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ABSTRACT

Family and demographic factors, such as parental deviance, disturbed homes, delinquent siblings, and poverty, are useful predictors that some form of childhood deviance will occur. They are not sufficiently specific, however, in predicting its quantity, variety or type. In this paper evidence is sought which would explain deviance in children as part of the developmental process. The patterns and sequence of age dated initiations of 13 deviant behaviors during the childhoods of 233 young black men are examined. The behaviors are defined and their frequency and the range of ages at which they first occurred are shown. It is demonstrated that the number of deviant behaviors per child is not the product of a purely random process. The kinds of correlations that should be expected among acts beginning at various ages and affecting varying proportions of a population are considered. After establishing what seem to be causal connections between behaviors, their practical importance for those interested in prediction or intervention is evaluated. The theoretical implications of a developmental model of deviance are discussed within the context of the field of child development. (GC)

CHILDHOOD DEVIANCE AS A DEVELOPMENTAL PROCESS: A STUDY OF 223 URBAN BLACK MEN FROM BIRTH TO 18*

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CHILDHOOD DEVIANCE AS A DEVELOPMENTAL PROCESS: A STUDY OF 223 URBAN BLACK MEN FROM BIRTH TO 18

Behaviors in childhood that can be described as deviant are of great practical interest because of the difficulties they cause parents, teachers, peers, and the community, and as predictors of many aspects of adult life (Robins, 1966). The more varied, serious, and frequent the deviance of childhood, the greater the risk of its predicting later maladjustment. Yet we know very little about how childhood deviance <u>becomes</u> varied, serious, and frequent. Family and demographic factors such as parental deviance, disturbed homes, delinquent siblings, and poverty are useful predictors that <u>some</u> form of deviance will occur, but they are not sufficiently specific in predicting its quantity, variety, or type.

What should we make of the fact that some children exhibit a great variety of deviant behaviors? It could have several meanings. First, we could be misled. Committing deviant acts might be a purely random process, in which we identify children in the tail of the distribution as distinct only when they cross a "badness" threshold that we impose on the facts as an observer.

Second, it could mean that some children are intrinsically more at risk of deviance than others, whether as a result of genetic or environmental influences or both. This predisposition to deviance might be one of three types—a general predisposition to do whatever is socially disapproved, no matter what it is; it might be a susceptibility to one special form of deviance, such as truancy, which when added to other types of deviance that occur by chance makes us perceive the children as indulging in an unusual variety of disapproved behaviors; or it might be a tendency to act precociously, in which case the children are called deviant only because they do early what will be permitted when they are adults (i.e., they are "status" deviants).

Third, deviance may have its own developmental process, which once started leads from one type of deviance to another, unless social controls effectively interrupt it. That developmental process could be a quantitative one—in which the likelihood of committing an untried deviant behavior depends principally on the number of other types of deviance already tried—or a qualitative one, where certain specific acts are necessary or nearly necessary stepping stones to others.

We can be reasonably sure that childhood deviance is not a purely random process since we can already predict rather reliably which young children will be deviant. We do this in two ways—one consistent with a "predisposition" hypothesis, the other with a "developmental" hypothesis. Predicting that children of inadequate parents and from impoverished neighborhoods will be deviant means assuming they have a genetically or environmentally produced predisposition. Predicting that children who disobey the teacher in first grade will be delinquents assumes a natural progression from one type of deviance to another—i.e., a developmental process. Of course, this inference of progression would be incorrect if the same genetic and environmental factors predicted both types of deviance, but at different ages.

This paper seeks evidence for a developmental process in childhood deviance. Describing that process, if it exists, has both theoretical and practical importance. On the theoretical level, it should assist in integrating the study of deviant behavior into the field of child

development, which has long concentrated almost entirely on positive achievements: physical growth, neurological maturation, and the acquisition of intellectual skills.

Further, it contributes to the efforts of the many social theorists (Cloward and Ohlin, Jessor et al., Kaplan) who have been struggling to develop a theoretical system that handles the interaction between opportunities and pressures to deviance provided by the social environment and the individual's perceptions of those opportunities and pressures, perceptions that must in part grow out of his own earlier behavior. On the practical level, knowing the natural course of the development of deviance could suggest both the degree of urgency and the best timing of intervention to prevent progression from less serious to more serious forms.

To discern whether there is evidence for a developmental process of deviance and if so whether it is both a quantitative process, in which committing any one deviant behavior makes all others more likely, and a qualitative one, in which committing certain specific behaviors makes committing another specific behavior more likely, we will use the patterns and sequencing of the age-dated initiations of 13 deviant behaviors during the childhoods of 223 young black men.

We will begin by defining the behaviors selected and showing their frequency and the range of ages at which they first occurred. We will then demonstrate what we already strongly suspect—that the number of deviant Behaviors per child is not the product of a purely random process.

Next we will consider what kinds of correlations should be expected among acts beginning at various ages and affecting varying proportions of a population if there is a developmental process, and if it is (a) quantitative or (b) qualitative. If the findings are consistent with a developmental pattern, we will next try to establish which acts lead to which other acts. To do this, we will need to take into account their order of appearance, while controlling for variation in the periods at risk and variation in the number and types of other behaviors that may render apparent causal relationships spurious. Once we have established what seem to be causal connections between behaviors, we will evaluate their practical importance for those interested in prediction or intervention.

In the present paper we will not try to compare the importance of a developmental process with the importance of either predispositions to deviance (whether inborn or environmentally created) or of social controls in determining the choice of deviant acts or the likelihood of transitions from one form of deviance to another. Obviously predisposition and social controls are extremely important. But they are also the focus of most prior research on deviance—our own along with that of others. It is rather on the long-neglected topic of deviance as a developmental process in its own right that we will focus, leaving a broader integration for the future.

METHODS

The present paper is part of a follow-up study of normal black men. Their names were selected from elementary school records, and they were located and interviewed in their early thirties. In interview, each subject was asked about a series of behaviors and their age of initiation. In addition, school and police records were collected, providing dates of onset of school problems and date of first police contact. These data make possible the study of the sequence of onsets.

The current study has important limitations. The sample is small (N=223) and homogeneous. It consists entirely of St. Louis born-and-reared black males born in the early 1930's. Only 13 deviant behaviors out of the many one could imagine investigating were dated to allow studying their onsets. While the school and police records were made contemporaneously with the commission of the behaviors and so must be assumed to be correctly dated, the age at onset for other behaviors was obtained by retrospection at the age of approximately 33. Obviously these men did not always correctly recall the age of first occurrence of each of these behaviors. Ages reported appear to have some validity, nonetheless, since we found age of reported first alcohol and first drug use to be powerful predictors of both self-reported and record indicators of degree of adult drug and alcohol involvement (Robins and Murphy, 1967; Robins et al., 1968).

It is also possible that men may have omitted telling us about some of their childhood deviance. However, a survey of official records has shown their checkable statements about past deviance to be remarkably valid. For instance, every man who had a police or Federal Bureau of Narcotics record indicating heroin abuse reported heroin use in interview. Thus we believe intentional denial of childhood deviance to be rare.

We are also optimistic about the generalizability of our findings despite the small homogeneous sample, since we have already shown that the childhood predictors of adult psychiatric status in this sample are very similar to those discovered in our previous study of whites of an older generation (Robins et al., 1971).

Selection of the sample.

The criteria for eligibility for the study were being male, born in St. Louis between 1930 and 1934, attending for six years or more a St. Louis public elementary school serving the black community, having an intelligence quotient (IQ) score of at least 85 while in elementary school, and guardian's name and occupation appearing on the school record. The total population of eligible boys was 930; 240 of these were initially selected for follow-up. The sample was designed to provide 30 men in each of the eight categories created by taking all combinations of three dichotomized school-record variables: father's presence or absence, guardian's occupation at the lowest level versus a higher level, moderate or severe school problems versus mild problems or none. The distributions of IQ scores, year of birth and number of addresses at which the boys were known to have lived during elementary school were matched across all eight groups. The level of breadwinner's occupation and the distribution of the nature and seriousness of elementary-school problems were matched across the four groups composing each half of a dichotomy in order to avoid, for example, children from intact homes being predominantly grade repeaters, while children from broken homes were predominantly truants. Additional

matching was done within the halves of the father-present-or-absent dichotomy for the father's continued absence or presence when the boy reached high school.

Men who had not lived in the St. Louis area at all during the last six years were discarded from the sample and replaced by the best matching of the remaining pool of eligible cases. A statement by a relative or by the man himself, or a death certificate before 1959, was required as evidence of a man's not meeting the residence criterion. Because of non-residence or death, 87 men were eliminated.

In the category "father absent, high occupation and no school problems" all eligible cases in the pool were exhausted, leaving a sample of 25 instead of the desired 30 cases in this category. The final sample, then, consists of 235 men whose elementary-school records showed half with school problems, half without; half with father in the home, half without; half with guardians who were unemployed, domestic servants or laborers, and half with guardians in better jobs; all with IQs of 85 or higher and all born in St. Louis between 1930 and 1934.

The sample selection procedures were relevant to the general purposes of the study—to test hypotheses about the independent effects of social class, antisocial fathers, and own early deviance on adult adjustment—but are not relevant to the issues which the present paper addresses.

Because the sample was selected in this special way, it is weighted properly to make it representative of the population from which it was selected—black males born in St. Louis between 1930-1934 who attended public school for at least six years and who had

an IQ of 85 or higher. However, it should be remembered that the eligible population itself is a special one.

In 1965 and 1966 interviews were obtained for 223 of these young men, 221 with them personally and two with relatives of men who had died within the six years prior to interview. The current paper omits the 12 (5%) not interviewed. Since all these young men grew up in the same era and in the same community, school and police records provide complete and comparable data from which to assess their school behavior and juvenile arrest histories.

The deviant acts.

The 13 deviant behaviors which we will consider are: 1) elementary school academic problems (FAIL), defined as elementary school records showing at least three quarters held back, and at least one of these in Grade Three or later—or placement in special class or school for the educationally handicapped; 2) behavior problems in elementary school (ABSENCE) as indicated by school records showing more than 20% of school days missed in at least five quarters, at least one of these in Grade Three or later, or notations of truancy or expulsion or transfer to a reformatory; 3) leaving school before graduation from high school (DROPOUT), as indicated on school records by permanent withdrawal before high school graduation or temporary withdrawal for a semester or more; 4) juvenile offense (ARREST), as indicated by a police record of an offense prior to age 18 or juvenile court record resulting from the child's own misbehavior (records resulting from parental neglect, adoption or temporary placement are excluded); 5) precocious use of alcohol (DRINK) defined as interview reports of taking a first drink of alcohol before the age of 15; 6) precocious

sexual experience (SEX) as indicated by interview report of first intercourse before the age of 15; 7) use of marijuana before age 18 (MARJ); 8) use of barbiturates before age 18 (BARB); 9) use of amphetamines before age 18 (AMPH); 10) use of opiates before age 18 (OPIATE); 11) leaving the parental home to live on his own before age 18 (LEFT HOME); 12) marriage before age 18 (MARRIAGE); and 13) developing alcohol problems such as "the shakes" or family complaints before age 18 (ALC PROB). As noted above, the first four of these variables come from records, the remainder from retrospective report.

It will be noted that sex and drinking were counted only if they occurred before age 15. This age was chosen because after 15 both behaviors were so common that it was hard to believe that they could have been considered deviant in the local subculture. Failure and absence also have a cut-off age below 15 because children were no longer in elementary school after that time.

School problems present a unique difficulty in assigning a time of initiation. Children can be occasionally absent or temporarily behind their classmates in achievement without being considered by the school as having a problem. School problems are recurrent difficulties. When then does such behavior "begin"—when the child takes the first step that eventuates in his meeting the criterion or when he takes the final step that puts him over the criterion threshold? We chose the former definition, assessing academic and behavior problems on the basis of the whole elementary school record, and for those who qualified as having had problems at some time during elementary school, counting the earliest age at which that problem behavior appeared. It may seem odd to consider school failure as a form of deviance.

However, since all members of the sample had IQ scores of at least 85, a level more than adequate for progressing normally through elementary school, failure could be interpreted as a behavior problem.

RESULTS

Frequency and age of initiation for 13 behaviors.

The 13 behaviors varied in frequency, age of first initiation and whether they occurred predominantly early or late in the age span at risk. Table 1 shows that the proportion of children committing these behaviors varied from 56% who had sex experience before 15 to only 3% who used opiates before 18.

Ages of first elementary school failure and absence could not precede age of school entry at six, and marriage, which waited on puberty, did not occur before 14. Alcohol problems had to wait on some drinking

(TABLE 1 HERE)

experience. Otherwise, there were no absolute lower limits (as the not infrequent prepubertal sex experience shows). Sex, drinking, and arrests occurred in rare children even before school age, and first marijuana use and leaving home also occasionally occurred very early. Other drug use and alcohol problems occurred only in adolescence.

Elementary school problems were distinct from other behaviors in that they began early or not at all. Before their eighth birthday, more than half the children who would ever be seriously held back or truant had already been so. For all other behaviors, the majority of first occurrences were found in the last three years of the period at risk, defined as the period from the earliest age at which any child showed the behavior to the cut-off age of 15 or 18. The behaviors that occurred last of all were opiate use, leaving home, and marrying.

The accumulation of initiations at the end of their childhood risk periods suggested that we might be witnessing the beginning of accelerating rates. To learn whether acceleration with aging occurred for all behaviors other than school problems, we extended our look at initiations for two additional years (Figure 1). To reveal possible

(FIGURE 1 ABOUT HERE)

acceleration, initiation rates were calculated based only on those who entered each year of age without yet having committed the act in question, and thus were at risk of initiating the act at that age.

We found, as expected, that rates of school absence and failure did not accelerate with aging. Indeed, rates of onset of ABSENCE rapidly declined after seven, reaching close to zero by age ten. FAILURE also began to decline after seven, reaching a low, steady level by age nine.

The behaviors which were still accelerating at the end of the childhood risk period and continued at high levels for two years thereafter were SEX, ALCOHOL, MARRIAGE, MARIJUANA, and LEFT HOME. ARREST continued to accelerate until the end of the childhood period, but declined thereafter. We investigated the possibility that this decline was due to entering the military, but we found that those who were not inducted also had a decline in arrest liability after 17. DROPOUT peaked at 16 (the legal age for leaving school) and then declined steadily, in large part because so many graduated at 18.

For drugs other than marijuana, AMPH, OPIATE, and BARB rates of initiation remained virtually flat and close to zero. The same pattern was seen for ALC PROB.

A pattern of accelerating onsets at the end of "childhood" is one way of operationalizing the concept of "status deviance", those behaviors considered deviant in children but acceptable in adults. According to our results there were five such behaviors, four of which we would have so identified *a priori*. Almost every urban male eventually has sex experience, drinks, leaves home, and marries. The questionable one of the five is MARIJUANA. Marijuana use never became the norm in this sample. Eventually not quite half the sample tried it. Apparently one must consider not only acceleration but slope in judging what is and is not "status deviance". The rise in marijuana initiations was much less steep with the approach of adulthood than was the rise in the other four behaviors, perhaps reflecting social pressure against marijuana use which, although stronger for younger than older persons, does not disappear with maturity.

The fact that hard drug use did not follow marijuana's pattern of increasing risk with aging may seem surprising, given the fact that marijuana has repeatedly been shown to precede hard drug use. We showed in an earlier paper (Robins and Murphy, 1967), however, that those who begin marijuana at an early age are at much greater risk of progression to hard drugs than those with later onset. The flat curves of hard drug onsets despite the rising marijuana curves simply expresses this finding graphically: the addition of new late onset users of marijuana is not reflected in corresponding increments in the use of other drugs.

Is the number of deviant acts randomly distributed?

On an average, men in our sample reported having committed (or their school and police records showed the commission of) 3.2 of the 13 behaviors we have considered. While no man committed all 13 of

these acts, one did commit 12—he failed only to marry before age 18.

(FIGURE 2 ABOUT HERE)

In Figure 2, we find the distribution of number of acts committed at least once strongly skewed toward the left or lower end. A distribution skewed toward the left suggests a possible Poisson distribution. If the number of acts had a Poisson distribution, we would assume the variety of deviant acts was the result of a random process and there would be no necessity for any causal explanations, much less for positing a developmental model.

When we tested for goodness of fit to a Poisson distribution, however, we found our results significantly different from expected values (χ^2=62.2, df=8, p<.0001). As Figure 2 shows, our distribution has too many cases at both the lower and upper ends of the distribution to fit the Poisson model. Still, the distribution might be random, but not Poisson. However, when we tested it against the binomial distribution, assuming 13 independent trials, we again got a highly significant difference (t=4.14, p<.0001).

Testing for the occurrence of a developmental process.

Having identified the commission of deviant behaviors as a non-random process, we have grounds for exploring whether there may not be a developmental process going on. There need not be, since a departure from randomness could be entirely explained by background variables which have made some children relatively immune to deviance or others relatively deviance-prone or which have affected liability to certain of the behaviors we are investigating.

The present paper will not be able to prove that relationships we find between behaviors can be attributed to a developmental process, since we cannot rule out these other possibilities. However, we can describe the kind of relationships between acts we would expect to see if there is a developmental process at work, and learn to what extent the relationships found are consistent with such patterns.

A first expectation, if there is a developmental process, is that acts that are most common should be those that occur earliest in childhood. As a corollary, acts typically occurring late should imply the previous commission of many other acts. This follows from the fact that in a developmental process, a later stage can be reached only after having passed through an earlier stage. A simple paradigm is that of height—where there are fewer people at least six feet tall than at least five feet tall and all six-footers have at some time passed every fixed increment in height between four and six feet, while five-footers have passed only half as many.

The expected relationships were indeed found. The rank order correlation between an act's frequency rank (with the highest frequency ranked 1) and its rank by median age at initiation was -.70, and between its frequency rank and the number of other acts also committed was -.93. Thus rare acts occur late and imply having committed many other acts.

A second expectation if there is a developmental process is that deviant acts should be intercorrelated, since if a later stage can be reached only by passing through an earlier one, any contingency table involving two acts that are part of the process will have one zero cell, for the case where the later act is positive and the earlier act is negative. Intercorrelations between pairs of behaviors were indeed common, positive, and strong (Table 2). Of the 78 2x2 contingency

tables generated by 13 behaviors, 73 were positive and 42 (54%) were statistically significant and positive ($p<.05$, two-tailed), 21 times

(TABLE 2 ABOUT HERE)

the number of significant positive relationships expected by chance. Indeed, 20 (26%) were significant at the $p<.001$ level, 513 times the number that should have been significant by chance. Every one of the 13 behaviors was significantly related to at least one other behavior.

A quantitative vs. a qualitative process.

While both quantitative and qualitative developmental processes imply correlations between deviant behaviors, which acts would be most strongly intercorrelated would differ. If the developmental process were entirely quantitative, so that committing any one act increased the likelihood of committing any other, all correlations between acts should be positive and the strength of correlation should depend primarily on temporal relationships. Earliest occurring acts (which are also the most frequent) should be most highly correlated with the next earliest and least strongly correlated with those appearing late (and rarest). If instead the causal relationships between acts were qualitative, one might expect some pairs of acts to be uncorrelated and one would expect strongest correlations between acts in the same conceptual realm, whether or not they occurred close to the same ages. That is, we would expect truancy to predict school dropout better than amphetamine use, even though amphetamine use is a bit closer to truancy in median age of first occurrence.

We have already noted the large number of positive and significant correlations among our 13 deviant behaviors. There were only five negative correlations, all close to zero. While a quantitative developmental process would lead us to expect all relationships to be positive and significant in a sample of reasonable size, our small sample might explain the non-significant relationships. The small sample size would be particularly likely to be the explanation for failing to find significant relationships when one of the pair of behaviors was rare. We found, however, that pairs of acts in which one or both behaviors were rare (defined as occurring in less than 7% of the sample) were about as often significantly correlated as pairs in which both acts were more common (52% vs. 57%). Thus, the failure to find all correlations significant was probably not entirely due to sample size. Perhaps then at least some of the relationships discovered were part of a qualitative process.

Our second criterion for a purely quantitative developmental process was that acts adjacent in age of appearance should be the most strongly correlated. To see whether this criterion was met, we inquired whether the most highly correlated pairs of behaviors also had the smallest differences between the ranks of their median ages of initiation. There was a striking association between strength of correlation and similarity of ages of onset. When acts were especially strongly correlated ($p<.001$), the average difference between the ranks of their median age at initiation was 2.9. When the value of p was greater than .001 but less than .01, the average difference in ranks rose to 4.0, while for still less highly correlated pairs, it reached 5.7. On the other hand, the strongest correlations were also between acts that seemed conceptually related, a fact that would argue for a qualitative developmental process. The strongest relationships ($p<.001$)

occurred with the use of two mood-modifying drugs and between two measures of school problems. Thus, while we have some evidence for a quantitative process, we also have a suggestion that certain specific behaviors are likely to induce other specific behaviors.

To argue convincingly that certain specific behaviors caused others, we need to do more than show that correlations between acts from a similar conceptual realm were stronger than their similarity in frequency or age of onset could explain. We must also be able to show that certain specific behaviors were actually followed by other specific behaviors at a rate higher than chance expectation, and that these relationships were not spurious. The next section attacks this problem.

An actuarial test for causal relationships between specific behaviors.

To show in a non-experimental setting that one specific type of act is a plausible cause of another specific act, one begins with persons who have committed neither, and shows that those who commit the first act (ACT 1) thereafter have an increased probability of committing the second (ACT 2). When the two acts share a common age-range of risk, the estimate of the change in probability attributable to the first act must be adjusted for the amount of risk period of the second act which had already elapsed prior to the occurrence of the first.

To make the requirement for adjusting for elapsed risk clear, assume that we want to see whether DROPOUT leads to ARREST. Table 1 shows that dropouts occurred on the average at age 16.2, while arrests occurred at an average age of 15.2. Thus by the time the average dropout occurred, most of the period at risk was already over. Further,

the only cases for whom we can show a possible causal effect of dropout on arrest are those who dropped out without a prior arrest. Thus the eligible group is made up of people free of early arrests. To find a comparable group who did not drop out, we must identify those persons who not only did not drop out, but who had no arrest before the age at which the dropout left school. Only then will they have the same length of time at risk of arrest, the same age period at risk, and be equally resistant to early arrests.

To solve this problem we have modified a classic age-adjusted actuarial method to manage a two-risk condition: the risk of the presumed cause (DROPOUT) and the risk of the presumed consequence (ARREST) (Robins and Taibleson, 1972). This method allows us to test the significance of a difference in rates of a behavior between persons with and without a prior behavior, while instituting controls for age at risk.

All pairs of behaviors were tested by this method, when possible. Pairs were lost to testing (a) when the "cause" occurred too rarely at any age (in less than ten persons) to allow confidence in the results (e.g., OPIATES and AMPH as causes each provided no more than nine cases still at risk of any given other behavior), (b) when the "cause" occurred so late that no risk period for possible "effects" remained (e.g., fewer than ten cases of MARRIAGE occurred before age 17, the last year in which a consequent behavior could appear), or (c) when the "consequence" must logically occur prior to its hypothetical "cause" (as FAIL could not be a consequence of DROPOUT). Out of the 156 theoretically possible cause-effect pairs given 13 behaviors, 83 were testable.

Out of 83 tests, 38 (46% were statistically significant by chi-square test[2] (all those marked '+' in Table 3). Among the behaviors found to predict other behaviors, MARIJUANA, DROPOUT, and early DRINK were the most potent causes, predicting six or seven behaviors each, more than half of those for which tests were possible. DROPOUT and

(TABLE 3 ABOUT HERE)

ALCOHOL PROBLEMS were the behaviors best predicted by other behaviors, each predicted by six of the other behaviors, all those in which tests were possible for DROPOUT (that is, not blank in the DROPOUT row of Table 3) and two-thirds of possible tests for ALCOHOL PROBLEMS.

Tests for spuriousness.

The age-adjusted method as described thus far has not considered the possible spuriousness of these relationships. When an event has multiple significant "causes" (as DROPOUT, for instance, is predicted by six different behaviors), some of these "causes" may be the effects of other of these "causes", and simply happen to occur at a younger age than the event of interest. In order to see whether a causal relationship has been spuriously attributed, one holds constant any variables correlated with and occurring prior to both the imputed cause and the imputed outcome. If the correlation between the "cause" and "effect" then remains significant, one assumes that the common precursor has not engendered a spurious relationship, and the causal relationship remains plausible.

In the present study there remains one problem, however. Even after we control on correlated prior behaviors, the "with cause" cases necessarily enter the period of risk having experienced, on the average, at least one more type of deviant behavior than the matched

controls, because they have experienced the "cause" itself. And if that cause is also correlated with other forms of deviance not correlated with our consequent behavior, and therefore not held constant, the "with cause" group may easily exceed the "without cause" group in average number of prior deviant behaviors by more than one. Then, if there is a quantitative developmental process, i.e., if more deviant behaviors in the past mean a greater risk of some new type of deviance, we may find the "cause" significantly predicting our "effect" even if there is no specific causal relationship between them. Because both specific behaviors and number of previous behaviors can create spurious relationships, we instituted controls for both types of spuriousness.

Controlling on specific precursors. To test for spuriousness due to some third form of deviant behavior's explaining both the "cause" and the "effect", we selected a matched "without cause" case for every "with cause" case, while controlling on the prior occurrence of any third type of deviance that had been found to significantly predict both the "cause" and its "effect". We then tested for a significantly higher proportion showing the "effect" after the "cause" than in its absence.

A "without cause" case was defined as an appropriate match for a "with cause" case if it met three conditions: 1) the "causal" behavior either did not occur before 18 (or before 15 for sex and alcohol) or occurred only after the behavior thought to be its "effect" had already occurred; 2) the "without cause" child had reached the age at which the child "with cause" first demonstrated the "causal" behavior without yet having committed the "effect" behavior; 3) if the "with cause" child had already shown the third form of deviant behavior that

might render the "cause" spurious by the age he first showed the "cause", the "without cause" child had also shown it by that age, and if the "with cause" child had not shown that third type of behavior by that age, the "without cause" child also had not.

The first criterion identified the potential match as "without cause", the second criterion guaranteed an identical age period at risk of the "effect", and the third criterion guaranteed that the cases were matched with respect to the presence or absence of a third variable that might render the cause-effect relationships spurious.

As an example, to test whether the finding that DROPOUT leads to ARREST was spurious, we controlled successively on the two events found significant predictors of both: ABSENCE and MARIJUANA (note that these are the only two variables with a '+' in both the DROPOUT and ARREST rows in Table 3). Suppose that when controlling on MARIJUANA, we found that our first "with cause" case had dropped out at 14 and had first smoked marijuana at age 13. From the randomly ordered data set, the next case was selected as his match who either never dropped out or did so only after arrest (i.e., was not a dropout when arrested, if arrested), who had not been arrested before or at 14, and who had used marijuana by age 14. Through these criteria, the matched "without cause" case was known never to have been simultaneously a dropout and at risk of arrest; he was at risk of arrest during the same age period (15 to 17) as the dropout, and, like the dropout, he had used marijuana prior to this risk period.

When a match could not be found, the "with cause" case was dropped. This loss of cases made finding significant results more difficult, not only because the number was reduced, but because the unmatchable cases were those at highest risk of the effect—cases in whom the cause appeared early and had been preceded by a precursor behavior—giving them more predictors and a longer period at risk.

McNemar's test for matched pairs was applied to see whether the cause-effect relationship had survived this test for spuriousness. A cause-effect relationship was considered to have survived if the number of "with cause" cases showing the outcome still significantly ($p<.11$) exceeded the number of "without cause" cases showing it.

In Table 3 where there are one or two asterisks, relationships initially found significant by the actuarial method have survived all these tests for spuriousness. (Note that DROPOUT no longer predicted ARREST when ABSENCE and MARIJUANA were held constant.) Eleven of the relationships found significant by actuarial methods had no significant precursor of both events, and therefore no test for spuriousness was necessary. Of the remaining 27 relationships significant by the actuarial method and tested for spuriousness, 15 survived. Among the survivors, DRINK was the most frequent predictor of other forms of deviance, predicting six other types. MARIJUANA and ABSENCE each predicted five other behaviors. DROPOUT was the behavior most susceptible to the influence of other behaviors. It was predicted by five different behaviors: FAIL, ABSENCE, DRINK, SEX, and ARREST.

All 13 types of deviant behaviors survived this first set of tests for spuriousness as an effect of some other form of deviance, and seven behaviors survived as a cause as well: ABSENCE, FAIL, DRINK, SEX, ARREST, MARIJUANA, and DROPOUT.

Controlling on the number of prior deviant behaviors. To see whether the causal relationships that withstood the test of holding constant the predictors of both cause and effect would also withstand the test of holding constant the number of previous behaviors, we again found matches among the "without cause" cases for the "with cause" cases. Cases were defined as "with" and "without" cause just as they were in our first test for spuriousness, and the cases were put into random order as before. Again the first matching case was selected, but the qualification for matching was now the number of prior behaviors rather than the type. A matching "without cause" case in this test was required to have exactly the same number of deviant behaviors through the age at which the "cause" first occurred as did the "with cause" case. Since the "cause" was itself a deviant behavior, the "without cause" case was required to have the same number of other forms of deviance as the "with cause" case plus one more to make up for the absent "cause". No attention was paid to whether or not the types of deviance were the same. Again cases were discarded when no match could be found, and again those unmatchable were the cases at greatest risk of the outcome—i.e., those with the largest number of precursors.

The 26 relationships that had survived the controls for specific precursors were now tested to see whether the number of earlier behaviors rather than the presumed "cause" might be the real predictor of the later behavior. Only eight of these relationships survived this second test at a statistically significant level. These successful survivors are marked with double asterisks in Table 3. The eight surviving relationships included as causes DRINK, which increased the risk of MARJ and AMPH; ABSENCE, which led to FAIL, DROPOUT, MARRIAGE, and LEFT HOME; and FAIL, which led to ABSENCE. The two forms of elementary school deviance constituted the only reciprocal relationship surviving.

Even when results were not statistically significant, in all but four cases (DRINK and SEX as causes of each other and of DROPOUT), the "effect" behavior occurred more often when the presumed cause was among the preceding deviant behaviors than when it was absent from the same number of preceding deviant behaviors. For nine of these non-significant relationships, the proportion of cases with the effect was at least half again as large following the "cause" than in its absence, despite an equally extensive history of deviance. Relationships that approached significance after both tests for spuriousness had been applied included as causes DRINK and DROPOUT, both of which portended ALCOHOL PROBLEMS; and ARRESTS, which led to DRINK; SEX, which predicted MARIJUANA use; and MARIJUANA, which in turn predicted use of all other types of illicit drugs as well as ARREST. OPIATES were additionally predicted by DROPOUT.

Given these trends even in the absence of many statistically significant results, it seems probable that most of the behaviors entered into this last test as possible "causes" were actually making some contribution to these "effects". However, the sharp drop in the number of significant relationships when the number of prior behaviors was held constant supports the argument that the developmental process is in large part a quantitative one.

How important are these specific acts as "causes"?

The fact that one act apparently increases the risk of another is not necessarily information of practical importance. Whether it is important depends in part on whether that first act is either a necessary or sufficient cause of the second. The first act approximates a necessary cause if the second act almost never occurs unless preceded by the first; it approximates a sufficient cause if the first act is almost invariably followed by the second. (Of course, from a purely practical point of view, necessary and sufficient causes which cannot be controlled are less important than less powerful causes that are subject to control. However, other things being equal, the potential for control is greatest when the cause is necessary or sufficient.)

Table 4 evaluates the degree to which each causal relationship found to be statistically significant or near statistical significance after our tests for spuriousness fulfills criteria for being necessary

(TABLE 4 ABOUT HERE)

or sufficient. None of the "causal" behaviors in Table 4 appeared sufficient to produce further types of deviance. The closest approximations to sufficient causes were ABSENCE, which half the time was followed by DROPOUT, and ARREST, which was followed by early DRINKING in half the eligible cases. In only two other relationships, ABSENCE as a cause of LEAVING HOME and MARIJUANA as a cause of ARREST, did the "effect" actually occur in even one-third of the cases at risk following the "cause". Thus, if the occurrence of the precursor were used to select children for intervention to prevent their committing the second behavior, many children would probably be selected who were not going to commit the predicted deviance even if no intervention took place (or who would commit it only later, after they were adult).

While there are few sufficient causes in our list, there are a number of virtually necessary ones. OPIATES were used almost solely (92%) by children who had already used MARIJUANA (even though very few marijuana users (15%) went on to use opiates before age 18). OPIATE users were also almost always (75%) previously high school DROPOUTS, although again only 8% of dropouts went on to use opiates before 18. The use of AMPHETAMINES was almost exclusively (85%) among children who had begun DRINKING before 15, as were ALCOHOL PROBLEMS (76%). MARIJUANA use was largely restricted (78%) to children who had already had SEX experience.

One of these "necessary" causes seems obvious: a child who does not drink early hardly has time to develop alcohol problems before 18. Similarly, the role of marijuana as a necessary stepping stone to opiates has been widely reported. (Kandel, 1975). The other relationships are not self-evident. That amphetamine use rarely occurred in the absence of early drinking may reflect the fact that in the years when these men were adolescent, amphetamines were typically the last illicit drug to be initiated. Perhaps to already have reached this last outpost before 18 required a very early interest in mood-modifying drugs.

From the point of view of those who plan to intervene in the natural development of deviant behavior, the most useful discoveries are of early behaviors that are both necessary and sufficient causes

of later behaviors. When these are used to flag "high risk" cases, the intervention is directed at almost all the children likely to show the behavior to be prevented and at almost no one else. Three of the causal links discovered between deviant behaviors approach, although they do not fulfill both criteria: ABSENCE as a cause of both DROPOUT and LEFT HOME, and DRINK as a cause of LEFT HOME. If there is a practical message in our efforts, it is that centering efforts on preventing truancy in the first and second grade and drinking before 15 is likely to have the greatest payoff at least cost.

DISCUSSION

Our excursion into . . study of the development of deviance in the childhoods of young urban-born black men reviewed the frequency, ages at initiation, and temporal patterning of 13 forms of deviance. All 13 types of deviance were found to be statistically linked. Those behaviors beginning young were the most common and the most likely to occur alone. The patterning of deviance was not a random process. There were more highly deviant and more non-deviant children than would have been expected by chance. This set us looking to see whether there might be a developmental process at work.

Evidence supporting a developmental process included the facts that 1) the most frequently committed acts were those typically committed youngest, 2) strong positive correlations existed between behaviors, and 3) the strongest correlations were between pairs of behaviors initiated at about the same age and conceptually related. These findings suggested a developmental process made up of both quantitative and qualitative relationships.

Qualitative relationships were tested by an age-adjusted actuarial method followed by tests for spuriousness which required holding constant acts that were presumptive causes of both members of a pair of acts as well as the total number of prior acts. Eight relationships survived these tests. In addition, there were nine relationships close to significance. While none of these early behaviors was sufficient to produce other behaviors, several were virtually necessary. Three relationships (ABSENCE→DROPOUT, DRINK→LEFT HOME, ABSENCE→LEFT HOME) came close enough to being both necessary and sufficient to make them attractive candidates for efforts at intervention.

The fact that most statistically significant relationships between specific pairs of behaviors were reduced by controlling on number of prior acts suggests that the development of deviance in childhood has an important quantitative aspect, as well as the qualitative aspect supported by relationships surviving these tests. If the developmental process is largely quantitative, it is possible to forecast which children will be the pioneers when new forms of deviance are introduced: they will be children who already have varied experience in "conventional" deviant behaviors. Evidence that this is the case has been supported by studies of the diffusion of drug experimentation among adolescents during the last decade. Drug experimentation began first among highly deviant children; then spread to a much more broadly based group.

Establishing the plausibility of a developmental process required special data and special analytic tools. In addition to the usual information about what behaviors had occurred, we needed to know at what age each behavior first occurred. These ages then had to be used

in analysis both to establish the sequence of initiations and to cope with the problem of how much of the risk period for a potential second behavior had already elapsed before the first behavior occurred. Two sources of spuriousness had to be investigated—the common one, that some prior behavior may have caused both the presumed "cause" and "effect", and second, a source usually overlooked, that it may have been simply the fact that some deviant behavior occurred first, rather than a specific effect of the first behavior, which accounted for the increased risk. Our data were sometimes inadequate to handle all these requirements simultaneously. A larger and less homogeneous sample of children followed prospectively via a panel design would have quieted concerns about the validity and generalizability of our results.

The same results from even such a sample would not prove, however, that the relationships between number and types of behaviors are due to a developmental process. It remains possible, though perhaps improbable, that discovered relationships between temporally ordered behaviors, even when highly reliable, valid, and not explained by the number or type of other behaviors preceding them, could occur simply because common background factors produced both forms of deviance and thus accounted

for the intercorrelations between them. To resolve this issue, background factors must be allowed to compete in the analysis with developmental processes—a difficult analytic problem indeed. Meanwhile, the present analysis has pinpointed some relationships between deviant behaviors which are prime candidates for further exploration in better samples and with more complex analyses.

We introduced this effort to explore the developmental patterns in deviance in the hopes that it would have theoretical as well as practical utility. How then does the postulation that deviance has its own developmental process fit into a general theory of deviance? A gap which the developmental approach can fill was pointed out by Cloward and Ohlin (1960), who noted that "the pressures that lead to deviant patterns do not necessarily determine the particular pattern of deviance that results....We must therefore explain each solution in its own right...." (p. 40). The developmental view is not in conflict with the view that the social environment and the constitution of the actor play important roles in deviant behavior, but it adds an important element to the armamentarium of predictors: the behavioral history.

A developmental theory specifies which new deviant behavior is most likely to appear next. It postulates that if a new behavior is adopted, the odds are in favor of its being the behavior which is next in frequency and next in typical age of onset to the last deviant behavior adopted and which is in the same conceptual area as behaviors already in the repertoire.

These are the implications of the developmental process's being both a quantitative and qualitative one.

We also hoped that exploring the developmental aspects of deviance might help to integrate deviance research into the larger body of research into normal growth and development. There is one obvious difference between deviance and normal growth that needs a theoretical bridge: that difference is the likelihood that a given individual will travel "the whole distance." In normal growth and development, the expectation is for progression to the end—almost all children eventually learn to walk, talk, and read; they vary only with respect to the age at which they reach these milestones. In the development of deviance, the modal pattern is cessation at an early age. The necessary bridge to allow uniting these two apparently disparate patterns may be simply the recognition of the role social norms play in both developmental processes. Society presses children to develop the skills it values as rapidly as possible and to avoid or terminate the behaviors that conflict with its norms. (The effectiveness of such social pressures against deviance may well explain our failure to find a single deviant act which proved to be a sufficient cause for any subsequent act.) This formulation requires assuming that the speed with which children reach mature levels for a particular skill that is part of normal growth and development depends not only on the rate of growth of biological capacity, but also on the priority which their socializing agents assign to that skill. If this formulation should be correct, it opens up the interesting possibility that differences between subcultures in the ages at which various aspects of normal growth and development typically occur may constitute a key to differences between their respective rankings of the values they hold in common. Similarly, it suggests that failure in socialization can be measured not only by the appearance of deviance but by postponement in the ages at which it normally terminates.

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FOOTNOTES

The study also includes a small normal control group for whom we had school records as well as interviews, but the controls had been selected for an absence of serious school problems and in addition lacked the detailed social and behavioral histories available in the clinic records. Thus, they were not a sample in which we could study the development of childhood deviance.

There is no completely satisfactory way to test the significance of differences between age-adjusted rates for an additive two-risk model. Because of this problem, we have used an extremely conservative test, and may therefore be overlooking some causal relationships. (See Robins and Taibleson, 1972.)

TABLE 1

DEVIANT BEHAVIORS IN CHILDHOOD
(223 YOUNG BLACK MEN)

	Proportion Doing This (%)	Age Range of Initiations	Median Age at Initiation
SEX	56	4-14	13.1
ABSENCE	43	6-14	7.3
DROPOUT	39	6-17	16.2
ARREST	38	5-17	15.2
FAIL	34	6-13	7.7
DRINK	34	2-14	13.1
LEFT HOME	26	8-17	17.2
MARIJUANA	20	8-17	15.7
MARRIAGE	6	14-17	17.5
BARBS	6	11-17	16.5
ALC PROB	5	14-17	16.7
AMPHS	4	13-17	15.8
OPIATES	3	12-17	17.1

TABLE 2

SIGNIFICANT CORRELATIONS BETWEEN BEHAVIORS

p<.001 (20)	ϕ
OPIATE-BARBS	.63
AMPH-BARBS	.46
MJ-BARBS	.44
ALC PR-AMPH	.39
FAIL-ABS	.39
OP-MJ	.38
OP-AMPH	.37
DO-ABS	.33
AMPH-MJ	.32
LH-MARRY	.32
BARB-ALC PR	.30
DO-LH	.29
DK-MJ	.29
SEX-MJ	.29
DO-ARR	.27
DO-FAIL	.24
MJ-ARR	.23
DO-ALC PR	.22
DK-LH	.22
DK-SEX	.22

p<.01 (15)	ϕ
OP-ALP PR	.21
DO-DK	.20
OP-ARR	.20
AMPH-OK	.20
MJ-DO	.19
MJ-ALC PR	.19
DK-ALC PR	.19
ARR-ALC PR	.19
ABS-ARR	.19
SEX-DO	.18
MJ-LH	.17
BARB-ARR	.17
BARB-LH	.17
BARB-SEX	.17
OP-LH	.17

p<.05 (7)	
OP-DO	.16
ALC PR-SEX	.16
AMPH-ARR	.15
DO-BARB	.13
DK-BARB	.13
ABS-LH	.13
ABS-MARR	.13

TABLE 3

RESULTS OF AGE-ADJUSTED ACTUARIAL TESTS AND TESTS FOR SPURIOUSNESS

		CAUSES: MJ	DO	DK	BARB	ARR	SEX	ABS	FAIL	LH
No. of Tests Possible as Cause:		8	9	11	2	12	12	12	12	6
EFFECTS	No. tests possible as effect:									
DO	6	+		+*		+*	+*	+**	-*	
ALCP	9	+	+*	+*	+	+	+	0	0	0
BARB	7	+*	+	0		+	+*	0	0	
LH	7	+	+*	+**		0	0	+**	0	
ARR	7	+*	+	0			0	+*	0	0
MJ	7		+	+**		0	+*	0	0	0
DK	4					+*	+*	0	0	
OP	8	+*	+*	0		+	0	0	0	0
AMPH	8	+*	0	+**		0	0	0	0	+
ABS	3					0	0		+**	
FAIL	4			0		0	0	+**		
SEX	4			+*		0		0	0	
MARR	9	0	0	0	0	0	0	+**	0	0

\+ = p<.06 by actuarial test before controls to check spuriousness
0 = p>.06
Relationships not testable are left blank

*Controlling on significant predictors of cause and effect, if any, did not reduce to n.s.

**Controlling on both predictors and number of prior behaviors did not reduce to n.s.

See Appendix Table for N's.

CAUSES

EFFECTS		HJ	DO	DK	BARB	ARR	SEX	ABS	FAIL	LH
DO	(a)	28		79		51	120	89	65	
	(b)	28, 28		76, 74		51, 50	56	69	59	
	(c)	*		55		43	56	34	39	
ALCP	(a)	35	65	79	10	61	121	88	65	18
	(b)	35, 35, 34	65, 64, 55	74, 63	10x4	60, 58	42	*	*	*
	(c)	*	32	57	*	*	*			
BARB.	(a)	31	69	81		62	123	89	68	
	(b)	31, 31	69, 67, 67	*		61, 60	—	*	*	
	(c)	26	*			*	55			
LH	(a)	33	63	79		62	120	86	68	
	(b)	33, 33	58, 53, 46	—		*	*	—	*	
	(c)	*	56	57				37		
ARR	(a)	28	48	69			108	87	65	13
	(b)	28	47, 46	*			*	—	*	*
	(c)	22	*					32		
HJ	(a)		55	75		52	117	89	67	16
	(b)		55, 51	69		*	58	*	*	*
	(c)		*	56			56			
DK	(a)					26	72	79	61	
	(b)					—	—	*	*	
	(c)					24	44			
OP	(a)	34	70	81		62	124	89	68	19
	(b)	34	69, 67	*		62, 61	*	*	*	*
	(c)	27	32			*				
AMPH	(a)	32	67	81		62	123	89	60	19
	(b)	32	*	—		*	*	*	*	19, 18
	(c)	26		57						*
ABS	(a)					11	38		28	
	(b)					*	*		—	
	(c)								19	
FAIL	(a)			32		16	38	56		
	(b)			*		*	*	—		
	(c)							26		
SEX	(a)			40		20		84	60	
	(b)			—		*		*	*	
	(c)			33						
MARR	(a)	36	70	81	11	64	123	90	88	19
	(b)	*	*	*	*	*	*	—	*	*
	(c)							37		

KEY: (a) N = cases positive for "cause" in age-adjusted test while still at risk of "effect". This number also represents the number of matched pairs desired for tests for spuriousness. (223-N = Cases without "cause".)
Blank = not testable.

(b) N(s) = matched pairs actually obtained for controlling on precursor behaviors.
— = no common precursor.
* = age-adjusted test not significant, so no test (0 in Table 3).

(c) N = matched pairs actually obtained for controlling on number of prior behaviors.
* = test controlling precursors not significant, so no further test (no * in Table 3).

theoretically obtainable except when SEX was the "cause". Since SEX was a "cause" in more than half the sample, matching all positive cases was obviously impossible. The theoretically maximum number of matches was the total sample (223) minus the number (n (a)) for all categories in which (a)>111.

TABLE 4

WERE ANY ACTS NECESSARY OR SUFFICIENT CAUSES OF OTHERS?

	NECESSARY? How Often Was the 2nd Act Preceded By the 1st	SUFFICIENT? How Often was the 1st Act Followed by the 2nd
	%	%
"NECESSARY"		
MARJ→OPIATE	92	15
DRINK→AMPH	85	10
SEX→MARJ	78	25
DRINK→ALC PROB	76	12
DROPOUT→OPIATE	75	8
MARJ→BARB	59	14
"SUFFICIENT"		
ARREST→DRINK	21	51
MARJ→ARREST	16	36
BOTH (?)		
ABSENCE→DROPOUT	60	54
DRINK→LEAVE HOME	58	44
ABSENCE→LEAVE HOME	55	33

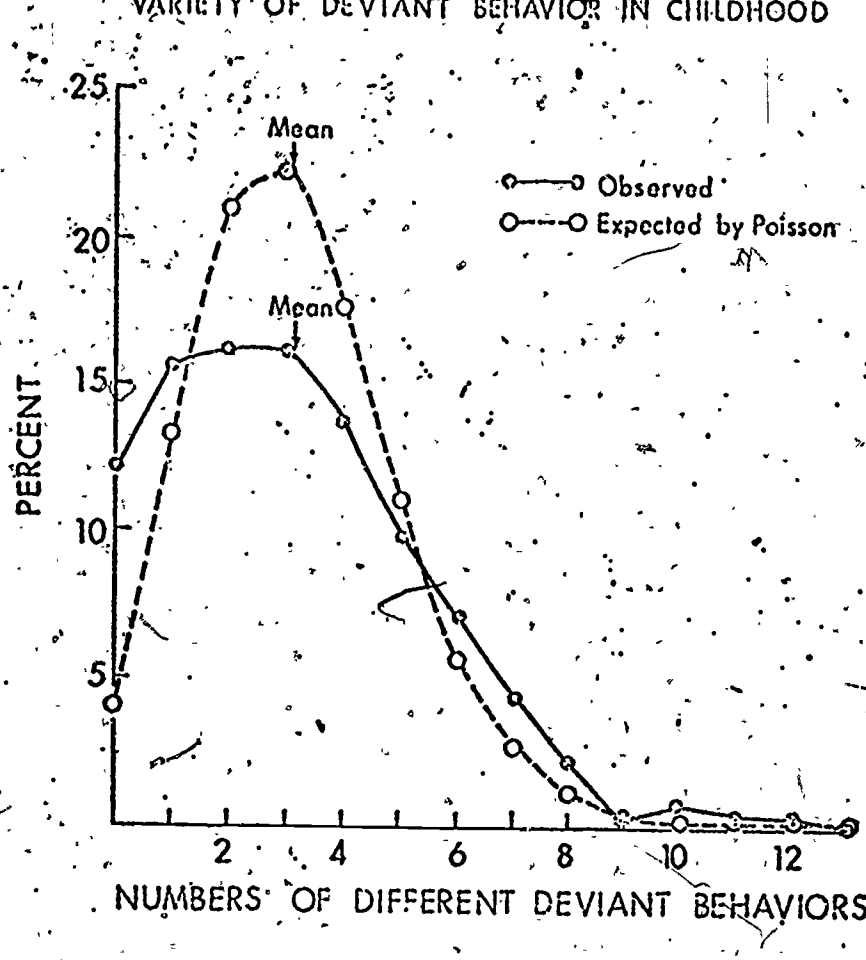

FIGURE 1

PERCENT OF THOSE AT RISK OF BEGINNING A NEW FORM OF DEVIANCE WHO DID SO EACH YEAR.