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Can Childhood Factors Predict Workplace Deviance?

Nicole Leeper Piquero and Terrie E. Moffitt

Compared to the more common focus on street crime, empirical research on workplace deviance has been hampered by highly select samples, cross-sectional research designs, and limited inclusion of relevant predictor variables that bear on important theoretical debates. A key debate concerns the extent to which childhood conduct-problem trajectories influence crime over the life-course, including adults' workplace crime, whether childhood low self-control is a more important determinant than trajectories, and/or whether each or both of these childhood factors relate to later criminal activity. This paper provides evidence on this debate by examining two types of workplace deviance: production and property deviance separately for males and females. We use data from the Dunedin Multidisciplinary Health and Development Study, a

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birth cohort followed into adulthood, to examine how childhood factors (conduct-problem trajectories and low self-control) and then adult job characteristics predict workplace deviance at age 32. Analyses revealed that none of the childhood factors matter for predicting female deviance in the workplace but that conduct-problem trajectories did account for male workplace deviance.

Keywords workplace deviance; trajectories; self-control

The Context of Workplace Deviance

In this article, we study workplace deviance committed by a cohort of individuals who represent the full population spectrum of occupations. Since most of the theoretical work on workplace deviance has been written in reference to white-collar crime, we draw on that body of literature to develop hypotheses. Defining white-collar crime has been a source of debate and controversy since Sutherland first coined the term in 1939. Some scholars, such as Sutherland (1983), favor an offender-based definition that focuses on individual characteristics (e.g. respect and social status) as the defining characteristics of white-collar crimes, while others prefer an offense-based definition (Edelhertz, 1970; Shapiro, 1990) that, like other legal statutes, focuses on the act rather than the actor in defining white-collar crimes. Still others suggest attention should be focused on who benefits from the act either the individual or the organization (Clinard & Quinney, 1967) and criminal opportunities that arise because of one's occupation (see Benson & Simpson, 2009). Settling this debate is beyond the purview of the current study; instead, the main point is that research should also focus on groups of offenders not commonly regarded as criminal—those who occupy a legitimate occupation. As this definitional debate has not yet been resolved, the more general term workplace deviance is used when we refer to our empirical findings. The offenders in our birth cohort had both low and high prestige occupations (thus, not all meet the criteria for an offender-based definition) but all of the offenses were committed in the occupational context and victimize the employer (thus, all meet an offense-based definition).

In their classic study of employee theft, Hollinger and Clark (1982, 1983) separate workplace deviance into property and production deviance. Property deviance refers to the commonly regarded aspects of employee theft including stealing tangible property or assets from the company, while production deviance refers to violating the norms regarding the quality and quantity of work to be accomplished (Hollinger & Clark, 1982, p. 98). The latter, also referred to as the "theft of time", includes behaviors such as tardiness or leaving early from work, slow workmanship, and "goofing off" while on company time (Hollinger & Clark, 1982; Snider, 2001). The National White Collar Crime Center (NW3C, 2009) reports that theft by employees, which includes embezzlement, is one of the most prevalent and costly problems faced by businesses today.

Some criminologists have questioned the value of studying white-collar crime, including workplace deviance, indicating that these offenses are no different

than conventional crimes and thus do not need separate explanations (Gottfredson & Hirschi, 1990). By offering a general theory of crime, which suggests that low self-control is the cause of all types of criminal behaviors including crimes committed in the workplace, Gottfredson and Hirschi contend that workplace structure will do little to influence criminal behavior.¹ Further, they argue that these types of crimes do not occur with enough frequency to warrant study.

The study of workplace deviance is both relevant and important to study for several reasons. First, employee theft is a costly and widespread form of crime from which no industries are immune (Friedrichs, 2010; Greenberg, 1997; Hollinger, 1989; Hollinger & Clark, 1983; Mustaine & Tewksbury, 2002; NWC3, 2009). For example, retail business losses are often estimated to be in the billions of dollars annually with some reporting losses as low as \$5 billion and others as high as \$400 billion (Friedrichs, 2010; Mustaine & Tewksbury, 2002; Payne & Gainey, 2004). The Association of Certified Fraud Examiners (ACFE, 2010) recently reported that the typical organization loses 5% of its annual revenue to occupational fraud. The consequences of these losses have adverse effects for consumers since US retailers often raise the price of consumer goods from 10-15% to cover the losses (Hollinger & Clark, 1983). Second, workplace deviance victimizes the organization which must compensate for the losses and take preventative steps to protect itself from future violations. Workplace deviance is so costly for some organizations (30-50%) that many are forced to declare bankruptcy (Greenberg, 1997; Hollinger, 1989; NWC3, 2009; Thomas, Wolper, Scott, & Jones, 2001). Finally, studying workplace deviance aids in shedding light on the structuring of criminal opportunities. Criminologists have studied the opportunity structures available for street crimes yet, much less is known about the structuring of criminal opportunities for workplace offenders (though see Benson & Simpson, 2009).

Like most other crimes, there is a gender component to workplace deviance as men are over-represented in the commission of these acts. Although, the gender gap in white-collar crime depends upon the specific offense type, recent official statistics in the US show that the gender gap is closing for embezzlement and fraud (Federal Bureau of Investigations, 2009). Similarly, research indicates that women are better represented in low-level, less organizationally complex offenses (Daly, 1989; Holtfreter, 2005; Weisburd, Wheeler, Waring, & Bode, 1991). Research using the Yale data, collected from presentence investigation reports from a sample of convicted white-collar offenders from the mid-1970s, shows that the proportion of female defendants varies across the eight offense categories,² ranging from a high of 45% (for bank embezzlement) to a low .5% (for anti-trust offenses) (Daly, 1989; Weisburd et al., 1991). In a related

1. The generalizability of Gottfredson and Hirschi's theory to the study of white-collar crime has been criticized by many scholars (Barlow, 1991; Geis, 2000; Reed & Yeager, 1996; Simpson & Piquero, 2002; Steffensmeier, 1989).

2. The eight offenses include: (1) anti-trust violations; (2) securities fraud; (3) mail and wire fraud; (4) lending and credit institution fraud; (5) false claims; (6) bribery; (7) tax fraud; and (8) bank embezzlement.

investigation, Holtfreter (2005) examined data on three kinds of occupational fraud collected from ACFE and found that women were underrepresented compared to men in fraudulent statements, the type of occupational fraud that requires the use of organizational resources, and equally present in committing asset misappropriation (i.e. embezzlement) and corruption.³

What can account for the differential participation of women and men in high-level organizationally based crimes? Why did women comprise less than 5% of those convicted of antitrust violations and securities fraud in the Yale data while representing almost half of all convicted bank embezzlers? Many scholars argue that women are more likely to be found committing the low-level crimes due to the very nature of the positions in the workplace that they hold (Benson & Simpson, 2009; Daly, 1989; Dodge, 2009; Holtfreter, 2005). For example, Daly (1989, p. 790) found that women in the Yale data were mostly employed as clerical workers and suggested the term "pink-collar" crime to better explain their offending since "one need not be in the white-collar world to commit embezzlement, fraud, or forgery." Benson and Simpson (2009, p. 162) argue that opportunities for white-collar crime are influenced by gender (as well as race and social class) since "any characteristic that influences access to occupational positions will also indirectly influence access to opportunities to commit white-collar crime."

Research examining gender differences has also pointed to differences in the motivation of white-collar offenders (Daly, 1989; Klenowski, Copes, & Mullins, 2011; Zietz, 1981). In interviews with convicted female embezzlers in California, Zietz (1981) found that they rationalized their offending as a way of providing for their families. On the other hand, Daly (1989) found that both men and women convicted of white-collar crime equally cited providing for the family but also indicated benefits to self as the motivations for their offenses. More recently, Klenowski et al. (2011) found in interviews with a different sample of convicted white-collar offenders that men and women use different linguistic strategies to rationalize their offending that fall in line with gender expectations.

In sum, extant research has shown that there are not only differences in rates of offending across men and women but that there are also different opportunities for offending (as gender stratifies the positions available within the workplace), and different motivations and rationalizations for misdeeds committed in the workplace.

What Accounts for Workplace Deviance?

Understanding workplace deviance has focused primarily on two broad categories of explanation, external and individual factors. External or situational

3. Corruption is defined as employees wrongfully using their influence in business transactions to obtain benefits for themselves that were contrary to duties to their employer (Holtfreter, 2005, pp. 357-358).

explanations of workplace deviance tend to focus on the elements of the environment that exert pressure on the individual or release the restraints for the individual to offend. Constraining forces can include the individual's economic or financial pressures (Cressey, 1953; Hollinger, 1989; Hollinger & Clark, 1983; Mustaine & Tewksbury, 2002) or the level of job dissatisfaction among those who perceive that they are being treated unfairly or feel they are underpaid more likely to offend (Hollinger & Clark, 1982, 1983; Hollinger & Dabney, 1994; Mustaine & Tewksbury, 2002). Other external forces (to the individual) such as organizational structure and climate permit offending. Hollinger and Clark (1983) found that physical opportunity to offend was a major determinant in employee theft, as those who have the opportunity to steal from the organization are likely to do so. Organizational climate can also contribute to workplace deviance by providing the rationales or justifications necessary to allow individuals to steal from their employer (Green, 1997; Hollinger, 1991; Piquero, Tibbetts, & Blankenship, 2005; Shover & Hochstetler, 2001). Taken together, these external pressures comprise what is commonly referred to as the fraud triangle or the necessary elements for a fraud (or theft) to occur: a perceived pressure, an opportunity, and rationalization for the behavior (see Albrecht & Albrecht, 2004).

Individual explanations, which are the focus of the current study, have examined offender demographic characteristics. Several demographic characteristics have emerged as significant predictors of workplace deviance. Hollinger and Clark (1983) found that young, unmarried men were most likely to engage in employee theft, while Mustaine and Tewksbury (2002) found gender (male), race (non-white), and alcohol use were significantly related to self-reported employee theft among a sample of college students. Other studies have found that those individuals who are not bonded to their job, who feel marginalized or isolated from work, or do not envision themselves staying at the job for an extended period of time are more likely to engage in employee theft (Hollinger & Clark, 1983; Hollinger, Slora, & Terris, 1992; Huiras, Uggen, & McMorris, 2000; Thomas et al., 2001). Personality factors have also been linked to workplace deviance. Psychologists have studied the linkages between personality traits such as conscientiousness, agreeableness, and emotional stability with workplace deviance (Dilchert, Ones, Davis, & Rostow, 2007; Salgado, 2002), integrity (Ones, Viswesvaran, & Schmidt, 1993), and cognitive ability (Dilchert et al., 2007).

Criminologists have examined the link between self-control and crimes committed in the workplace. Benson and Moore (1992) examined the relationship between self-control and white-collar crime using a sample of adults convicted in federal court for a white-collar offense, finding that behavioral measures of self-control were stronger correlates of street offenders than for the sample of white-collar offenders. Simpson and Piquero (2002) examined whether low self-control predicted intentions to engage in corporate crime and similarly found little support for behavioral measures of low self-control in predicting intentions. Wright and Cullen (2000) studied a sample of employed high school

students and found that the presence of delinquent co-workers and prior delinquency were better predictors of occupational delinquency (measured as lying on timecard, calling in sick when not ill, using alcohol or drugs on the job, etc.) than was low self-control (measured attitudinally). However, low self-control did emerge as a significant predictor of delinquent involvement outside of the workplace. Gibson and Wright (2001) further explored the interaction effects between low self-control and co-worker delinquency in the same sample of employed youth and found it to be a significant predictor of occupational delinquency.

Other studies have reported more favorable results with regard to low self-control predicting workplace deviance. Marcus and Schuler (2004) used the Retrospective Behavioral Self-Control Scale (Marcus, 2003) as a measure of internal control to predict counterproductive work behavior (measured as a 50-item scale including behaviors such as theft, fraud, deception, absenteeism and lateness, and substance abuse) and found that self-control was the dominant predictor of workplace deviance among a sample of adults (similar results emerged with a sample of adolescents, see Marcus & Wagner, 2007). Langton, Piquero, and Hollinger (2006) assessed the relationship between employee theft (measured as intentions to offend) and low self-control among a sample of college students and found that self-control was the strongest predictor of intentions to steal from the cash register.

Taken together, white-collar crime scholars have not only illustrated that these types of offenses are different than street crimes (Weisburd et al., 1991) but also that these offenses are gendered in both the opportunities to commit them and the motivations or rationalizations used to justify them. Theoretical understandings of crimes committed in the workplace are being examined by incorporating mainstream explanations of crime, such as Gottfredson and Hirschi's (1990) theory, with mixed results. The use of different samples (e.g. adults, youths, and college students) and different measures of both self-control and white-collar crime outcomes (e.g. corporate crime, offense-based measures of white-collar crime, and workplace deviance) likely add to the inconsistency of the results. More importantly, the reliance on cross-sectional samples hampers the ability to more completely assess the factors associated with predicting workplace deviance, such as the examination of early childhood factors that may influence deviance in the workplace, a topic that we turn to in the following section.

Applying Life-Course Theory to Workplace Deviance

The criminal career paradigm has challenged scholars to rethink not only the way they examine active offenders but also the ways in which they study their behaviors. As such, it has propagated developmental or life course criminology explanations of offending behavior, which tend to link behaviors early in life to later outcomes (Farrington, 2003). At the heart of this approach lies the

quest to better understand the relationship between age and crime. In order to investigate this relationship, scholars focus on how events in one's life, both legal and illegal, exert influence in terms of timing and sequencing of events in other life domains (Piquero & Benson, 2004). Given this longitudinal focus on an individual's life, contemporary but novel analytic techniques (such as hierarchical linear modeling, trajectory modeling) that allow for the investigation of these newly identified long-term patterns of offending behavior have been developed and critiqued.

Developmental theories of criminal behavior have spawned a theoretical debate about the importance of dynamic versus static explanations of criminal behavior (Paternoster & Brame, 1997; Paternoster, Dean, Piquero, Mazerolle, & Brame, 1997). On one side of the debate are the scholars who argue in favor of a single causal model of offending, such as Gottfredson and Hirschi's focus on self-control (or criminal propensity), that also contends that cross-sectional data are sufficient for the study of crime. On the other side of the debate are the development theorists (e.g. Moffitt, 1993) who favor multiple paths (or different causal processes) of offending behavior and stress the need for longitudinal data in order to study change over the life course. A mixed-perspective approach, such as Sampson and Laub's (1993) age-graded informal social control theory adopts the more general pathway view, but permits continuity and change in the correlates and outcomes throughout the life-course.

A source of frequent discussion and associated empirical research emerging from this debate has been whether childhood conduct-problem trajectories represent a useful strategy for understanding criminal activity and whether the complexity associated with specifying distinct trajectories yields more and different information than simply studying the distinction between offenders and non-offenders (Nagin & Tremblay, 2005; Sampson & Laub, 2005). Several theoretical models espouse that the offending population is heterogeneous comprised of distinct types of offenders, who evince distinct age/crime relationships, and whose offending has a unique set of predictors. A principal example of this perspective is Moffitt's (1993) developmental taxonomy.

In this theory, two groups of offenders are believed to underlie the aggregate age-crime curve. The first, life-course-persistent, is a small, highly select group of individuals (~5-8%) who engage in antisocial, deviant, and criminal (especially violent) behaviors early on and throughout the life course. The cause of their misbehavior lies in an interaction between compromised neuropsychological development and deficient familial/socioeconomic environments that are ill-equipped to help them overcome their early life cognitive difficulties. The consequence is the gradual development of an antisocial personality structure that leaves few, if any, options for change and many more opportunities for negative (especially serious) behaviors that reverberate over the life course. Therefore, it seems that childhood conduct problems may cut off opportunities for young people who, for example, leave school without graduating, the effect of which will limit their employment opportunities and thus are subsequently funneled into low-skill jobs. In contrast, adolescence-limited

offenders, comprised of a much larger group of individuals, confine their anti-social involvement to adolescence, largely because of their keen desire to engage in behaviors that convey a sense of adult-like status. Finding themselves in a maturity gap, (i.e. biologically capable of being adults but legally prevented from doing so), adolescence-limited offenders seek out the aid and comfort of the peer social context, whom in like-minded fashion, crave being recognized as adults. As such, they partake in many, group-oriented activities such as smoking, drinking, theft, and high-risk sexual activity, but their lack of an injurious childhood prevents their involvement in serious, person-oriented offenses. Moreover, as they enter adulthood and become legally recognized as adults and able to partake in adult-like behaviors, they should desist from criminal activity and enter more traditional work and family roles and relationships.⁴

These early-life trajectory theories are often countered by those who suggest there is little reason to parcel the offender population into distinct groups. Rather, these scholars prefer to draw attention to the distinction between offenders and non-offenders. In this perspective, best exemplified by Gottfredson and Hirschi's (1990) general theory, individuals are arrayed along a continuum of self-control and those with lower self-control are hypothesized to engage in a myriad of deviant, antisocial, and criminal acts and lifestyles over the life course. As such, this theory "is meant to explain all crimes, at all times, and, for that matter, many forms of behavior that are not sanctioned by the state" (Gottfredson & Hirschi, 1990, p. 117). It is, then, a theory that explains crime as well as analogous behaviors that are easy to commit, involve little skill and prioritize momentary benefits over long-term costs. Additionally, the theory posits that events occurring after self-control has been developed should do little to alter the effects of (low) self-control on poor or negative outcomes (Gottfredson & Hirschi, 1990). Hirschi and Gottfredson's (2000) view on the disutility of a group-based perspective or multiple pathways to crime, in favor of one relying on self-control and a simple offender/non-offender distinction, could not be clearer. In referencing Moffitt's developmental taxonomy, they note: "It is hard to find research that clearly locates one of these groups and provides data bearing directly on the hypothesis that it is unique with respect to causation, offense patterning, and stability" (Hirschi & Gottfredson, 2000, p. 60).

Theoretically, the theories of both Moffitt and Gottfredson and Hirschi anticipate that early-life predictors will continue to exert effects throughout the life course and into various life domains, though the causal processes dif-

4. Many empirical studies have assessed Moffitt's and others' developmental theories (see Moffitt, 2006; Piquero & Moffitt, 2005). Most studies provide evidence for a two-group model that closely follows predictions regarding key risk factors (Bartusch, Lynam, Moffitt, & Silva, 1997), but other studies show evidence of more and different groups, including a low-level chronic group not originally anticipated by Moffitt (Moffitt, 2006; Nagin, 2005; Piquero, 2008). A long-term study finds that life-course-persistent offenders do not persist to old age but instead desist by middle adulthood (Laub & Sampson, 2003).

fer. Within Moffitt's developmental taxonomy, the life-course persistent group is expected to evince the highest levels of conduct problems beginning in childhood and persisting into adulthood while the adolescent-limited group is predicted to initiate conduct problems in mid-adolescence and desist in adulthood. The range of behaviors engaged in by the two groups is believed to be different and extend into adulthood for the life-course persistent group. As Moffitt (1993, p. 679) notes:

As implied by the label, continuity is the hallmark of the small group of life-course-persistent antisocial persons. Across the life course, these individuals exhibit changing manifestations of antisocial behavior: biting and hitting at age 4, shoplifting and truancy at age 10, selling drugs and stealing cars at age 16, robbery and rape at age 22, and fraud and child abuse at age 30; the underlying disposition remains the same, but its expression changes form as new social opportunities arise at different points in development.

For Gottfredson and Hirschi, those with low self-control will continue to act out in negative ways and exert negative social consequences across many life domains, including in the workplace. They contend that for individuals with low-self control: "there is a general tendency to engage in a wide variety of offenses, including legal and illegal drug use, and to manifest behavioral problems in school and occupational settings, to have difficulty making and retaining friends and to be involved in a variety of accidents" (Hirschi & Gottfredson, 1995, p. 134, emphasis added). Therefore, the effects of low self-control will manifest later in life in that "people with low self-control will have difficulty meeting the obligations of structured employment" (Gottfredson & Hirschi, 1990, p. 165).

As previously mentioned, this theoretical debate has spurred a series of methodological advances aimed at charting the longitudinal development of criminal offending. One particular technique, the trajectory method (Nagin, 2005), has been applied to the longitudinal study of criminal offending in many empirical studies covering a vast array of samples and offending data (see review in Piquero, 2008). While several of these studies have specifically examined the extent to which the early-life trajectories and childhood (low) self-control provides a good explanation of criminal offending over the life course (Lieberman, 2008; Piquero, Farrington, & Blumstein, 2003), with many of these studies pitting one explanation against the other (Bartusch, Lynam, Moffitt, & Silva, 1997; Dean, Brame, & Piquero, 1996; Nagin & Farrington, 1992a, 1992b; Paternoster et al., 1997), these studies have employed both general population and offender-based samples, and all of them have focused on more traditional forms of criminal offending. Moreover, the totality of these studies has failed to provide support for one perspective to the neglect of the other and instead coalesce on the finding that both early-life trajectories and childhood low self-control are important for a more complete understanding of crime over the life course (Laub & Sampson, 2003; Paternoster et al., 1997). An important

limitation to these efforts is their lack of attention regarding the extent to which either or both the early-life trajectory and childhood low self-control explanations is applicable to the study of white-collar crimes such as workplace deviance.

To date, all but one of these studies have focused on more common forms of antisocial, delinquent, and criminal behavior. The sole exception is the recent white-collar focused analysis conducted by Piquero and Weisburd (2009), who applied the trajectory method to a large sample of convicted white-collar offenders who were followed in official records for over 10 years. Their analysis identified three distinct offender trajectories: low rate, intermittent, and high-rate/persistent offenders. Importantly, the small (~5% of the sample) high-rate/persister trajectory evinced a high and stable rate of offenses over the follow-up period. In short, Piquero and Weisburd's analysis indicated meaningful variability in the rate and shape of offending among white-collar offenders.⁵

Current Study: Linking Childhood Factors to Workplace Deviance in Adulthood

This study examines how elements from both sides of the theoretical debate, namely the childhood factors of conduct-problem trajectories and low self-control, relate to workplace deviance in adulthood. Empirical research with respect to Moffitt's developmental taxonomy shows that early life characteristics reverberate throughout the life course and impact various life domains including health (Odgers et al., 2007; Piquero, Farrington, Nagin, & Moffitt, 2010), employment (Piquero, Piquero, & Farrington, 2010), and relationship quality (Laub, Nagin, & Sampson, 1998). Empirical research with regard to Gottfredson and Hirschi's theory shows that low self-control relates to a range of criminal and analogous behaviors (Arnkelev, Grasmick, Tittle, & Bursik, 1994; Evans, Cullen, Burton, Dunaway, & Benson, 1997; Piquero, Gibson, & Tibbetts, 2002). The current study extends previous work by testing whether childhood factors can predict workplace deviance in adulthood. Our study also investigates whether the effects of childhood factors on workplace deviance will be eliminated once job characteristics are controlled for. Therefore, this study provides the first longitudinal examination of how these two competing theoretical perspectives measured in the first decade of life relate to workplace deviance in the third decade of life.

The data we use, the Dunedin Multidisciplinary Health and Human Development Study, also has some desirable design features. For example, due to its

5. It is important to note that descriptive statistics regarding certain criminal career dimensions observed among their white-collar offenders differs greatly from the more traditional street offenders (Piquero & Benson, 2004). For example, the average age of onset among white-collar offenders is much later in the life course than among traditional street offenders (Weisburd & Waring, 2001).

longitudinal nature, all the relevant predictor variables were assessed well before the sample entered the workforce and certainly prior to the collection of the principal outcome variables. This aspect permits an assessment of the prospective effect of key theoretical variables on subsequent workplace deviance. In addition, the large sample size and virtually even split across gender permits the first gender-specific examinations of the afore-mentioned theoretical specifications and empirical analyses in the workplace deviance area.

Data and Variables

Participants are members of the Dunedin Study (Moffitt, Caspi, Rutter, & Silva, 2001), a longitudinal investigation of the health and behavior of a complete cohort of consecutive births born between 1 April 1972 and 31 March 1973, in Dunedin, New Zealand. When the children were traced for follow-up at 3 years of age, 1,037 children (91% of the eligible births) participated in the assessment and formed the base sample for the longitudinal study. With regard to social origins, the children's families were representative of the social-class and ethnic distribution in the general population of New Zealand's South Island. With regard to ethnic distribution, the Dunedin Study members are of predominantly white European ancestry with fewer than 7% of the sample identifying themselves as Maori or Pacific Islander at age 18. Follow-ups of the sample have been carried out at various ages with the most recent at age 32, when 972 (96% of the original cohort, of whom 51% were male) of the study members were assessed.⁶

Dependent Variable: Workplace Deviance

Respondents were asked at age 32 to indicate whether (yes = 1) or not (no = 0) they engaged in 16 different types of workplace deviance in the past year.⁷

6. For this analysis, a small number of homemakers ($n = 72$) and persons who were in jail during the previous 12 months ($n = 7$) were removed because they were not "at-risk" of engaging in workplace deviance. Supplemental analysis that retained the homemakers in the sample did not yield any substantive differences with respect to coefficient estimates in terms of strength, significance, and substantive interpretation.

7. If a study member held no job in the past year ($n = 47$, 5%), they were asked to report about a job from the previous year. As such, everyone had some job to report about (either in the past 12 months or past 24 month time period). There were no significant relationships between unemployment at the age 32 survey and the four conduct disorder trajectory groups ($F = 1.20$, $p > .05$). As expected, the childhood persistent group was the most likely (though not significant) to be unemployed at the time of the survey. There was, however, a significant difference between self-control and unemployment with those evincing lower self-control early in life being more likely to be unemployed at the age 32 survey.

Following previous research, these deviant acts were divided into two variety scales with one focusing on production deviance and the other on property deviance.⁸ Higher values indicate the presence of more types of deviance in the workplace.⁹

Production Deviance

This scale is comprised of nine items measuring counterproductive behavior in the workplace. Respondents were asked whether they had in the last year: (1) taken an additional/longer break than acceptable at work, (2) purposely worked slower than you could have, (3) discussed confidential work information with someone who you should not have, (4) left work early without permission, (5) left your work for someone else to finish, (6) attempted to pass your own work on to others, (7) been frequently late to work, (8) pretended you were sick or injured or gave another false excuse so you get time off work, and (9) been under the influence of drugs or alcohol while at work.

Property Deviance

This scale is comprised of seven items measuring the theft of assets from one's employer. Respondents were asked in the last year whether they had: (1) falsified a receipt to get reimbursed for more money than you spent on business expenses, (2) dragged out work to get overtime, (3) used things at work without permission (like using the telephone, photocopier, computer, tools or company car), (4) stolen money, (5) reported working hours or days (so you could get paid) that you really did not work, (6) stolen things from work such as office supplies, tools, or merchandise, and (7) purposely damaged or destroyed property, equipment, tools or merchandise where you worked.

8. An overall workplace deviance scale (that combined the production and property deviance scales) was also computed. However, this scale was highly correlated ($r = .96$) with the production deviance scale and, not surprisingly, the results were substantially similar. Given the theoretical differences between production and property deviance, we elected to present the two separate models to show how early life predictors affect the different workplace outcomes later in life. Results for the overall workplace scale are available upon request.

9. Some may question the validity of self-reported rates of workplace deviance speculating that people who have the most to lose will be less likely to report it. While this is relevant for all self-reported data, we note here that the Dunedin sample has repeatedly been interviewed all their lives about illicit behaviors with no violation of confidentiality. Additional analyses (available upon request) comparing the cohort members to a sample of local people of the same age (recruited from electoral rolls) through the same interview process revealed that the cohort sample reported slightly but significantly more workplace deviance than the research-naïve sample as well as more dangerous sexual behaviors and substance abuse. As such, this pattern suggests that an experienced cohort gives self-reports less biased by fear of exposure than a typical first contact survey sample.

Independent Variables

Childhood conduct-problem trajectories

This four-category variable is a trajectory-based classification¹⁰ of responses to the Antisocial Conduct Problems scales at ages 7, 9, 11, and 13 for males and females through six key symptoms of DSM-IV CD (American Psychiatric Association, 1994) as being present/absent at each age: physical fighting, bullying others, destroying property, telling lies, truancy, and stealing (American Psychiatric Association, 1994).¹¹ It contains four classification categories: (1) childhood-persistent (CP), a group who initiated antisocial behavior in childhood with persistence into adolescence, (2) adolescent-onset (AO), a group whose conduct problems emerged at entry to adolescence, (3) childhood limited (CL), a group who demonstrated conduct problems in childhood but subsequently desisted in early adolescence, and (4) low (LOW) offending, a group characterized by very low levels of conduct problems at every age (more information regarding this measure may be found in Odgers et al., 2007, 2008).

Childhood low self-control (3-11)

This variable was measured during the respondents' first decade of life using a multi-occasion/multi-informant strategy. This article reports a composite measure of overall self-control that has been described in previous publications (Moffitt et al., 2011; Wright, Caspi, Moffitt, & Silva, 1999). Briefly, the nine measures of childhood self-control in the composite include observational ratings of children's lack of control as specified in theoretical writings of Hirschi and Gottfredson: parent and teacher reports of impulsive aggression, and parent, teacher, and child self reports of hyperactivity, lack of persistence, inattention, and impulsivity, altogether comprising more than 150 separate ratings (see Table 1). The nine measures of self-control in childhood were all similarly positively and significantly correlated. Based on principal components analysis, the standardized components were averaged into a single composite score with excellent internal reliability (.86); the first component in a principal compo-

10. The use of the empirically-based trajectory method is meant as a heuristic device that seeks to approximate a continuous distribution with points of support, or trajectories, that may vary in level and shape of the behavior of interest as well as how different variables distinguish between them (Nagin, 2005; Piquero, 2008).

11. We elected to use the trajectory groups in lieu of the DSM-IV conduct disorders because the latter is a heterogeneous diagnostic group, based on criteria met at one cross-section in time, which contains the proverbial "apples and oranges" in that it contains children with temporary conduct problems as an adjustment reaction to their current social setting as well as children with conduct problems that will persist for years. Even the DSM-IV acknowledges subtypes based on one's developmental course. As the group of children with conduct problems that persist for years is known to have the worse consequences for adult adjustment and we have access to longitudinal data that allow us to distinguish trajectories over the years of development, we have opted to use trajectory groups as a conceptual improvement over simple conduct disorder diagnosis or conduct problem scale.

Table 1 Measure of low self-control

Measure	Age(s) assessed	Source	Item content
Lack of control	3, 5	Observer	Labile, low frustration tolerance, lack of reserve, resistance, restless, impulsive, requires attention, brief attention to task, lacks persistence in reaching goals
Impulsive aggression	5, 7, 9, 11	Parent, teacher	Flies off the handle, get in fights on impulse
Hyperactivity	5, 7, 9, 11	Parent, teacher	Runs and jumps about, cannot settle, has short attention span
Hyperactivity	9, 11 (additional items)	Parent, teacher	"On the go" as if "driven by a motor", difficulty sitting still
Lack of persistence	9, 11	Parent, teacher	Fails to finish tasks, easily distracted, difficulty sticking to activity
Impulsivity	9, 11	Parent, teacher	Acts before thinking, has difficulty awaiting turn, shifts excessively between activities
Hyperactivity	11	Self	Fidgety, restless
Inattention	11	Self	Difficulty paying attention, trouble sticking to a task
Impulsivity	11	Self	Difficulty waiting turn, talking while others are still talking

ment analysis accounted for 51% of the variance. We report this robust measure in our models.

Potential multicollinearity between self-control and trajectory groups

The correlations between childhood self-control and the CP trajectory and the CL trajectory were, respectively, $r = .37, .33$. One item, fighting, had been used in constructing both the self-control composite and the conduct-problem trajectories. To address potential multicollinearity between the measure of low-self control and the measurement of childhood conduct problem trajectory groups, all analyses described here were repeated with and without this item in the self-control scale, the findings which were virtually identical. In this paper, we report on findings without the fighting item included in the self-control measure.

Income

Each participant's adult income earnings were measured at age 32 by asking each respondent, "For your main job, how much do you earn per year before taxes are taken out?" Response options included: indicating a loss (coded 1,

$n = 1$), zero income (coded 2), followed by categories in 5,000 dollar amount ranges from 1-5,000 (coded 3) to more than 100,001 (coded 13).

Job characteristics

At the age 32 interview, study members described their current or most recent job. Seven scales were created that were based on respondent's perceptions of their work environment at age 32. *Responsibility* was created as a summary of three items (no/yes): "Are you responsible for a budget at work?", "Do other people come to you for advice on how to do their work?", and "Do you supervise the work of other employees?" *Physical work* is a summary of two items (no/sometimes/yes): "Do you sweat daily from physical effort?" and "Do you get dirty?" *Time pressure* was created as a summary of five items (no/sometimes/yes): "Do you have to work under the pressure of time?", "Do you have too much work to do everything well?", "Do you have to plan your work far in advance?", "Do you have to work quickly?", and "Is your job hectic?" *Unpredictability* was created as a summary of two items (no/sometimes/yes): "Are you held responsible for things that are really out of your control?" and "Does what you have to do at work change unpredictably?" *Autonomy* is a summary of eight items (no/sometimes/yes): "Are you responsible for large amounts of money?", "Do you get to decide what to wear on the job?", "Do you get to decide when to take a holiday?", "Do you get to decide when to take a break?", "Do you get to decide what time to come to work and when to leave?", "Do you get to decide what kind of tasks you do?", "Do you get to decide how to do them?", and "Are you allowed to make or receive personal phone calls?" *Meaningful work* was created by summing two items (no/sometimes/yes): "Do you consider your job very important?", and "Do you feel that your job is meaningful?" *Job strain* was created as a summary of two items (no/sometimes/yes): "Does your home life interfere with your performance at work?", and "Does your work life interfere with your home life?"

Analytic Plan

The analysis proceeds in a step-wise manner. First, we examine how the individual characteristics from childhood, conduct-problem trajectories and low self-control, predict production and property deviance in adulthood. Then, we examine mediation by testing whether job characteristics account for the effect of both sets of individual characteristics on both types of workplace deviance. Finally, both sets of individual characteristics are examined to assess whether they predict each of the seven job characteristics described at age 32. Recognizing that opportunities in the work place are qualitatively different for men and women and that the incidences of workplace deviance vary across gender all analyses are conducted separately for males and females.

Results

Descriptive statistics for the full sample, females, and males are presented in Table 2. As can be seen, compared to females, males self-reported significantly more production and property deviance, evinced more childhood low self-control, reported higher incomes, and were more likely to have been classified in the CP and CL trajectories, but less likely to have been classified in the low offending trajectory. With respect to job characteristics, males self-reported significantly more responsibility, physical work, time pressure, unpredictability, and job strain at work compared to females.

Do Childhood Factors Predict Workplace Deviance?

A series of stepwise regression models predicting production (Table 3a) and property (Table 3b) deviance were estimated using the negative binomial model because each of these measures are event counts and exhibit count-oriented distributions that are not normally distributed. The first model investigated whether childhood conduct-problem trajectories predicted workplace deviance while Model 2 examined the effects of childhood low self-control. Model 3 explored the simultaneous effects of childhood conduct-problem trajectories and low self-control in predicting workplace deviance. The final

Table 2 Descriptive statistics by sex (mean (SD))

Variable	Full sample (N = 886)	Female (n = 406)	Male (n = 480)
<i>Dependent variable</i>			
Production deviance	2.03 (1.84)	1.76 (1.71)	2.25 (1.91)*
Property deviance	.44 (.77)	.30 (.56)	.56 (.90)*
<i>Individual characteristics</i>			
CP trajectory	.05 (.22)	.03 (.15)	.07 (.26)*
CL trajectory	.20 (.40)	.15 (.36)	.25 (.43)*
AO trajectory	.08 (.27)	.07 (.25)	.09 (.29)
LOW trajectory	.67 (.47)	.76 (.43)	.59 (.49)*
Low self-control	-.03 (.95)	-.32 (.77)	.21 (1.02)*
Income	9.11 (2.50)	8.35 (2.65)	9.74 (2.19)*
<i>Job characteristics</i>			
Responsibility	1.76 (.98)	1.60 (1.02)	1.89 (.93)*
Physical work	1.52 (1.57)	1.05 (1.33)	1.92 (1.65)*
Time pressure	5.95 (2.56)	5.68 (2.67)	6.18 (2.44)*
Unpredictability	1.72 (1.27)	1.51 (1.25)	1.90 (1.26)*
Autonomy	10.06 (3.79)	10.05 (3.63)	10.06 (3.92)
Meaningful work	3.20 (1.24)	3.16 (1.28)	3.23 (1.20)
Job strain	1.02 (1.08)	.88 (1.05)	1.13 (1.08)*

* $p < .05$.

Table 3a Negative binomial regression predicting production deviance (Coef (SE))

Variable	Model 1		Model 2		Model 3		Model 4	
	Females	Males	Females	Males	Females	Males	Females	Males
<i>Individual characteristics</i>								
CP trajectory	-.12 (.36)	.22 (.16)	-.21 (.37)	.19 (.17)	-.03 (.36)	.15 (.17)		
CL trajectory	-.06 (.15)	.19 (.10)*	-.10 (.15)	.17 (.10)**	-.13 (.15)	.17 (.10)**		
AO trajectory	.22 (.19)	.39 (.14)*	.19 (.20)	.38 (.14)*	.26 (.19)	.34 (.14)*		
Low self-control					.12 (.07)**	-.00 (.05)		
Income			-.04 (.07)	-.07 (.04)**	.07 (.07)	.02 (.05)	.04 (.02)**	-.02 (.02)
<i>Job characteristics</i>								
Responsibility							.01 (.06)	-.01 (.05)
Physical work							-.05 (.04)	.06 (.03)*
Time pressure							.03 (.02)	-.01 (.02)
Unpredictability							.03 (.05)	.04 (.03)
Autonomy							-.01 (.01)	.00 (.01)
Meaningful work							-.15 (.04)*	-.10 (.03)*
Job strain							-.05 (.05)	.10 (.04)*
LL	-.696.16	-.905.69	-.716.49	-.928.05	-.695.73	-.905.61	-.681.48	-.888.59

Note. * $p < .05$, ** $p < .01$; all models include constant and alpha parameter; LOW Traj is reference group.

Table 3b Negative binomial regression predicting property deviance (Coef (SE))

Variable	Model 1		Model 2		Model 3		Model 4	
	Females	Males	Females	Males	Females	Males	Females	Males
<i>Individual characteristics</i>								
CP Trajectory	.08 (.59)	.69 (.26)*			.07 (.62)	.68 (.29)*	.22 (.64)	.70 (.29)*
CL Trajectory	-.15 (.27)	.41 (.18)*			-.15 (.29)	.40 (.19)*	-.15 (.29)	.42 (.19)*
AO Trajectory	-.17 (.40)	.51 (.25)*			-.18 (.40)	.51 (.25)*	-.10 (.40)	.51 (.26)*
Low Self-Control			-.01 (.12)	.14 (.07)*	-.00 (.13)	-.01 (.08)	.03 (.13)	-.02 (.08)
Income							-.01 (.04)	-.03 (.04)
<i>Job characteristics</i>								
Responsibility							.05 (.11)	-.09 (.10)
Physical Work							-.08 (.08)	.06 (.05)
Time Pressure							.13 (.04)*	.01 (.04)
Unpredictability							.19 (.08)*	.15 (.07)*
Autonomy							-.05 (.03)**	.01 (.02)
Meaningful Work							-.14 (.08)*	-.04 (.06)
Job Strain							-.20 (.10)*	.08 (.07)
LL	-270.46	-470.69	-278.53	-486.24	-270.46	-470.69	-256.25	-463.65

Note. * $p < .05$; ** $p < .10$; all models include constant and alpha parameter; LOW Traj is reference group.

model examined the extent to which situational job characteristics mediated the effect of the two childhood measures.

Production Deviance

The first three models examined only the effects of childhood factors predicting production deviance and revealed several gender differences. Model 1 found that, compared to the low offending trajectory group, none of the childhood conduct-problem trajectories related to production deviance for females; however, two of the three groups, CL and AO, positively predicted production deviance among the males. Model 2 found that childhood low self-control was positively related to production deviance for men but not women. Model 3 simultaneously examined the effects of childhood conduct-problem trajectories and low self-control revealing still no effects of the childhood factors for women but showed that two childhood conduct-problem trajectories, CL and AO, continued to exert significant effects for male production deviance. Additionally, Model 3 revealed that the effect for childhood low self-control became insignificant when the childhood conduct-problem trajectories were included in the same model.

The fully-specified model (Model 4) showed that for females, none of the childhood factors predicted production deviance but that low self-control and income were marginally significant. One situational job characteristic, meaningful work, was significant and reduced production deviance. Among males, two childhood conduct-problem trajectories, CL and AO, reported higher production deviance (relative to the low offending group). Finally, three situational job characteristics predicted production deviance among males including physical work and job strain, both of which increased production deviance, and meaningful work which, as for females, decreased production deviance.

Property Deviance

As was the case in predicting production deviance, none of the childhood predictors significantly predicted property deviance in the female Models (1-3). The male Models (1-3) revealed substantially similar results with the notable exception of the CP conduct-problem trajectory; whereas in the production deviance models it was not significant, it was significant in the models predicting property deviance. Thus, compared to the low offending trajectory group, all three male conduct-problem trajectory groups reported more property deviance even when low self-control was added into the model. For males, low self-control significantly predicted property deviance by itself (Model 2) but the effects were eliminated with the addition of the childhood conduct-problem trajectories (Model 3).

The fully-specified model (Model 4) continued to reveal a lack of significant effects for the childhood factors in predicting property deviance for females. However, five of the situational job characteristics emerged as significant predictors. Women who reported autonomy on the job, meaningful work, and job strain reported decreased property deviance, while those who reported jobs with time pressure and unpredictability reported more property deviance. For males, all three childhood conduct-problem trajectories reported higher property deviance (relative to the low offending group) while only one situational job characteristic, unpredictability, increased property deviance.

Do Childhood Factors Predict Job Characteristics?

In order to investigate whether childhood conduct-problem trajectories and low self-control somehow sort or select individuals into jobs with certain characteristics (e.g. physical work, autonomy, responsibility), sex-specific ordinary least squares (OLS) regressions were estimated to examine their effects in predicting each of the seven job characteristics (Table 4).

Only low self-control attained significance in the model predicting job responsibility-but only among males, suggesting that males with childhood low self-control are less likely to report responsible jobs. Three coefficients emerged as significant predictors for physical work in the female model and two in the male model. Childhood low self-control and CP trajectory were positive predictors of physical work for both women and men while AO trajectory was also positive and significant for women only. This suggests that conduct-problem trajectories and low self-control sort individuals into work environments that demand physical as opposed to mental work. With respect to time pressure, none of the coefficients were significant among females while among males the CP and AO trajectories (relative to the low offending trajectory) and low self-control were less likely to report time pressure on the job. This raises the possibility that conduct-problem trajectories and low self-control sort males into certain jobs that entail less time pressure. For unpredictability only one coefficient, the CL trajectory for females was a positive and a significant predictor. For autonomy, both females and males with childhood low self-control reported less autonomy on the job, while among males, all three trajectories reported less autonomy. No significant effects emerged from the prediction of meaningful work perceptions for either males or females. Finally, regarding job strain, results indicate that among females, one coefficient, CP trajectory, was a significant predictor and that among males one coefficient, childhood low self-control among males, was significant indicating that males with low self-control were less likely to report job strain.

Table 4 OLS regression predicting job characteristics (B(SE))

Variable	Responsibility		Physical work		Time pressure		Unpredictability		Autonomy		Meaningful work		Job strain	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
<i>Individual characteristics</i>														
CP trajectory	-.26 (.36)	.02 (.18)	1.02 (.46)*	.55 (.32)**	.86 (.94)	-1.09 (.48)*	.49 (.44)	-.29 (.25)	-1.18 (1.26)	-1.55 (.75)*	.61 (.45)	-.04 (.24)	.79 (.37)*	.08 (.21)
CL trajectory	-.11 (.15)	-.17 (.11)	-.07 (.19)	.31 (.19)	-.35 (.39)	-.33 (.29)	.33 (.18)**	-.14 (.15)	-.10 (.53)	-.87 (.45)**	-.05 (.19)	-.00 (.15)	-.05 (.16)	-.17 (.13)
AO trajectory	-.15 (.21)	-.04 (.15)	.44 (.27)**	.36 (.27)	-.52 (.54)	-.79 (.41)*	-.22 (.25)	-.03 (.22)	-.90 (.72)	-1.37 (.64)*	-.10 (.26)	-.17 (.21)	-.11 (.21)	-.19 (.18)
Low self-control	-.04 (.07)	-.14 (.05)*	.26 (.09)*	.37 (.08)*	-.22 (.19)	-.21 (.12)**	.04 (.09)	.03 (.07)	-.72 (.25)*	-.74 (.20)*	.10 (.09)	.07 (.06)	-.01 (.08)	-.11 (.06)*

Note. * $p < .05$; ** $p < .10$, all models include constant, LOW Traj is reference group.

Discussion

Using data from the Dunedin Birth Cohort, this study examined whether the childhood conduct problem trajectories and childhood low self-control could predict two types of workplace deviance, production and property deviance, and job characteristics at age 32. In so doing, it provides the first longitudinal analysis of how two competing theoretical perspectives (group-based trajectories vs. self-control) relate to workplace deviance, with a focus on comparisons across gender. Collectively, this is the first study of its kind to examine these questions with the inclusion and range of data permissible from the Dunedin Study.

This investigation revealed that childhood factors are important when predicting both types of workplace deviance in adulthood but only for males and not quite as predicted by Gottfredson and Hirschi.¹² In fact, we find, as expected, that little boys with CP conduct problems grow up to become men who were likely, on average, to engage in deviant acts in the workplace; but, this does not appear to be the same for troubled girls. While at first glance, the lack of female effects for childhood factors predicting workplace deviance may seem counter intuitive and against theoretical expectations, this is not necessarily the case as both theories anticipate some gender differences. For example, Gottfredson and Hirschi (1990, p. 147) note that there will be “substantial self-control differences between the sexes”, while Moffitt (1993, see also Moffitt et al., 2001) anticipates fewer female life-course-persisters compared to males. In support of these suppositions, we found a significant relationship between sex and childhood conduct disorder trajectories with more females in the low offending group and more males in the CP (our equivalent to life-course-persister group). As such, the null female findings may be attributed to a power issue in that our most delinquent trajectory groups had very few females (see Moffitt et al., 2001), a limiting feature of virtually every population-based longitudinal study.

Another possible explanation for the lack of childhood effects for female workplace deviance may be due to differences in male and female opportunities to offend. Recall that Benson and Simpson (2009) suggest that gender influences access to occupational positions and by extension, opportunities to offend. One possibility not taken into consideration in the current study is the gendered difference in childrearing responsibilities and the effects of child-

12. Our analyses uncovered some positive effects for the adolescent-onset trajectory. A strict interpretation of Moffitt's theory would predict that this group should, as adults, desist from all forms of crime and deviance, including workplace deviance. However, previous reports from the Dunedin Study indicated that adolescent-onset offenders continued to have some social problems and substance abuse problems into their 30s (Odgers et al., 2007) and reports from the Cambridge Study in Delinquency Development indicated that adolescent onset offenders were still engaging in substance-related fighting into their 30s as well (Nagin, Farrington, & Moffitt, 1995). Based on these findings, it is not entirely surprising then, that the adolescent onset group would have some workplace deviance-but less than the childhood persistent trajectory. Further theoretical and empirical work on this finding is needed.

birth and parenthood on occupational position. Moffitt and colleagues (2001) found that adolescent antisocial behavior increased the risk of parenthood for both males and females in the Dunedin sample but that more women than men had a child by the age of 21, suggesting that:

it is not appropriate to conclude that female adolescent antisocial behavior is inconsequential for women's work lives; it is simply the case that antisocial behavior among females reduces their risk of exposure to the workplace because they are more likely to have made an early transition into parenting. (Moffitt et al., 2001, pp. 172-173)

While it is true that everyone in the sample had a job to report about, what we do not know is whether respondents took time off for the birth of a child and what effect such an event had on the individual's employment trajectory. Hence, the "pregnant pause" in one's employment may have gendered effects in that it significantly alters the occupational opportunities made available to women. As Klenowski et al. (2011) found that constructions of masculinity and femininity help account for gender differences in accounting for offending, it may also be that these same gendered constructs influence the kind of positions available to new moms versus new dads. It may be that women remain or return to lower level occupational positions or simply prefer these less strenuous and time consuming positions in order to attend to other domestic matters.

Additionally, we found that the exhibited effects of low self-control in the male models are eliminated once conduct-problem trajectories were controlled. While Gottfredson and Hirschi predicted that childhood low self-control would have continued to exert influence well into adulthood deviance regardless of other individual and situational variables, we do not find much support for this hypothesis. Therefore, in terms of the theoretical debate between group-based trajectories and self-control, we find more explanatory power for understanding workplace deviance through the use of childhood conduct disorder trajectories.

When examining a mediation model, to test if childhood factors predict workplace deviance even after adding job conditions, we find that the addition of job characteristics did not statistically eliminate the effects of either of the childhood factors. Our results suggest that although individuals with childhood low self-control and conduct disorder trajectories may be selected into certain jobs (i.e. those with more physical work and less autonomy) this does not account for the relationship between these same childhood predictors and adult workplace deviance. Thus, there is evidence for selection in some of the models but the effects of childhood factors are independent of it. For example, among the seven kinds of job characteristics we examined, only one, job unpredictability, was able to predict property work deviance beyond prediction from the individuals' childhood risk status. Unpredictability could increase work deviance if individuals in unpredictable, disorganized jobs feel more

resentment of their employer, or if unpredictable, disorganized work settings provide easier opportunities for property deviance.

Finally, when investigating whether childhood factors would matter when predicting the characteristics of jobs held by sample members at age 32, we found that these effects fall in line with the theoretical expectations of Gottfredson and Hirschi. For example, both little boys and little girls with lower self-control are more likely as adults to be in jobs that require them to get dirty and sweat from physical (but not mental) effort while those boys and girls with higher self-control are more likely to be found in jobs that grant them autonomy in the workplace.

Although the current study had many desirable features and was able to contribute both to an important criminological debate and to the extant white-collar crime knowledge base, several limitations and points for future research are noted. As this was the first empirical test of childhood factors on adult workplace deviance and was derived from theoretical hypotheses that have rather specific prediction regarding which childhood factors should influence future behavior, our analyses were consistent with the intent of the tested theories, including only the theoretically specified childhood factors that are believed to be relevant—low self-control and conduct problem trajectories. Future research efforts should aim to include additional childhood (e.g. childhood socio-economic status), adolescence (e.g. peer associations), and adulthood contextual variables (e.g. family/children commitments) that may relate to adult deviance.

Also, while the Dunedin data provide rich and detailed data of a birth cohort, it is longitudinal in nature and as such the effects and size of the coefficients are likely to be somewhat attenuated, as is the case with any comparisons spaced over 30 years. Additionally, the Dunedin data are of a racially homogeneous sample. While the sample is representative of the general population of New Zealand's South Island and cross-national comparisons and replication analyses provide some confidence about generalizing findings from this sample to other western nations (Moffitt et al., 2001), results may differ with a more racially and geographically diverse sample of respondents.

Finally, data constraints limited our focus to individual-level predictors of workplace deviance. Organizational and corporate crime scholars have argued for the importance of examining organizational factors especially those that would relate to crime at the workplace (Coleman, 1987; Simpson & Piquero, 2002; Vaughan, 1992). The extent to which these factors create an opportunity structure that would magnify or depress the individual-level factors from predicting workplace deviance needs to be examined. Elaborating on these themes, it would be useful to examine deviant acts for which the individual does not necessarily benefit, instead focusing on crimes that are committed on behalf of the company. One interesting question here is whether the same sets of factors considered in our study similarly predict non-individual workplace acts, or are there a different set of characteristics at play for more complex organizational acts of deviance.

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