to manipulate people to get what I wanted. ♦ At times I bully or flatter people into doing what I want them to do.
3. Altruism	Generosity, consideration, and willingness to help others	♦ I try to be courteous to everyone I meet. ♦ I go out of my way to help others if I can.	♦ Some people think I am cold and calculating. ♦ Some people think I am selfish and egotistical.
4. Compliance	The desire to be cooperative rather than compete	♦ I would rather cooperate with people than compete with them. ♦ I hesitate to express my anger, even when it is justified.	♦ I often get into fights with my family and coworkers. ♦ I'm hard-headed and stubborn.
5. Modesty	Humility or the lack of arrogance	♦ I would rather not talk about myself and my accomplishments. ♦ I try to be humble.	♦ I don't mind bragging about my talents and accomplishments. ♦ I am better than most people, and I know it.
6. Tender-Mindedness	The capacity to feel concern, pity, and sympathy for others.	♦ I believe all human beings are worthy of respect. ♦ Human need should always take priority over economic considerations	♦ I am hard-headed and tough-minded in my attitudes. ♦ I have no sympathy for panhandlers.

Miller et al. (2003) found Straightforwardness and Compliance were related to the stability and variety of criminal behavior as well as interpersonal aggression even after accounting for gender and primary traits subsumed by Neuroticism and Conscientiousness. Straightforwardness was negatively related to the stability and variety of criminal behavior and interpersonal aggression ($r = -.25$, $p < .01$, 95% CI = -.34 to -.17 $r = -.18$, $p < .01$, 95% CI = -.27 to -.09 and $r = -.09$, $p < .05$, 95% CI = -.18 to -.01, respectively). Compliance was also negatively related to the stability and variety of criminal behavior and interpersonal aggression ($r = -.10$, $p < .05$, 95% CI = -.19 to -.01, $r = -.13$, $p < .01$, 95% CI = -.22 to -.04, and $r = -.15$, $p < .05$, 95% CI = -.24 to -.06, respectively). This suggests that those who are manipulative and competitive tend to engage in criminal behavior more frequently and engage in a greater variety

of criminal and aggressive acts than those who are straightforward and cooperative. Samuels et al. (2004) found Trust (r = - .14, p < .001, 95% CI = -.22 to -.06), Straightforwardness (r = - .16, p < .001), Compliance (r = - .18, p < .001, 95% CI = -.26 to -.10) and Modesty (r = - .13, p < .001, 95% CI = -.21 to -.05) were negatively associated with the likelihood of having an arrest history. Altruism and Tendermindedness were unrelated to criminal arrest history. Additional analysis indicated that these primary traits reduced the odds of having a criminal arrest history by 3-5%. The magnitude of these relationships did not change appreciably when participant age, gender, race, alcohol/drug use and personality disorders, and primary traits subsumed by other master traits were controlled.

Agreeableness and Analogs of Security Violation Behavior

COUNTERPRODUCTIVE WORK BEHAVIOR. The results of Salgado's (2002) and Berry et al.'s (2007) meta-analyses suggest that those high in Agreeableness are less likely to engage in CWB. Salgado (2002) found Agreeableness was negatively related to CWB (ρ = - .20, k = 9, N = 1,299, 95% CI = -.26 to -.15), and Berry et al. (2007) demonstrated that Agreeableness was negatively associated with both interpersonally- and organizationally-targeted CWB (ρ = - .46, k = 10, N = 3,336, 95% CI = -.49 to -.43 and ρ = -.32, k = 7, N = 2,934, 95% CI = -.36 to -.29, respectively). Comparison of the confidence intervals indicates that Agreeableness is more strongly related to interpersonal than organizational CWB.

WHITE COLLAR CRIME. Two studies suggest that those lower in Agreeableness are more likely to engage in white collar crime. Collins and Schmidt (1993) found the Tolerance subscale of the California Psychological Inventory (CPI) discriminated between white collar criminals and noncriminals. The Tolerance scale measures the degree to which a person is tolerant and trusting of others. People scoring lower on this scale are suspicious, judgmental, and do not believe they can depend on others. As evident in this scale description, it is conceptually similar to Agreeableness, particularly the primary trait Trust. In both the validation and cross-validation samples, white collar criminals scored lower on Tolerance than noncriminals (r = -.42, p < .001, 95% CI = -.50 to -.34, and r = -.34, p < .05, 95% CI = -.46 to -.22, respectively). This suggests that white collar criminals are more suspicious and judgmental of others than white collar noncriminals.

Alalehto (2003) identified a Disagreeable type of white collar criminal in her interviews. According to Alalehto, the Disagreeable white collar criminal lacks all forms of social competency. S/he is grudging, suspicious, and envious, full of bitterness and peevishness, and may act with contempt toward the world. S/he is also prejudiced, stubborn, and inflexible and is willing to be dishonest with others when the time is "right." Though Alalehto's description of this type of white collar criminal clearly overlaps with trait Agreeableness, there are also elements of Neuroticism present, particularly Angry Hostility. In particular, the Disagreeable white collar criminal is described as "exploding with anger" when things do not go his or her way.

WORKPLACE SAFETY. Clarke and Robertson's (2005) meta-analysis of the workplace safety literature demonstrated that people low in Agreeableness are more likely to be involved in workplace accidents (ρ = .61, k = 7, N = 420, 95% CI: .55 to .66). The authors note that reason(s) for this relationship are unclear. One explanation is that disagreeable people tend to be hard-headed and stubborn, and therefore may refuse to follow along with rules and regulations pertaining to workplace safety, instead acting in ways that they think are right.

Psychoticism: A Brief Note

In addition to Extraversion and Neuroticism, Eysenck (1970) proposed that a personality trait called Psychoticism is positively associated with criminal behavior. In other words, those high in Psychoticism are more likely to engage in criminal behavior. Psychotics are characterized as aggressive, antisocial, cold, egocentric, lacking in empathy, impersonal, tough-minded, impulsive and creative (Eysenck, 1996). Miller and Lynam's (2001) meta-analysis indicated that Psychoticism is positively related to criminal behavior (ρ = .39, k = 35, N = 15,339, 95% CI = .32 to .35). Cale's (2006) meta-analysis also indicated that Psychoticism is positively related to criminal behavior (ρ = .44, k = 73)[3]. As these effect sizes show, Psychoticism is more strongly related to criminal behavior than both Extraversion and Neuroticism. Despite this evidence, a review of the literature failed to produce any studies with Psychoticism as a predictor of espionage or any of the analogs of security violation behavior. Consequently, it could not be used to provide evidence for an association between criminal behavior and analogs of security violation behavior. While the available evidence made it impossible to establish a link between criminal behavior and analogs of security violation behavior using Psychoticism, it should be noted that Eysenck (1992) argued that Psychoticism is a combination of Conscientiousness and Agreeableness. Costa and McCrae (1995) presented empirical evidence in support of this view. Therefore, Psychoticism was included somewhat indirectly.

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[3] Cale (2006) did not provide an overall N.

SUMMARY OF FINDINGS FROM LEVEL 1, 2, AND 3 EVIDENCE

A review of the literature found few studies providing direct Level 1 and 2 evidence about the Criminal Behavior Guidelines' ability to predict security violation behavior. While Level 1 evidence for IT misuse and criminal sexual behavior was nonexistent, one study provided Level 1 evidence for criminal conduct.

♦ Thompson's (2003) dissertation provided evidence that past criminal behavior is associated with espionage; however, due to the size of his sample, the magnitude of this relationship is unclear, ranging from small to moderately large. This study also focused on the most severe form of security violation, so it provides little insight into the relationship between criminal conduct and security violations that are less serious in nature but more frequent in occurrence.

Level 2 evidence consisted of a small number of studies suggesting that the Criminal Behavior Guidelines, Criminal Conduct in particular, are related to analogs of security violation behavior.

♦ Evidence suggested that Criminal Conduct was related to counterproductive work behavior. However, some evidence was contradictory and points to the importance of gathering comprehensive and current data.
♦ Criminal Conduct and IT misuse were related to malicious insider activity. Studies suggested these behaviors are present in the backgrounds of those that engage in malicious insider activity. However, these studies rely on case study analysis, and do not provide comparisons to insiders that have not engaged in malicious activity, so the extent to which a history of criminal behavior and IT misuse serve as risk factors for such activity is unclear.

Because of the dearth of studies providing Levels 1 or 2 evidence, less direct Level 3 evidence was also reviewed. These efforts were intended to provide indirect evidence for a link between the behaviors encompassed by the Criminal Behavior Guidelines and analogs of security violation behavior through underlying psychological attributes.

♦ A review of the literature resulted in the identification of five personality traits common to criminal behavior and one or more of the analogs of security violation behavior. These included Self-Control, Extraversion, Neuroticism, Conscientiousness, and Agreeableness. The evidence suggested that people most likely to engage in behavior analogous to security violations are High in Neuroticism (particularly Aggressive Hostility), low in Self-Control and low in Conscientiousness and Agreeableness. Though

Extraversion's relationships with criminal behavior and analogs of security violations were low to nonexistent, additional research suggests that those high in Excitement-Seeking are more likely to engage in these behaviors.

♦ Results from studies of criminal behavior provided support for Gottfredson and Hirschi's (1990) proposition that the consistency of criminality reflects a broader syndrome of antecedents described as "deviance proneness." Similar evidence reported for unsafe work behavior suggests that "deviance proneness" underlies a broad range of dysfunctional work behavior analogous to security violation behavior.

MITIGATORS OF CRIMINAL BEHAVIOR EVIDENCE

Evidence of criminal conduct can raise security concerns; however, it does not necessarily result in the denial of a security clearance. When an adjudicator uncovers evidence of criminal conduct in an individual's background, s/he is asked to consider several factors thought to mitigate associated security concerns. The Criminal Conduct guideline outlines several types of mitigating information to consider, including the number of previous offenses, the length of time since the offense(s), evidence that the behavior was coerced, and evidence of successful rehabilitation.

Because mitigating variables play an important role in risk assessment, it is important that adjudicators have the most up-to-date and empirically valid knowledge of factors that increase or decrease the risk associated with an individual who has a criminal past. Ideally, this information would be drawn from research that includes data on criminal history, relevant mitigators, and security violation behaviors. From this data, the hypothesized mitigating role of various factors could be tested. Unfortunately, no such data exists, which is consistent with the scarcity of research linking criminal conduct to security violation behavior or its analogs.

Given this lack of direct evidence, the best alternative is to draw on studies of criminal recidivism. Recidivism is defined as the reversion of an individual to criminal behavior after s/he has committed a prior offense (Maltz, 1984). Over the past several decades, criminologists have focused their efforts on better understanding and predicting this phenomenon. These efforts have resulted in the identification of several risk factors—variables that are associated with and predict the likelihood of future arrest, conviction, or incarceration. Because recidivism research draws on data collected over time to predict future behavior from past behavior, and has identified variables that can increase the predictability of future criminal behavior (or absence thereof) from past criminal behavior, it provides a useful resource for the adjudication process. This research can provide validation for mitigating factors already in use, assist in the identification and provision of concrete metrics to inform adjudication decisions, and highlight mitigating factors not yet a part of the guideline. The following provides a review of recidivism risk factors, drawing on those most likely to inform an adjudicator's assessment of risk.

While recidivism research can inform the adjudication process, measurement and sampling practices can pose serious challenges to drawing valid inferences from this line of work. Typically, criminologists measure recidivism using any of several criteria, such as rearrest, reconviction, and/or reincarceration. These criteria capture serious forms of deviant behavior, those serious enough to be officially recorded, but fail to capture less serious forms of deviance. This is problematic because security violation behavior can range in severity from relatively minor breaches of rules and regulations to gross misconduct resulting in prison time. Consequently, drawing conclusions about mitigators from this literature could be misleading. To minimize this issue, the literature focused on studies that measure recidivism with official arrest

and self-report data. Arguably, these criteria capture a wider range of deviant behavior than reconviction and reincarceration and therefore minimize inferential errors.

A second issue with applying recidivism research to a national security context concerns the samples typically used. These samples are generally composed of adolescents and/or males. Presumably, these samples are different from the pool of individuals seeking clearances, since the adjudication process deals with adult males and females. To reduce this discrepancy, studies relying on adolescent samples were excluded. Including only studies with males and females proved more problematic, since a majority of recidivism studies are based on men. Therefore, we supplemented studies relying on male samples with those that were more diverse in gender composition when such research was available. Another problem with recidivism research samples is that they tend to be composed of individuals that have served time in local, state, and federal institutions. Because the Criminal Conduct guideline specifically states that the commission of offenses resulting in a sentence of a year or longer is disqualifying, the applicability of these results is questionable. Preferably, only studies relying on samples of individuals that have been convicted but not incarcerated or convicted and incarcerated for a period less than 12 months would be presented. Unfortunately, such research is scarce, so we present the results of studies relying on samples that have served time in correctional facilities as juveniles and/or adults. While this limitation cannot be completely overcome, the results of studies using samples that have not been convicted and those using samples that have been convicted and received light sentences are presented where such research was available.

A third consideration is about the relevance of recidivism evidence to the risk of future security violations. The adjudicative process (Adjudicative Guidelines, 2005) assumes that the risk of future security violations is reduced by evidence suggesting a reduced likelihood of reoffending. That is, the adjudicative process assumes the risk of future security violations is closely related to the risk of future criminal behavior, given a history of past criminal behavior. This is an untested assumption. Further, this assumption is not tested by the recidivism evidence presented in this section. Rather, the language used here to describe recidivism evidence as "mitigator" evidence is based on this same untested assumption about a relationship between security violation risk and future criminal behavior risk.

The following section presents research on several variables associated with the probability of future criminal behavior. These variables have been organized into three categories—demographic, criminal history, and lifestyle characteristics. This organization of the literature was chosen to reflect the types of information an adjudicator likely has in hand when assessing the risk associated with an individual with a criminal history.

Demographic Characteristics

When an adjudicator finds evidence of past criminal conduct, one source of data that can be used to gauge risk is the demographic makeup of the individual. Recidivism research suggests that three demographic characteristics are associated with an increased risk of recidivism—age, gender, and race.

Age and Recidivism

The relationship between age and crime is one of the most firmly established empirical relationships in Criminology (Beaver, Wright, DeLisi, & Vaughn, 2008). The relationship between age and crime, or the age-crime curve as it is called, is nonlinear. Research consistently shows that criminal behavior rises markedly in the beginning of adolescence, peaks around the ages of 18-19, and begins to decline sharply thereafter (Gottfredson & Hirschi, 1990). The age-crime curve is depicted in Figure 2[4].

Given the relationship between age and the rate of criminal behavior, it is not surprising that research has shown that age is related to recidivism. Gendreau, Little, and Goggin (1996) reviewed over 130 studies of adult recidivism. From these studies, the authors identified 56 studies with data on the relationship between age and recidivism. Meta-analysis of this data indicated that younger age was positively associated with higher recidivism ($\rho = .11$, N = 61,315, 95% CI = .10 to .12).
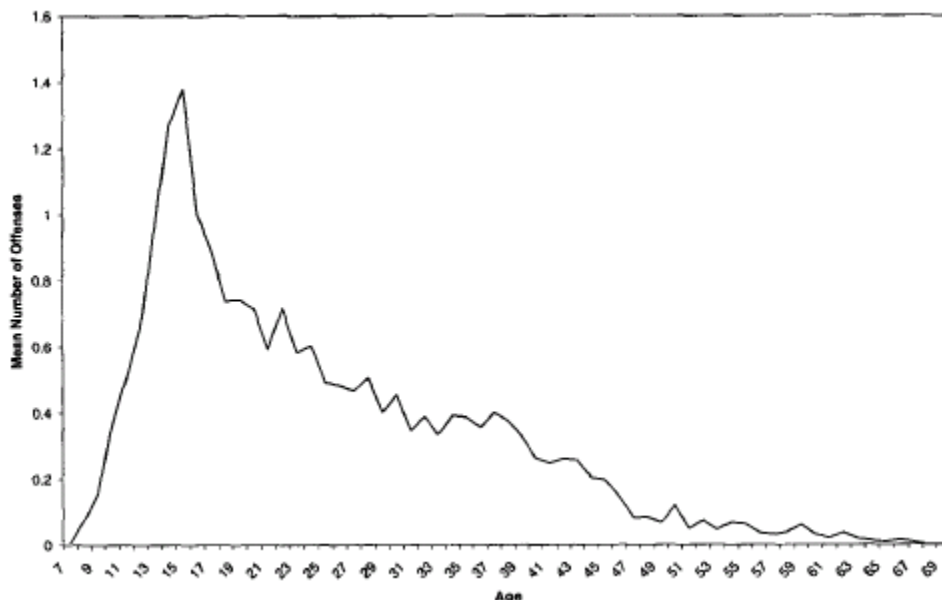

Figure 2. Effect of age on number of crimes.

[4] Figure 2 is based on the arrest data of a group of 500 men that were followed from the ages of 7 to 70 (Sampson & Laub, 2003).

Langan and Levine (2002) conducted one of the largest studies of recidivism to date. The authors tracked rearrest, reconviction, and reincarceration data for 272,111 prisoners for three years subsequent to their release from prison in 1994. The study included 15 states, and the sample represented two-thirds of the prison population released in 1994. Among the data provided were the rearrest rates of different age brackets. This information is provided in Table 12. Comparison of the confidence intervals shows that recidivism increases with age, but the rearrest percentages do overlap for several groups. For example, with a 95% confidence interval of 67.2%-70.4%, those aged 30-34 are less likely to be rearrested than those aged 14-17 and 18-24, but this group is just as likely to be rearrested as those aged 25-29.

A series of reports produced by the North Carolina Sentencing and Policy Advisory Commission (NCSPAC) provides additional data on this relationship between age and recidivism. Every two years, the NCSPAC evaluates the effectiveness of the state's correctional programs. The main evaluation criteria used are the rearrest, reconviction, and reincarceration data of individuals released from prison and probation. From 2002 to 2008, the NCSPAC produced four reports with analysis of the rearrest, reconviction, and reincarceration rates of individuals released from prison and probation. Among the reports' various analyses are multiple regressions used to determine the direction and strength of various factors' relationships with rearrest.

Table 12. 3-Year Rearrest Rates of Prisoners Released in 1994 by Age Bracket

Age	Rearrested	95% Confidence Interval
14-17	82.1%	72.5 - 91.7%
18-24	75.4%	73.8 - 77.0%
25-29	70.5%	68.9 - 72.1%
30-34	68.8%	67.2 - 70.4%
35-39	66.2%	64.2 - 68.2%
40-44	58.4%	55.7 - 61.1%
45+	45.3%	42.4 - 48.2%

Table 13 provides data on the association between age and rearrest probabilities for three release cohorts. These estimates account for the several demographic and criminal history variables reported below, including gender, substance abuse, offense classification, number of prior arrests, and employment and marital status. For each cohort, the relationship is presented for the overall sample and prison and probation release subsamples. As shown, age has a small, but statistically significant effect, on the probability of rearrest in each release cohort. The percentages shown in bold are the changes in arrest rates for each year of increase in age. For example, among the 58,238 people released in 1998-1999, people older by one year had an average rearrest rate over the four year follow up period .08% lower than people one year younger. Comparison of this relationship in the prison and probation subsamples indicates that age had approximately the same degree of impact on rearrest probability in both groups.

Table 13. The Impact of Age on the Probability of Rearrest

Year of Sample's Release (FY)	Follow-up Period	All Releases	N	ARP	Prison	N	ARP	Probation	N	ARP
1998/1999	4 years	-0.8%	58,238	42.7%	-1.0%	18,691	55.4%	-0.8%	39,547	36.8%
2001/2002	3 years	-1.0%	57,973	38.2%	-1.6%	17,118	49.8%	-0.8%	40,855	33.3%
2003/2004	3 years	-0.7%	56,983	38.7%	NS	17,093	50.2%	-0.7%	39,890	33.7%

NS = No significant difference; **ARP** = Average Rearrest Probability

Gender and Recidivism

Another consistent finding in the field of Criminology is that men are more likely to engage in criminal behavior than women (Simons, Stewart, Gordon, Conger, & Elder, 2002). As with age, it is not particularly surprising that men are more likely to recidivate than women. Gendreau et al.'s (1996) meta-analysis showed that men were more likely to recidivate than women (ρ = .06, k = 17, N = 62,021, 95% CI = .05 to .07). Though statistically significant, the size of this effect is rather small.

Benda (2005) tracked the felony arrests and parole violations of 300 male and 300 female graduates of a correctional boot camp over a period of 60 months. The sample was composed of first-time referrals to adult correctional facilities taking part in a boot camp to reduce their prison sentences. Benda's analyses showed that men were more likely to recidivate over this period than women (p < .01). Figure 3 depicts the number of men and women that did not recidivate (i.e., Survival Rate) over this period. By the end of the 60-month period, 44% (95% CI = 38.4% to 49.6%) of men recidivated compared to 26% (95% CI = 21.0% to 31.0%) of women[5].

Bersani, Laub, and Niewbeerta (2009) analyzed data from the Criminal Career and Life-Course study (CCLS). The CCLS tracked the conviction rates a representative sample of 4, 615 individuals convicted of various offenses in the Netherlands in 1977. Participants were followed up to the year 2000. The sample was predominantly male (N = 4,187) but also included several females (N = 428). Analyses revealed that males were more likely to be reconvicted for a new offense over this time period than females (r = .14, p < .001, 95% CI = .11 to .17).

Huebner and Cobbina (2007) analyzed data from the 2000 Illinois Probation Outcome Study. The sample included 3570 individuals released from probation in the fall of 2000; it was 80% male and 20% female. The authors tracked the sample's arrest rate over a period of 4 years. Accounting for age, employment status, and marital status, the authors found that the odds a male would be rearrested was 1.29 times greater than that of a female, p < .05.

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[5] These figures are based on adjustments to the figures reported in the article. For both males and females, those that violated parole have been excluded from the percentages.
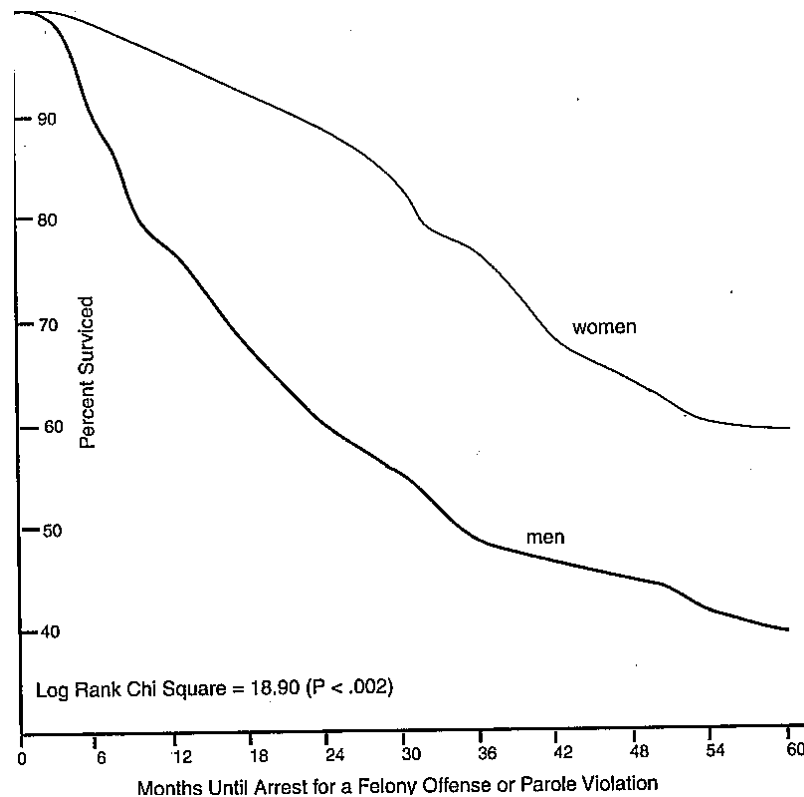
Figure 3. Rearrest Survival Rates for Men and Women

The NCSPAC has included the gender of those released in its regression analyses. These analyses show that males are more likely to be rearrested than females in each cohort. As shown in Table 14, males were 3.1 – 5.7% more likely to be rearrested than females in the follow-up periods. These data control for several demographic and criminal history variables, including age, substance abuse, offense classification, number of prior arrests, and employment and marital status. Breaking the data down by release type indicates that this relationship was only significant for those released from probation.

Table 14. The Impact of Gender on Rearrest Probability

Year of Sample's Release (FY)	Follow-up Period	All Releases	N	ARP	Ps	N	ARP	Pr	N	ARP
1998/1999	4 years	3.3%	58,238	42.7%	NS	18,691	55.4%	4.2%	39,547	36.8%
2001/2002	3 years	5.3%	57,973	38.2%	3.1%	17,118	49.8%	5.7%	40,855	33.3%
2003/2004	3 years	4.6%	56,983	38.7%	NS	17,093	50.2%	5.4%	39,890	33.7%

NS = No significant difference   **ARP** = Average Rearrest Probability   **Ps** = Prison Releases   **Pr** = Probation Releases

Race and Recidivism

Gendreau et al.'s (1996) meta-analysis indicated that Whites were less likely to recidivate than non-Whites (ρ = .17, k = 21, N = 56,727. 95% CI = .16 to .18). Langan and Levine (2002) also found a relationship between race and recidivism in their study of the three-year rearrest rates of prisoners released in 1994. According to their data, Blacks were more likely to be rearrested than Whites (72.9%, 95% CI = 72.7% to 73.1% and 67.9%, 95% CI = 62.4% to 63.0%, respectively). Additionally, those in the "Other" racial category were less likely to be rearrested than both Blacks and Whites (1.1%, 95% CI = 0.7% to 1.5%). They also found that non-Hispanics were more likely to be rearrested than Hispanics (71.4%, 95% CI = 71.2% to 72.0% and 64.5%, 95% CI = 64.2% to 65.1%, respectively).

The North Carolina Sentencing and Policy Advisory Commission included race as a predictor of rearrest in each of it reports. Race was measured dichotomously in each report. The "Race" variable indicates whether a member of the sample was Black or non-Black. As shown in Table 15, Black members of the cohorts were between 4.6% and 6.4% more likely to be rearrested than those of other racial categories. This relationship controlled for several demographic and criminal history variables, including age, substance abuse, offense classification, number of prior arrests, and employment and marital status. Across all release years, this difference is slightly stronger for those released from prison (95% CI = 6.8%-7.2%) than probation (95% CI = 4.9%-5.1%).

Table 15. Impact of Number of Race on Rearrest Probability

Year of Sample's Release (FY)	Follow-up Period	All Releases	N	ARP	Ps	N	ARP	Pr	N	ARP
1998/1999	4 years	6.4%	58,238	42.7%	7.3%	18,691	55.4%	6.1%	39,547	36.8%
2001/2002	3 years	6.3%	57,973	38.2%	8.4%	17,118	49.8%	5.4%	40,855	33.3%
2003/2004	3 years	4.6%	56,983	38.7%	5.3%	17,093	50.2%	3.5%	39,890	33.7%

NS = No significant difference **ARP** = Average Rearrest Probability **Ps** = Prison Releases **Pr** = Probation Releases

A potential limitation of evidence about relationships between race and recidivism based on rearrest data is that it may reflect racism inherent in the criminal justice system rather than true racial differences. The degree to which these racial differences reflect racial bias in the system and/or true racial differences in criminal offending is still the subject of some debate (Piquero & Brame, 2008). Consequently, this factor should be considered with caution.

Criminal History Characteristics

In addition to age, gender, and race, adjudicators could inform their assessments of risk by looking at dimensions of an individual's criminal history. A review of the research suggests that at least four dimensions of an individual's criminal history may be important—the number of past offenses, offense class, offense type, and time since last offense. A review of research on the association between each of these characteristics and recidivism is provided below.

Number of Past Offenses and Recidivism

Research indicates that the number of previous offenses predicts the probability that an individual will recidivate (Blumstein, Farrington, & Moitra, 1985; Greenburg, 1991; Kurleychek, Brame, & Bushway, 2006). For example, Kurlychek et al. (2006) examined the relationship between number of prior arrests and the probability of future arrest with data from the 1958 Philadelphia Cohort Study. The Philadelphia Cohort Study tracked the arrest data of over 13, 000 males born in Philadelphia in 1958. Participants were followed from the ages of 18-26. These data are presented in Figure 4. As illustrated, the probability of a new arrest increases with the number of prior arrests up to a point, increasing from a 40% probability with 1 prior arrest to approximately an 80% probability with 4 offenses. The probability of a new arrest levels remains relatively constant after this point.
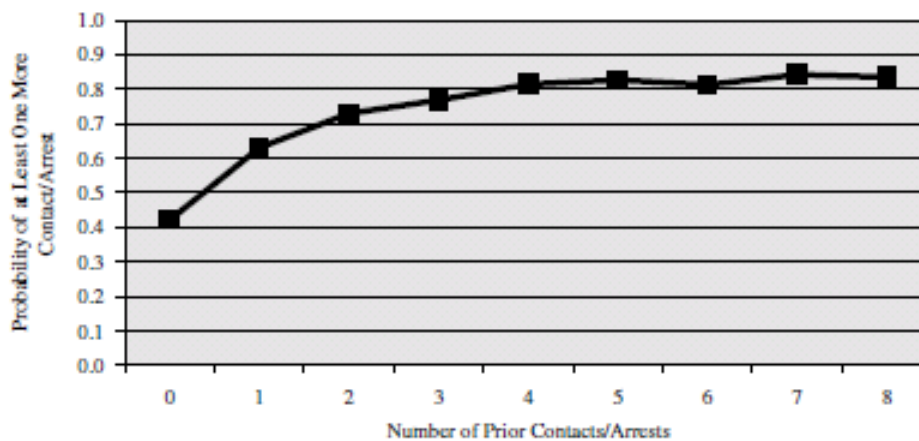
Figure 4. The Effect of Number of Prior Arrests on Likelihood of Future Arrest

The North Carolina Sentencing and Policy Advisory Commission included the number of previous arrests in its regression analyses. As shown in Table 16, the number of prior arrests was associated with rearrest in each cohort. An increase of one prior arrest increased the likelihood of rearrest between 2.1 and 3.8%. This relationship remains statistically significant, even after controlling for age, gender, substance abuse, offense class, and employment and marital status. Across all release years, this effect was stronger in the probation sample (95% CI = 3.6% to 3.84%) than the probation sample (95% CI = 2.1% to 2.4%).

Table 16. Impact of Number of Prior Arrests on Rearrest Probability

Year of Sample's Release (FY)	Follow-up Period	All Releases	N	ARP	Ps	N	ARP	Pr	N	ARP
1998/1999	4 years	3.8%	58,238	42.7%	2.8%	18,691	55.4%	5.2%	39,547	36.8%
2001/2002	3 years	3.1%	57,973	38.2%	2.8%	17,118	49.8%	3.5%	40,855	33.3%
2003/2004	3 years	2.1%	56,983	38.7%	1.1%	17,093	50.2%	2.5%	39,890	33.7%

NS = No significant difference ARP = Average Rearrest Probability Ps = Prison Releases Pr = Probation Releases

Offense Class and Recidivism

Offense class refers to whether a crime is classified as a felony or misdemeanor. Offense class is discussed in the Adjudication Desk Reference. According to the ADR:

"Conviction, admission, or strong evidence of a felony will usually support a recommendation for disapproval unless there are unusual mitigating circumstances."

An inference underlying this statement is that those convicted of or admitting to felonies are more likely to engage in security violation behavior than those convicted of or admitting to a misdemeanor. This inference can be tested with the regression data provided by the North Carolina Sentencing and Policy Advisory Commission. The Commission compared the rearrest data of the FY2003/2004 cohort down into those originally convicted of misdemeanors and those originally convicted of felonies. A comparison of each group's rearrest rates indicated that those convicted of misdemeanors (33.9%, 95% CI = 33.6% to 34.4%) were less likely to be rearrested than those convicted of felonies (44.2%, 95% CI = 43.6% to 44.8%). These data provide support for this portion of the guideline. Interestingly, the Commission's regression analysis indicated that, controlling for the effects of age, gender, substance abuse history, number of prior arrests, and employment and marital status, reversed this apparent effect. Those convicted of felonies were 8.1% less likely to be rearrested than those convicted of a misdemeanor in the probation subsample. The Commission found the same result in the FY2001/2002 and FY1998/1999 cohorts. These data are presented in Table 17.

Table 17. Impact of Offense Classification on Rearrest Probability

Year of Sample's Release (FY)	Follow-up Period	All Releases	N	ARP	Ps	N	ARP	Pr	N	ARP
1998/1999	4 years	-7.5%	58,238	42.7%	NS	18,691	55.4%	-9.7%	39,547	36.8%
2001/2002	3 years	-7.6%	57,973	38.2%	NS	17,118	49.8%	-8.0%	40,855	33.3%
2003/2004	3 years	-6.7%	56,983	38.7%	NS	17,093	50.2%	-8.1%	39,890	33.7%

NS = No significant difference ARP = Average Rearrest Probability Ps = Prison Releases Pr = Probation Releases

Offense Type and Recidivism

Crime type is third characteristic of an individual's history to consider in the assessment of risk, as research indicates that those convicted of some crime types are more likely to be rearrested than others. Langan and Levine (2002) provided the three year rearrest data of

prisoners released in 1994 by the type of crime for the prisoners were originally convicted. Several crime types were considered, including violent, property, drug, and public order offenses. Recidivism data was also provided for crimes falling under each type. These data are presented in Table 18. A comparison of the rearrest percentages indicates that those most likely to recidivate were those convicted of property offenses. A greater percentage of those convicted for a property offense were rearrested over the 3-year tracking period than those convicted of violent, drug, and public order offenses. In addition, those convicted of drug offenses were more likely to be rearrested in the tracking period than those convicted of violent offenses and public order offenses. The rearrest rates of violent and public order offenders were not statistically different.

Table 18. 3-Year Rearrest Rates of 1994 Prison Releases by Offense Type

Violent Offenses	3-Year Rearrest Rate	95% Confidence Interval	Property Offenses	3-Year Rearrest Rate	95% Confidence Interval
Violent Offenses					
Overall	61.7%	60.3% to 63.1%	Overall	73.8%	72.4% to 75.2%
Homicide	40.7%	37.4% to 44.0%	♦ Burglary	74.0%	72.0% to 75.0%
Kidnapping	59.4%	41.4% to 77.4%	♦ Larceny/Theft	74.6%	72.3% to 77.0%
Rape	46.0%	46.0% to 46.0%	♦ Motor Vehicle Theft	78.8%	74.5% to 83.1%
Other Sexual Assault	41.4%	41.2% to 41.6%	♦ Arson	57.7%	45.0% to 70.4%
Robbery	70.2%	67.9% to 72.6%	♦ Fraud	66.3%	62.2% to 70.4%
Assault	65.1%	62.8% to 67.5%	♦ Stolen Property	77.4%	71.1% to 83.7%
Other Violent	51.7%	37.0% to 66.4%	♦ Other Property	71.1%	63.6% to 78.6%
Drug Offenses					
Overall	66.7%	65.1% to 68.3%	Overall	62.2%	59.7% to 64.8%
Possession	67.5%	64.4% to 70.6%	♦ Weapons	70.2%	64.7% to 75.7%
Trafficking	64.2%	62.6% to 65.8%	♦ DUI	51.5%	47.4% to 55.6%
Other	75.5%	70.2% to 80.8%	♦ Other Public Order	65.1%	62.0% to 68.2%

The Recidivism of Sex Offenders

In 2003, Langan, Schmitt, and Durose reported on the three-year recidivism rates of 1994 prison releases originally convicted of sex crimes. Comparing the three-year recidivism rates of those convicted of sexual crimes to those convicted of nonsexual crimes revealed that sex offenders were less likely to be rearrested for any offense (43%, 95% CI = 42.00% to 44.00% versus 68.4%, 95% CI = 68.2% to 68.5%). The authors also broke sex offenses down into four types: rape, sexual assault, child molestation, and statutory rape. Each of these groups had lower three-year recidivism rates than those previously convicted of nonsexual offenses. The three-year rearrest rates for each offense are presented in Table 19

Table 19. 3-Year Rearrest Rates of 1994 Prison Releases by Sexual Offense Type

Sexual Offenses	3-Year Rearrest Rate	95% Confidence Interval
Child Molestation	39.4%	38.0% to 40.9%
Statutory Rape	49.9%	45.2% to 54.6%
Rape	46.0%	44.2% to 47.2%
Sexual Assault	41.5%	40.3% to 42.7%
Overall	43.0%	42.0% to 44.0%

Time since Last Offense and Recidivism

The Criminal Conduct guideline refers to the time since last offense as a mitigating factor. The primary inference underlying this mitigator is that the risk of future security violations is like the risk of future criminality. The assumption is that just as risk of new criminal offenses decreases with the time since last offense, the risk of security violations also decreases with time since last criminal offense. Considerable data have shown decrease in new crime rates with length of time since last offense (see, Blumstein & Nakamura, 2009; Kurleycheck, Brame, & Bushway, 2007; Kurleycheck et al., 2006; Soothill & Francis, 2009) but no studies have investigated the companion assumption that the risk of security violations decreases with time since last criminal offense.

Kurlycheck etl al. (2006) analyzed the arrest data of over 13,000 males from ages 18 to 26 from the 1958 Philadelphia Cohort Study. To better understand the length of time it takes for a person with an arrest to have approximately the same arrest probability as someone without an arrest history, the authors separated the sample into two groups. The first group—Offenders—was composed of individuals with at least one arrest by age 18, while the second—Non-offender—was composed of individuals with no arrests by age 18. Using these groupings, the authors calculated the proportion of individuals arrested to those not arrested in each group. This proportion was calculated for 24 consecutive time periods (i.e., every 4 months) over an 8 year period (i.e. ages 18-26). As shown in Figure 5, the Offender group had a much higher rate of arrest than the Non-offender group at age 18. However, this gap narrowed substantially across time due to a steady decline in the arrest rate of the Offender group. By age 26, the proportion of those arrested to those not arrested in the Offender group was approximately 2%, while this proportion was 1% in the Non-offender group. Though the arrest rate of those in the Offender group was still twice that of the Non-offender group, this represented a very low rate of arrest.
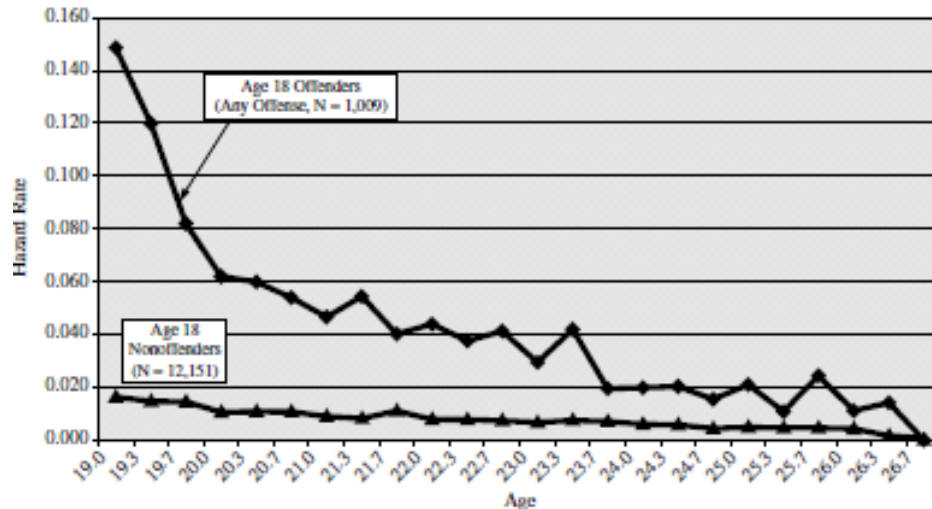
Figure 5. Comparison of Arrest Rates for age 18 Offenders and Nonoffenders

Kurleycheck, Brame, and Bushway (2007) investigated the probability that an individual would come in contact with the police at ages 25-32 and ages 28-32 based on the length of time since their last police contact. To examine this issue, the authors collected data on the number of police contacts for a group of 670 males from the 1942 Racine Cohort Study. The Racine Cohort Study was a prospective study following males born in 1942 up to the age of 32. As shown in Table 20, the probability of police contacts at ages 25-32 and ages 28 to 32 increases as the time since last contact decreases. Subscript differences indicate that the probability of police contacts at ages 25-32 for those with a juvenile record or those whose last police contact was at ages 18 through 21 is approximately the same as those who have no history of police contacts. When the probability of police contacts between the ages of 28-32 is considered, those whose last police contact at age 21 are also equivalent to those with no record.

Blumstein and Nakamura (2009) examined the time it takes for the arrest rate of those with a criminal record to approach that of the general population as a function of first offense type and age at first offense. The *Age at First Offense* variable had three levels—16, 18, and 20. The *Type of Offense* variable also had three levels—Robbery, Burglary, and Aggravated Assault. Arrest data from 1980 to 2007 was collected from a criminal record depository in New York State for almost 2,000 people. Table 21 provides the estimated time (in years) it takes for the arrest rates of these groups to approximate that of the general population. The probability of arrest at the point of overlap is presented in parentheses. These data suggest that the time it takes for the arrest risk of a person with a criminal record to approximate that of the general population depends on age at first offense and the nature of the first offense. For example, if a person committed their first offense at age 16 and that offense was a robbery, it would take approximately 8 years, 6 months (i.e., up to around the age of 25) for this person to have the arrest risk as someone from the general population. At that time, the proportion of those arrested to those not arrested with the same onset age and original arrest type is 10%.

Table 20. Probability of Police Contacts at Ages 25-32 and Ages 28-32 as a Function of Age at First Contact

	Ages 25-32		Ages 28-32	
	N	Probability of Police Contact	N	Probability of Police Contact
No Record	199	.18[a]	177	.08 [a]
Juvenile Record	119	.29 [a,b]	100	.16 [a,b]
Age 18	27	.30 [a,b,c]	24	.21 [a,b,c]
Age 19	39	.36 [a,b,c]	30	.17 [a,b,c]
Age 20	44	.34 [a,b,c]	34	.15 [a,b,c]
Age 21	41	.54 [b,c]	24	.21 [a,b,c]
Age 22	45	.58 [c,d]	31	.39 [b,c,d]
Age 23	65	.54 [c,d]	41	.27 [b,c]
Age 24	91	.75 [d]	33	.30 [b,c]
Age 25			34	.41 [b,c,d]
Age 26			54	.39 [b,c,d]
Age 27			88	.69 [d]

Probability estimates with differing subscripts are different at $p < .05$

Table 21. Years to Convergence of Arrest Risk of Offenders and General Population as a Function of Age at First Offense and Offense Type

First Offense	Age at First Offense		
	16	18	20
Robbery	8.5 (.10)	7.7 (.10)	4.4 (.09)
Burglary	4.9 (.11)	3.8 (.10)	3.2 (.09)
Aggravated Assault	4.9 (.11)	4.3 (.10)	3.3 (.09)

Lifestyle Characteristics

Adjudicators might also have an interest in the extent to which characteristics of an individual's lifestyle mitigate against a history of criminal behavior. The literature on recidivism has identified several lifestyle characteristics worthy of consideration. These include the criminality of one's associates or friends, substance abuse, employment history, marital/relationship quality and history, and military service.

Criminal Associates

Sutherland's Differential Association Theory (1955) proposes that people learn criminal values, attitudes, techniques and motives through interaction with antisocial people. Criminal associations can also lead to the continuation of criminal offending as close, meaningful relationships with criminal others provides opportunities for offending and perpetuates criminal proclivities and perspectives (Serin & Lloyd, 2009). Gendreau et al.'s (1996) meta-analysis revealed that the criminality of one's companions was positively associated with recidivism (ρ = .21, N = 11,962, 95% CI = .20 to .23), suggesting that the more criminal one's associates, the more likely he or she is to engage in criminal behavior.

Three studies have provided data on the relationship between criminal associates and recidivism in both males and females. Giordano et al. (2003) asked participants with a history of juvenile delinquency to indicate how frequently they and their friends engaged in crime over 12 months preceding the study. The results indicated that the criminal involvement of one's friends was positively associated with self-reported criminality (r = .22, p < .01, 95% CI = .08 to .35), even after accounting for age, gender, race, self-reported juvenile delinquency, spousal attachment, job stability, and partner criminal involvement. In addition, this relationship varied as a function of gender. The relationship between peer criminal involvement and self-reported criminal involvement was significantly stronger for males than females.[6] Benda (2004) also found evidence suggesting that the influence of criminal associates on recidivism varies by gender. In this study, participants indicated how many of their friends engaged in criminal behavior. Among males, increases in the number of criminal associates increased the odds of recidivism by 73%, whereas among females, the odds of recidivism increased only by 21%. In contrast to Giordano et al. (2003) and Benda (2005), Simons et al. (2002) did not find a significant interaction between gender and peer criminal involvement when using self-reported criminal behavior as a criterion. The number of criminal peers was, however, positively associated with self-reported criminal involvement for both males (r = .28, p < .05, 95% CI =.09 to .45) and females (r = .24, p < .05, 95% CI = .04 to .40). These relationships remained significant after accounting for self-reported juvenile delinquency, delinquent adolescent peers, the criminal involvement of one's romantic partner, the quality of one's romantic relationship, and job attachment. A major difference between Simons et al.'s study and the previous two

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[6] The authors did not provide the data necessary to calculate the size of this difference.

studies is that Simons et al. used a sample that had not been adjudicated in the past. This suggests that gender differences may emerge in the relationship between criminal associates and crime for those whose behavior has been serious enough to warrant legal action but not those who have not.

Substance Abuse

Scores of studies have examined the link between substance abuse and recidivism. The results of these studies have been statistically aggregated in two meta-analyses. Gendreau, Little and Goggin's (1996) meta-analysis showed a positive relationship between substance abuse and adult recidivism(ρ = .21, k = 60, N = 54,383, 95% CI = .20 to .22). More recently, Dowden and Brown (2002) conducted a meta-analysis of 45 studies on the relationship between substance abuse and recidivism. The authors broke down substance abuse into three types: drug, alcohol, and combined drug and alcohol. Drug and alcohol abuse refer to both previous and current abuse. Recidivism was defined broadly, encompassing new charges, rearrest, reconviction, and reincarceration. In addition to overall recidivism, recidivism was separated into two types—violent and general. Dowden & Brown's analyses resulted in several notable findings. First, alcohol, drug, and drug-alcohol abuse were positively related to recidivism for general offenses (ρ = .12, k = 36, N = 23,992, 95% CI = .11 to .13; ρ = .19, k = 38, N = 25,409, 95% CI = .18 to .20; and ρ = .22, k = 11, N = 3,214, 95% CI = .19 to .26, respectively). Effect size comparisons indicated that drug and alcohol-drug abuse were stronger predictors of overall recidivism than alcohol abuse, although they did not differ from each other. Second, alcohol and drug abuse were positively related to recidivism for violent offenses (ρ = .10, k = 15, N = 3,557, 95% CI = .07 to .13 and ρ = .14, k = 9, N = 2577, 95% CI = .10 to .18, respectively). Combined alcohol-drug abuse, however, was not significantly related to this type of recidivism (ρ = .12, k = 2, N = 119, 95% CI = -.06 to .29). This latter result is likely a result of a small sample, which limited statistical power. Finally, these relationships did not vary as a function of gender, suggesting that the relationship between substance abuse and recidivism is similar for males and females. Together, the results of this study suggest that a drug abuse problem is more likely to result in recidivism than alcohol abuse. Though alcohol abuse problems increase the likelihood of violent reoffenses, it does not necessarily have the same effect on general reoffending.

The North Carolina Sentencing and Policy Advisory Commission examined the role of substance abuse history on the rearrest probabilities of its prison and probation releases. As shown in Table 22, those with a history of substance abuse were 1.4%-4.3% more likely to be rearrested than those without a substance abuse history in each cohort. This relationship remained significant after accounting for age, gender, offense classification, the number of prior arrests, and employment and marital status. This effect was inconsistent in the prison sample but was significant in all probation samples.

Table 22. The Impact of Substance Abuse History on Rearrest Probability

Year of Sample's Release (FY)	Follow-up Period	All Releases	N	ARP	Ps	N	ARP	Pr	N	ARP
1998/1999	4 years	1.4%	58,238	42.7%	NS	18,691	55.4%	1.5%	39,547	36.8%
2001/2002	3 years	4.3%	57,973	38.2%	4.5%	17,118	49.8%	3.5%	40,855	33.3%
2003/2004	3 years	3.5%	56,983	38.7%	NS	17,093	50.2%	3.7%	39,890	33.7%

NS = No significant difference   ARP = Average Rearrest Probability Ps = Prison Releases Pr = Probation Releases

Marriage, Employment, Military Service and Recidivism

Theory and research suggests that marriage, employment, and military service can contribute to desistance from criminal offending. Sampson and Laub's (1990) Age-Graded Theory of Informal Social Control (ASC) is the primary theoretical framework underlying this line of research. The main premise is that criminal behavior varies as a function of the strength of an individual's ties to elements of conventional society. When social bonds are weak or absent, a person is more likely to start or persist in criminal behavior. Conversely, when these ties are strong, s/he is less likely to engage in criminal behavior, regardless of criminal propensities.

The strength of a bond depends on social exchange. As a person invests time and energy into a relationship, they accumulate various forms of social capital, such as privilege, status, affection, and support. The more a person invests, and the more social capital s/he acquires from a given social bond, the stronger it is. Strong ties to elements of conventional society inhibit criminal behavior because such behavior can damage or break the ties, resulting in the loss of social capital that has accumulated over time.

Elements of conventional society vary in importance over the lifespan (Sampson & Laub, 1993). In childhood, strong ties to school, family, peers, teachers, and parents are believed to inhibit delinquent behavior. For example, a child that puts a lot of effort into his or her schoolwork and receives special attention from the teacher is unlikely to act out in class. In adulthood, strong ties to marriage, employment, peers, and community are believed to be the most important inhibitors of crime.

The following provides a review of the crime-inhibiting effects of marriage, employment, and military service, especially since these bonds have received special empirical attention. It should be noted, however, that though empirical evidence for the crime-inhibiting effects of marriage and employment are abundant, that for military service is more limited.

Marriage and Recidivism

Several studies have provided evidence suggesting that marriage reduces criminal offending (Horney, Osgood, & Marshall, 1995; Huebner & Cobina, 2004; Sampson & Laub, 1990; Sampson, Laub, & Wimer, 2006).Horney and colleagues (1995) collected retrospective survey data from 658 newly convicted males. Participants were asked to provide information on

their involvement in criminal behavior and life circumstances for every month in the two years preceding their arrest. The measurement period ranged from 25 to 36 months. Analysis of this data indicated that living with one's spouse was negatively related to assault offenses ($r = -.09$, $p < .05$, 95% CI = -.17 to -.01). Living with one's spouse, however, was unrelated to property ($r = -.02$, ns, 95% CI = -.06 to .10) and drug offenses ($r = -.02$, ns, 95% CI = -.06 to .10). In contrast, living with one's girlfriend was positively associated with drug crimes ($r = .09$, $p < .05$, 95% CI = .01 to .17).

Sampson and Laub (1990) tested the relationship between marital status and criminal behavior using data from the Glueck Study—a 25-year study (1940-1965) on life course differences among 500 males with a history of juvenile delinquency and 500 males without such history. The groups were matched on age, ethnicity, IQ and low income residence. The authors analyzed data collected when the participants were between the ages of 17-25 and 25-32. Criminal behavior was measured with official arrest data and self-reported deviance. The results indicated that marital status was unrelated to both indices of criminal behavior after accounting for prior arrest, job stability, occupational commitment, and income. However, when focusing on those who were married, there was a positive relationship between how attached a man was to his spouse and criminal behavior (discussed below).

Sampson et al. (2006) tested the relationship between marital status and criminal behavior longitudinally with data from the Glueck study. In 1994, the authors supplemented data this data by collecting additional information on 52 participants with histories of juvenile delinquency. With this additional information, Sampson and his colleagues were able to lengthen the study period from the time participants were aged 7 to 70. To measure marriage during these years, participants were asked to indicate the years in which they were married using a life calendar. The authors used this information and official arrest data to test whether or not within-person changes in marital status were related to within-person changes in criminal behavior. Analyses of these data provided evidence that marriage reduced criminal behavior by approximately 35%. Figure 6 displays the probability of marriage and crime over time.
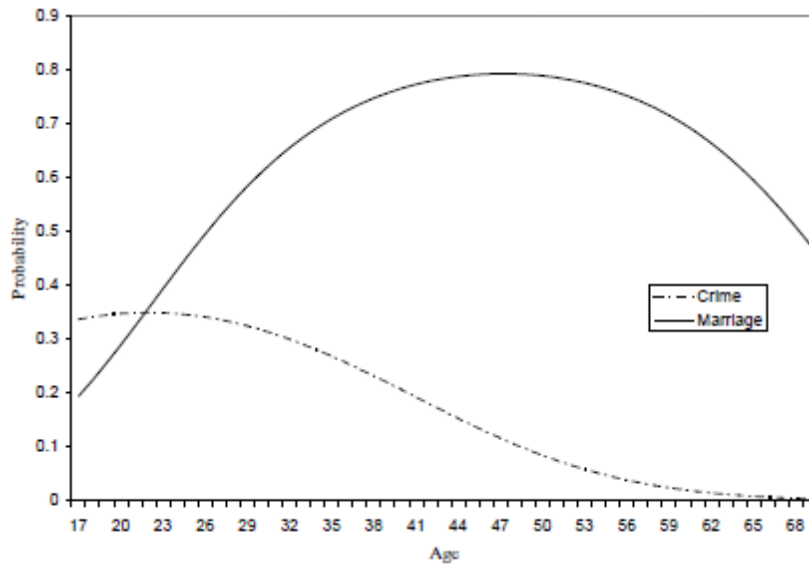
Figure 6. Predicted Crime and Marriage Probabilities

The North Carolina Sentencing and Policy Advisory Commission included marital status (i.e., married/not married) as a predictor of rearrest in each of its reports. As shown in Table 23, the results were mixed across cohorts. For those released in FY 2003/2004, marriage reduced the likelihood of rearrest in the probation sample by 2.6% but failed to do so for the prison sample. Conversely, for those released in FY 2001/2002, marital status reduced the likelihood of rearrest by 4.1% in the prison release sample but failed to do so for the probation sample. Finally, marital status had no impact on the likelihood of rearrest for those released from prison or probation in FY 1998/1999. These results controlled for age, gender, substance abuse, number of prior arrests, and employment and marital status.

Table 23. Impact of Marital Status on Rearrest Probability

Year of Sample's Release (FY)	Follow-up Period	All Releases	N	ARP	Ps	N	ARP	Pr	N	ARP
1998/1999	4 years	NS	58,238	42.7%	NS	18,691	55.4%	NS	39,547	36.8%
2001/2002	3 years	-2.2%	57,973	38.2%	-4.1%	17,118	49.8%	NS	40,855	33.3%
2003/2004	3 years	-2.8%	56,983	38.7%	NS	17,093	50.2%	-2.6%	39,890	33.7%

NS = No significant difference **ARP** = Average Rearrest Probability **Ps** = Prison Releases **Pr** = Probation Releases

Each of the previous results is based on a dichotomous measure of marital status (i.e., married - not married). While this dichotomy serves to identify those who are in or have been in a marital union, it does not capture the strength of the marital bond. Sampson and Laub (1993) argued that it is not marriage per se that reduces criminal offending; it is the quality of marital attachment. Some of the studies mentioned above, therefore, also included measures of marital attachment. Focusing on married individuals with and without a history of juvenile delinquency, Sampson and Laub tested the hypothesis that marital attachment reduces criminal behavior. Marital attachment was defined as the fulfillment marital responsibilities, both emotional and

financial as well as the absence of voluntarily prolonged periods of separation from one's spouse (e.g., separation, divorce, desertion). The results indicated that, among those with a history of juvenile delinquency, marital attachment was negatively related to self-reported delinquency ($r = -.18$, $p < .05$, 95% CI = -.33 to -.02). Similarly, marital attachment was negatively related to arrests per year free ($r = -.18$, $p < .05$, 95% CI = -.33 to -.02) at ages 17-25 and at ages 25-32 ($r = -.24$, $p < .05$, 95% CI = -.38 to -.10 and $r = -.31$, $p < .05$, 95% CI = -.44 to -.18, respectively). The results were mixed for those without a history of juvenile delinquency. In particular, at ages 17-25, marital attachment was negatively related to arrests ($r = -.25$, $p < .05$, 95% CI = -.38 to -.14) but not to self-reported delinquency ($r = -.11$, ns, 95% CI = -.24 to 0.00). Simialrly, at ages 25-32, marital attachment was negatively related to arrests ($r = -.21$, $p < .05$, 95% CI = -.32 to -.10) but not to self-reported delinquency ($r = -.04$, ns, 95% CI = -.15 to .07).

Sampson et al. (2006) looked at the relationship between changes in marital attachment and criminal behavior in 226 members of the delinquent group from the ages of 17 to 32. Controlling for spousal deviance, the number of years married, and between-person differences in marital attachment, the authors found that within-person changes in marital attachment were negatively related to arrests ($r = -.31$, $p < .01$, 95% CI = -.43 to -.19). This finding suggests that criminal behavior in males with a history of juvenile offending decreases as they become more strongly attached to their spouse. Conversely, men with a history of delinquency tend to engage in more criminal behavior as their attachment to their marriage/spouse weakens.

Capaldi, Kim and Owen (2008) examined the relationship between relationship stability and criminal behavior in a sample of 206 men from the Oregon Youth Study (OYS). The OYS is a community-based sample of young men at risk for delinquency. Arrest information has been collected on the participants every year since adolescence. As a part of this study, participants also engaged in the Couples Study, where data was collected on the romantic relationships of men over a period of 12 years. Criminal behavior was measured with official arrest data, and relationship stability was assessed by the number of years each man remained with a particular romantic partner. The authors tested the relationship between relationship stability and the onset and persistence (i.e., recidivism) of criminal behavior in young adulthood. The results indicated that relationship stability was negatively related to criminal persistence ($r = -.15$, $p < .05$, 95% CI = -.29 to -.01) but was unrelated to the onset of criminal behavior ($r = .05$, ns, 95% CI = -.09 to .19) when accounting for prior arrests, age, substance abuse, deviant peer association, depressive symptoms, and the criminal behavior and substance abuse of one's partner.

The previous studies generally support the notion that marriage reduces criminal behavior among males, particularly those with a history of juvenile delinquency. A major limitation of these studies is that they rely on mostly/entirely male samples, so they provide little insight into the relationship between marriage and recidivism in females. There are at least three studies that have examined this relationship using mixed gender samples. King, Massoglia and McMillian (2007) analyzed the relationship between gender, marital status, and criminal behavior using data from the National Youth Survey. Beginning in 1976, the NYS was a longitudinal study of crime, alcohol and drug use, and well-being during the transition from adolescence to young adulthood.

The NYS included three waves of data collection, with the final wave occurring in 1986. At the final wave, the subjects were between the ages of 21 and 27. King et al. analyzed marital and self-reported crime data from this last wave of data collection. For marital status, the participants indicated whether or not they had been married in the year prior to this last wave of data collection. The sample included 699 males and 683 females. The results indicated that marriage was negatively associated with self-reported criminal behavior in both males and females ($r = -.15$, $p < .001$, 95% CI = -.23 to -.08 and $r = -.08$, $p < .05$, 95% CI = -.16 to -.01, respectively). However, after matching the subjects on propensity to marry—a composite variable consisting of several background factors including educational aspirations, work history, relationship orientation, criminal history, and age—marital status was not related to self-reported criminal behavior in females ($r = -.05$, ns, 95% CI = -.13 to .03). In males, the relationship remained significant ($r = -.10$, $p < .05$, 95% CI = -.17 to -.03). While the relationship between marital status and self-reported criminal behavior became nonsignificant with the addition of these variables, overlapping confidence intervals indicate that this relationship was not stronger in males than females.

Bersani, Laub and Nieuwbeerta (2009) analyzed data from the Criminal Career and Life-course Study (CCLS)—a large-scale longitudinal study carried out in the Netherlands. The CCLS tracked a group of individuals convicted in 1977 over a period of 25 years. Bersani et al. retrieved violent and property crime conviction data for almost 5,000 males and 500 females over this period. Combining violent and property crimes into an overall conviction variable, and accounting for age and generational status, the authors found that the relationship between marital status and reconvictions was stronger for men than women. Marriage reduced the odds of reconviction by 36% for men and 21% for women, $p < .001$. This marriage by gender interaction was also significant when convictions for property crime were considered by itself. Being married decreased the odds of property crime convictions by 37% for men and 13% for women, $p < .001$. This interaction was not significant for violent crime convictions, though marriage did reduce the odds of being reconviction of a violent crime by 32% for both males and females.

Stewart, Gordon, Conger, & Elder (2006) examined the relationship between partner attachment (i.e., steady boyfriend/girlfriend, cohabitation partner, and/or spouse) and self-reported criminality in a sample 234 young adults. The sample included 102 males and 134 females. To measure spousal attachment, trained observers recorded the interactions of couples on a variety of dimensions including physical affection, assertiveness, communication, endearment, etc. Accounting for adolescent delinquency, delinquent peers, partner criminality, job attachment, and deviant adult friends, the authors found that the quality of the romantic relationship was negatively related to criminal behavior in females ($r = -.22$, $p < .05$, 95% CI = -.38 to -.05) but not males ($r = -.03$, ns, 95% CI = -.23 to .17). Though the relationship was nonsignficant in males, overlapping confidence intervals indicate that this relationship was not necessarily stronger in females.

Though Sampson and Laub (1990) attribute the relationship between marriage and crime to the quality of the marital bond, a couple of studies have provided evidence that this

relationship is attributable, at least in part, to how marriage impacts the time a person spends with deviant friends (Simons et al., 2002; Warr, 1998). Warr (1998) proposed that marriage reduces criminal behavior primarily because it reduces the time a person spends with deviant friends. To test this hypothesis, he analyzed data from the National Youth Survey—an ongoing longitudinal study of delinquent behavior in a national probability sample of 1,765 person aged 11 to 17 in 1976. The author focused on data collected in two waves. The first wave of data collected occurred when the participants were 15-21 and the second occurred when they were 18-24. In support of Warr's hypothesis, the relationship between marriage, theft, and vandalism became nonsignificant when delinquent friends were accounted for. Using a sample that was more heterogeneous in gender composition, Simons et al. (2002) reported evidence that the quality of romantic attachment was indirectly related to self-reported criminal behavior through deviant friends in males, but not females. In particular, the romantic attachment was negatively associated with the number of deviant friends, and the number of deviant friends was positively associated with self-reported criminal behavior. This provides support for the notion that when a man has a strong attachment to his partner, he is likely to have fewer deviant friends, and consequently is less likely to engage in criminal behavior.

Marriage and the strength of the marital attachment may serve important crime-reducing roles, but the criminality of one's spouse or partner is also an important consideration. Marriage to a deviant spouse can enable, rather than inhibit, a criminal lifestyle (Savolainen, 2009). Sampson et al. (2006) found that the more deviant a spouse, the more likely a man was to engage in criminal behavior ($r = .15$, $p < .05$, 95% CI = .02 to .28). This relationship remained significant after controlling for within- and between-person differences in marital attachment and the number of years married. Calpadi, Kim and Owen (2008) found that the criminality of a male's partner was positively associated to persistent criminal offending ($r = .20$, $p < .05$, 95% CI = .07 to .33) and the onset of criminal behavior ($r = .18$, $p < .05$, 95% CI = .04 to .31). These relationships held after controlling for the number of prior arrests, substance abuse, depressive symptoms, relationship stability, and the substance abuse of one's partner. Giordano, Cernkovich, and Holland (2003) asked 196 males and females with a history of juvenile delinquency to self-report on their and their partner's involvement in criminal behavior over the 12 months preceding the study. The results indicated that partner criminality was positively related to self-reported involvement in criminal behavior ($r = .35$, $p < .001$, 95% CI = .22 to .47). This relationship remained significant after controlling for the age, gender, race, adolescent delinquency, marital attachment, and job stability. Simons et al. (2006) and Benda (2005) suggest that spousal/partner criminality is more potent in women than men. Simons et al. (2006) found that, although partner criminality was positively associated with the self-reported criminality of men and women, the effect was stronger in women ($r = .45$, $p < .05$, 95% CI = .50 to .67) than men ($r = .28$, $p < .05$, 95% CI = .22 to .45), $p < .05$. Benda's (2005) study also showed evidence for a gender difference in this relationship. In particular, having a criminal partner increased the odds of criminality by 82% for women but only 7% for men.

Employment and Recidivis

Several studies have provided evidence suggesting that employment is another variable associated with desistance from criminal behavior (Kazemian, Farrington, & Le Blanc, 2009; Huebner & Cobbina, 2005; Simons, Stewart, Gordon, Conger, & Elder, 2002; Sampson & Laub, 1990; Savolainen, 2009). Savolainen (2009) retrieved conviction data for a sample of 1,325 males in Finland. Data on employment status and convictions were tracked for this group between 1996 and 2001. Each member of the sample had at least 3 convictions prior to the beginning of the study. The employment status variable indicated whether or not participants were able to get and stay employed by the end of the year 2000. The results indicated that being employed decreased the odds of a new conviction by 40%, even after accounting for age, prior convictions, marital status, and dimensions of the participants' rehabilitative regimen (e.g., length of sentence), Huebner and Cobbina's (2005) study included data on the relationship between employment status and the probability of rearrest among probationers. The authors found that being employed decreased the odds of rearrest by 32%. This relationship remained significant after accounting for the effects of age, gender, marital status, the number of prior arrests, whether or not the most recent offense was drug-related, and the completion of a drug treatment program. Kazemian et al. (2009) tested the relationship between employment status and de-escalation in criminal behavior using self-reported and official conviction data. The sample included 98 French Canadian males with juvenile records. Data was collected on these individuals into their early forties. The authors' analyses indicated that within-person changes in employment status were positively related to within person changes in criminal behavior using official conviction data ($r = .34$, $p < .001$, 95% CI = .15 to .51). However, changes in employment status were unrelated to changes in criminal behavior using self-report data ($r = .12$, ns, 95% CI = -.08 to .31). The authors speculated that this was due to differences in the behavior encompassed by the self-report and official conviction data. The North Carolina Sentencing and Policy Advisory Commission included employment status as a predictor of the probability of rearrest in each of its reports. Table 24 provides the results of these analyses. As shown, being employed reduced the likelihood of rearrest for each sample. This effect varied from 2.8% to 3.0%. This relationship remained significant after accounting for age, gender, substance abuse, number of prior arrests, and employment and marital status. Employment reduced the likelihood rearrest among the probation sample but not the prison sample.

Table 24. The Impact of Employment on Rearrest Probability

Year of Sample's Release (FY)	Follow-up Period	All Releases	N	ARP	Ps	N	ARP	Pr	N	ARP
1998/1999	4 years	-2.8%	58,238	42.7%	NS	18,691	55.4%	-3.9%	39,547	36.8%
2001/2002	3 years	-3.4%	57,973	38.2%	NS	17,118	49.8%	-4.8%	40,855	33.3%
2003/2004	3 years	-3.0%	56,983	38.7%	NS	17,093	50.2%	-3.4%	39,890	33.7%

NS = No significant difference **ARP** = Average Rearrest Probability **Ps** = Prison Releases **Pr** = Probation Releases

The previous studies focused on a dichotomous measure of employment (i.e., employed versus not employed). Other studies have hypothesized that the stronger a person's attachment to his or her job, the more likely they are to desist from criminal behavior. As with marriage, Sampson and Laub (1990) propose that it is not employment per se that reduces criminal behavior; it is the quality of one's bond with the job or employer.

Sampson and Laub (1990) measured job attachment using a composite of three indicators: employment status, employment stability, and work habits. Employment status referred to whether or not an individual held a job, employment stability referred to the number of years an individual has been in their current job, and work habits refer to reliability, effort and performance on the job. For those with a juvenile record, job stability was negatively related to self-reported deviance (r = -.17, p < .05, 95% CI = -.29 to -.07) and arrests per year free (r = -.29, p < .05, 95% CI = -.40 to -.18) at ages 17-25. Job stability was also positively related to self-reported deviance (r = -.21, p < .05, 95% CI = -.33 to -.09) and arrests per year free (r = - .25, p < .05, 95% CI = -.38 to -.13) at ages 25-32. In support of a causal relationship between job stability and criminal behavior, job stability at ages 17-25 predicted arrests per year free at ages 25-32 (r = -.15, p < .05, 95% CI = -.28 to -.02). However, it was unrelated to self-reported deviance at ages 25-32 (r = -.06, p < .05, 95% CI = -.19 to .07). These relationships remained significant after accounting for marital status, prior arrests, income, and occupational commitment. For males without a juvenile record, job stability was negatively related to self-reported deviance (r = -.12, p < .05, 95% CI = -.22 to -.02) but not arrests (r = -.07, ns, 95% CI = -.17 to .03) at ages 17-25. At ages 25-32, job stability was negatively related to both self-reported deviance delinquency (r = - .11, p < .05, 95% CI =-.21 to -.01) and arrests (r = - .17, p < .05, 95% CI = -.27 to -.07). In support of a causal relationship between job stability and criminal behavior, job stability at ages 17-25 predicted arrests (r = - .17, p < .05, 95% CI = -.21 to -.01) at ages 25-32.

Kazemian et al. (2009) examined the relationship between job attachment and rates of de-escalation in criminal offending in a sample of 103 working class males in London. Data were collected from the time the participants were 17-18 up until they were 25. Job attachment was measured with several indicators including the number of jobs held over the years, lateness to work, and the quality of relationship with one's employer. De-escalation was measured with both self-report and official (i.e., convictions) offending data. Correlation analyses revealed that changes in job attachment were positively associated with de-escalation of criminal behavior (r = .22, p < .05, 95% CI = .03 to .40) using official convictions but not self-reported criminality (r = .02, ns, 95% CI = -.18 to .22). The authors speculated that this was likely due to differences between the behavior encompassed by the official and self-report data. Simons et al. (2002) used 23-item scale of job rewards and frustrations to measure job attachment. Results showed that, after controlling for adolescent delinquency, quality of romantic attachment, deviance of romantic partner, and deviant friends, job attachment was negatively associated with self-reported criminal behavior in males (r = - .28, p < .05, 95% CI = -.50 to -.15) but not females (r = .04, ns, 95% CI = -.13 to .20). A comparison of these confidence intervals indicates that the effect is stronger for men than women. Benda (2005) also provided evidence for gender

differences in the relationship between employment and criminal behavior. Benda measured the strength of job attachment using job satisfaction. His analysis indicated that job satisfaction was associated with a reduction in the rate of recidivism over a 5-year period in both males and females; however, this effect was stronger in males. For males, increases in job satisfaction were associated with a 50% reduction in reconvictions. For females, increases in job satisfaction were associated with a 29% reduction in reconvictions. This relationship accounted for age, alcohol and drug abuse, criminal associates, the criminality of one's partner, quality of partner relationship as well as other factors in both groups.

Military Service

Researchers have found that military service influences criminal offending (Bouffard, 2003, 2005; Mattick, 1960; Sampson & Laub (1996). Two studies have provided evidence that military service is negatively associated with criminal offending (Bouffard, 2003; Mattick, 1960). Mattick (1960) compared the recidivism rates of men paroled from Illinois penitentiaries to the Army from 1940-1947 to the national recidivism rate. He found that the recidivism rate of those released to the Army was 10.5% after 8 years compared to 66.6% for a national sample of ex-prisoners. Unfortunately, Mattick did not indicate whether the time periods used to assess recidivism were equal between these groups. Bouffard (2003) examined the relationship between military service and criminal offending using two longitudinal birth cohorts—the 1945 Philadelphia birth cohort and the 1949 Racine birth cohort. Both samples included men that served in the military during the Vietnam era. The Philadelphia cohort was composed of 565 men and the Racine cohort was composed of 243 men. Number of police contacts was used to measure criminal offending. Bouffard looked at police contacts for all non-traffic-related offenses but also focused on violent offenses. Violent offenses included offenses, such as murder, rape and other sexual offenses, robbery, and assault. The results indicated that those who served in the military service were less likely to engage in non-traffic-related offenses than those without military service in both the Philadelphia cohort ($r = -.14$, $p < .001$, 95% CI = -.22 to -.06) and Racine cohort ($r = -.19$, $p < .01$, 95% CI = -.31 to -.07). This relationship remained significant after accounting for race, education, socioeconomic status, and the number of juvenile police contacts. In contrast, military service was not significantly related to post-military police contacts for violent offenses in both cohorts (Philadelphia cohort: $r = -.05$, ns, 95% CI = -.13 to .03; Racine cohort: $r = -.10$, $p < .01$, 95% CI = -.23 to -.03).

Bouffard (2005) found evidence contradicting Bouffard (2003). Bouffard tested the relationship between military service and violent offending with using the self-report data of a sample of 5,406 participants from the National Longitudinal Youth Study. The results indicated that those who served in the military were more likely to engage in violent offending than those who did not serve in the military ($r = .03$, $p < .05$, 95% CI = .01 to .06). This relationship accounted for age, gender, juvenile arrests, and education. Bouffard also broke this relationship down by race, socioeconomic status and delinquent status. These analyses indicated that Whites and Hispanics who served in the military were more likely to report violent offending than those

White and Hispanics who did not serve in the military (11.6% versus 7.3%, p < .001 and 21.6% versus 5.4%, p < .001, respectively). There was no relationship between military service and violent offending among Blacks. The results also indicated that those with a history of juvenile delinquency that served in the military were more likely to report criminal offending (15.6%) than delinquents who did not serve in the military, p < .01, suggesting that military service exacerbated pre-existing propensities towards criminality.

The reason(s) that the results of Bouffard (2003) and Bouffard (2005) contradicted each other are unclear but could be attributed to several factors. The difference could be due to differences in the measures of criminal behavior. Bouffard (2003) used officially recorded police contact data and Bouffard (2005) used self-reports of violent offending. The difference could also be due to historical differences in the samples. Bouffard (2003) relied on a sample serving primarily during the Vietnam War, while Bouffard (2005) relied on a sample that served after the Vietnam War. Though the exact reason underlying these contradictory findings is unclear, what is clear is that using a variable distinguishing between military service and no military service as a mitigator of risk is insufficient. The military has elements that can contribute to desistance from criminal behavior as well as elements that can contribute to it. Sampson and Laub (1996) found involvement in educational and training opportunities during World War II contributes to the development of social bonds, particularly job stability, that research suggests contribute to desistance from criminal behavior. Research has also shown that exposure to combat is associated with several negative consequences, such as increased aggression and marital and job difficulties (Bohannan, Drosser, & Lindey, 1995; MacLean & Elder, 2007; Bryant, 1979) that can possibly contribute to criminal offending.

SUMMARY OF FINDINGS ABOUT MITIGATORS OF CRIMINAL BEHAVIOR EVIDENCE

When adjudicators uncover evidence of criminal history, they consider several factors thought to mitigate security risk based on that criminal history. Appropriate risk assessment requires valid and up-to-date knowledge of factors that can increase or decrease the risk associated with an individual who has a criminal record. To inform this process, the criminal recidivism literature was consulted. To maximize the applicability of this research, an effort was made to include studies that used recidivism criteria most likely to tap the full range of security violation behavior. Another tactic was to include studies that used samples most closely aligned the presumed characteristics of adjudication individuals.

A review of the literature resulted in the identification of several risk recidivism risk factors. These variables were organized into three categories—demographic characteristics of the individual, characteristics of the individual's criminal history, and characteristics of the individual's lifestyle.

♦ This evidence suggested that those most likely to reoffend are young, male, and Black. The magnitude of these associations, however, suggests that relying on this information alone is likely to provide inaccurate assessments of risk. Information on the individual's criminal history should also be collected and considered.

♦ The research suggested that those who have committed a felony or property crime are at an increased risk for recidivism compared to those who have committed other types of crimes.

♦ The number of previous offenses and the time since the last offense was committed are also important considerations. Individuals who have committed more offenses or have committed an offense recently are at an increased risk for recidivism.

In addition to demographic characteristics of the individual and his or her criminal history, elements of the individual's lifestyle can be used to assess risk.

♦ The literature suggests that those least likely to recidivate are married to conventional partners, have few (if any) criminal associates, do not have substance abuse problems, and are employed.

♦ For marriage and employment, the strength of attachment to one's partner and job is important, with those who are in marriages characterized by mutual affection and support and have demonstrated reliable performance in a steady job are least likely to recidivate.

♦ Regarding substance abuse, the literature suggests that those who abuse illegal drugs are more likely to recidivate than those who abuse alcohol, although both are likely to recidivate.

♦ Military service may also influence risk of recidivism, although simply assessing whether or not an individual has served in the military is likely to be misleading. Contradictory evidence suggests that it is not military service per se that reduces criminal offending. Military experiences differ and the crime-reducing (as well as the crime-facilitating) aspects of those experiences need to be identified.

The appropriate method for combining this information into an overall assessment of risk is not clear, but a simple linear composite may be insufficient. Several studies provided evidence that risk factors may interact. For example, some studies have provided evidence suggesting that the criminality of one's associates is more strongly related to criminal behavior in men than women.

Finally, no evidence was found to evaluate the basic assumption of the adjudicative process that reduced risk of recidivism implies reduced risk of future security violations.

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