

MULTIPLE ROUTES TO DELINQUENCY? A TEST OF DEVELOPMENTAL AND GENERAL THEORIES OF CRIME

RAYMOND PATERNOSTER
ROBERT BRAME

University of Maryland at College Park

General and developmental theories take very different approaches to the study of crime. General theories, like Gottfredson and Hirschi's recent theory of self-control, assume that crime can be explained with reference to a single or very limited set of explanatory factors. In addition, some general theories, like Gottfredson and Hirschi's, adopt a very static approach to causality. They presume that prior offending has no causal effect on current offending once time-stable criminal propensity is controlled, and they assume that the relationship between changes in life events and changes in offending are spurious. Recent developmental theories, like those proposed by Moffitt and Patterson, stand in stark contrast to Gottfredson and Hirschi's theory. These developmental theories are far more complex because they relax the assumption of general causality and adopt a more dynamic position about the relationship between changes in life circumstances and changes in crime. In this article we examine whether the added complexity of a developmental theory of crime is preferable to the more parsimonious general/static theory of Gottfredson and Hirschi. We find that the evidence is not faithful to either a pure static/general model or a pure developmental model of crime. Our findings appeal to a theoretical middle ground that assumes that pathways to crime are more similar than different and that allows for a causal effect of past offending and life experiences on future criminality. When viewed in the context of previous studies that have assessed offending over the life course, our results suggest that further theoretical development can profit from studying issues of measurement and sample composition.

INTRODUCTION

Beginning in the 1950s a dispute brewed in criminology between those who argued for the development of general theories of crime and those who argued for typological theories. As the label connotes, those favoring a general theory believed that seemingly diverse criminal acts and actors were homogeneous enough to be explained by either a single factor or a very limited set of factors. An example of general theory at the time was

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Sutherland's (1947) differential association theory. Differential association was thought by its proponents to be able to explain seemingly very diverse forms of criminality, from professorial theft and the crimes of corporate managers to pyromania and other "compulsive" crimes (Cressey, 1960, 1969). The position of general theory was that whatever specific form it took, crime was the expression of a single or common set of causal factors.

Opponents of this view held that apparent similarities among different crimes and criminals were deceptive, and that criminological phenomena were too heterogeneous to be explained by a common set of causes (Gibbons, 1975, 1979). From the vantage of this alternative perspective, crimes, or the individuals who commit them, should be categorized or placed into distinct typologies with distinct etiologies. Rather than advancing a common explanation for all crimes or a common etiological pathway to offending for all individuals who commit crimes, the typological orientation to theory was the criminological analogue of the "different strokes for different folks" adage (Gibbons, 1982:219). In short, the typological approach is friendly to the idea that one causal process operates for one subset of individuals or criminal events while another process operates for other individuals or criminal events. Examples of typological theories included Glaser's (1972) offender-based classification of five distinct types of criminals: adolescent recapitulators, subcultural assaulters, vocational predators, crisis-vacillation predators, and addicted performers.

Although an active and vibrant debate in criminology for over two decades, the clash between general and typological theorists waned by the 1970s. It has, however, recently been revived with a slightly different cast of characters. The contemporary debate pits those who argue for general theory against theorists who anticipate differences in the developmental pathways that lead to offending behavior.

Contemporary varieties of general theory include social learning (Akers, 1985), strain (Agnew, 1992), social control (Sampson and Laub, 1993), control balance (Tittle, 1995), and transcendence (Katz, 1988) theory. Easily the most parsimonious of these general theories of crime is the one advanced by Gottfredson and Hirschi (1990). Gottfredson and Hirschi forcefully argue that all forms of crime (e.g., acts of force and fraud) require two things: (1) an opportunity to engage in them and (2) an inadequately restrained person who is unable to resist the obvious and momentary benefits and gratification that such acts provide. The degree of restraint that individuals possess, however, is not particularly relevant for specific types of criminal acts. Rather, restraint or self-control is a person-specific construct that has implications for the probability of all of the acts within the crime domain, conditional on adequate opportunity. As can be discerned, Gottfredson and Hirschi's theory is not friendly to the idea that

different sets of causes give rise to different kinds of proclivities. Like other general theorists, therefore, they assert that the explanatory factors that account for crime are constant across different kinds of crime and criminals.

Gottfredson and Hirschi also argue that within any population, individuals can be ranked in terms of their propensity to offend (or, alternatively, their ability to restrain themselves from offending). Until about age 8 or 10, individual rankings on a valid construct tapping this propensity should fluctuate over time. Thus, individuals can change positions within this hierarchy of criminal propensity during the first decade of the life course. After that point, however, individual rankings in criminal propensity tend to become highly resilient, and changes in relative standing within the criminal propensity hierarchy become unlikely. Similar themes are also evident in theoretical work by Wilson and Herrnstein (1985). As Nagin and Paternoster (1993:470) have argued, both of these streams of criminological thought suggest that the most important causes of enduring offending propensities are likely to be found early in life.

This proposition is of fundamental importance to the Gottfredson and Hirschi framework because it implies that dynamic factors such as accumulating experience, situational contingencies, and changing life circumstances can have only trivial effects on the offending propensity (even though they might exert effects on whether offensive acts occur at particular times or places). According to this view, linkages among the occurrence of salient life events, experience, or other dynamic factors and changes in offending propensity are likely to be much more apparent than real. The source of the apparent correlation is self-control, which is predicted to influence heavily the unfolding of life events and the rates at which changes in offending behavior occur over time (Hirschi and Gottfredson, 1995:136-138).

Developmental theories of crime offer a more complex explanation for the distribution of crime in the population. These developmental theories harmonize with the so-called career criminal framework. Proponents of the criminal career paradigm suggested that the differentiation of offending "stages", including onset of, duration of, and desistance from an offending "career," might lead to insights and explanations that would be otherwise overlooked (Blumstein et al., 1986:17). The criminal career framework accommodates the possibility that explanatory factors accounting for the onset of offending might be quite different from those that account for its duration or desistance.

Despite a rich conceptual vocabulary of different stages of a criminal career, architects of the criminal career framework were largely silent on what the full array of differences might include or why one might expect to find them. The contemporary developmental theory movement provides

various theoretical rationales that may guide research using the offending stages and dimensions identified by criminal career proponents (Osgood and Rowe, 1994:519). While differing in their specific features, developmental theories all assume that different explanatory factors affect crimes occurring at different points in life (Loeber and LeBlanc, 1990). Two particularly prominent variants of this approach, the developmental theories of Patterson (Patterson and Yoerger, 1993; Patterson et al., 1989) and Moffitt (1993), suggest that one set of explanatory variables will explain why some persons begin offending at a very early age and persist in problem behavior throughout life, while another set of variables will explain why some begin a brief period of offending that is largely confined to the adolescent years.

After early childhood, these theories predict that propensities for serious, long-term problem behavior are relatively well established and time stable. Among those who offend primarily in adolescence, however, problem behavior is predicted to be much more dependent on dynamic factors such as the tutelage of and reinforcement from delinquent peers and the benefits and consequences of previous offending experience. These developmental theories, therefore, propose an alternative to Gottfredson and Hirschi's theory insofar as they relax the constraint that all offending behavior is driven by the same causal process. Part and parcel of their anticipation of two different types of offenders is their prediction that static factors will be of primary importance in distinguishing who becomes a long-term offender and who does not, while dynamic factors will be most important for explaining variation in offending behavior among those who are active for relatively short periods of time.

There is also a theoretical middle ground. Specifically, not all general theories are as parsimonious as the one advanced by Gottfredson and Hirschi. Some of these theories, while adopting the assumption that the causes of crime are invariant over crime types and across the life course, are still willing to relax Gottfredson and Hirschi's assumption that dynamic factors are of little importance. This is a source of disagreement between the theories of Gottfredson and Hirschi (1990; Hirschi and Gottfredson, 1995) and Sampson and Laub (1993, 1995). The latter assume that variation in offending throughout life is due to variations in social control. Unlike Gottfredson and Hirschi, however, they explicitly argue for the importance of dynamic events. Granting impressive stability in offending behavior over the life course, Sampson and Laub (1993) nevertheless contend that individuals do exhibit significant changes in offending propensity over the life course. Such changes, they argue, cannot be explained by childhood differences in the ability to resist engaging in crime and deviance. Instead, dynamic factors that increase or decrease informal social controls account for these changes in the proclivity to offend. Based on

evidence from the Glueck and Glueck (1950) data, Sampson and Laub (1993) contend that the acquisition of spousal and occupational attachments predicts changes in behavior above and beyond early childhood differences in offending and other misbehaviors. In support of this prediction, Horney and her colleagues (1995) collected self-report data from prison inmates and found that short-term variations in informal sources of social control were associated with variations in offending behavior. An important component of much contemporary general theoretical work, then, is that dynamic factors are likely to be important predictors of offending behavior. Recent examples include the general yet dynamic theories offered by Agnew (1992), Tittle (1995), and Katz (1988). Our basis for categorizing these dynamic/general theories as "the middle ground" is based on their willingness to grant the importance of dynamic factors. They are, therefore, less parsimonious than the theory proposed by Gottfredson and Hirschi. At the same time, by virtue of their generality, these theories are more parsimonious than those proposed by Moffitt and Patterson, which anticipate distinct groups of offenders.

In this article we offer an empirical test of the two extreme theoretical models: the static/general model of Gottfredson and Hirschi and the dynamic/developmental model of Moffitt and Patterson. We first describe our interpretation of the developmental theories of crime recently advanced by Moffitt, Patterson, and their colleagues. Our purpose in doing so is not to provide a detailed explanation of their respective theories. Rather, it is to illustrate the common predictions that the two models make. Next, we derive and test several key hypotheses from this "amalgam" of developmental theories, the general but static theory of Gottfredson and Hirschi and general but more dynamic theories, such as the model proposed by Sampson and Laub (1993).

MODELS OF DEVELOPMENTAL THEORY: TWO ROUTES TO DELINQUENCY

Theories of offending with developmental emphases have been independently proposed by Patterson and his colleagues and Moffitt and her colleagues. Though differing in certain respects, the Patterson and Moffitt theories share a common central theme—that there exist two distinct groups of offenders and two distinct causal processes that explain their behavior. One group of offenders initiates antisocial conduct early in life and persists in offending throughout life—Patterson's "early starter" and Moffitt's "life-course-persistent" offender. A second, comparatively larger group begins offending only in adolescence and desists upon entering the early adult years—Patterson's "late starter" and Moffitt's "adolescence-limited" offender.

In explaining the early start/life-course-persistent route to offending, both Patterson and Moffitt argue that a key causal factor is poor or ineffective socialization. In the Moffitt (1993) model a combination of physiological and environmental factors produce a child with neuropsychological impairment. These impaired children have early deficits in intellectual, motor, executive, and social skills, and most important they exhibit early antisocial behaviors. The consequence is that parents are confronted with an unruly, disagreeable, and conduct-disordered child. While some parents have the necessary stock of parenting skills and resources to deal with such children, many others do not. Some parents have poor monitoring skills and respond in unproductive or counterproductive ways to their children's behavior problems. Such parents ignore inappropriate child conduct at some times and react destructively at others. The combination of a behaviorally and temperamentally difficult child and an overwhelmed parent causes the socialization process to break down. The ultimate product is a child with strong propensities to engage in highly varied criminal and other problem behaviors over much of the remainder of the life course.

Echoing a theme of Gottfredson and Hirschi (1990), Moffitt notes that deficient early socialization is not likely to be modified by successful socialization later on in life. In fact, poorly socialized children enter schools unable to contend with the demands of either their new academic or social lives. As a result, they confront failure and social rejection. In other words, difficult young children become difficult older children and difficult adults. In Moffitt's words (1993:683) these children "miss out on opportunities to acquire and practice prosocial alternatives at each stage of development." Propensities for negative and antisocial behavior are, therefore, stable over time and invariant across persons.¹

The early-starting-offender theory proposed by Patterson shares some important similarities with the causal process that produces Moffitt's life-course-persistent offender. Like Moffitt, Patterson et al. (1989, 1992) portray the early starter as a youngster who experiences great difficulty with family relationships (see also Simons et al., 1994). Early starters exhibit early problem behaviors such as temper tantrums and aggression. They learn how to manipulate parental reactions to their misbehavior to their own short-term advantage. As a result, the behaviors of such children soon exceed the control and discipline of their overwrought parents. These problems soon reap many collateral consequences. Because of their early behavior problems and poor interpersonal skills, early starters have

1. Neither Moffitt nor Patterson offer unambiguous descriptions of what they mean by stability within the early-start/life-course-persistent groups. Specifically, do they expect absolute levels of socialization to be time stable or do they only anticipate that the relative standing of socialization among individuals will be time stable?

weak social bonds to their families; bonds to school and peer relationships are similarly weak. According to Patterson and Yoerger (1993:331), "the child who receives antisocial training from the family during the preschool and elementary years is likely to be denied access to positive socialization forces in the peer groups and school." Like Moffitt, therefore, Patterson links an early entry into delinquency to early conduct problems, poor parenting, and failure with school and normal peer relations. Further, like Moffitt, those poorly socialized at the outset typically do not redirect their lives to a more conventional route. Hence, socialization is relatively stable over time. In both the Moffitt and Patterson models, then, poor or ineffective socialization produces a time-stable propensity to commit criminal and other antisocial acts.

Patterson and his colleagues part company with Moffitt on the expected role of peers in the generation of the early-starting or life-course-persistent offender. For Moffitt, peers have no influence on the delinquent behavior of life-course-persistent offenders. Their antisocial propensities are sufficient, in her view, to explain their early and continuous involvement in crime. Patterson, however, seems to suggest that delinquent peers have a direct causal effect on the delinquent behavior of even the most poorly socialized youth by providing already undersocialized children with the "attitudes, motivations, and rationalizations to support antisocial behavior" (Patterson et al., 1989:331). Although delinquent peers exert causal effects in both Patterson's early and late-starting group of delinquents, our reading of his theory leads us to expect that it will be stronger in the former than the latter group. With this in mind, we believe that Moffitt and Patterson's models converge to offer some common predictions about the etiology of serious, long-term problem behavior.

In addition to a comparable explanation for those youth who offend early and throughout life, Patterson and Moffitt also offer similar accounts of the second route to delinquency, the adolescence-limited or late-starter route. For Moffitt (1993:685-686) adolescence-limited offenders are effectively socialized. Indeed, she argues that offending of an adolescence-limited nature is normative within the general adolescent population. They have no early history of antisocial behavior, they have warm and supportive relationships with parents both at an early age and when adolescents, are successful in school and peer relationships. As these well-socialized youngsters enter high school, however, most experience a strain-inducing "maturity gap." This maturity gap results from a desire to acquire adult-like independence amidst the constraints of continuing dependence on parents and school authorities. The dissonance created by this maturity gap can be relieved by acts of rebellion and assertions of independence that adolescence-limited offenders learn from life-course-persistent youth and participate in with the aid and comfort of delinquent peer groups. In

fact, Moffitt (1993:687) predicts a growing behavioral convergence during adolescence between the two groups: "One hypothesized by-product of the maturity gap is a shift during early adolescence by persistent antisocial youth from peripheral to more influential positions in the peer social structure."

Patterson believes that peer support is necessary for late starters to initiate offending. His late starters are adequately socialized in early adolescence. Nevertheless, they experience "family disruptors" (conflict with parents, change of residence, parental unemployment), which in turn decrease supervision. Temporarily free from control, these youth over time come into greater contact with delinquent peers. Under the influence of more-delinquent peers, they begin a short period of experimental delinquency. There is no doubt that like Moffitt, Patterson (Patterson and Yoerger, 1993:163) places the blame for the delinquency of the late starters squarely on the shoulders of delinquent peers: "The direct cause for the ensuing delinquency is the deviant peer group" (see also, Simons et al., 1994).

A final and key point of convergence between the Moffitt and Patterson theories is that they both anticipate that past conduct will have important implications for and causal effects on future conduct. The prediction of a causal effect of past offending behavior on future criminality, a state-dependent effect (Nagin and Paternoster, 1991), implies that past criminal acts will have consequences and benefits that modify the probability that future criminal acts will occur (e.g., they erode conventional relationships and cement deviant ones). The reinforcement provided by prior behavior is a central component of the dynamic quality of developmental models. This is particularly likely to be true for adolescence-limited/late-starting offenders. For these generally well-socialized youths, one would expect the correlation between past and future conduct to be primarily driven by dynamic contingencies such as varying exposure to delinquent peers and the benefits and consequences of prior experience. Given the profound socialization defects for the early-starter/life-course-persistent offender, however, most of the correlation between past and future criminality should be due to relatively high and stable levels of antisocial propensity.²

2. Our prediction would be that offending within the adequately socialized adolescence-limited group depends upon dynamic variables such as prior experience and delinquent peer exposure. For these generally conventional youths we would expect that correlations between prior and future offending behavior cannot be explained by time-stable differences in offending propensity. Within this framework, correlations between past and future delinquency should convey causal effects. The opposite is expected to be true for life-course-persistent/early-starting offenders. Most of the correlation between past and future conduct should be due to stable individual differences in offending propensity. We would, nonetheless, hold out the possibility that there may

As the above discussion suggests, the Moffitt and Patterson theories offer predictions that differ from those of Gottfredson and Hirschi (1990) and even general dynamic theories like the model proposed by Sampson and Laub (1993). For example, where Moffitt and Patterson would predict that there are distinct groups of offenders whose behavior depends on qualitatively different causal processes, Gottfredson and Hirschi and Sampson and Laub would predict that the same causal process can be invoked to account for the offending behavior of all individuals. General theorists predict that the population exhibits variation in degrees of offending propensity, whereas the Moffitt and Patterson developmental typologies anticipate the existence of distinct groups of individuals who follow different pathways to offending behavior. On the question of whether dynamic factors are important for the explanation of offending behavior over the life course, however, Gottfredson and Hirschi's theory stands apart from the Moffitt and Patterson as well as the Sampson and Laub models. For Gottfredson and Hirschi, dynamic factors such as delinquent peer exposure and the benefits and consequences of prior experience should exert only trivial effects on future behavior after individual differences in offending propensity have been taken into account. For Moffitt and Patterson, dynamic factors should be important for the vast majority of the population since only a small minority of the population fits into the life-course-persistent/early-start group. For Sampson and Laub, dynamic factors are potentially important for everyone regardless of prior history or differences in offending propensity. Many other contemporary general theories would offer similar predictions.

With these differences among various criminological theories in mind, we turn now to a set of empirical tests of the models proposed by Moffitt and Patterson, Gottfredson and Hirschi, and general dynamic theorists. One of the most basic propositions, common to many theoretical approaches, predicts the following:

Hypothesis 1: Antisocial or offending propensity will be associated with economic disadvantage, family disruptions, and parenting practices.

be a small state-dependent effect for this group. Moffitt (1993:684) predicts that life-course-persistent offenders become "ensnared by [the] consequences of [their] antisocial behavior." One reason why the life chances of life-course-persistent offenders fail to improve (what Moffitt, 1993:683, calls "cumulative continuity") is because their criminal conduct *worsens* their bond to conventionality. The process of ensnarement into further crime, therefore, is essentially a state-dependent process. We question the substantive importance of this, however, for two reasons. First, the bond to conventionality should already be quite weak for individuals within this group. Second, Moffitt does not suggest any sources of variation in the ensnarement process within the life-course-persistent group; quite to the contrary, Moffitt provides ample reason to believe that everyone fitting the description of the life-course-persistent offender will experience similar kinds of cumulative continuity.

This hypothesis does not qualify as a "critical test" of the various models discussed above because it is relatively noncontroversial. The following two hypotheses, however, constitute comparative and critical tests between models that anticipate important dynamic effects:

Hypothesis 2: Exposure to delinquent peers should have no substantial effect on delinquency once stable individual differences in offending propensity have been taken into account.

Hypothesis 3: There should be no correlation between past and current delinquency once stable individual differences (persistent heterogeneity) are controlled.

Empirical support for these hypotheses would constitute confirming evidence for the general theory of Gottfredson and Hirschi, who argue that dynamic factors such as delinquent peer exposure and prior offending experience do not affect delinquent behavior once individual differences in criminal propensity have been controlled. Contrary findings would constitute confirming evidence for theories that allow for important dynamic effects.³

Our final hypothesis test assesses the empirical necessity of theories, like those advanced by Moffitt and Patterson, that focus on distinct groups of offenders. Specifically, our reading of the Moffitt and Patterson theories leads us to predict the following:

Hypothesis 4: Within a group of individuals with high offending propensity, the effect of dynamic variables such as delinquent peer exposure and prior offending experience should be trivial. Within a group of individuals with low offending propensity, however, delinquent peer exposure and prior experience should exert positive effects on offending behavior. In short, the effects of dynamic variables should differ between groups of individuals defined by their levels of offending propensity at the beginning of adolescence.

METHODS

SUBJECTS

Our analysis was based upon the 508 respondents who were age 11 or 12 at the first wave of the National Youth Survey (or NYS; Elliott et al., 1985, 1989). The number of cases available for analysis ranged from 471 to 479

3. Although Moffitt and Patterson would apparently acknowledge a strong effect of time-stable antisocial or offending propensity in the early-starter/life-course-persistent group, this effect should be weak or nonexistent in the late-starter/adolescence-limited group and this latter group accounts for the vast majority of the adolescent population. As such even a strong, persistent heterogeneity effect in the early-start group should not emerge in analyses that do not separate samples into groups based on their early childhood socialization levels.

for the various questions posed by the survey. The sample ranged from age 15 to 16 at the fifth survey wave. Table 1 presents descriptive statistics for the variables included in the various analyses presented below. All indicator (dummy) variables were coded so that a 1 represents the presence of the characteristic and a 0 represents its absence. Many of the variables listed in Table 1 have obvious interpretations. Some, however, require additional comment. In the sections below, the various measures are discussed in more detail.

MEASURES

HOME ENVIRONMENT/PARENT VARIABLES

The variables in the top section of Table 1 were based on interviews with parents at the first wave of the survey. Income was ordinally scaled so that higher values imply greater family income. A small number of cases reported no family income. These cases were recoded to the sample mean on the family income variable and were coded 1 on a missing income dummy variable. All event indicators (e.g., divorce, unemployment, moving in or out of a house) were based on questions asked about the previous year.

The parental attitudes toward deviance scale was based on items that asked parents "how wrong" they believed it was for adolescents to engage in a variety of mischievous or delinquent activities. The parental disapproval of negative acts construct was drawn from a number of items that asked parents how much they would approve or disapprove of their own child engaging in various actions. The scale was coded so that high scores represent strong disapproval of negative behaviors. The inductive discipline measure was coded 0 if either parent used noninductive disciplinary methods (hitting, yelling) and was coded 1 if discipline was uniformly inductive. About 15% of the sample had missing data on this variable. These cases were assigned the mean value (0.671) on the discipline indicator and were assigned a value of 1 on the indicator variable for missing discipline score.

Several of our hypotheses make reference to the notion of antisocial or offending propensity. A key assumption of the Moffitt and Patterson models as well as the general theories of Gottfredson and Hirschi and Sampson and Laub is that ineffectively socialized children have a substantially higher propensity to offend early, longer, and with greater frequency than those more effectively socialized. As a proxy for ineffective or poor socialization, we constructed two separate, but related, measures of offending propensity. One is based on respondent answers to questions at the first wave of the survey (when individuals were all 11 or 12 years old) that make up a number of attitude scales. We refer to this measure as

Table 1. Descriptive Statistics

Variable Description	Mean	S.D.	Range
Home Environment/Parent Variables			
Income in Previous Year	3.965	2.166	1 to 10
Missing Income	0.042	0.200	0/1
Family Receives Public Assistance in Past Year	0.186	0.389	0/1
Divorce Occurred in Past Year	0.033	0.180	0/1
Marital Separation in Past Year	0.040	0.195	0/1
Remarriage in Past Year	0.017	0.128	0/1
Father Unemployed in Past Year	0.094	0.292	0/1
Mother Unemployed in Past Year	0.106	0.309	0/1
Father Moved in or out of House in Past Year	0.042	0.200	0/1
Mother Moved in or our of House in Past Year	0.019	0.136	0/1
Parental Attitude Toward Deviance	3.849	0.269	2.7 to 4.0
Parental Disapproval of Negative Acts	4.738	0.346	3.1 to 5.0
Parents Use Inductive Discipline	0.668	0.471	0/1
Missing Discipline Score	0.152	0.360	0/1
Time-Fixed Youth Characteristics			
Sex = Male	0.503	0.501	0/1
Race = Nonwhite	0.219	0.414	0/1
First = Negative Behavior Propensity	11.635	59.661	0 to 944
First = Negative Attitude Propensity	0.003	0.953	-2.9 to 3.5
Indicator Variable for Any Missing Data Waves	0.119	0.324	0/1
Time-Varying Characteristics (Waves 2-5)			
Time Index (Wave 2 = 1, Wave 3 = 2, Wave 4 = 3, Wave 5 = 4)	2.447	1.113	1 to 4
Delinquent Peer Exposure	1.545	0.547	1.0 to 4.1
Any Serious Delinquency Participation	0.152	0.359	0/1
Frequency of Serious Delinquent Acts	0.960	9.543	0 to 331

NOTE: Home/environment variables are based on 479 respondents; all other variables are based on 471 respondents.

negative attitude propensity. The other is based on respondent self-reported antisocial behaviors at the first survey wave that are "analogous" to crimes but are not included in our actual offending measures (discussed below). We refer to this measure as *negative behavior propensity*. For purposes of the tests we performed, we assume that individuals who rank

at high levels on these negative behavior and attitude propensity constructs are less adequately socialized than their counterparts with lower scores on these constructs.

NEGATIVE ATTITUDE PROPENSITY MEASURE

An attitude-based measure of criminal propensity was developed from a number of scales administered within the first wave of the NYS and described more fully in Elliott et al. (1985). These scales were created by computing the average score of all items contributing to them. The appendix presents a detailed breakdown of the items and coding used in computing these scales.

The first indicator was an attitude toward deviance scale. This measure represents one's level of moral beliefs and is comprised of items that asked respondents to indicate how wrong they believed it was to engage in a variety of dishonest and/or delinquent acts. Higher scores connote a stronger set of moral beliefs.

A commitment composite was developed from two sets of items in the NYS. The family commitment measure included items asking about the importance of family activities and relationships. School commitment was tapped by items that asked respondents about the importance they placed on achieving good grades, pleasing teachers, and doing a good job in school. For those with high scores on these composites, family relationships and school performance were important. Attachment to others was gauged by asking respondents how isolated they felt from parents, school, and peers. Low levels of isolation were interpreted as representing high levels of attachment. High scores on the attachment dimension indicate strong social attachment to parents, school, and peers. A six-item normlessness scale, which asked respondents how much they agreed with statements about honesty with parents, cheating to get ahead, and fighting to solve conflicts, was scored high for prosocial answers.

Self-concept was assessed by using items that represent respondents' views of how significant others see them; other analyses of the NYS have treated these scales as measures of informal negative labeling (see, e.g. Matsueda, 1992). A positive self-concept can represent a "stake in conformity" that is forfeitable if one engages in delinquency (Briar and Piliavin, 1965; Gibbons and Krohn, 1991; Hirschi, 1980; Reckless, 1973; Tittle, 1988; Wells and Rankin, 1983) or a source of "containment" on purely self-interested behavior (Reckless, 1973). For this analysis, "significant others" included parents, peers, and teachers. High scores on these three scales indicate a poor self-concept (e.g., youngster believes that parents think he/she is a "bad kid," breaks rules).

Patterson and his colleagues have repeatedly stressed the importance of

multiagent reports to complement self-reported measures of key theoretical constructs (Patterson, 1993:913; Patterson and Yoerger, 1993:143; Patterson et al., 1989:330). Unfortunately, information in the National Youth Survey is generally confined to self-reported measures of attitudes, perceptions, and behaviors. One exception to this is, as described above, the parent survey administered at the first wave. A group of 12 items on this survey assessed parental perceptions of the child's behavior. These items asked parents how much they agreed or disagreed with various statements about their child (e.g., my child is a bad kid, breaks rules, messes up). It was scaled so that high scores represented negative views of one's child.

Inspection of the correlation matrices associated with these scales at each survey wave suggested the possibility that the measures designed to tap attitudinal propensity were all indicators of a single underlying construct. To investigate this possibility, a factor analysis was executed among the scales described above; the analysis revealed that only one factor had an eigenvalue exceeding unity. This is the default cutoff point for factor extraction in SAS software (SAS Institute Inc., 1992). Based on this factor analysis, presented in Table 2, a single-dimension negative attitude propensity score was created for each case by taking the product of the vector of factor score coefficients and the vector of normalized scores on the "subscales" described above. A high score on this negative attitude based construct of offending propensity is interpreted as being a proxy for poor or inadequate socialization.

BEHAVIOR-BASED PROPENSITY MEASURE

It is, of course, possible that the attitudinal measures of poor socialization or criminal propensity described above are of limited value in the measurement of offending propensity. Hirschi and Gottfredson (1993:48, 52-53), for example, argue that criminal and "analogous" behaviors are the best index of their self-control construct. In an attempt to corroborate our results using two distinct propensity constructs, an index counting the number of problem behaviors that were outside the sweep of our outcome variables was developed. The index items included self-reported counts of running away from home, lying about one's age, hitting other students, avoiding payment (e.g., sneaking into a movie theater), skipping school, failing to return excess change, school suspension, making obscene telephone calls, hitchhiking, cheating on tests, and liquor consumption. A high level of self-reported involvement in these activities is interpreted as being a proxy for poor or inadequate socialization.

DELINQUENT PEER EXPOSURE

Delinquent peer exposure data were collected at the second, third,

Table 2. Reliability and Factor Analysis Results for Negative Attitude Propensity Measure

Scale Comprising Composite	Factor Loading	Composite Reliability
Attitude Toward Deviance	.479	.769
Family Commitment	.534	.687
School Commitment	.416	.599
Family Attachment	.609	.628
School Attachment	.569	.632
Peer Attachment	.481	.601
Perception of Parents' Views Toward Respondent	-.813	.755
Perception of Peers' Views Toward Respondent	-.851	.804
Perception of Teachers' Views Toward Respondent	-.855	.815
Conventional Norms/Aspirations	.542	.675
Parents' Actual Views Toward Respondent	-.403	.849

fourth, and fifth survey waves. This construct was measured by a group of 13 items that asked respondents how many of their friends participated in a variety of both minor and more serious deviant or delinquent acts. High scores imply high levels of delinquent peer exposure.

DELINQUENT ACTIVITY

Two measures of delinquent activity were used. The first indicates whether a respondent self-reported involvement in one or more delinquent acts (listed below) at each survey wave. The second is a count of the number of self-reported delinquent acts committed during each year of the study. The following self-reported delinquent acts were included: two theft items of varying dollar amounts (exceeding \$5.00), motor vehicle theft, aggravated assault, sexual assault, involvement in gang fights, robbery, and breaking and entering (either a vehicle or structure).

MODEL ESTIMATION

As the above discussion suggests, a cogent test of developmental theory predictions against the predictions of Gottfredson and Hirschi's more static theory will rely on data that follow the same individuals over time. In such an analysis, the assumption of independence between individuals is generally still plausible, but the assumption of independent outcomes

within individuals over time is less so. It is, therefore, desirable to relax the constraint that within-person outcomes at a given time are independent of the outcomes at another given time. It is also desirable to have the flexibility to estimate such a model in the absence of a complete set of measurements for each case over the entire five-wave period. As has been documented in previous analyses of the NYS data (see Elliott et al., 1989), there is significant attrition in the sample over time. The two age cohorts on which we focus our analysis are no different. An estimation routine that allows for the use of all information contributed by all individuals is a less restrictive alternative to the requirement that all individuals must be observed at all survey waves.

The longitudinal components of our analyses accomplish these tasks by relying on panel models for unbalanced data and discrete dependent variables. To study the effects of various study variables on the probability that an individual engages in any delinquency at all during a particular survey wave, we used a probit model. We used a negative binomial model to assess the effects of the same variables on the frequency of delinquent acts committed by an individual during a particular survey wave. The probit model is especially appropriate for our purposes because it maintains continuity with prior work in this area (Nagin and Farrington, 1992a, 1992b; Nagin and Paternoster, 1991); the negative binomial model is also useful when the dependent variable is an event count. In such cases, conventional linear regression models produce biased and inconsistent estimates of the effects of predictor variables on the event count outcome (King, 1989:126). The negative binomial model anticipates the discrete nature of event count outcomes and is particularly appropriate when event counts exhibit overdispersion (e.g., the variance exceeds the mean); see generally Land et al., 1996:394–398; Lawless, 1987.⁴

The LIMDEP (version 7.0) software package was used to estimate all models described here (Greene, 1995:426–431; 566–571).⁵ The output

4. An alternative approach to the analysis of event-count outcomes is the Poisson regression model. Although more parsimonious than the negative binomial model (it contains one fewer parameter to estimate), the Poisson regression model depends on a restrictive assumption about the distribution of the dependent variable in the population; namely, it assumes that the mean and the variance of that distribution are equal. The negative binomial model includes the Poisson regression model as a special case, and we can, therefore, use likelihood-ratio tests to decide whether the negative binomial process is more likely to have generated the current data set than the Poisson process. In all cases, our analyses rejected the simpler Poisson model in favor of the more complicated negative binomial model.

5. It is worth noting that the substantive results presented in this article were replicated using hierarchical linear models. The software program to estimate these models, HLM version 3.01, is described in detail by Bryk and Raudenbush (1994).

from the probit model includes estimates for each of the predictor variables (which incorporate observed individual differences into the model) as well as a correlation, ρ , between error terms associated with the same individual. Nagin and Farrington (1992b:242) interpret this correlation as an index of the importance of unobserved individual differences that account for offending behavior. The objective of controlling for persistent individual differences (both observed and unobserved) is to secure a consistent estimate of the effect of dynamic variables, such as delinquent peer exposure and prior offending behavior, on the probability of future offending behavior.

The output from the negative binomial model for offending frequency similarly focuses on controlling for observed and unobserved time-stable individual differences related to offending behavior in order to secure consistent estimates of the effects of dynamic variables. This is a random-effects model in which the random effects are assumed to be drawn from a beta distribution with parameters α and β (Greene, 1995:570–571). The statistical significance of these parameter estimates is an index of the importance of persistent individual differences for the explanation of offending frequencies.⁶ Our estimates of the effects of dynamic variables such as delinquent peer exposure and prior offending experience are obtained after incorporating observed and unobserved individual differences into the specification.

Random-effects models make assumptions about the population distribution of unobserved individual differences that are relevant for the explanation of criminal offending. In the case of the negative binomial model, residual terms are assumed to be drawn from a gamma distribution with parameters (Θ_i, Θ_i) , where $\Theta_i/(1 + \Theta_i)$ is distributed as a beta variable with parameters α and β (Greene, 1995:566). Recently, Nagin and his colleagues (Nagin and Land, 1993; Land et al., 1996; Land and Nagin, 1996) developed a model in which no a priori assumptions are made about the shape or form of the distribution from which the residual terms are drawn. In short, the model is nonparametric on the question of the error-term distribution. We concede that correct inferences about the effects of dynamic variables depend to some extent on the proper specification of this “mixing” distribution and that a model that weakens the need for a priori assumptions about such distributions should prove to be a valuable tool for assessing the comparative importance of static and dynamic effects in future work. Nevertheless, the apparatus for estimating this model is

6. For each of the negative binomial frequency models, we compared the specification with random effects to a specification with no random effects. The random-effects model includes the negative binomial model with no random effects as a special case. Likelihood ratio tests with one degree of freedom revealed that the random-effects specification was the preferred model in all cases.

not currently available in major computer packages such as LIMDEP, SAS, or SPSS. In this analysis, we confine our efforts to the standard probit and negative binomial specifications available in LIMDEP version 7.0.

RESULTS

In this section, the ideas discussed above are framed within a set of statistical models. We address each of the four hypotheses in turn.

HYPOTHESIS 1

As suggested above, a key issue is whether our two propensity constructs are empirically associated with predators gleaned from the parent-interview data. If they are related, we may more confidently assume that our two measures of propensity demonstrate significant empirical overlap with a "poor socialization" construct. The models for this analysis required a regression of first-wave propensity scores (attitude and behavior) on the parent-interview variables.

The left panel of Table 3 presents the results of a negative binomial regression analysis of the behavior-based propensity construct (higher scores indicating a greater frequency of problem behaviors). The coefficient estimates reveal that paternal unemployment and paternal mobility were associated with higher scores on this outcome, while maternal unemployment, the use of inductive discipline, and negative parental attitudes toward deviant acts were associated with lower scores. These results appear to be largely consistent with the prediction of Hypothesis 1.

The right panel of Table 3 presents the results of a regression analysis of the attitude-based propensity construct. The model was estimated by a maximum-likelihood method that included a variance function because the residuals from the ordinary-least-squares model were heteroscedastic (Davidian and Carroll, 1987:1,079).⁷ The analysis reveals that several of the parent-reported characteristics were significantly associated with

7. We wish to thank Douglas Smith for suggesting this general approach. To estimate the model, we maximized the log-likelihood function:

$$\text{Log}(L; \Theta, \gamma_0, \gamma_1) = \sum (1/\sigma_i) \cdot \phi(y_i - x_i' \Theta) / \sigma_i,$$

where y_i = the observed attitude/perception-based socialization score for the i th case, x_i = the vector of scores on the predictor variables for the i th case, $\sigma_i = [\exp(\gamma_0 + \gamma_1 \cdot x_i' \Theta)]^{1/2}$, and $\phi(\cdot)$ is the standard normal probability density function. Note that Θ and γ are parameter vectors at the maximum of the log-likelihood function. The maximum-likelihood solution was identified using a Gauss program.

Table 3. Regression of First-Wave Negative Behavior and Attitude Propensity Measures (Based on Self-Reported Attitudes/Perceptions and Behaviors) on Parent/Home Environment Covariates

Variable Description	Negative Binomial Regression With Negative Behavior Propensity Measure			Least Squares Regression With Negative Attitude Propensity Measure		
	Coefficient	S.E.	T Ratio	Coefficient	S.E.	T Ratio
Structural Model: $\hat{S}_{it} = f(x_i, \theta)$						
Intercept	4.551*	2.280	2.00	-.681	.876	0.78
Income	.026	.073	0.35	.015	.023	0.66
Missing Income	-.917	.628	1.46	-.209	.200	1.05
Family Receives Public Assistance	.097	.430	0.23	.438*	.130	3.37
Divorce Occurred in Past Year	-.653	1.114	0.59	-.018	.304	0.06
Marital Separation in Past Year	-1.678	1.037	1.62	-.236	.381	0.62
Remarriage in Past Year	.325	1.281	0.25	.666	.372	1.79
Father Unemployed	1.145*	.247	4.64	.245	.150	1.64
Mother Unemployed	-.856*	.360	2.38	-.324*	.150	2.16
Father Moved in or out of House	3.446*	1.081	3.19	.827*	.401	2.06
Mother Moved in or out of House	-.796	1.449	0.55	.404	.362	1.12
Parental Attitude Toward Deviance	-.236	.332	0.71	.328	.236	1.39
Parental Disapproval of Negative Acts	-.640*	.118	5.42	-.531*	.206	2.58
Parents Use Inductive Discipline	-.344*	.172	2.00	-.398*	.103	3.86
Missing Discipline Score	.664	.432	1.54	.248	.140	1.76
Variance Function: $\hat{\sigma}_i^2 = \exp(z_i' \gamma)$						
Intercept (γ_0)				.172*	.065	2.64
$x_i' \theta (\gamma_1)$				.403*	.061	2.51
Dispersion Estimate for Negative Binomial Regression Model (α)	3.159*	.227	14.04			

NOTE: Estimation based on sample of 479 respondents.

* $p < .05$.

Table 4. Baseline Probit and Negative Binomial Models

Variable	Probit Participation Models				Negative Binomial Frequency Models			
	Attitude Propensity Measure		Behavior Propensity Measure		Attitude Propensity Measure		Behavior Propensity Measure	
	Estimate	z Ratio	Estimate	z Ratio	Estimate	z Ratio	Estimate	z Ratio
Constant	-2.900	14.60	-2.876	14.78	-4.398	18.10	-4.484	18.44
Sex = Male	.389	3.86	.379	3.86	.458	3.24	.461	3.21
Race = Nonwhite	.016	0.15	.023	0.21	.230	1.54	.229	1.44
Time Index	-.118	2.46	-.118	2.47	-.120	1.86	-.112	1.71
Any Missing Waves	.238	1.66	.236	1.65	.030	0.20	.042	0.27
Delinquent Peer Exposure	.939	9.92	.934	9.86	1.132	13.15	1.142	13.33
Prior Wave Delinquency	.837	6.84	.862	7.11	.959	6.03	.984	6.28
High Propensity Indicator	.406	2.69	.332	2.22	.445	2.59	.505	3.12
$\rho (\sigma^2_\tau / (\sigma^2_\tau + \sigma^2_\nu))$	.080	0.61	.068	0.51				
α					1.829	3.95	1.928	3.65
β					3.538	2.19	3.977	2.08
Log-likelihood	-531.99		-533.30		-1093.88		-1093.03	

NOTE: Estimation based on sample of 471 respondents.

higher attitude-based propensity scores. Receipt of public assistance and paternal mobility were associated with higher attitude propensity levels. Maternal unemployment, negative parental attitudes toward deviance, and use of inductive disciplinary methods were associated with lower scores on the attitude-based propensity measure. These results are also generally consistent with the predictions of Hypothesis 1.⁸

HYPOTHESES 2 AND 3

Our second and third hypothesis tests focus on the comparative merits of static and dynamic theoretical models. In particular, we are concerned with whether the effects of two dynamic variables, delinquent peer exposure and prior offending experience, are positive and statistically significant once time-stable individual differences in criminal propensity have been taken into account.

Table 4 presents the results of this test. All of the models include predictor variables capturing the sex and race of the respondents. They also include variables that index the passage of time (i.e., time index = 1 at wave 2, time index = 2 at wave 3, etc.) and an indicator variable for whether the respondent failed to respond to all four survey waves. Delinquent peer exposure is a scale capturing the proportion of friends the respondent has who engage in various deviant and delinquent acts. Prior delinquency is coded 1.0 if the respondent self-reported participating in any of the serious delinquent acts (and 0.0 otherwise) in the immediately prior wave of the survey listed above. Indicator variables for high negative attitude and behavior propensity were coded 1.0 if the respondent ranked above the 90th percentile on the first-wave propensity measures and 0.0 otherwise.⁹

For the probit models of offending participation and the negative binomial models of offending frequency (regardless of whether we control for attitude or behavior propensity), the results convey a similar story. Delinquent peer exposure and prior offending experience, our two dynamic explanatory variables, exert strong positive effects on whether and how frequently individuals offend, and these effects are obtained after observed and unobserved individual differences have been taken into

8. It is interesting to note that the zero-order correlation between the attitude-based propensity measure and the natural logarithm of the behavior-based propensity measure was substantively and statistically significant ($r = .397$; $p < .05$).

9. We estimated models controlling for the continuous versions of the attitude- and behavior-based offending propensity variables. In addition, we estimated models using alternative cutoff points for identifying those with "high" offending propensity. Our alternatives included coding those above the 93rd, 85th, and 80th percentiles into the high-offending propensity group. None of these alternative specifications materially altered our results.

account. The results in Table 4 are consistent with the predictions of dynamic general theorists such as Sampson and Laub as well as the predictions of Moffitt and Patterson, who argue that dynamic variables will exert important effects on offending in a typical cross-sectional sample of adolescents.

There is another feature of Table 4 that warrants attention. Probit models such as those presented in Table 4 have appeared in two previous studies in this journal. These studies, conducted by Nagin and his colleagues (Nagin and Farrington, 1992b; Nagin and Paternoster, 1991) focused squarely on the question of whether prior and future offending behavior were causally, or only spuriously, linked. As discussed above, Gottfredson and Hirshci (1990) dismiss the importance of dynamic variables such as prior offending experience in the explanation of offending behavior at any given time. Dynamic theorists, on the other hand, view the possibility of so-called "state-dependent" effects as highly plausible.

Using survey data from two waves of panel data collected on a sample of 1,163 South Carolina high school students in the Columbia Metropolitan Statistical Area, Nagin and Paternoster (1991:178) estimated a probit model to assess the effect of self-reported property offending in the year before the first wave of the survey on self-reported property offending in the year before the second wave of the survey. Their analysis revealed a strong positive effect of prior offending experience on the probability of a property crime during the year before the second-wave survey after adjusting for observed and unobserved time-stable features of the respondents.

Nagin and Farrington (1992b:248) used a probit model to examine the effect of conviction during each 2-year period (of an 11-period panel) on the probability of conviction during the next 2-year period for 403 individuals. These individuals were all male, they were followed from ages 10 to 31, and they were selected from a working-class area of London. They are, therefore, not likely to be representative of the general population of individuals in their sex and age group in London. The probit coefficient for prior conviction, before adjusting for unobserved stable features of subjects, was greater than 1.0 and was statistically significant. The magnitude of this probit coefficient dropped by about 60%, however, after adjusting for unobserved stable differences in criminal propensity. The coefficient remained statistically significant, but the magnitude of the drop combined with its relatively small value after adjusting for unobserved propensity differences led Nagin and Farrington (1992b:253) to conclude that "evidence of true state dependence is limited."

Table 5 presents the results of our analysis from Table 4 alongside those of Nagin and his colleagues. The top section of Table 5 reveals a striking difference between the coefficients in our models and the Nagin and

Paternoster model compared to the coefficient observed in the Nagin and Farrington study. In order to compare these probit coefficients formally, we constructed *z*-tests on the hypothesis that the difference between each pair of coefficients was equal to zero. These *z*-tests are presented alongside the coefficient differences in the bottom section of Table 5. They show that the differences between the probit coefficients in our study and the Nagin and Paternoster study are not statistically significant. All three of these coefficients, however, are significantly different from the Nagin and Farrington probit coefficient at the 95% confidence level. The probit point estimates obtained in our study, therefore, provide an independent replication of the Nagin and Paternoster point estimate, but they fail to replicate the Nagin and Farrington point estimate. We believe this pattern of results is potentially important because either the composition of the samples (moderate risk vs. general adolescent cross-section) or the differences between self-reported and official-record offending will probably account for it. Of course, a striking coincidence could also account for it, but we think this is unlikely. We return to this issue in our conclusions below.

Table 5. Comparison of Findings on the Link Between Prior and Future Offending Behavior in Three Studies

Study	Effect of Prior Behavior on Future Behavior ^a	S.E.	<i>z</i> Ratio
Nagin and Paternoster (1991)	.804	.086	9.33
Table 4 (Attitude Model)	.837	.122	6.84
Table 4 (Behavior Model)	.862	.121	7.11
Nagin and Farrington (1992b)	.446	.106	4.21
Pairwise Comparisons (Entries Are Coefficient Differences and <i>z</i> Ratios are in parentheses)			
	Nagin and Paternoster (1991)	Table 4 (Attitude Model)	Table 4 (Behavior Model)
Nagin and Paternoster (1991)	—	—	—
Table 4 (Attitude Model)	.033 (0.22)	—	—
Table 4 (Behavior Model)	.058 (0.39)	.025 (0.15)	—
Nagin and Farrington (1992b)	.358 (2.63)	.391 (2.41)	.416 (2.58)

^a Effects are net of controls for persistent individual differences (both observed and unobserved).

HYPOTHESIS 4

We now turn to a critical point of contention in the debate between developmental proponents and general theorists such as Gottfredson and Hirschi and Sampson and Laub. The question we address is whether the uniquely typological features of the Moffitt and Patterson developmental models are consistent with the data analyzed here. As discussed above, a key feature of the developmental models is their prediction that dynamic factors such as delinquent peer exposure and prior offending experience will exert stronger effects within a group of individuals with comparatively low offending propensity. The Moffitt and Patterson developmental models also lead us to expect that the effects of dynamic factors will be significantly weaker within a group of individuals with comparatively high levels of offending propensity. The Moffitt and Patterson theories also suggest that the group with comparatively high levels of offending propensity will be significantly smaller than the low-propensity group. In other words, membership in the low-propensity group should be normative while membership in the high-propensity group should be exceptional.

To conduct this test, we estimated product terms that multiplied the high-propensity indicator variable (individuals who ranked above the 90th percentile of offending propensity were coded 1; all other cases were coded 0) by delinquent peer exposure and prior offending experience. This is equivalent to estimating separate effects for the dynamic variables within the low- and high-offending propensity groups, respectively. If the uniquely typological features of the Moffitt and Patterson theories are consistent with the data, we expect to see differences in the effects of delinquent peer exposure and prior offending experience between the low- and high-propensity groups. Across the range of the participation and frequency analyses presented in Table 6, however, none of these product terms was significantly different from zero. This result is inconsistent with the prediction of Hypothesis 4.

In order to assess the resilience of this result across different definitions of high-offending propensity, we estimated the same set of models depicted in Tables 4 and 6 including individuals in the high-propensity samples if they ranked above (1) the 93rd percentile; (2) the 85th percentile; and (3) the 80th percentile. We then computed likelihood-ratio tests on the null hypothesis that the two additional degrees of freedom did not increase the model log-likelihood. Table 7 presents the results of the assessment in Table 6 along with the three other specifications. In none of these analyses could the additional two degrees of freedom be justified on the basis of the likelihood-ratio tests. On the basis of this evidence there

Table 6. Probit and Negative Binomial Models Augmented with Interaction Terms

Variable	Probit Participation Models			Negative Binomial Frequency Models		
	Attitude Propensity Measure		Behavior Propensity Measure	Attitude Propensity Measure		Behavior Propensity Measure
	Estimate	z Ratio	Estimate	Estimate	z Ratio	Estimate
Constant	-.2875	14.11	-2.809	-4.419	16.77	-4.440
Sex = Male	.389	3.85	.391	.463	3.22	.459
Race = Nonwhite	.017	0.16	.023	.233	1.54	.230
Time Index	-.118	2.48	-.116	-.123	1.85	-.115
Any Missing Waves	.232	1.61	.208	.012	0.07	.039
Delinquent Peer Exposure	.922	9.17	.896	1.127	12.12	1.116
Prior Wave Delinquency	.878	6.67	.831	1.070	6.29	1.004
High Propensity Indicator	.355	0.85	-.387	.842	1.68	.217
Interaction Terms						
Propensity x Del. Peer Exp.	.069	0.33	.329	-.013	0.06	.139
Propensity x Prior Delinquency	-.193	0.64	.244	-.556	1.42	-.035
$\rho (\sigma^2_\tau / (\sigma^2_\tau + \sigma^2_v))$	.076	0.56	.063			
α				1.806	4.00	1.958
β				3.423	2.20	4.109
Log-likelihood	-531.70		-531.92	-1092.43		-1092.84

NOTE: Estimation based on sample of 471 respondents.

appears to be little support for the hypothesis that dynamic processes will exert different effects between groups defined on the basis of propensity to offend.

CONCLUSIONS

The results of our analysis suggest that an exclusive focus on characteristics of individuals that do not change over time after the beginning of adolescence is inconsistent with the data. Specifically, the entire range of results suggests that delinquent peer exposure and prior offending experience—both of which are dynamic factors—have important implications for whether and how often individuals participate in relatively serious acts of delinquency. The analysis also emits strong themes of invariance. In particular, we found no statistical evidence that these dynamic variables exert different effects within groups of youngsters defined on the basis of their offending propensity at ages of 11 or 12 years and followed well into adolescence. Collectively, these results strike us as being inconsistent with the strict stability predictions of Gottfredson and Hirschi (1990) and the strong typological themes in the Moffitt (1993) and Patterson et al. (1989) theories. In sum, the results seem to harmonize most closely with theories such as those advanced by Sampson and Laub (1993) that (1) anticipate a general-delinquency-producing process that applies to all individuals and (2) predict the salience of dynamic influences in the explanation of offending behavior.

We hasten to add that the models presented here are not capable of absolutely ruling out alternative time-stable causes and that our attempts to define offending propensity rigorously may not be satisfactory to all. Only through accurate specification of the distribution of unobserved but time-stable individual differences that can account for offending behavior can results like those obtained in this analysis be used to argue for the falsification of static and typological theories. Unfortunately, we have no way of knowing with certainty how plausible our characterization of those individual differences (i.e., our specification of the random effects) is. These limitations notwithstanding, we believe our estimation procedures and our empirical results harmonize well with previous work in this area. Put slightly differently, we believe that the results of this analysis need not be interpreted in a vacuum. Indeed, the collective landscape of results from a number of important studies in this area may exceed the sum of its parts.

First, the probit models we estimated here fit within the mainstream of models that have been used to address the question of linking prior offending experience with future offending behavior. Exploiting this similarity, we demonstrated in Table 5, that our point estimates of the effect of

Table 7. Comparisons of Baseline Models to Specifications with Interaction Terms

Specification	Attitude Propensity Measure		Behavior Propensity Measure	
	Log-Likelihood	χ^2 w/2 D.F.	Log-Likelihood	χ^2 w/2 D.F.
Specification 1: High-Propensity Group Includes Individuals Above 90th Percentile of Negative Propensity				
Baseline Probit (Participation)	-531.99		-533.30	
Probit with Interactions	-531.70	0.58	-531.92	2.76
Baseline Negative Binomial (Frequency)	-1093.88		-1093.03	
Negative Binomial with Interactions	-1092.43	2.90	-1092.84	0.38
Specification 2: High-Propensity Group Includes Individuals Above 93rd Percentile of Negative Propensity				
Baseline Probit (Participation)	-533.97		-532.45	
Probit with Interactions	-533.95	0.04	-529.88	5.14
Baseline Negative Binomial (Frequency)	-1095.31		-1092.17	
Negative Binomial with Interactions	-1094.51	1.60	-1092.04	0.26
Specification 3: High-Propensity Group Includes Individuals Above 85th Percentile of Negative Propensity				
Baseline Probit (Participation)	-531.48		-532.56	
Probit with Interactions	-530.62	1.72	-532.47	0.18
Baseline Negative Binomial (Frequency)	-1090.72		-1091.36	
Negative Binomial with Interactions	-1090.34	0.76	-1090.22	2.28
Specification 4: High-Propensity Group Includes Individuals Above 80th Percentile of Negative Propensity				
Baseline Probit (Participation)	-533.32		-534.38	
Probit with Interactions	-533.28	0.08	-534.07	0.62
Baseline Negative Binomial (Frequency)	-1092.46		-1092.18	
Negative Binomial with Interactions	-1092.42	0.08	-1091.98	0.40

NOTE: No χ^2 values are statistically significant at the 95% confidence level.

prior offending behavior on the probability of future offending behavior independently replicate the estimate obtained by Nagin and Paternoster (1991) in a survey sample of South Carolina high school students (z values on both comparisons were less than 0.4). Moreover, the Nagin and Paternoster point estimate along with our point estimates were all significantly greater than the effect discovered in the Nagin and Farrington (1992b) analysis of males from a working-class area of London.

What might these similarities and differences reveal? We believe they

raise more questions than they answer but the questions raised are of considerable interest. For example, although our analysis found little support for the uniquely typological features of the Moffitt and Patterson models, it might be plausibly argued that our sample, along with the sample of high school students studied by Nagin and Paternoster (1991), tap a limited spectrum of individuals. More specifically, these two samples might systematically exclude or underrepresent individuals in the life-course-persistent or early-starter groups anticipated by Moffitt and Patterson. Both the NYS and Nagin and Paternoster's sample of high school students in Columbia, South Carolina, contain fairly conventional youths. The vast majority of respondents had not dropped or flunked out of school, few had arrests, and only a handful had convictions. Our's and Nagin and Paternoster's finding of a pronounced state-dependent effect might reflect the fact that dynamic processes are more pronounced and population heterogeneity ones muted in low-risk populations. Both studies may have found evidence of population heterogeneity had the samples included more high-risk respondents.

Some tentative support for this conjecture can be gleaned from our finding that in the moderate-risk, working-class sample of London boys studied by Nagin and Farrington (1992b), the estimated causal effects of prior offending behavior were much weaker. Of course, such a result might have been produced by the fact that the analyses in Nagin and Farrington are based on official records while our study and Nagin and Paternoster used self-reported offending. The observed difference in findings may, therefore, be due to simple measurement differences. We think that this is unlikely, however, and cite two pieces of evidence: Previous research has shown that (1) a moderate correlation exists between self-reported and official measures of delinquency (Blumstein et al., 1986; Farrington, 1989; Hindelang et al., 1981) and (2) the determinants of self-reported offending seem to track closely those of official measures of offending (Hindelang et al., 1981; Sampson and Laub, 1993:52, 116).

At this point, however, we offer only conjecture, and an answer to the question is well worth pursuing in future research. Studies that examine longitudinal offending patterns using both self-reports and official records on the same individuals will be able to help resolve the measurement question, while studies that include youths across the full spectrum of criminal propensity may shed light on whether the importance of dynamic factors is a declining function of such propensity.

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Ray Paternoster is Professor of Criminology at the University of Maryland. His research interests include the testing of criminological theory.

Robert Brame is a doctoral student in the Department of Criminology at the University of Maryland. His research interests include the testing of criminological theory and applied statistics.

APPENDIX
COMPONENTS OF ATTITUDE/PERCEPTION
BASED PROPENSITY CONSTRUCT

YOUTH-REPORTED ITEMS

ATTITUDES TOWARD DEVIANCE SCALE

- Cheat on school tests
- Destroy property
- Use marijuana
- Steal something worth less than \$5
- Hit someone
- Use alcohol
- Break into vehicle
- Sell hard drugs
- Steal something worth more than \$50

Codes: 4 = very wrong, 3 = wrong, 2 = a little bit wrong, 1 = not wrong at all

FAMILY COMMITMENT SCALE

- Family that does things together
- Have parents that you can talk to
- Parents who comfort you when you're unhappy
- Have your parents think you do things well
- Get along well with your parents

Codes: 1 = not well at all, 3 = OK, 5 = very well

SCHOOL COMMITMENT SCALE

- Have other students think of you as a good student
- Do well in hard subjects
- Do your own schoolwork without help
- Have teachers think of you as a good student
- Have a high grade point average

Codes: 1 = not well at all, 3 = OK, 5 = very well

FAMILY ATTACHMENT SCALE

- Outsider with family
- Family listens to problems
- Feel lonely with family

Feel close to family

Family not interested in problems

Codes: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

SCHOOL ATTACHMENT SCALE

Not included in school activities as much as I'd like

Teachers don't call on me

Nobody at school cares

Don't belong at school

Feel lonely at school

Teachers don't ask me to work on projects

Codes: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

PEER ATTACHMENT SCALE

Don't fit well with friends

Friends don't take interest

Feel close to friends

Friends listen to problems

Feel lonely with friends

Codes: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

CONVENTIONAL NORMS/ASPIRATIONS

Important to be honest with parents

To avoid trouble, lie to teachers

Play dirty to win at school

Lying okay if it keeps friends out of trouble

Beat up kids to gain respect of friends

Break parents' rules to keep friends

Codes: 1 = Strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

YOUNGSTER'S PERCEPTION OF PARENT VIEWS TOWARD HIM/HER

Well liked

Need help

Bad kid

Get along well with others

Messed up

Break rules

Often upset

Good citizen

Personal problems

Get into trouble

Codes: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

YOUNGSTER'S PERCEPTIONS OF PEER VIEWS TOWARD HIM/HER

Well liked

Need help

Bad kid

Often upset

Likely to succeed

Do things against law

Get along well with others

Messed up

Break rules

Personal problems

Get into trouble

Codes: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

YOUNGSTER'S PERCEPTIONS OF TEACHER VIEWS TOWARD HIM/HER

Well liked

Need help

Bad kid

Often upset

Likely to succeed

Do things against law

Get along well with others

Messed up

Break rules

Personal problems

Get into trouble

Good citizen

Codes: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

PARENT-REPORTED ITEMS

PARENT'S PERCEPTIONS OF YOUNGSTER

Well liked

Need help

Bad kid

Often upset

Likely to succeed

Do things against law

Get along well with others

Messed up

Break rules

Personal problems

Get into trouble

Good citizen

Codes: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

PARENT'S ATTITUDES TOWARD ADOLESCENT DEVIANCE

Use marijuana or hashish

Purposely damage or destroy property

Hit someone

Use alcohol

Steal something worth > \$50

Break into vehicle or building to steal

Use hard drugs such as heroin

Steal something worth < \$5

Cheat on school tests

Have sexual intercourse with person other than husband/wife

Codes: 4 = very wrong, 3 = wrong, 2 = a little bit wrong, 1 = not wrong at all

PARENT'S DISAPPROVAL OF PARTICULAR BEHAVIORS

Cheated on school tests

Stole something worth < \$5

Used marijuana or hashish

Stole something worth > \$50

Used alcohol

Purposely damaged or destroyed property

Broke into vehicle or building to steal

Codes: 1 = strongly approve, 2 = approve, 3 = neither approve nor disapprove, 4 = disapprove, 5 = strongly disapprove