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Delinquent Behavior and the Five-Factor Model: Hiding in the Adaptive Landscape?

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ABSTRACT - Is the Five-Factor Model (FFM) of personality (Big Five) comprehensive? Only two of its dimensions, Agreeableness and Conscientiousness, consistently predict criminal offending. FFM attributes may facilitate success in the "adaptive landscape" of a reciprocal society, but crime subverts reciprocity. Other criminogenic traits may involve deception, self-deception, and adaptive strategies. With controls, these traits explained 35% and 34% of the variance in offending in multiple regressions using self-reports from college students and prisoners, respectively, and increased explained variance among a second college sample from 26% to 41% beyond sex, Agreeableness, and Conscientiousness. That some criminogenic traits lie outside the FFM means that the rationality assumption--that laypersons reliably report their own and others' traits--may not hold in the prediction of crime.

Key Words: Delinquency; Five-Factor Model; Personality; Crime

Anyone, scientist or layperson, who benefits from a well-functioning society would also benefit from the ability to recognize potential criminal offenders. One way to recognize offenders would be to identify psychological differences--personality attributes--associated with offending. Three questions are embedded: whether individuals perceive personality traits, whether these perceptions correspond to actual traits, and whether these traits predict offending. If the traits humans routinely perceive do not adequately predict offending, then two more questions arise: Which other traits predict offending, and why are they not routinely perceived?

The first question, whether individuals perceive traits, has the simplest answer. Research strongly suggests that humans routinely perceive attributes in themselves and others that exhibit considerable consistency across individuals and cultures (Digman, 1996; McCrae, 2001) and even across species (King & Figueredo, 1997). These attributes can be described by five broad factors, giving rise to the Five-Factor Model of personality (FFM; Costa & McCrae, 1988) or

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the Big Five (Goldberg, 1990)[1]. They include Emotional Stability or Neuroticism (N), Extraversion or Surgency (E), Openness to Experience or Intellect (O), Agreeableness (A), and Conscientiousness (C) (John, 1990; McCrae & John, 1992). Despite numerous theoretical and empirical challenges (Block, 2001)[2], the FFM has generated more consensus than any other modern theory of personality (McCrae, 2001).

That humans perceive five dimensions of personality does not necessarily mean that human personalities contain five dimensions. The tendency of individuals to ascribe regularities in behavior to intrapersonal sources has been deemed their "implicit personality theory" (IPT; see Cronbach, 1955). This leads to the second question: Does the FFM contain actual traits, or merely describe an IPT common to most humans (see Mischel & Peake, 1982; Shweder & D'Andrade, 1979)? Although we may perceive five factors only because we *expect* to, the myriad of studies establishing significant correlations among traits, or facets, subsumed within the dimensions of the Big Five, and between traits and behaviors, seem to suggest that "traits are real, and that they are quite accurately perceived and judged by actors as well as observers" (Borkenau, 1992, p. 301; see generally Pervin & John, 1999). Research establishing substantial heritability quotients for the Big Five (Bouchard, 1997; Riemann, Angleitner, & Strelau, 1997) further suggests that these particular dimensions can be influenced by biology (a "real" phenomenon) under certain environmental conditions (MacDonald, 1995)[3]. Thus, the FFM may well have a dual nature: as both a pan-human IPT and a summary description of many or most human traits (John & Srivastava, 1999).

Third, is the FFM, as the IPT of ordinary humans, useful in predicting offending? The relatively few empirical studies in this area have produced modest correlations between some of the Big Five dimensions, and some of their facets, with crime and delinquency (e.g., Heaven, 1996). Although this might mean that the ability of traits to explain behavior is limited (Bandura, 1999), it might mean instead that, because of the relationship between the nature of the Big Five and the nature of crime, the Big Five should not be *expected* to correlate strongly with offending. This implies that traits outside the FFM might explain additional variance in delinquency.

What might these traits be? This paper hypothesizes that certain traits related to offending, involving deception, self-deception, and a preference for short-term, impersonal sexual relationships, cannot be derived under the assumptions underlying the FFM: that ordinary individuals recognize, and can accurately report, what is socially significant about themselves and others (Borkenau, 1992; McCrae & Costa, 1999; Saucier & Goldberg, 1996). The paper presents a preliminary test of this hypothesis, using both the Big Five and the additional traits to account for delinquency. It reports three studies among two different samples of university students and a sample of prisoners: two that establish the ability of the additional traits to account for offending, and one that combines them with a measure of the Big Five. Because this is exploratory research with

a unique set of variables, these studies used self-reports of both traits and delinquency. A finding that traits beyond the Big Five predict offending would set the stage for future studies using different samples and methods.

The Big Five and Crime

The Big Five have been used in several studies of crime and personality. A recent meta-analysis examined the relationship between offending and four different comprehensive models, including the Big Five (Miller & Lynam, 2001). The authors concluded that both A and C consistently predicted offending, whether using self-reports or other methods. Further, they concluded that the traits from the other three models--Eysenck's (1990) PEN model, Tellegen's (1985) 3-dimensional model, and Cloninger's (1987) temperament and character model--that also consistently predicted offending could be understood as variants of A and C. Of the 14 FFM studies included in the meta-analysis, most predicted symptoms of antisocial personality disorder, while one, by Heaven (1996), used self-reported delinquency as its dependent variable.

As noted by Miller and Lynam (2001), other studies have found connections between offending and analogous scales to the Big Five. One self-report study too recent to have been included in the meta-analysis used Eysenck's PEN scales, which combine A and C into Psychoticism (Harpur, Hart, & Hare, 1994; but see Kaiser, Barry, & Beauvale, 2001; Zuckerman, 1994), to predict self-reported delinquent versatility among 101 young offenders (Alexio and Norris, 2000). This study found Psychoticism to correlate significantly with delinquent versatility, with E significant for crimes against the person and N non-significant across the board. A measure of deception absent from the Big Five, Eysenck's "Lie Scale," also correlated significantly with delinquency (see also Heaven, Caputi, Trivellion-Scott, & Swinton, 2000).

Taken together, these studies suggest that two of the Big Five dimensions--A and C--consistently correlate with offending. While neither N, E, nor O are consistent predictors, low O appears to have some connection with crime. Openness is similar to the construct of intelligence (Zuckerman, 1994), a negative correlate of offending (Herrnstein, 1995; Hirschi & Hindelang, 1977; Kandel et al., 1988; Piquero, 2000). Further, one study predicting recidivism among adult offenders found that O, as well as C and an interaction between O and C, were significant negative predictors (Clower & Bothwell, 2001).

For N and E, the story is different. It appears that the extremes of each can be associated with crime among different individuals. For example, among a sample of forensic psychiatric patients, Blackburn (1986) found both high anxiety (high neuroticism) and low anxiety (high emotional stability) psychopaths (see also Lykken, 1995; Mealey, 1995; Miller & Lynam, 2001). Extraversion exhibits similar findings. While some offenders may be highly social and highly active, others may be withdrawn and sullen (Blackburn & Maybury, 1985).

Assumptions Underlying the FFM and the Comprehensive Adaptation Hypothesis

Both the Big Five and Five-Factor models of personality incorporate the

"rationality assumption," which holds "that, despite errors and biases . . . people are in general capable of understanding themselves and others" (McCrae & Costa, 1999, p. 141, cites omitted; see also Borkenau, 1992). These models also assume that individuals routinely observe what is socially significant about each other and, in the case of the Big Five, encode those observations in everyday language (Saucier & Goldberg, 1996; see Norman, 1967). If true, these assumptions imply that individuals can accurately assess potential rewards and dangers of interacting with others, summarizing their assessments along the Big Five dimensions.

In turn, the rationality assumption implies that the Big Five /Five-Factor model is a "comprehensive system, a framework for organizing virtually all personality traits" (McCrae & Costa, 1996, p. 61; see also John & Srivastava, 1999). To explain why "virtually all" traits can be organized within this framework, David Buss, working within the Darwinian paradigm, has proposed what is called here the "Comprehensive Adaptation Hypothesis" (CAH). The CAH suggests that personalities are both consistent and comprehensive because all humans faced the same set of challenges, or *adaptive problems*, in the environment of evolutionary adaptiveness (EEA), including resource acquisition and protection; inter- and intrasexual competition; negotiation of status hierarchies; group affiliation; reciprocal dyadic alliances; preference for relatives; parenting; and mate identification, attraction, and retention (Buss, 1991). Successfully negotiating adaptive problems increases potential reproductive success, or *fitness*. To solve these problems, individuals use both their own attributes and their perceptions of the attributes of others (Buss, 1996, 1999; Hogan, 1996; MacDonald, 1995, 1998; see also Ashton, Paunonen, Helmes, & Jackson, 1998; Budaev, 1999). For example, persons in long-term relationships must account for not only their own levels of A (Agreeableness), but those of their partners.

By helping solve adaptive problems in the EEA and thereby allowing individuals to take advantage of the synergy created by cooperation (Sanderson, 2001; Wright, 2000), certain personality attributes systematically enhanced fitness and became part of human nature (Buss, 1995; see also MacDonald, 1995; but see Tooby & Cosmides, 1990). According to the CAH, individual differences in these attributes have coalesced along the five dimensions of the FFM, representing "the most important dimensions of the social landscape to which humans have had to adapt" (Buss, 1991, p. 471). Thus, the FFM should be viewed as two distinct phenomena: a set of intrapersonal attributes that can help individuals navigate the social, or adaptive, landscape (see Wright, 1932), which itself contains individuals with varying attributes (Buss, 1991)[4]; and an IPT that describes salient aspects of other individuals that must be perceived, attended to, and dealt with in order to solve adaptive problems.

Adaptive strategies and traits

Not all individuals seek the same solutions to adaptive problems. It has been

observed that different individuals pursue different *adaptive strategies*, organized sets of behaviors that evolved to maximize reproductive fitness (Rowe, 1996; see Kenrick, Dantchik, & MacFarlane, 1983). Different adaptive strategies correspond to different psychological profiles (Buss, 1999; Figueredo & King, 2001). Thus, traits such as the Big Five may systematically relate to an individual's adaptive strategy.

The evolutionary literature commonly identifies two contrasting strategies. The first focuses on obtaining diverse and numerous mating opportunities, producing a large quantity of offspring with little parental care, entering into exploitative short-term relationships without regard to long-term reciprocal transactions, and satisfying immediate desires; while the second focuses on retaining long-term mates, allocating resources among few offspring, maintaining long-term, reciprocal relationships, and preparing to satisfy future interests. This dichotomy (or ends of a continuum) may be characterized as antisocial vs prosocial strategies, though other terms have been used, including mating effort vs parenting effort (Rowe, 1996).[5] This paper focuses on the this dichotomy, but does not claim that this is the only dimension along which human adaptive strategies vary (Buss & Greiling, 1999; Figueredo & King, 2001).

The attributes represented by positive values on the Big Five appear to facilitate prosocial strategies; e.g., A facilitates cooperation, C facilitates long-term success. For this reason, they are useful to the self and desirable in others (Buss, 1991; see Trivers, 1971). In contrast, individuals with lower levels may be less effective at prosocial strategies and less desirable for social interactions[6]. They may turn to antisocial strategies because prosocial niches are foreclosed to them (Vila, 1994; see Buss & Greiling, 1999; Tooby & Cosmides, 1990; see also Cloward & Ohlin, 1960). Thus, the CAH implies that low levels on FFM attributes should predict antisocial behaviors. And if this model is both valid and applicable to the modern world (see Rowe, 1995), then traits outside the FFM should not significantly augment the prediction of offending.

One caveat is in order: Because the social environment has changed since the EEA, to find correlates of crime beyond the Big Five would not falsify the CAH. The FFM may have been comprehensive in the EEA but is no longer, creating a mismatch between our evolved traits and our current environment (see Burnham & Phelan, 2000; Crawford, 1998; Mealey, 1997; Ornstein & Ehrlich, 1989), possibly because antisocial behavior was less common, or less important, then than now (Figueredo & King, 2001; Rowe, 1995). Alternatively, a mismatch may have ensued because antisocial behavior in the EEA may have been directed primarily against members of other groups, thereby benefitting the "antisocial" person's own group. Only with the advent of agriculture and urban living and the disintegration of close-knit groups might antisocial behavior have become a within-group problem (Rowe, 1995). Thus, the present study can be taken as a test of the CAH only in the current environment.

Criminogenic Traits Beyond the Big Five: Deception, Self-Deception, and Mating Effort

The CAH incorporates the rationality assumption. But is this assumption valid? Hogan (1996) has suggested not:

> Conventional trait theory assumes a point-for-point correspondence between item endorsements and underlying traits; people who endorse items referring to dominant behavior are expected to see themselves as dominant and perhaps to be disposed on occasion to behave in a dominant fashion. . . . An item endorsement as an interesting behavior whose nontest meaning must be discovered empirically. An item endorsement is a symbolic act, not a self-report, and in order to determine what it means, one must do some research. (pp. 175-6)

The rationality assumption may be especially inapposite to the study of personality and crime. By incorporating the rationality assumption, the CAH implies that individuals can detect criminality in others and report it in themselves. However, it is to the advantage of potential criminals to hide their criminogenic traits, even from themselves (see Miller, 1997). Thus, the rationality assumption inhibits the search for predictors of offending by excluding traits that cannot be, or generally are not, accurately reported by individuals (see Hogan, 1996). This notion is supported by evidence that psychopaths, a subset of persistently deceptive and antisocial individuals, are not easily located within the FFM (Harpur et al., 1994). Three kinds of traits, related to three limitations of a personality theory incorporating the rationality assumption, are proposed as additional correlates of offending, involving (a) intentional deception, (b) self-deception, and (c) adaptive strategies.

The first limitation is that individuals often intentionally deceive each other. A person can pretend to be prosocial in order to gain sexual contact or access to resources, without intending to take responsibility for the consequences. Because much crime involves deception, it is unsurprising that criminality is not easily detectable by observers, such as study participants describing themselves or others, or researchers with FFM questionnaires. Though an honesty or trustworthiness factor has been detected by some Big Five research using an expanded set of trait terms (Ashton et al., 2000; Paunonen & Jackson, 2000), it falls outside the Big Five. The first proposed trait is therefore the willingness to manipulate and deceive others for personal gain. This is a key component of psychopathy (Hare, 1980, 1993) and relates to the construct of Machiavellianism (Wilson, Near, & Miller, 1996).

The second limitation is that individuals often deceive themselves (Hogan, 1996; Mele, 1997; see Miller, 1997). Self-deception may assist in the relatively benign task of maintaining self-esteem (Bandura, 1986), but may also assist in deceiving others (Trivers, 1985; see Frank, 1988).

The second trait is therefore a form of self-deception directly related to antisocial behavior: the tendency to justify, or neutralize, one's antisocial acts so that they appear to the self, and potentially to others, as moral acts. The connection between such cognitive distortions and offending has long been noted

(Maruna, 2001) and can be found in the historical record: for example, in applications for pardons among accused criminals in 16th century France (Davis, 1987). Sykes and Matza (1957) delineated several "techniques of neutralization," such as denying that the victim was really injured (e.g., "she has so much money, she'll never miss it"), or claiming that there really was no victim (e.g., "he deserved what was coming to him"), that help perpetrators assuage or avoid any guilt associated with injuries caused by their antisocial acts. Others (e.g., Bandura, 1986; Baumeister, 1997; Beck, 2000; Burt, 1980; Hirschi, 1969) have also noted the presence among offenders of cognitions that minimize the psychological impact of their offenses. These cognitions may assist the individual in maintaining high self-esteem despite behavior that suggests that such self-esteem is undeserved (Baumeister, Smart, & Boden, 1996; Weigel, Hessing, & Effers, 1999). Thus, neutralizations increase the probability of continued antisocial behavior, because they allow the individual to both preserve a favorable self-image after offending (Bandura, 1986) and to avoid guilt. This tendency to neutralize should vary across individuals and correlate positively with offending (Wiebe, 2003)[7].

The third limitation pertains to adaptive strategies. Individuals are unlikely to be aware of strategies they pursue (Rowe, 1996), and some strategies may be associated with psychological phenomena beyond the Big Five. A person need not be engaged in deception or self-deception to fail to recognize his or her strategy (Rowe, 1996; see also Schmitt & Buss, 2000). The third trait therefore is an adaptive strategy that has been specifically linked to crime: mating effort, or the psychological effort to obtain and guard short-term mates (Rowe, 1996; Rowe, Vazsonyi, & Figueredo, 1997; but see Quinsey, Book, & Lalumiere, 2001). This trait, which is not simply an absence of parenting effort (commitment to existing relationships and offspring), lies outside the Big Five, which primarily relate to parenting effort. The exception is E, which can help attract potential mates of any duration (Buss, 1991).

Of course, some individuals may flaunt a prosocial strategy. A person may declare, to self and others, a commitment to and respect for the "system," hoping to persuade others of his or her trustworthiness (see Frank, 1988; Ridley, 1996). Therefore, a fourth trait is proposed: an overt declaration of respect for, or commitment to, authority should correlate negatively with crime. The willingness to declare respect for authority may itself inhibit offending, in part because it becomes a self-fulfilling prophecy (see Maruna, 2001). Unlike a person high in self-justification, a person who claims to respect authority has no excuses for harming others without good cause.

In light of the foregoing, the hypotheses tested here are straightforward. The CAH, which implies that low levels on each of the Big Five, and no other traits, should predict delinquency, is contrasted with the hypothesis that other traits, for various reasons not accurately perceived by laypersons and thus absent from the Big Five, will improve the ability of the Big Five to explain variance in delinquency. The studies reported here use self-reports of both traits and

delinquency; self-reports of delinquency are generally accepted by criminological researchers (Hindelang, Hirschi, & Weis, 1981), and self-reports of both traits and offending were found in the meta-analysis to produce the same correlates of offending as other methods (Miller & Lynam, 2001)[8].

Study 1

Method

Participants. The first study used a sample of 152 male and 155 female students (N = 307) at an (American) Southwestern university who completed surveys during classes in 1996. Both attendance and survey completion were voluntary. Participants, described in greater detail elsewhere (Wiebe, 2003), reported that 71% were White, 16% Hispanic, 3% Black, 8% Asian, and 2% Native American. Most of their parents were college educated, and 55% reported household incomes of at least $60,000.

Measures. The measures, derived from exploratory analyses of items from self-control, social control, and psychopathy research (Wiebe, 2003), included self-report scales of Deception, Neutralization, Promiscuity, Respect, and delinquency, in addition to demographic and family variables. For the four created scales, the items were scored from 1 = strongly agree to 5 = strongly disagree. Scales were computed as unit-weighted factors, i.e., means of all valid responses. This allows for more generalizability across samples, as well as for within-subjects estimates of missing data (Figueredo, Cox, & Rhine, 1995): A scale score could be reported with as few as two responses without imputing scores from other study participants.

The Deception scale, with five items and a coefficient alpha (Cronbach, 1951) of .60, contained reports of overt antisociality. Its two highest-loading items were, "When I get caught in a lie, I just tell another one" and "I try to get the things I want even when I know it's causing problems for other people." The Neutralizations scale (10 items, alpha = .79) contained justifications for lawbreaking, such as, "It's okay to steal something that's covered by insurance" and "Only fools tell the truth all the time." Mating Effort (4, .79) represented an orientation toward short-term relationships, and contained items such as, "One-night stands are not for me" and "I have had sex with more than one partner in the same week." Respect (3, .60) items evinced respect for the police as well as "People who break the law are almost always caught and punished." Finally, socioeconomic status (4, .76) was assessed with father's occupation, family income, and father's and mother's education. A full list of all items, scales, and unit-weighted factor loadings for all three studies is available upon request.

The delinquency scale was also constructed as a unit-weighted factor. Participants were asked whether they had ever taken part in eight different activities--three categories of theft (less than $2, STET 2 - $50, over $50), car theft, public vandalism, robbery, assault, and driving while drinking. Items were scored 1 = never, 2 = once or twice, 3 = several times, or 4 = many times, assessing both frequency and versatility. Scale scores were the means of valid responses. The

sample reported considerable offending, with 73.5% reporting driving while drinking and 64.1% reporting a theft less than $2 to 18.4% reporting a theft of more than $50. Percentages for the other offenses were: theft between $2 and $50, 34.5%; vandalism ("purposely destroyed or damaged public property"), 30.8%; assault ("beaten up someone other than a brother or sister"), 27.4%; robbery ("used force to get something from another person"), 27.2%; car theft or joyriding ("driven a car without the owner's permission"), 21.3%; and theft over $50, 18.4%. Overall, 90.5% of the sample reported at least one offense. This scale produced an alpha of .79. To reduce both skewness and kurtosis, its natural logarithm was used in all analyses.

Results

Both bivariate and multivariate regressions were used to predict delinquency. In bivariate regressions, Deception (Pearson's $r = .40$), Neutralization ($r = .46$), and Promiscuity ($r = .42$) scales, as well as sex (being male correlated .35), significantly predicted delinquency at the $p > .0005$ level. Neither Respect ($r = -.11$, $p = .067$) nor SES ($r = -.11$, $p = .052$) did so. In multivariate regressions, controlling for sex ($t = 3.62$, $p < .0005$) and SES ($t = 1.48$, $p = .139$), Deception ($t = 4.09$, $p < .0005$), Neutralization ($t = 4.64$, $p < .0005$), and Promiscuity ($t = 4.04$, $p < .0005$) each produced a statistically significant partial correlation, while Respect ($t = .24$, $p = .813$) did not. Together, sex and SES produced an adjusted R^2 of .13; with the additional variables, explained variance (adjusted R^2) rose to .35.

Study 2

Method

Participants. Study 2 used a sample of 85 male and 29 female inmates (N=115; one case missing data for sex) at a Southwestern correctional institution, who voluntarily completed instruments during a job training class. This sample was clearly unrepresentative of the prison population. Their ages ranged from 17 to 56, with a mean of 31, a median of 29, and a standard deviation of 9.7. Eighty-seven percent had some high school education or less, while 6% had graduated from high school, another 3% had some college, 1% had graduated from college, and 3% had an advanced degree. Ten percent of their mothers and 7% of their fathers had earned a college degree or better. Thirty percent identified themselves as White, 47% Hispanic, 18% Black, 1% Asian, and 4% Native American.

Measures. The measures used in Study 2 replicated as nearly as possible those from Study 1, with three major exceptions. First, the crime scale was more extensive, with 19 different offenses including with four categories of theft (less than $2, 2 - $50, $50 - $100, over $100) and additional items concerning tire slashing, shootings and drive-by shootings, threatening with a gun, burglary, bicycle theft, assault of parents, and sexual assault. Its alpha was .89. It was fairly normally distributed in this sample (skewness = -.16, $SE = .23$; kurtosis = -1.2, $SE = .45$) and was not transformed. Second, the measure of Mating Effort

came from a study by Rowe, Vazsonyi, and Figueredo (1997), and assessed mate guarding and intrasexual competition as well as promiscuity. With 10 items, its alpha was .79. Third, the items were scored yes or no, resulting, for the crime scale, in a measure of versatility (Hirschi & Gottfredson, 1995).

The other scales differed in content. Deception lost its key item regarding causing problems for others; the 4-item scale had an alpha of .53. Neutralization lost items regarding stealing from big business and stealing items covered by insurance, and an item reading, "Cheating and lying are always wrong, whatever the situation" substantially decreased reliability and was omitted. An item stating that delinquency generally didn't hurt anyone was added. With five items, the scale produced an alpha of .48. The Respect scale included, as in Study 1, two items regarding respect for, and the fairness of, the police. Perhaps because of the nature of the sample, an item that said that lawbreakers were almost always caught and punished did not fit with the other two, but an item that claimed "Most people can be trusted," not present in Study 1, was added. The three items produced an alpha of .60. The parent education and occupation variables failed to produce a cogent scale, so they were used as separate predictors in regressions.

Results

The same analyses were performed as in Study 1. Of the various control variables, only self-rated school ability correlated significantly with crime (r = -.19, p = .040). Neither sex, education, or parental education or occupation were significant predictors. In contrast, each of the four created scales significantly predicted offending: Neutralization (r = .27, p = .003), Respect (r = -.41, $p <$ .0005), Deception (r = 39, $p <$ .0005), and Mating Effort (r = .43, $p <$ .0005).

In multiple regressions retaining sex and academic ability as control variables, the four additional scales increased adjusted R^2 from .04 to .34. In the final equation, academic ability (t = -2.85, p = .005), Deception (t = 3.25, p = .002), Respect (t = -3.28, p = .001), and Mating Effort (t = 3.01, p = .003) were significant predictors of offending, while sex (t = .35, p = .726) and Neutralization (t = -.81, p = .421) were not.

Study 3

Method

Participants. The study was conducted with a sample of 102 male and 128 female criminal justice undergraduates (N = 230) at an Eastern university who completed surveys during classes in 1999. Neither attendance nor survey completion was required. Because of missing data, the analyses reported used a sample of 90 males and 107 females. Most participants self-identified as White (89.3%), with the remainder divided among Black (3.6%), Hispanic (2.5%), Asian (2%), and Indian Subcontinent (1%); 1.5% did not report ethnicity. College degrees were earned by 43% of their mothers and 47% of their fathers. Family incomes were diverse: 5.6% reported a household income, while

participants were in high school, of less than $20,000 per year, with 14.2% between $20,000 and $40,000, 26.4% between $40,000 and $60,000, 21.3% between $60,000 and $80,000, and 31% over $80,000; 1.5% did not report family income.

Measures. *Big Five.* Study 3 was the only study to include measures of the Big Five as well as the other scales. Because questionnaire length was limited, a subset of questions from the short form of the NEO, the NEO-FFI (Costa & McCrae, 1992), were used to measure the dimensions of the FFM. Because reversed items indicate agreement with items that theoretically correlate with delinquency under the hypothesis that low scores on FFM dimensions predict offending, at least two reversed items were included in each scale. Otherwise, items were chosen randomly. This resembled the methodology used by Heaven (1996), who selected a random set of items from the NEO is his study of delinquency. The C dimension was supplemented with three items related to the construct of diligence, akin to conscientiousness, considered to be a component of the larger construct of self-control by Gottfredson and Hirschi (1990). The number of items for each of the scales--the Big Five and those added for this study--and their alpha coefficients appear in Table 1. The low reliability of the O scale is consistent with other research that has found it to be less reliable than the rest of the Big Five (e.g., Riemann et al., 1997).

Items for the Big Five and the additional personality scales described below were scored on a 4-point scale: Strongly Agree, Agree, Disagree, Strongly Disagree. As in the other studies, scales were constructed by using the mean of valid responses

Deception, Neutralization, Mating Effort, Respect. Deception was measured by the same four items used in Study 2. Neutralization contained five items; an item stating, "I see no need for hard work," present in earlier studies, was omitted because of possible content overlap with C. Mating Effort was measured with the 10-item scale drawn from Rowe and colleagues (1997). Respect was measured by the single item "I have lots of respect for the police."

Crime and delinquency. Participants were asked whether they had ever taken part in nine different activities--three categories of theft (less than $2, 2 - $50, over $50), car theft, vandalism, robbery, assault with and without a weapon, and driving while intoxicated, scored 1to 4 as in Study 1. Scores were calculated from the means of valid responses. The sample mean was 1.5 (1 to 4 scale) with a range of 1.0 to 4.0 and, not surprisingly, was strongly skewed to the right (skewness = 1.42, *se* = .17, skewness/*se* = 8.2) with a long right tail (kurtosis = 3.07, *se* = .35, kurtosis/*se* = 8.88). Taking the natural logarithm of this scale reduced skewness (skewness/*se* = 3.33) and brought kurtosis within the range of a normal curve (kurtosis/*se* = .20; SPSS, 1998). Therefore, this logarithmic scale was used for the analyses reported here.

Results

The analyses comprised three phases: bivariate correlations with delinquency,

multiple regression analyses using significant predictors of delinquency to test whether the additional constructs improved the variance explained by the FFM, and factor analyses and other diagnostic procedures to examine whether the additional constructs fit empirically within the FFM.

Values for Pearson's *r* appear in Table 1. As expected, the additional constructs--Deception, Neutralization, Mating Effort, and Respect-- correlated significantly with delinquency, as well as A and C and sex; SES, N, E, and O did not. Differences emerged by sex. Although the men showed the same pattern as the entire sample, among the women neither Mating Effort nor A correlated significantly. A version of Mating Effort that omitted mate guarding and emphasized desire for sexual variety also failed to predict delinquency among women, while doing so among men and the full sample.

Table 1

Correlations (Pearson's r) with Self-Reported Offending

Scale (# of items, alpha)	Women (*n* = 107)	Men (*n* = 90)	Full Sample
Control			
Sex (1, n/a)	n/a	n/a	.41 (.0005)
SES (4, .63)	-.15 (.125)	-.05 (.657)	-.06 (.399)
Big Five			
Neuroticism (7, .76)	.14 (.157)	.11 (.318)	.05 (.465)
Extraversion (6, .67)	-.00 (.968)	-.09 (.406)	-.07 (.341)
Openness (6, .51)	-.07 (.493)	-.02 (.855)	-.08 (.266)
Agreeableness (6, .61)	-.09 (.380)	-.33 (.001)**	-.25 (.0005)**
Conscientiousness (9, .78)	-.30 (.002)**	-.32 (.002)**	-.30 (.0005)**
Others			
Deception (4, .56)	.22 (.025)*	.30 (.0005)**	.32 (.0005)**
Neutralization (5, .67)	.41 (.0005)**	.51 (.0005)**	.50 (.0005)**
Mating Effort (10, .70)	.13 (.175)	.38 (.0005)**	.33 (.0005)**
Prosocial Belief (1, n/a)	-.34 (.0005)**	-.47 (.0005)**	-.34 (.0005)**

Note: Significance level in parentheses. Dependent variable: Natural Logarithm of Self-Reported Delinquency.
*$p < .05$ **$p < .01$

Table 2

Multiple Regression Models

	R	R^2	adj R^2	diff R^2	*F diff*	*p*
Full Sample (*N* = 197)						
Block 1 (Sex)	.41	.17	.17	.17	40.2	.0005**
Block 2 (A, C)	.52	.28	.26	.11	13.8	.0005**
Block 3 (D, ME, R, N)	.66	.43	.41	.15	12.8	.0005**
Females (*n* = 107)						
Block 1 (C)	.30	.09	.08	.09	10.6	.002**
Block 2 (D, R, N)	.47	.22	.19	.13	5.5	.001**
Males (*n* = 90)						
Block 1 (A, C)	.43	.19	.17	.19	9.9	.0005**
Block 2 (D, ME, R, N)	.64	.41	.37	.22	7.8	.0005**

Note: A = Agreeableness, C = Conscientiousness, D = Deception, ME = Mating Effort, R = Respect, N = Neutralization. Dependent variable: Natural Logarithm of Self-Reported Delinquency.
*$p < .05$ **$p < .01$

Table 3

Standardized Regression Coefficients (beta weights) and Significance in Multiple Regression Models

	Full Sample			*Female*			*Male*	
	Beta	*t*	sig. *t*	Beta	*t*	sig. *t*	Beta	*t*	sig. *t*
Model 1									
Sex	.38	6.19	.0005**		*not in model*			*not in model*	
A	-.16	-2.51	.013**		*not in model*		-.29	-2.96	.004**
C	-.25	-4.01	.0005**	-.30	-3.26	.002**	-.28	-2.84	.006**
Model 2									
Sex	.35	5.97	.0005**		*not in model*			*not in model*	
A	.02	0.26	.797		*not in model*		-.02	-0.24	.815
C	-.18	-3.2	.002**	-.20	-2.15	.034*	-.17	-1.96	.054‡
D	.02	0.27	.791	.01	0.14	.893	.07	.52	.603
ME	.14	2.09	.038*		*not in model*		.20	1.83	.071‡
R	-.23	-3.66	.0005**	-.15	-1.78	.171	-.30	-3.24	.002**
N	.24	2.84	.005**	.28	2.27	.025*	.28	2.19	.032*

Note: A = Agreeableness, C = Conscientiousness, D = Deception, ME = Mating Effort, R = Respect, N = Neutralization. Dependent variable: Natural Logarithm of Self-Reported Delinquency

‡ p .10 * p .05 ** p .01

The results of the multiple regression analyses appear in Table 2 and 3. These models were run hierarchically, to determine whether the new constructs added anything to the ability of the Big Five to account for offending. Only significant predictors of offending were used. Sex was entered first as a control variable, followed by A and C from the FFM (C only among the females) as the second block, and the four additional predictors (three only among the females) as the third. The contribution of each block in each model was statistically significant. The FFM elements improved explained variance (adjusted R^2) from 17% to 26% over sex alone, and the new scales resulted in an increase to 41%. In models run separately by sex, the new scales improved explained variance from 8% to 19% among females and 17% to 37% among males.

The unique variance explained by A nearly disappeared when the four additional predictors were added. The reason for this finding is not immediately clear. What seems clear is that they are not simply different measures of the same construct: Collinearity diagnostics revealed a tolerance of .745 for A among the full sample for the estimated model, indicating that only 25.5% of the variance in A is explained by the other variables in the model. Simultaneous regressions using all the other Big Five scales as well as sex, Deception, Neutralization, Mating Effort, and Respect explained 27.3% of the variance in A. Deception (t = -3.05, p = .003) , and, surprisingly, E (t = 3.45, p = .001) were significant predictors, while Neutralization (t = -1.76, p = .080) and Mating Effort (t = -1.69, p = .093) approached significance.

Which of the non-FFM predictors caused the diminution of the unique variance in offending explained by A? Neutralization appeared to be primarily responsible. When entered alone as the second step of a hierarchical regression

model, following A and C, it decreased the significance of A's contribution (increased *p*) from .003 to .808. In contrast, the *p* value for A increased only to .148 after entering Deception, .067 after Mating Effort, and .029 after Respect.

Was A part of the same higher-order construct as some or all of the other scales (see Loehlin, 1992)? In other words, were the additional scales truly outside the FFM? To answer these questions, an exploratory factor analysis, using a generalized least squares procedure that assumed, consistent with personality theory in general, a latent variable structure (Widaman, 1993), was performed with the Big Five and the four additional scales. Because at least some of the factors were expected to covary, an oblique (Promax) rotation was used (Kim & Mueller, 1978). Three factors with eigenvalues greater than 1.0 emerged, accounting for 45% of the variance among the factors after rotation. The chi-square was not significant ($p = .072$), indicating that three factors adequately represented the data (SPSS, 1998).

The first two factors loaded onto A. The first was a general antisocial factor (factor loadings in parentheses): Deception (.75), Mating Effort (.73), and Neutralization (.75), as well as low A (-.39) and high E (.28). The second, more prosocial, loaded onto E (.63), C (.26), and Respect (.53) as well as A (.31), low Neutralization (-.30) and low Mating Effort (-.28). O produced the sole loading on a third factor (1.00), and N had no loading over .16.

Discussion

Implicitly, all studies of the Big Five and crime test the CAH, which postulates that the Big Five represent "the most important dimensions of the social landscape" (Buss, 1991, p. 471; see also Miller & Lynam, 2001). This implies that the five factors should predict crime and delinquency. The three studies reported here tested an alternative hypotheses, derived from the observation that the FFM is most relevant to prosocial strategies, that certain traits exist outside the FFM that reflect the idea that offenders "hide in the adaptive landscape"and that help to explain offending. The overall results of this research support the hypotheses that traits derived from this analysis of the nature of crime can add to the variance explained by the Big Five. However, these traits may not lie unequivocally outside the FFM. In particular, three of the four related empirically to A.

Both Study 1 and Study 2, on different samples, found that traits theoretically beyond the Big Five related to deception, self-deception, and adaptive strategies could significantly predict offending. Across the studies, different traits made unique contributions in multiple regressions. The failure of Neutralization to do so in the correctional sample may have resulted from the source of the sample: prisoners in a release-preparation program, who may have been learning to be on guard for the kinds of cognitive distortions that justify offending. Mating Effort, however, was a very good predictor, possibly because it is not a focus of rehabilitation or reentry programs. As Hogan (1996) implies, the purpose of self-reports is to gather data from which the researcher can make inferences, not to

rely on the reporter to provide an accurate assessment.

The first two studies, having established the utility of these traits in the prediction of crime, laid the foundation for the third study, which combined Big Five measures with the other traits. In bivariate regressions, as expected, N, E, and O failed to correlate significantly with delinquency, while A, C and the four other traits did. In multiple regression models, three of the other traits--Mating Effort, Neutralization, and Respect--significantly contributed to explained variance in offending even after controlling for A and C, while the contributions of Deception and A were largely muted by the other variables in the equation. Among females, fewer traits were significant; none were significant among females but not among males or the full sample.

Do these results indicate that important predictors of offending lie beyond the Big Five? The answer is an equivocal "yes." On one hand, the non-FFM predictors seem related to Agreeableness: Its ability to account for offending nearly disappeared when the four non-FFM predictors were added, primarily due to the presence of Neutralization, and an exploratory factor analysis indicated that three of the four loaded with A. On the other hand, the collinearity between A and the four scales was not extreme, and, among the females, A did not predict delinquency in either bivariate or multivariate models, while two of the four non-FFM scales did. Overall, the results support the hypothesis that the Big Five--A in particular--fail to account sufficiently for the nature of crime and delinquency, for the following reasons.

The Neutralization scale contains five items, each of which provides an excuse for lawbreaking. From these excuses, a trait is inferred: the readiness to justify one's antisocial behavior in order to avoid facing its emotional or social consequences. Endorsement of these items implies a lack of guilt about wrongdoing, and the ability to present oneself to others as a "good person," or at least not as a bad person. If crime were not associated with this trait, antisocial persons would be more easily identifiable, and their opportunities to interact with potential victims would be limited. This trait should be distinguished from A, which, in accord with the rationality assumption (McCrae & Costa, 1999), is indicated by straightforward reports of attributes ("If necessary, I am willing to manipulate people to get what I want") that, for items correlating positively with delinquency, contain no excuses or justifications. Both scales are interpreted under the assumption that respondents believe their responses, but only the A scale is interpreted as if those responses were true.

Although the excuses reported in the Neutralization scale seem reasonable on their face, they entail, if not outright deception, a certain amount of cognitive distortion (Bandura, 1986). The finding that offenders tend to engage in such distortion comports with research that indicates that offenders have the same moral values as non-offenders, but find more reasons to exempt their own acts from moral strictures (Kornhauser, 1978). Therefore, they will not recognize themselves as less morally constrained (thus more likely to offend). Research incorporating the rationality assumption will be unable to detect this tendency to

neutralize (see Hogan, 1996). Therefore, Neutralization, though it may be part of the same higher-order construct as A, lies outside the FFM. To illustrate this finding, one could picture the adaptive landscape as an Arctic seascape. Agreeableness may appear above water, but the part of the iceberg that does the most damage, comprising Neutralization and Mating Effort, remains submerged.

Although it is the strongest correlate of crime, is the predictive ability of Neutralization nothing more than the product of a tautology? It may simply reflect approval of antisocial acts engaged in by the reporter (see Tennenbaum, 1977). However, individuals do not approve of everything they have done; for example, a hallmark of depression is precisely the opposite, a pervasive disapproval of one's behaviors, a rejection of the self. The present results simply add to the growing number of findings that associate the tendency to self-justify--or, to put it another way, the inability or unwillingness to engage in self-criticism--with antisocial behaviors (see, e.g., Beck, 2000; Maruna, 2001), and is consistent with findings that depression--associated with self-*abnegation*--is negatively correlated with antisocial behaviors (Baumeister, 1997).

Further, the acceptance of delinquency need not be characteristic only of delinquents. Many criminological theories--strain, labeling, cultural deviance--tend themselves to justify or excuse delinquency (Kornhauser, 1978). Adherents of strain theory (Cloward & Ohlin, 1960), for example, might agree with the statement, "To get ahead, sometimes you have to do things that aren't right" without themselves engaging in antisocial behaviors, while law-abiding adherents of labeling theory might agree that "Most things people call delinquency don't really hurt anyone."

The ambiguity surrounding A is not present with C. Research suggests that the tendency to work hard, even without external rewards, is not only a strong predictor of offending, but remains strong even in models containing more overtly antisocial traits (Wiebe, 2003; see also Glueck & Glueck, 1950; Gottfredson & Hirschi, 1990). Further, unlike A, it appears factorially distinct from the other predictors used here. Finally, it appears amenable to straightforward self-report and, therefore, appears to conform to the rationality assumption.

Of the other non-FFM predictors, only Respect showed unique explanatory power in the full model across sexes. Because its reflected respect for police, it may have been an especially salient indicator of prosociality among this particular sample of criminal justice students.

In contrast to earlier research (Rowe et al., 1997), Mating Effort was not significant among females. The fourth non-FFM predictor, Deception, the willingness to lie and cheat, overlapped with A, Mating Effort, and Neutralization in theory as well as practice, was nonsignificant in multivariate models. This suggests that looking for indirect indicators of antisociality, such as Neutralization and Mating Effort, may be more fruitful than asking antisocial persons to identify themselves.

Implications for Darwinian Hypotheses

Overall, these results appear to support the notion that some of the traits of offenders are not readily apparent to individuals equipped only with the pan-human IPT represented by the FFM. This does not, of course, mean that individuals could not learn to recognize such attributes, only that they tend not to (A. J. Figueredo, personal communication, May 1, 2002). In fact, it appears that the sample of prisoners had learned to be attentive to a tendency to neutralize, such that their present levels of this tendency no longer predicted past offending.

These results accord with four Darwinian hypotheses. Each rests on the assumption that individuals in the EEA were probably more dependent than modern persons upon the group, and could not afford to poison their in-group relationships. Thus, it would have been very unusual to find a persistently antisocial person within one's group (Lykken, 1995). After all, unless they find new marks, cheaters run out of victims.

First, because of the limited rewards of persistent cheating, selection pressure in the EEA may have been insufficient to produce a specific adaptation for persistent antisociality. Any such adaptation may have evolved only after people began to leave their close-knit groups (Rowe, 1995). Second, there may have been a specific adaptation, but it occurred at such low frequencies that it did not stimulate the evolution of the ability to detect it. Third, there may have been an adaptation, but it may have been used mainly or exclusively in interactions with non-group members, triggered by the perception of difference; this adaptation might be involved in hate crime and prejudice among modern humans. Fourth, there may not be a specific adaptation. Instead, certain traits may bias individuals toward antisociality and, under some conditions, result in persistent antisociality (see Mealey, 1995). In any case, the ability to detect violations of reciprocity (Cosmides & Tooby, 1992) rather than antisocial traits would have been sufficient in the EEA to protect oneself from in-group cheating. Conversely, it would also have been unusual to find a person from a different group who had one's group's interests at heart. To determine whom to mistrust, therefore, one would have needed only the ability to identify outsiders.

Study Limitations and Suggestions for Future Research

Although its results generally supported its hypotheses, this research had several limitations. Of the three studies reported, only one contained a full set of variables, and it was conducted on a relatively small, homogeneous, generally noncriminal population. To remedy this, the study could be replicated with a population of juvenile or adult offenders, as well as with more representative samples. A second limitation was the Study 3's use of only a subset of previously-validated Big Five questionnaire items. While increasing reliability may only incrementally increase predictive validity (Nunnally & Bernstein, 1994), using longer, intact, scales would certainly increase confidence in the results. It should be noted, however, that the strongest predictor outside the Big

Five, Neutralization, contained fewer items than the Big Five scales and exhibited similar reliability. A third limitation was the use of only self-report items. Future studies should include assessments of others as well as the self, to determine, among other things, whether naive subjects accurately perceive criminogenic traits in other individuals (A. J. Figueredo, personal communication, May 1, 2002). If they do, then the FFM may reflect the methods used to derive it rather than the perceptions of ordinary individuals.

A more interesting reason to use longer Big Five scales, especially of A, would be to investigate whether the non-FFM traits used here are actually manifestations of low A, a plausible hypothesis if A indicates the willingness and ability to work in a cooperative setting. This could be tested by examining the factor structure of the combined pool of items from the non-FFM scales and a larger set of A items. The results could be compared with the various facets (FFM) or adjective clusters (Big Five) of A, some of which (e.g., Cooperation, Cunning) may overlap with the non-FFM traits, while others (e.g., Courtesy, Irritability) may not (see Goldberg, 1990; see also Ashton, 1998; Heaven, 1996). Future research should also investigate whether the unique content of the non-FFM scales can still explain variance in multivariate models after controlling for the FFM facets that overlap with them.

Conclusion

The results of this study have implications for personality psychology, evolutionary psychology, and criminology. For personality psychology, this study gives reason to question the rationality assumption underlying the FFM. It further points to the value of concentrating not merely on the content of the human personality, but on its connections with important real-world behaviors. This can not only create more comprehensive models of personality, but can facilitate commensurability between personality and social psychology (Baumeister, 1999), and can aid, in this case, in efforts to prevent antisocial behavior.

For evolutionary psychology, these results call into question the validity of the CAH as applied to modern humans, although the FFM may truly describe what were the "most important dimensions of the social landscape" during the EEA, at least within groups. In this case, the inability of the Big Five to detect the antisocial personality might represent another case of the mismatch between our evolved traits and our current environment (Burnham & Phelan, 2000).

Finally, the implications for criminology are similar to those for personality psychology. The results suggest that criminogenic traits are logically, as well as empirically, related to criminal offenses. This study follows the approach of Gottfredson & Hirschi (1990), who inferred the characteristics of criminals from the characteristics of crimes, but looks beyond the phenomenology of crime to its ecological context, inferring the nature of criminals from the nature of crime.

Footnotes

1. Some scholars consider the FFM and the Big Five separate models, because of the methods used to derive them--the Big Five emerge from factor analyses of natural language terms for human

attributes, while the FFM emerges from factor analyses of traditional measures of traits--and what is claimed to be the "dispositionalist explanatory hypothesis" that the five factors of the FFM represent discrete biological entities (Saucier & Goldberg, 1996, p. 37). However, both models converge on basically the same factors (Digman, 1996), and many scholars use the FFM without accepting the dispositionalist hypothesis (e.g., Borkenau & Ostendorf, 1998; Hogan, 1996). The two are used interchangeably here, unless specifically contraindicated.

2. Researchers have criticized the methods used to produce five factors, suggesting either adding (Ashton, Lee, & Son, 2000; Becker, 1999; Block, 2001; Paunonen & Jackson, 2000; Piedmont, 1999; see also Bouchard, 1997), subtracting (Eysenck, 1990; Wiggins & Trapnell, 1996; Zuckerman, 1994), or consolidating (Digman, 1997) dimensions.

3. The five factors may constitute states (Borkenau & Ostendorf, 1998) or aspects of individual reputations (Hogan, 1996), rather than stable traits (see also Hogan, 1990). If true, this might attenuate but not necessarily eliminate the ability of the FFM to predict relevant behaviors.

4. How deeply these attributes reach into human nature is unresolved. While Hogan (1996) considers the Big Five to exist solely in the realm of perception, MacDonald (1995, 1998) describes four of the five factors (excluding O) as bridges between three biological systems--approach (A and E), avoidance (C), and emotional reactivity (N)--and the challenges presented by human society. Eysenck's (1990) PEN model is similar (Bouchard, 1997); Zuckerman (1994) has proposed an alternative five-factor model reflecting underlying biological systems. The biology of personality lies outside the scope of the present paper.

5. This dichotomy has also been characterized as relative r vs. relative K selection (Ellis, 1987), unrestricted vs restricted sociosexuality (Gangestad & Simpson, 1990), and low vs high parental investment (Burgess, 1994; Hrdy, 1987; Trivers, 1974). Strategies are also thought to vary according to individual perceptions of future unpredictability: the less predictable the future, the more present-oriented (and potentially antisocial) the behavior (Belsky, Steinberg, & Draper, 1991; Hill, Ross, & Low, 1997).

6. This perspective resembles that of Hogan (1996), who describes the Big Five as important aspects of individuals' reputations relevant to the negotiation of status hierarchies and horizontal alliances, including those with friends and family (see also McAdams, 1996). It also resembles the perspective of Wiggins (Wiggins & Trapnell, 1996), who uses rotated versions of E and A, called Dominance and Nurturance, to explain human social interactions.

7. This trait should not be understood as a broad tendency to deceive oneself--after all, individuals who maintain unrealistically negative self-images engage in self-deception, but are more likely to be depressed than criminal (Baumeister, 1997).

8. This study assumes that antisocial persons do not form a discrete class, and that most people could offend, under certain circumstances (Ellis, 1990; Gottfredson & Hirschi, 1990). Although some offenders may be primary psychopaths, wholly unsuited for prosocial interactions (Hare, 1993; Mealey, 1995), most appear to be more flexible. However, traits that primary psychopaths share with secondary psychopaths (Mealey, 1995) or non-psychopaths may relate to antisocial behaviors. Similarly, although persistent offenders may be underrepresented in college samples, variance in offending within those samples may still systematical relate to certain traits. The goal is to discern traits that increase the probability of offending, not to identify psychopaths.

References

Alexio, P. A., & Norris, C. E. (2000). Personality and moral reasoning in young offenders. *Personality and Individual Differences, 28*, 609-623.

Ashton, M. C. (1998). Personality and job performance: The importance of narrow traits. *Journal of Organizational Behavior, 19*, 289-303.

Ashton, M. C., Lee, K., & Son, C. (2000). Honesty as the sixth factor of personality: Correlations with Machiavellianism, primary psychopathy, and social adroitness. *European Journal of Personality, 14*, 359-368.

Ashton, M. C., Paunonen, S. V., Helmes, E., & Jackson, D. N. (1998). Kin altruism,

reciprocal altruism, and the Big Five personality factors. *Evolution and Human Behavior, 19*, 243-255.

Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1999). Social cognitive theory of personality. In L. A. Pervin, & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 154-196). New York: Guilford.

Baumeister, R. F. (1997). *Evil: Inside human violence and cruelty*. New York: W. H. Freeman.

Baumeister, R. F. (1999). On the interface between personality and social psychology. In L. A. Pervin, & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 367-377). New York: Guilford.

Baumeister, R. F., Smart, L., & Boden, J. M. (1996). Relation of threatened egoism to violence and aggression: The dark side of high self-esteem. *Psychological Review, 103*, 5-33.

Beck, A. T. (2000). *Prisoners of hate: The cognitive basis of anger, hostility, and violence*. New York: Perennial.

Becker, P. (1999). Beyond the Big Five. *Personality and Individual Differences, 26*, 511-530.

Belsky, J., Steinberg, L., & Draper, P. (1991). Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development, 62*, 647-670.

Blackburn, R. (1986). Patterns of personality deviation among violent offenders: Replication and extension of an empirical taxonomy. *British Journal of Criminology, 26*, 254-269.

Blackburn, R., & Maybury, C. (1985). Identifying the psychopath: The relation of Cleckley's criteria to the interpersonal domain. *Personality and Individual Differences, 6*, 375-386.

Block, J. (2001). Millennial contrarianism: The five-factor approach to personality description 5 years later. *Journal of Research in Personality, 35*, 98-107.

Borkenau, P. (1992). Implicit personality theory and the Five-Factor Model. *Journal of Personality, 60*, 295-327.

Borkenau, P., & Ostendorf, F. (1998). The Big Five as states: How useful is the five-factor model to describe intraindividual variations over time? *Journal of Research in Personality, 32*, 202-221.

Bouchard, T. J. (1997). The genetics of personality. In R. S. Sparkes, T. H. J. Chen, & J. G. Cull (Eds.), *Handbook of psychiatric genetics* (pp. 273-296). Boca Raton, FL: CRC Press.

Budaev, S. V. (1999). Sex differences in the Big Five personality factors: Testing an evolutionary hypothesis. *Personality and Individual Differences, 26*, 801-813.

Burgess, R. L. (1994). The family in a changing world: A prolegomenon to an evolutionary analysis. *Human Nature, 5*, 203-221.

Burnham, T., & Phelan, J. (2000). *Mean genes: From sex to money to food: Taming our primal instincts*. Cambridge, MA: Perseus.

Burt, M. (1980). Cultural myths and supports of rape. *Journal of Personality and Social Psychology, 38*, 217-230.

Buss, D. M. (1991). Evolutionary personality psychology. *Annual Review of Psychology, 42*, 459-491.

Buss, D. M. (1995). Evolutionary psychology: A new paradigm for psychological science. *Psychological Inquiry, 6*, 1-30.

Buss, D. M. (1996). Social adaptation and five major factors of personality. In J. S. Wiggins (Ed.), *The five-factor model of personality: Theoretical perspectives* (pp. 180-207). New York: Guilford.

Buss, D. M. (1999). Human nature and individual differences: The evolution of human personality. In L. A. Pervin, & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 31-56). New York: Guilford.

Buss, D. M., & Greiling, H. (1999). Adaptive individual differences. *Journal of Personality, 67*, 209-243.

Cloninger, C. R. (1987). A systematic method for clinical description and classification of personality variants. *Archives of General Psychology, 44*, 573-588.

Cloward, R., & Ohlin, L (1960). *Delinquency and opportunity*. New York: Free Press.

Clower, C. E., & Bothwell, R. K. (2001). An exploratory study of the relationship between the Big Five and inmate recidivism. *Journal of Research in Personality, 35*, 231-237.

Cosmides, L., & Tooby, J. (1992). Cognitive adaptations for social exchange. In J. H. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 163-228). New York: Oxford.

Costa, P. T., & McCrae, R. R. (1988). From catalog to classification: Murray's needs and the five-factor model. *Journal of Personality and Social Psychology, 55*, 258-265.

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO personality inventory and NEO five-factor inventory: Professional manual*. Odessa, FL: Psychological Assessment Resources.

Crawford, C. (1998). The theory of evolution in the study of human behavior: An introduction and overview. In C. Crawford & D. L. Krebs (Eds.), *Handbook of evolutionary psychology: Ideas, issues, and applications* (pp. 3-41). Mahwah, NJ: Lawrence Erlbaum Associates.

Cronbach, L. J. (1951). Coefficient Alpha and the internal structure of tests.
Psychometrika, 16, 297-334.

Cronbach, L. J. (1955). Processes affecting scores on "understanding of others" and "assumed similarity". *Psychological Bulletin, 52*, 177-193.

Davis, N. Z. (1987). *Fiction in the archives: Pardon tales and their tellers in sixteenth-century France*. Stanford, CA: Stanford University Press.

Digman, J. M. (1996). The curious history of the five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality: Theoretical perspectives* (pp. 1-20). New York: Guilford.

Digman, J. M. (1997). Higher-order factors of the Big Five. *Journal of Personality and Social Psychology, 73*, 1246-1256.

Ellis, L. (1987). Criminal behavior and r/K selection: An extension of gene-based evolutionary theory. *Deviant Behavior, 8*, 149-176.

Ellis, L. (1990). Conceptualizing criminal and related behavior from a biosocial perspective. In L. Ellis, & H. Hoffman (Eds.), *Crime in biological, social, and moral contexts* (pp. 18-35). New York: Praeger.

Eysenck, H. J. (1990). Biological dimensions of personality. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 244-276). New York: Guilford.

Figueredo, A. J., Cox, R. L., & Rhine, R. J. (1995). A generalizability analysis of subjective personality assessments in the Stumptail macaque and the Zebra finch. *Multivariate Behavioral Research, 30*, 167-197.

Figueredo, A. J., & King, J. E. (2001, June). *The evolution of individual differences in behavior*. Presented at the annual meeting of the Human Behavior and Evolution Society, London, UK.

Frank, R. H. (1988). *Passions within reason: The strategic role of the emotions*. New York: W. W. Norton.

Gangestad, S. W., & Simpson, J. A. (1990). Toward an evolutionary history of female sociosexual variation. *Journal of Personality, 58*, 69-96.

Glueck, S., & Glueck, E. (1950). *Unraveling juvenile delinquency*. New York: The Commonwealth Fund.

Goldberg, L. R. (1990). An alternative "description of personality": The Big-Five factor structure. *Journal of Personality and Social Psychology, 59*, 1216-1229.

Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.

Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality and Individual Differences, 1*, 111-119.

Hare, R. D. (1993). *Without conscience: The disturbing world of the psychopaths around us*. New York: Pocket Books.

Harpur, T. J., Hart, S. D., & Hare, R. D. (1994). Personality of the psychopath. In P. T. Jr. Costa, & T. A. Widiger (Eds.), *Personality disorders and the five-factor model of personality* (pp. 149-173). Washington, D.C.: American Psychological Association.

Heaven, P. C. L. (1996). Personality and self-reported delinquency: Analysis of the "Big Five" personality dimensions. *Personality and Individual Differences, 20*, 47-54.

Heaven, P. C. L., Caputi, P., Trivellion-Scott, D., & Swinton, T. (2000). Personality and group influences on self-reported delinquent behaviour. *Personality and Individual Differences, 28*, 1143-1158.

Herrnstein, R. J. (1995). Criminogenic traits. In J. Q. Wilson, & J. Petersilia (Eds.), *Crime* (pp. 39-63). San Francisco: Institute for Contemporary Studies.

Hindelang, M. J., Hirschi, T, & Weis, J. (1981). *Measuring delinquency*. Beverly Hills, CA: Sage.

Hill, E. M., Ross, L. T., & Low, B. S. (1997). The role of future unpredictability in human risk-taking. *Human Nature, 8*, 287-325.

Hirschi, T. (1969). *Causes of delinquency*. Berkeley, CA: University of California Press.

Hirschi, T., & Gottfredson, M. R. (1995). Control theory and the life-course perspective. *Studies on Crime and Crime Prevention, 4*, 131-142.

Hirschi, T., & Hindelang, M. J. (1977). Intelligence and delinquency: A revisionist review. *American Sociological Review, 42*, 571-587.

Hogan, R. T. (1990). Personality and personality measurement. In M. D. Dunnette, & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology (2nd ed.), vol. 2* (pp. 873-919). Palo Alto, CA: Consulting Psychology Press.

Hogan, R. (1996). A socioanalytic perspective on the five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality: Theoretical perspectives* (pp. 163-179). New York: Guilford.

Hrdy, S. B. (1987). Sex-biased parental investment among primates and other mammals: A critical evaluation of the Trivers-Willard hypothesis. in R. J. Gelles, & J. B. Lancaster (editors), *Child abuse and neglect: Biosocial dimensions* (pp. 97-147). New York: Aldine de Gruyter.

John, O. P. (1990). The "Big Five" factor taxonomy: Dimensions of personality in the natural language and in questionnaires. in L. A. Pervin (editor), *Handbook of personality: Theory and research* (pp. 66-100). New York: Guilford.

John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin, & O. P. John (Eds.), *Handbook of personality: Theory and research (2nd ed.)* (pp. 102-138). New York: Guilford.

Kaiser, J., Barry, R. J., & Beauvale, A. (2001). Evoked cardiac response correlates of

cognitive processing and dimensions of personality: Eysenck's concept of psychoticism revisited. *Personality and Individual Differences, 30*, 657-668.

Kandel, E., Mednick, S. A., Kirkegaard-Sorenson, L., Hutchings, B., Knop, J., Rosenberg, R., & Schulsinger, F. (1988). IQ as a protective factor for subjects at high risk for antisocial behavior. *Journal of Consulting and Clinical Psychology, 56*, 224-226.

Kenrick, D. T., Dantchik, A., & MacFarlane, S. (1983). Personality, environment, and criminal behavior: An evolutionary perspective. In W. S. Laufer, & J. M. Day (Eds.), *Personality theory, moral development, and criminal behavior* (pp. 217-241). Lexington, MA: D. C. Heath.

Kim, J.-O., & Mueller, C. W. (1978). *Factor analysis: Statistical methods and practical issues. Sage University Paper series on Quantitative Applications in the Social Sciences, series no. 07-014*, Beverly Hills, CA: Sage.

King, J. E., & Figueredo, A. J. (1997). The five-factor model plus dominance in chimpanzee personality. *Journal of Research in Personality, 31*, 257-271.

Kornhauser, R. R. (1978). *Social sources of delinquency: An appraisal of analytical models*. Chicago: University of Chicago Press.

Loehlin, J. C. (1992). *Latent variable models: An introduction to factor, path, and structural analysis (2nd ed.)*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Lykken, D. T. (1995). *The antisocial personalities*. Hillsdale, NJ: Lawrence Erlbaum Associates.

MacDonald, K. (1995). Evolution, the Five-Factor Model, and levels of personality. *Journal of Personality, 63*, 525-567.

MacDonald, K. (1998). Evolution, culture, and the five-factor model. *Journal of Cross-Cultural Psychology, 29*, 119-149.

Maruna, S. (2001). *Making good: How ex-convicts reform and rebuild their lives.* Washington, DC: American Psychological Association.

McAdams, D. P. (1996). Personality, modernity, and the storied self: A contemporary framework for studying persons. *Psychological Inquiry, 7*, 295-321.

McCrae, R. R. (2001). 5 years of progress: A reply to Block. *Journal of Research in Personality, 35*, 108-113.

McCrae, R. R., & Costa, P. T. (1996). Toward a new generation of personality theories: Theoretical contexts for the five-afctor model. In J. S. Wiggins (Ed.), *The five-factor model of personality: Theoretical perspectives* (pp. 51-87). New York: Guilford.

McCrae, R. R., & Costa, P. T. (1999). A five-factor theory of personality. In L. A. Pervin, & O. P. John (Eds.), *Handbook of personality: Theory and research* (pp. 139-153). New York: Guilford.

McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality, 60*, 175-215.

Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. *Behavioral and Brain Sciences, 18*, 523-599.

Mealey, L. (1997). Heritability, theory of mind, and the nature of normality. *Behavioral and Brain Sciences, 20*, 527-532.

Mele, A. R. (1997). Real self-deception. *Behavioral and Brain Sciences, 20*, 91-136.

Miller, G. F. (1997). Protean primates: The evolution of adaptive unpredictability in competition and courtship. In A. Whiten, & R. W. Byrne (Eds.), *Machiavellian intelligence II: Extensions and evaluation* (pp. 312-340). Cambridge, UK: Cambridge University Press.

Miller, J. D., & Lynam, D. (2001). Structural models of personality and their relation to antisocial behavior: A meta-analytic review. *Criminology, 39*, 765-798.

Mischel, W., & Peake, P. K. (1982). The illusory nature of implicit personality theory:

Logical and empirical considerations. *Journal of Personality, 50*, 203-222.

Moffitt, T. E., Krueger, R. F., Caspi, A., & Fagan, J. (2000). Partner abuse and general crime: How are they the same? How are they different? *Criminology, 38*, 199-232.

Norman, W. T. (1967). *2800 personality trait descriptors: Normative operating characteristics for a university population*. Ann Arbor, MI: University of Michigan Department of Psychology.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory (3rd ed.)*. New York: McGraw-Hill.

Ornstein, R., & Ehrlich, P. (1989). *New world new mind*. New York: Touchstone.

Paunonen, S. V., & Jackson, D. N. (2000). What is beyond the Big Five? Plenty! *Journal of Personality, 68*, 821-835.

Pervin, L. A., & John, O. P. (1999). *Handbook of personality: Theory and research (2nd ed.)*. New York: Guilford.

Piedmont, R. L. (1999). Does spirituality represent the sixth factor of personality? Spiritual transcendence and the Five-Factor model of personality. *Journal of Research in Personality, 67*, 42-59.

Piquero, A. R. (2000). Assessing the relationships between gender, chronicity, seriousness, and offense skewness in criminal offending. *Journal of Criminal Justice, 28*, 103-115.

Quinsey, V. L., Book, A., & Lalumière, M. L. (2001). A factor analysis of traits related to individual differences in antisocial behavior. *Criminal Justice and Behavior, 28*, 522-536.

Ridley, M. (1996). *The origins of virtue*. New York: Viking.

Riemann, R., Angleitner, A., & Strelau, J. (1997). Genetic and environmental influences on personality: A study of twins reared together using the self- and peer report NEO-FFI scales. *Journal of Personality, 65*, 449-475.

Rowe, D. C. (1995). Evolution, mating effort, and crime. *Behavioral and Brain Sciences, 18*, 573-574.

Rowe, D. C. (1996). An adaptive strategy of crime and delinquency. in J. D. Hawkins (Ed.), *Delinquency and crime: Current theories* (pp. 268-314). Cambridge, UK: Cambridge University Press.

Rowe, D. C., Vazsonyi, A. T., & Figueredo, A. J. (1997). Mating effort in adolescence: Conditional or alternative strategy. *Personality and Individual Differences, 23*, 105-115.

Sanderson, S. K. (2001). *The evolution of human sociality: A Darwinian conflict perspective*. Lanham, MD: Rowman & Littlefield.

Saucier, G., & Goldberg, L. R. (1996). The language of personality: Lexical perspectives on the five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality: Theoretical perspectives* (pp. 21-50). New York: Guilford.

Schmitt, D. P., & Buss, D. M. (2000). Sexual dimensions of personality description: Beyond or subsumed by the Big Five? *Journal of Research in Personality, 34*, 141-177.

Shweder, R. A., & D'Andrade, R. G. (1979). Accurate reflection or systematic distortion? A reply to Block, Weiss, & Thorne. *Journal of Personality and Social Psychology, 37*, 1075-1084.

SPSS, Inc. (1998). *SPSS Base 8.0 applications guide*. Chicago: Author.

Sykes, G. M., & Matza, D. (1957). Techniques of neutralization: A theory of delinquency. *American Sociological Review, 22*, 664-670.

Tellegen, A. (1985). Structures of mood and personality and their relevance to assessing anxiety with an emphasis on self-report. In A. H. Tuma & J. D. Maser (Eds.), *Anxiety*

and the anxiety disorders (pp. 681-706). Hillsdale, NJ: Lawrence Erlbaum Associates.

Tennenbaum, D. J. (1977). Research studies of personality and criminality: A summary and implications of the literature. *Journal of Criminal Justice, 5*, 1-19.

Tooby, J., & Cosmides, L. (1990). On the universality of human nature and the uniqueness of the individual: The role of genetics and adaptation. *Journal of Personality, 58*, 17-67.

Trivers, R. L. (1971). The evolution of reciprocal altruism. *The Quarterly Review of Biology, 46*, 35-57.

Trivers, R. L. (1974). Parent-offspring conflict. *American Zoologist, 14*, 249-264.

Trivers, R. L. (1985). *Social evolution*. Menlo Park, CA: Benjamin/Cummings.

Vila, B. (1994). A general paradigm for understanding criminal behavior: Extending evolutionary ecological theory. *Criminology, 32*, 311-359.

Weigel, R. H., Hessing, D. J., & Elffers, H. (1999). Egoism: Concept, measurement and implications for deviance. *Psychology, Crime, & Law, 5*, 349-378.

Widaman, K. F. (1993). Common factor analysis versus principal component analysis: Differential bias in representing model parameters? *Multivariate Behavioral Research, 28*, 263-311.

Wiebe, R. P. (2003). Reconciling psychopathy and low self-control. *Justice Quarterly, 20*, 297-336.

Wiggins, J. S., & Trapnell, P. D. (1996). A dyadic-interactional perspective on the five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality: Theoretical perspectives* (pp. 88-162). New York: Guilford.

Wilson, D. S., Near, D., & Miller, R. R. (1996). Machiavellianism: A synthesis of the evolutionary and psychological literatures. *Psychological Bulletin, 119*, 285-299.

Wright, R. (2000). *Nonzero: The logic of human destiny*. New York: Pantheon.

Wright, S. (1932). The roles of mutation, inbreeding, crossbreeding, and selection in evolution. *Proceedings of the XI International Congress of Genetics, 1*, 356-366.

Zuckerman, M. (1994). An alternative five-factor model for personality. In C. F. Jr. Halverson, G. A. Kohnstamm, & R. P. Martin (Eds.), *The developing structure of temperament and personality from infancy to adulthood* (pp. 53-68). Hillsdale, NJ: Lawrence Erlbaum Associates.

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