SEX DIFFERENCES IN CRIME: DO MEANS AND WITHIN-SEX VARIATION HAVE SIMILAR CAUSES?

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The mean level of delinquency is generally greater in males than in females. This article investigates whether the determinants of this mean sex difference are the same as those of delinquency variation within-sex. The first analytic approach focused on variables. A variable that explained more variation among individuals in delinquency also had a larger mean difference between males and females. The correlates of delinquency were also similar in males and females. The second analytic approach used individuals as the unit of analysis. In a structural equation model, a single latent trait could explain most of the sex difference in the manifest variables of delinquency, impulsivity, rebelliousness, and deceitfulness. The mean difference in delinquency between males and females may arise because males are more exposed to these common etiologic factors than are females.

A large sex difference in crime is widely acknowledged: proportionately more men than women commit crimes. This relationship holds true across historical periods and across societies. In England and Wales from 1842 to 1844, the crime rate for young men was about 800 per 100,000 population, whereas for young women it was only about 100 per 100,000 (Gottfredson and Hirschi 1990, p. 125). In cross-national data taken from 1963 to 1972 in societies as diverse as Brunei, Fiji, Japan, and West Germany, males were 5 to 50 times more likely to be arrested than females (Wilson and Herrnstein 1985). Proportionately more men than women also commit serious crimes resulting in injury, death, or the loss of property. In a compilation of statistics from self-reports of delinquent acts (Gottfredson and Hirschi 1990), the following sex ratios were found: drink alcohol, 1.28 males to 1 female; steal

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$2.00 to $50.00, 2.7 to 1; and steal more than $50.00, 3.7 to 1. Homicides have been especially dominated by males, both as murderers and as victims. Nearly all murders that involve two same-sex adults are committed by one man against another, and almost none by one woman against another (Daly and Wilson 1988). Given sex differences of a large magnitude, Wilson and Herrnstein (1985) noted that "gender demands attention in the search for the origins of crime" (p. 104).

At the same time, the variability in crime that exists within-sex is considerable. Typically, self-report crime distributions show a positive skew. The majority of females commit none or just a small number of criminal acts—yet many high-rate female offenders exist in the distribution's tail. Similarly, although the male distribution has a higher mean than the female one, most males also commit none or just a few criminal acts, with high-rate offenders concentrated in a long tail. In official statistics, a disproportionately small number of people account for the majority of detected crimes. In Wolfgang's Philadelphia study of a male cohort (Wolfgang, Thornberry, and Figlio 1987), "seventy-four percent of all arrests and 82 percent of all index offense arrests were charged to the chronic [15% of population] offenders" (p. 79). Criminological theories have sought explanations for individual differences in crime rates (e.g., Elliott, Ageton, and Huizinga 1985; Eysenck 1965; Glueck and Glueck 1950; Hirschi 1969).

Theories that explain individual differences in crime often ignore the male-female difference, and vice versa. One reason is that many theories of crime devote considerable attention to males' criminal behavior, but neglect females' altogether. Another reason is that different explanations have been given for male and female delinquency. In comparison to theories of female crime, Canter (1982) noted that theories of male delinquency have placed greater emphasis on peer influence, economic and political influence, and the access to educational and job opportunities than have theories of female crime. In contrast, theories of female crime put a greater emphasis on female delinquents' personal maladjustments; crime was typically attributed to women's biological or psychological make-up. Given different explanations of male and female crime, a theory could easily assume that the etiology of the higher crime rates in males versus females is unrelated to the causes of individual differences in crime rates among males (or vice versa).

Nonetheless, a curious observation has long appeared in the criminological literature: Any psychosocial variable that is associated with crime within one sex also seems to be associated with crime within the other. Wilson and Herrnstein (1985) made this observation:

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> The Gluecks' conclusion that women and men are both led into crime by essentially the same social forces and individual dispositions seems no less correct today than it was fifty years ago, despite the increasing rates of female offending and the changes fostered by the women's movement. (p. 124)

Gottfredson and Hirschi (1990, p. 148) also noted that the causes of crime appear to be similar in males and females.

Of course, similar causes of within-sex variation in males and females is not proof that these same etiologic factors determine the mean sex difference. Hypothetical cases can be created in which means and within-group variation have etiologically distinct causes. Consider two plots of plants. One plot is exposed to twice the sunlight of the other. Within each plot, the growing plants receive different amounts of fertilizer. In all other respects, the two plots have been equated. Now, if plant growth results from light plus nitrogen in fertilizer, then a plant that received the most fertilizer and light would grow best. Variation in growth between plots would have a different cause (light levels) from that within them (fertilizer levels). If these plots are regarded as analogous to males versus females, then this hypothetical case shows that it is at least possible for the causes of means (plots = sexes) and variation (plants = individual variation) to be different.

Males and females, however, are not raised physically apart from one another and then exposed to entirely different developmental influences. Developmental influences should strike each individual, one at a time; therefore, a mean difference between males and females may merely represent the aggregate of individual variation in crime proneness. In this article, we hypothesize that (a) within-sex variation in crime will have similar etiological determinants in males and females, and (b) these influences on within-sex variation will produce the mean male-versus-female difference in crime prevalence.

In a mathematical model of crime, Rowe, Osgood, and Nicewander (1990) provided some empirical support for the above hypotheses. They postulated a normally distributed latent trait representing individuals' proneness to commit criminal acts. This *crime proneness trait* was assumed to be normally distributed. Scores on the crime proneness trait were then translated mathematically into offending rates.

Their *latent trait* model suggested that sex differences could result from a displacement of the sexes' latent trait means. This conclusion was shown by fitting the mathematical model to male and female offense frequency distributions. For example, in the Racine study's males (Shannon 1988), 30% committed zero criminal acts, 21% one act, and 11% two acts, whereas in its females, the corresponding figures were 77%, 13%, and 4% for zero, one,

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and two acts, respectively. According to the latent trait model, the distribution of offending frequency in males and females could be explained if the males' latent trait distribution had a mean 1.4 standard deviation greater than the females'. Similarly, displacements in their latent trait means could explain male and female self-report offense frequency distributions if, on average, the male mean was .6 standard deviation units greater than the female mean. In this modeling approach, however, the test of the equivalence of the latent trait in males and females possessed a weakness in that the latent trait was not directly observed. The present article uses two analytic strategies to examine whether mean differences and individual differences in crime result from similar or different underlying influences.

ANALYTIC STRATEGY 1: VARIABLES AS OBSERVATIONS

The first analytic strategy used variables as the unit of observation. We hypothesized that males and females would differ more on a variable when it was more strongly correlated (within sex group) with delinquency. Note that no necessary relationship exists between a correlation coefficient computed on two variables within one sex and the mean sex difference on either variable. A *within*-sex correlation, by definition, cannot statistically contain a component of variation due to the sexes' mean difference.

The strength of association between a variable and delinquency is simply their statistical correlation (*within* males or females). The magnitude of a sex difference on a variable can be expressed in d units, as given in the following equation:

$$d = (M_m - M_f)/s,$$

where d is the sex difference in standard deviation units, M_m is the male mean, M_f is the female mean, and s is the standard deviation (for convenience, taken over the entire population). A relationship was expected to exist such that the more a measure correlated with delinquency within sex, the greater the effect size, d, of the mean sex difference on that same variable. This hypothesis was tested by treating variables instead of people as observations. Each variable had associated with it an r and a d value. Our hypothesis anticipated a positive correlation of these r and d values (where $N = 18$).

ANALYTIC STRATEGY 2: INDIVIDUALS AS OBSERVATIONS

Using variables as the unit of observation, the foregoing analytic strategy sought to establish a connection between the determinants of individual

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differences and those of the mean sex difference. However, it fails to answer this question: Does a single latent trait determine both individual variation and the male-versus-female difference in crime rates? To answer this question, we must turn to individuals, rather than to variables, as the unit of observation.

In Figure 1, a structural equation model is proposed to evaluate sex effects quantitatively. The basic idea is that a mean difference between males and females exists first in a latent trait variable (circle). If the hypothesis is correct, then the latent mean difference should explain all observed sex differences. Four observed variables are represented in the measurement model (A-D). Because sex determines the latent trait, but not any measured variable directly, a correlation between sex and any measured variable A-D must operate through the latent trait. By definition, the sex effect is thus a product of the loading of sex on the latent trait (m) and the loading of the measured variable on the latent variable (A-D). For example, suppose delinquency loaded on the latent trait variable .7 and impulsivity loaded on .30. If the path from sex to the latent trait was .25, then delinquency should correlate with sex as follows, $.25 \times .7 = .18$, whereas the correlation of impulsivity and sex should be $.25 \times .5 = .13$. Thus, if the latent trait accounted for the entire sex effect successfully, the observed correlations with sex should be strictly proportional to the trait loadings. Our hypothesis, then, is that once the latent trait effect has been removed statistically, any residual correlation between sex and an indicator of this trait, including self-report delinquency, would be zero.

SAMPLE AND MEASURES

A national marketing research firm provided a list of 7,014 working phone numbers in a southwestern city that was generated by cross-checking commercial data lists (e.g. school registrations, magazine subscriptions, phone directories, driver's license records) and including both directory-listed and unlisted numbers. A local survey organization used these numbers to locate English-speaking families with two birth-order adjacent siblings primarily 10 through 16 years of age. Consistent with expected base rates, 7% of the families contacted by phone qualified for our study, and nearly all these families (N = 499; 95%) agreed to participate (an incentive was a $50 payment to each family). In families with three or more siblings, the first eligible pair was chosen randomly.

Appointments were made with the parents to interview their children in their homes. Two interviewers visited each home, with one interviewer

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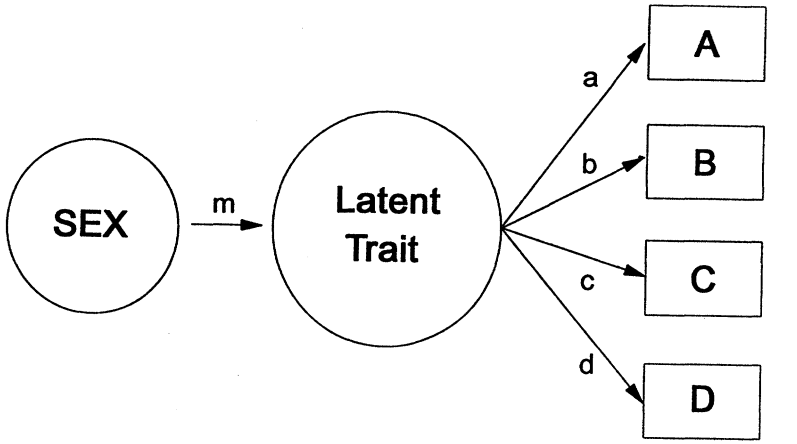

Figure 1. Structural Equation Model of Sex Effects on Delinquency

assigned to each sibling. A private place was found where each child could be interviewed without being overheard by other family members.

The surveys were administered using portable computers running D-Base III+ software, which presented a screen with each question and its response format. Adolescents were given the option to enter their own responses to sensitive questions. Otherwise, the interviewer read the questions and entered the subjects' responses. The computer program automatically skipped inapplicable questions and contained error-checking routines to guard against entry of out-of-range values. This procedure held most subjects' attention well.

Because of funding limitations and the loss of families through residential moves, siblings in 418 of the 499 families in the telephone sample were interviewed (84%) between June and November 1990. The final Arizona Sibling Relationship Study sample consisted of birth-order adjacent siblings forming 141 mixed-sex sibling pairs, 135 brother pairs, and 142 sister pairs (a total of 836 individuals in 418 families). Mean age of adolescents was 13.5 years. The average age difference between siblings was just under 3 years (mean = 2.7 years, SD = 1.08 years, range = .6 years to 6.2 years). (The use of siblings usually leaves correlations structures among variables unchanged when they are treated as individuals.)

The sample was relatively advantaged in terms of social class. The respondents' mothers were generally well educated: 3% less than high school,

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28% high school graduate, 24% some post-high school, and 44% college graduate or more. Eighty-nine percent of all youths were from intact families in which both a biological mother and father were present. Fifteen percent of youths had one or two Hispanic parents; 78% had two Caucasian parents. Few individuals belonged to other minority groups. Eleven percent of adolescents reported that they had used illicit drugs at least once in their lifetime (primarily marijuana and inhalants), and in the past year 39% had consumed alcohol, 18% had smoked, 78% had committed at least one delinquent act, and 60% had some dating or intimate experience with the opposite sex.

Measures

The delinquency scale consisted of 20 self-report items adapted from Rowe's (1985) instrument of delinquent behavior, with items covering behavior that occurred in the past year. Items from Rowe (1985) with low base rates (less than 10%) were omitted, and items referring to aggression were modified to exclude aggression directed toward a sibling. To reduce the potential skewness of the delinquency score distribution, a truncated set of response alternatives was summed to form the scale score: 0 = *never*, 1 = *one time*, 2 = *several times*, and 3 = *very often*. The items can be classified as: vandalism and trespassing (6 items); shoplifting and theft (4 items); lying (1 item); speeding in a car (1 item); noncompliance with an adult (1 item); and aggression (7 items). The 20-item scale's Cronbach alpha reliability was .81 and was not significantly different by sex.

The sexual experience scale consisted of five progressively more intimate sexual behaviors. That is, items were ordered from *least difficult* (i.e., most respondents endorsing) to *most difficult* (fewest respondents endorsing) as follows: (a) kissing, (b) dating, (c) made-out, (d) petted heavily (touched under clothes), and (e) sexual intercourse.

Maternal and paternal affection was assessed with two short scales. The four-item affection scale consisted of: "I share my thoughts with my ____." ; "I would like to be the kind of person my ____is."; "When I'm away from home my____knows where I am and who I'm with."; and "I have lots of respect for my ____." These items were repeated for mother and father. Internal consistency for the four items was adequate (alpha = .71 for fathers, .67 for mothers).

Two items assessed parental control: "As far as my ____is concerned, I'm pretty much free to come and go as I please (reversed)"; and "My ____is very strict about my behavior in general." The items were asked of mother and

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father separately, but responses to the two parents were so highly correlated (r = .57, N = 836) that maternal and paternal control fail to operate as distinguishable constructs. Thus this control scale combined the mother and father items into one four-item scale (alpha = .56).

Three subscales were taken from the Sibling Inventory of Differential Experience (SIDE; Daniels and Plomin 1985) that assessed peer delinquency, peer achievement, and peer sociability. On each scale, the scoring captures within-family variation in social experiences—that is, the respondent judges whether his or her peer group possesses more or less of a characteristic than his or her sibling's peer group. Each item is rated on a 5-point scale, with 1 = *my siblings' friends have more of the characteristics*; 3 = *both siblings' friends have the same characteristics*; and 5 = *my friends have more of the characteristics.* As a result, the correlation of sibling A's rating with sibling B's rating for reported peer group characteristics were negative in sign (e.g., if sibling A's peer group is more delinquent than sibling B's, the latter sibling should make an opposite response if their reports agree). Test-retest reliabilities of the SIDE scales range from .77 to .93, and they correlate with within-sibling pair differences in personality traits (Daniels 1986). Scale reliabilities for the present sample were consistent with those reported in the literature for this scale: peer achievement alpha (nine items) = .82; peer delinquency (seven items) = .81; and peer popularity (eight items) = .66.

Two academic scales were employed in the study. The first, assessing value on achievement, summed scores on three items: reports of average grades in school ("A," "B," "C," "D," or "F"); of the importance of getting good grades; and of interest in books, school, and education (alpha = .53). A second academic scale dealt with parental encouragement of academic work. Scores on two items were summed: "How often do you talk to your parents about how well you are doing in school?" and "How important do you think it is to your parents that you do well in school?" The respondent indicated a frequency to the first item (1 = *very often* to 4 = *never or almost never*) and a rating of importance to the second (1 = *very important* to 4 = *not important at all*). The first item correlated r = .90 with the total sum score; the importance item correlated with the total score r = .42.

Verbal IQ was assessed using a 15-item scale developed for use in survey research by Veroff, McClelland, and Marguis (1971). The Institute for Survey Research in Ann Arbor used this scale successfully to differentiate verbal IQ scores among social class groups. Each item requires choosing the correct word to complete a sentence from among five alternatives, and the 15 items are ordered in increasing difficulty. The score is the total number of items

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answered correctly. The split-half reliability for the 15-item scale controlling for age was .50. In our sample, verbal IQ correlated .26 with self-reported school grades ($p < .01$).

Four personality traits were assessed using scales from Buss and Plomin's (1984) EAS Temperament Survey: emotionality, anger, activity, and sociability. A fifth personality trait, impulsivity, was assessed using five items developed for use in this study (e.g., "I have to use a lot of self-control to keep out of trouble"). The distress and fear subscales of the EAS were combined to form an eight-item emotionality scale. Sample items for emotionality include "I often feel frustrated" and "I often feel insecure." Anger, activity, and sociability were each four-item scales; sample items include "It takes a lot to make me mad" (anger); "My life is fast paced" (activity); and "I like to be with people" (sociability). The respondent is asked to rate items on a scale from 1 (*not characteristic or typical of yourself*) to 5 (*very characteristic or typical of yourself*). The EAS has been used extensively in studies with children and adolescents (Buss and Plomin 1975, 1984). Average 2-week test-retest reliability of the EAS on a sample of adolescents was .82 (Buss and Plomin 1984). Internal consistency of the EAS scales on a sample of young children averaged .83 (Buss and Plomin 1984). For this sample, the internal consistency of the scales was as follows: emotionality = .75; anger = .52; activity = .50; sociability = .54; and impulsivity = .65.

Fourteen items from Elliott's (Elliott et al. 1985) Normlessness Scale were used to form a Deceitfulness Scale. The scale name Deceitfulness was chosen to better reflect the item content for the scale; that is, the adolescent reports being dishonest with someone who he or she would normally respect or love (parents, friends, teachers; Rowe 1986). A 5-point Likert response ranging from *strongly agree* to *strongly disagree* is employed with this scale (e.g., "To stay out of trouble, it is sometimes necessary to lie to teachers"). A high score reflects a high commitment to conventional norms. In Elliott et al. (1985), the alphas over three waves for family, school, and peer normlessness scales ranged from .63 to .69. In our sample, combining the three conceptual facets of Elliott's normlessness yielded a Cronbach's alpha of .85.

Eight rebelliousness items, representative of the total item content, were drawn from Smith and Fogg's (1979) 24-item Rebelliousness Scale. Subjects chose one of four responses, ranging from *definitely true* to *definitely false* on items such as "If I don't like something I'm told to do, I often put it off, or I just don't do it at all." Smith and Fogg's split-half reliability for the original 24-item scale ranged from .80 to .85. In their study of over 3,000 mainly middle-class youths, rebelliousness was a good predictor of adolescent involvement in drug use. Internal consistency for our sample was adequate (alpha = .78).

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ANALYSIS 1: VARIABLES AS OBSERVATIONS

Table 1 presents the means and *d* statistics on the explanatory variables to be used in subsequent analyses (*d*, the mean difference of boys' mean minus girls' mean in standard deviation units, was computed according to the formula given above). This *d* statistic was positive in sign when males had a greater mean than females, and negative in the reverse situation. In absolute value, the *d* values ranged from .64 on deceitfulness to .06 on verbal IQ. Trait-characteristics of the respondent yielded the largest *d* values (deceitfulness = .64, rebelliousness = .47, and impulsivity = .41). Mothers' warmth also yielded a large *d*, with girls perceiving greater maternal warmth ($d = -.44$). As shown in Table 1, the *d* values represented significant mean sex differences on 11 of the 18 behavioral variables. As expected, self-report delinquency itself yielded a large *d* of .63 in the direction of a greater male mean (mean males = 6.5, mean females = 3.1, $p < .05$). The variance of delinquency was also greater in males (36) than in females (16), because in a count variable, variance has a statistical dependence on the mean. When standardized against the smaller female variance, the *d* on delinquency was greater than that of any variable shown in Table 1 ($d = .85$).

Table 2 presents partial correlations between each variable listed in Table 1 and delinquency. These partial correlations controlled statistically for variables' association with age. In boys, delinquency correlated .32 with age; in girls, .23 ($p < .05$). Rebelliousness, deceitfulness, and the peer variables listed in Table 1 also tended to increase with age. These partial correlation coefficients gave the associations of delinquency with the explanatory variables in Table 1. The explanatory variables most strongly correlated with delinquency were the trait variables of impulsivity (.37 and .38 in males and females, respectively), deceitfulness (.41 and .31), and rebelliousness (.47 and .45). Sexual experience also correlated highly (relative to other variables) with delinquency (.35 and .41). On the other hand, verbal IQ lacked an association with delinquency in either sex (–.01 and .01).

The male and female correlations were similar to one another in magnitude, and they failed to differ statistically. In Table 2, the correlation coefficients of males and females themselves correlated .96 ($p < .05$, $N = 18$ variables), showing their close matching of magnitude. These findings thus supported our first hypothesis, that the origins of delinquency variation appears to be similar in the two sexes.

A major hypothesis was that variables with large male-versus-female mean differences would correlate more strongly with delinquency than ones with small mean differences. This hypothesis was tested by correlating *d* against *r* over the 18 variables. In males, the correlation equalled .80 ($p < .05$),

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TABLE 1: Mean Differences and Effect Size Between Males and Females

Variable	*Male Mean*	*Female Mean*	d
Sexual experience	1.5	1.3	.12
Father's affection	15.9	15.4	.17*
Mother's affection	15.8	16.8	–.44*
Father's control	5.3	5.2	.08
Mother's control	5.5	5.4	.08
School achievement	10.1	10.7	–.34*
Verbal IQ	9.3	9.2	.06
Encouraged achievement	6.8	6.9	–.13*
Anger	12.3	11.8	.18*
Activity	13.4	13.1	.11
Sociability	14.5	15.0	–.22*
Emotionality	20.7	21.5	–.18*
Impulsivity	16.0	14.8	.41*
Deceitfulness	33.1	28.5	.64*
Rebelliousness	21.8	19.7	.47*
Peer achievement	35.2	36.4	–.20*
Peer delinquency	21.3	20.4	.22*
Peer popularity	24.6	25.3	–.15*

*$p < .05$, $N = 407$ boys, 425 girls.

whereas in females it equalled .68 ($p < .05$). Figure 2 shows the scatterplots of d against r for males and females. A linear relationship of the two statistics is clearly visible in the scatterplot. These findings supported the second part of the hypothesis—that the causes of within- and between-sex variation were nearly identical.

It should be emphasized that no mathematical necessity whatsoever exists for within-sex correlations (r) to track the magnitude of mean sex differences (d). To demonstrate this point, height (statistically corrected for its association with age) was put in place of delinquency, and the above analytic steps were repeated. As was the case with delinquency, mean heights differed between the sexes (d height = .38). In this analysis, however, the relationship of the within-sex correlations to those variables' mean sex differences (in standard deviation units) was statistically nonsignificant ($r = –.22$ in boys, $r = .06$ in girls).

ANALYSIS 2: INDIVIDUALS AS OBSERVATIONS

In the second analytic approach, individuals were treated as the unit of analysis. We chose to use the three trait variables (impulsivity, rebelliousness, and deceitfulness) and delinquency to index a latent trait. A correlation matrix was computed across all four variables for all respondents ($N = 836$). All

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TABLE 2: Partial Correlations Between Each Variable and Self-Report Delinquency

Variable	*Male* r	*Female* r
Sexual experience	.35*	.41*
Father's affection	−.24*	−.28*
Mother's affection	−.28*	−.21*
Father's control	.03	−.14*
Mother's control	.01	−.08
School achievement	−.25*	−.27*
Verbal IQ	−.01	.01
Encouraged achievement	−.20*	−.12*
Anger	.22*	.13*
Activity	.12*	.07
Sociability	−.01	−.01
Emotionality	.12*	.15*
Impulsivity	.37*	.38*
Deceitfulness	.41*	.31*
Rebelliousness	.47*	.45*
Peer Achievement	−.07	−.06
Peer Delinquency	.22*	.19*
Peer Popularity	.04	.09

*$p < .05$, $N = 407$ boys, 425 girls. Partial correlations control statistically for associations with age.

respondents were used because the correlation coefficients must contain both a component that is attributed to individual variation and one that is attributed to the mean sex difference. The measurement model of the latent trait employed trait variables commonly used to predict delinquency. With this measurement model, the latent trait can be considered to reflect individual differences in some trait dimension of "delinquency proneness" as reflected in personality (e.g., impulsivity) and social attitudes and behaviors.

In Figure 1, the measurement model A-D corresponds to the three trait variables and delinquency, respectively. The model's statistical evaluation was carried out by LISREL 7 (Jöreskog and Sörbom 1989). Loadings of the four variables on the latent trait were expressed in the matrix λx. The loading of delinquency was fixed to 1.0, whereas the other loadings (a, b, and c) were estimated. Sex was fixed to a single latent variable in the matrix λy. Its path to the latent trait was estimated in the matrix γ. Finally, the matrix $\theta\delta$ was a zero matrix (i.e., sex was measured without error), whereas the matrix $\theta\varepsilon$ was diagonal and free (i.e., the errors of the measured variables were estimated).

Although the chi-square value was statistically significant ($\chi^2 = 64.2$, $df = 2$, $p < .05$), the model provided a satisfactory fit. LISREL chi-square values are inordinately sensitive to sample size (Loehlin 1987. For this reason, alternative indices of statistical fit have been generally preferred. The goodness-of-fit index (GIF), which is not influenced by sample size, was .97. A common

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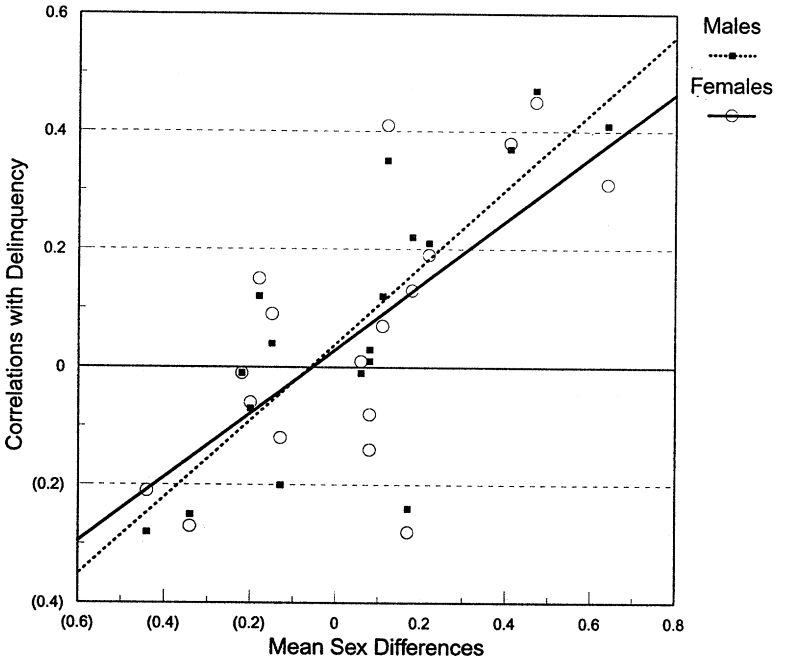

Figure 2. A Scatterplot Showing the Association of Mean Sex Differences and Correlations

guideline is that GFIs greater than .90 demonstrate satisfactory model fit (Green 1992). In addition, the average residual was only .04. In the standardized solution, the path from sex to the latent trait (*m* in Figure 1) equalled .35. The standardized trait loadings for the log score of delinquency plus one, impulsivity, rebelliousness, and deceitfulness were .64, .57, .86, and .79, respectively. Thus the best indicator of the latent trait was rebelliousness.

We hypothesized that the latent trait would account for sex differences in all measured variables. This hypothesis can be evaluated by examining the residual correlations (i.e., observed matrix-estimated matrix). Table 3 presents the original correlations and the model residuals. First, most model residuals were quite small. Second, the residual correlations with sex were small (.12, .01, –.07, and .04 for delinquency, impulsivity, rebelliousness, and deceitfulness, respectively). The standardized residual on delinquency (.12) was statistically significant (4.8, $p < .05$). About two thirds of the sex-

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TABLE 3: Correlations Among Measurement Model Traits and Model Residuals

Variable	*LOGDEL*	*IMPULS*	*REBEL*	*DECEIT*	*SEX*
LOGDEL		.05	−.01	−.03	.12
IMPULS	.42		.01	−.05	.01
REBEL	.54	.50		.02	−.07
DECEIT	.48	.41	.69		.04
SEX	.35	.21	.23	.32	

NOTE: All correlations statistically significant, $p < .05$. Model residuals shown above diagonal.

delinquency correlation, however, was explained by the model (predicted = .23 vs. $r = .35$), whereas about one third was left unexplained (residual = .12).

DISCUSSION

Despite the widely acknowledged sex difference in crime, most theories of crime consider the mean-level difference irrelevant toward understanding individual variation. The findings presented here, however, suggest that determinants of the mean-level sex difference, and those of individual variation, would be nearly identical. Our first analytic approach involved variables as a unit of analysis. As a variable explained *more* individual variation in delinquency, it also had a larger mean difference between males and females, and vice versa. This relationship was one of considerable magnitude across 18 commonly assessed psychosocial and trait variables ($r = .80$ in boys, $r = .68$ in girls). This interdependence of mean levels and correlations can be explained if both the mean-level differences and the individual differences possess the same etiological determinants (e.g., Rowe, Vazsonyi and Flannery 1994). For example, dietary and genetic factors that produce population mean differences in obesity (e.g., between the Pima Indians of the southwest and non-Indian Whites) may also produce variation in fatness within each respective population.

The second analytic approach used individuals as the unit of analysis. In this case, a correlation matrix on all respondents (i.e., males and females combined) was used. A latent trait could account for most of the correlation of sex with impulsivity, rebelliousness, and deceitfulness, and for about two thirds of its correlation with delinquency. Thus, quantitatively, a latent trait that accounted for most mean-level effects could also account for within-sex variation and for variables' correlations with delinquency (i.e., through their loadings on the latent trait).

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This article may therefore bring to the attention of criminologists the need to consider *how* individual variation and mean-level sex differences have similar etiologies. We believe that our theoretical explanations must refer to variables that (a) would have overlapping but distinguishable distributions in males and females, and (b) would be influential in both males and females. We do not claim to have identified these explanatory variables. Possible explanations would include combinations of social explanatory variables (e.g., parental supervision; Gottfredson and Hirschi 1990) and biological explanatory variables (e.g., pre- and postnatal hormonal exposures; Ellis and Ames 1987; Berenbaum and Hines 1992; see also Rowe 1994 for reasons to consider hormonal explanations).

One limitation of our findings is that whatever its causes, the latent trait failed to explain about one third of the sex-delinquency association. Other explanatory processes may have been involved in the remainder. Steffensmeier (1983) argued that structural barriers have existed to females' involvement in the social networks supporting crime. For example, male gangs may limit the role of females to emotional support, whereas the male members undertake direct, physical attacks on rivals. Social networks of drug pushers and fencers of stolen goods also appear to be predominately male. Such structural barriers would be missed by individual-level trait explanations. The poor distributional properties of the delinquency scores may also explain our results. With a skewed distribution and with many zero scores, the delinquency variable violated the assumption of normality that underlies structural equation modeling; hence a residual of covariance between sex and delinquency may be merely artifactual.

Another limitation of the study was that all measures were self-report. Method variance could increase the correlations among all variables if a general tendency existed either to admit or conceal deviant behaviors. It is difficult to imagine, however, how such a bias could induce a correlation between within-sex correlations and mean sex differences. The latter depend on results computed across different samples (i.e., males vs. females). Nonetheless, it would be desirable to have data from multiple informants. The latent trait analysis also relied on variables that were conceptually related to delinquent behavior. We did not demonstrate that the latent trait would be able to remove the sex difference in conceptually more distant correlates of delinquency (e.g., parental affection).

In summary, this study suggests that sex differences and individual variation in delinquency should require a single explanatory framework. It weakens criminological theories that postulate strikingly different influences on male versus female delinquency (e.g., individual pathology in females vs. differential association in males). It strengthens those theories that offer a

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unitary explanation of both sexes' delinquency (e.g., hormonal influences or a lack of perceived parental affection affecting both males and females). Furthermore, our findings imply that one male is more delinquent than another for primarily the same reasons that, on average, men engage more frequently in criminal acts than women do. Developing further linkages between mean sex differences and individual variation may promote new directions in criminological research.

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