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The association between psychopathic personality traits and health-related outcomes

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ABSTRACT

Purpose: Psychopathy and psychopathic personality traits (PPT) have been linked to a long list of negative life outcomes. To date, however, few studies have provided a systematic analysis of whether psychopathic personality traits contribute to increased health burden. The current study was designed to address this gap in the literature.
Method: This study analyzed data from the National Longitudinal Study of Adolescent Health and employed a measure of PPT derived from the five-factor model of personality. Analyses were conducted using OLS, logistic, and Poisson regression techniques.
Results: The results revealed that relatively higher scores on psychopathic personality traits were associated with a slight increase in a wide range of negative health outcomes. These significant associations were detected for both males and females.
Conclusions: We speak to the importance of these findings for the potential to reduce health burden among psychopaths and those who score relatively high on measures of psychopathic personality traits.

Introduction

One of the most important topics related to human development is health. Billions of dollars are spent annually on products that are designed to increase health and promote longevity. Researchers, too, have spent a considerable amount of resources examining the health-related costs and benefits associated with different diets, different lifestyles, and behaviors. Although this body of research has revealed that lifestyles, diets, and behaviors can all contribute significantly to health burden (Balia & Jones, 2008; Krueger & Chang, 2008; McNaughton, Wattanapenpaiboon, Wark, & Nowson, 2011), this body of research has also revealed that health-related outcomes are structured, in part, by certain individual-level traits. To illustrate, there is now a strong empirical knowledge base showing quite consistently that variation in intelligence scores is a significant predictor of health burden, with persons scoring lower on intelligence tests being at-risk for a range of negative health outcomes (Batty, Mortensen, Nybo Andersen, & Osler, 2005; Gunnell, Magnusson, & Rasmussen, 2005; Müller et al., 2013; Whalley & Deary, 2001). Other individual-level traits, including personality characteristics and self-regulation, have also been tied to an assortment of health outcomes (Lee, Wadsworth, & Hotopf, 2006; Mykletun et al., 2009; Nedelec & Beaver, 2014; Smith, 2006).

To date, however, there has been only limited research conducted on the nexus between psychopathic personality traits and health burden. This is a particularly salient omission from the literature because persons scoring high on psychopathic personality traits and related phenotypes have been found to be at-risk for a host of negative life outcomes, including reduced educational outcomes (Harpur, Hare, & Hakstian, 1989), persistent contact with the criminal justice system (DeLisi, 2009; Hare, 1996), and even an early death (Black, Baumgard, Bell, & Kao, 1996). Whether the list of outcomes related to psychopathic personality traits could be extended to a broader list of health-related items such that psychopathic personality traits could serve as an epidemiological predictor of health burden remains unknown. There are, however, at least three reasons that would suggest that variation in psychopathic personality traits might be linked to health outcomes.

First, emerging evidence has revealed that antisocial behavior and criminal involvement are strongly tied to health-related outcomes (Vaughn, DeLisi, Beaver, Perron, & Abdon, 2012). For example, analysis of data from the Dunedin Multidisciplinary Health and Development Study revealed that males with conduct problems were characterized

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as having significant health burdens at the age of 32 years (Odgers et al., 2007). In another study, Piquero, Daigle, Gibson, Piquero, and Tibbetts (2007) reported that life-course-persistent offenders were significantly more likely than adolescence-limited offenders to have adverse physical and mental health problems. Similar findings have been reported in other studies (Piquero, Farrington, Nagin, & Moffitt, 2010; Shepherd, Shepherd, Newcombe, & Farrington, 2009). This is particularly relevant to psychopathic personality traits because psychopathic personality traits have consistently been found to predict involvement in serious forms of antisocial and criminal behavior (Campbell, Porter, & Santor, 2004; Edens, Campbell, & Weir, 2007) and there is empirical evidence suggesting that there is substantial overlap among the constructors of chronic offenders (e.g., life-course-persistents), career criminals, and psychopaths (Vaughn & DeLisi, 2008). As a result, it is quite possible that antisocial and criminal behavior—particularly serious, violent, and chronic offending—are simply proxies for psychopathic personality traits or that psychopathic personality traits may be related to health outcomes via their effect on antisocial and criminal behavior.

Second, there is a significant amount of research indicating that lifestyle factors are linked to health burden. Smoking, drinking heavily, and using drugs have all been found to reduce health and increase the risk of a wide range of diseases (Degenhardt & Hall, 2012; Fox, Merrill, Chang, & Califano, 1995; McGinnis & Foege, 2003; Room, Babor, & Rehm, 2005; Single, Rehm, Robson, & Truong, 2000; Single, Robson, Rehm, & Xi, 1999). Other lifestyle factors, such as inadequate healthcare coverage and financial instability, have also been tied to increased health burdens (Hadley, 2003; Todd, Armon, Griggs, Poole, & Berman, 2006). It is important to note, moreover, that psychopathic personality traits have previously been linked to the use of drugs, alcohol, and tobacco (Patrick, Hicks, Kruegar, & Lang, 2005; Smith & Newman, 1990; Walsh, Allen, & Kosson, 2007) and that psychopathic personality traits have also been tied to reduced socioeconomic status and unemployment (Harpur et al., 1989; Vachon, Lynam, Loeber, & Stouthamer-Loeber, 2012). Consequentially, it stands to reason that psychopathic personality traits might affect health-related outcomes via their effect on lifestyle factors.

Third, a number of personality traits have been shown to predict health burden. Perhaps the most relevant to the current study is self-control/self-regulation. A number of studies have provided compelling evidence revealing that self-control is a robust correlate to health outcomes, with persons scoring relatively low on self-control being at-risk for high cholesterol, high blood pressure, reduced physical health, and even cancer (Miller, Barnes, & Beaver, 2011; Moffitt et al., 2011). Given that self-control has been shown to covary significantly with psychopathic personality traits (Wiebe, 2003), and that self-control and psychopathic personality traits share even some of the same biosocial underpinnings (Beaver, Barnes, May, & Schwartz, 2011; Wright, Beaver, Delisi, & Vaughn, 2008), it seems plausible that psychopathic personality traits may also influence a diverse range of health outcomes.

The above discussion highlights three key reasons why psychopathic personality traits might be related to a wide-ranging health burden. The available research bearing directly on this possibility is limited and thus relatively little is known about the psychopathic personality traits-health outcomes association. Much of what is known about this association tends to be confined to health outcomes associated with the risky sexual behavioral patterns of psychopaths (Fulton, Marcus, & Payne, 2010; Harris, Rice, Hilton, Lalumière, & Quinsey, 2007; Kastner & Sellbom, 2012). For instance, studies have revealed that psychopaths are at elevated HIV risk (Malow et al., 2007). In addition, research has also provided some evidence that measures tapping psychopathy are associated with early death (Black et al., 1996), suicidal behaviors and, for certain demographic groups, perhaps even self-inflicted injuries (Swogger, Conner, Meldrum, & Caine, 2009). Taken together, most of the research that has examined the influence of psychopathy on health outcomes has focused largely on risky behaviors (e.g., drug abuse, risky sexual behaviors) or on a narrow range of health outcomes (e.g., HIV risk). The current study is designed to provide a more systematic examination of the link between psychopathic personality traits health burden. To do so, we employ a measure of psychopathic personality traits that is derived, in part, from the five-factor-model of personality, and by focusing on thirteen health outcomes in a nationally representative sample of males and females.

Methods

Data

Analyses were conducted using the National Longitudinal Study for Adolescent Health (Add Health; Harris et al., 2009). Detailed information regarding the sampling procedures and overall data are described elsewhere (Harris et al., 2009). In brief, the Add Health is a prospective study of nationally representative American youth enrolled in over 80 different high schools. The data collection took place at four different time points over the course of approximately 14 years. The initial sampling occurred during the 1994-1995 school year and included approximately 90,000 students who completed in-school questionnaires. A subsample of these students (N = 20,745) were administered follow-up questionnaires during an in-home survey. The student's parent, typically the mother, also completed a questionnaire during the in-home survey providing information on a variety of topics such as relationship status, employment, and income. The second and third waves of data collection occurred in 1996 and 2001-2002, respectively. The final wave of in-home interviews occurred in 2007-2008 when all of the respondents had reached adulthood (age range: 24-32 years). Approximately 80% of the original Wave 1 respondents were successfully re-interviewed at Wave 4, providing a sample size of N = 15,701 (Harris, Halpern, Smolen, & Haberstick, 2006). Unless otherwise indicated, the current study employs data from Wave 4. Due to missing information on some variables, the analytical sample of the current study ranges in size from 6,647 to 15,584 in the full sample, 3,653 to 8,295 for females, and 2,994 to 7,289 for males.

Measures

Psychopathic personality traits (PPT)[1]

While the Add Health does not have a vetted measure of psychopathy such as the PCL-R (Hare, 1996), it does include an inventory of the "Big 5" personality dimensions which include items that can be employed to measure psychopathic personality traits or tendencies (Harris et al., 2009; Lynam, 2002; Lynam et al., 2005). As such, the measure of psychopathic personality traits (PPT) in the current study is derived from a variety of questions asked at Wave 4 tapping the five-factor model of personality as well as items assessing problems with self-regulation. Previous research has provided a detailed description of the creation of the PPT measure in the Add Health (Beaver, Rowland, Schwartz, & Nedelec, 2011). Briefly, 23 items assessing personality and self-control were subjected to factor analyses and these items were then summed to create the continuously coded PPT index ($\alpha = .82$; see the online supplemental materials for the results of these analyses). A higher score on the PPT index indicates a higher degree of psychopathic personality. The 23 questions used in the construction of the PPT scale, as well as which items were reverse-coded, are listed in Appendix A. This scale matches measures of PPT that have been previously employed by researchers using the Add Health (Beaver et al., 2011a, 2011b; Wu & Barnes, 2013). Importantly, only those respondents with non-missing data on the PPT were included in the analytical sample of the current study.[2]

Individual health-related items

The current study employs 13 different individual measures of health derived from the Wave 4 interviews. Respondents were asked a string of questions inquiring as to whether they had ever been diagnosed by a health-care professional with any of the following items: asthma, cancer, diabetes, high blood pressure, high cholesterol, heart disease, attention deficit disorder/attention deficit-hyperactivity disorder (ADD/ADHD), anxiety, depression, epilepsy, and migraines. Additionally, respondents were asked to report if they ever had stuttering or stammering problems and if they had, in the past 12 months, ever experienced persistent (i.e., longer than five minutes in duration) ringing or buzzing in their ears (tinnitus). Each of these individual health-related items were coded dichotomously, where 0 = no and 1 = yes. It is important to note that numerous researchers have found self-reported appraisals of health to be valid measures of both physical and mental health (Bond, Dickinson, Matthews, Jagger, & Brayne, 2006; Brissette, Leventhal, & Leventhal, 2003; Ford, Spallek, & Dobson, 2008; Idler & Benyamini, 1997).

General health

A single measure of general health is derived from a question asking respondents to indicate their perception of their health in general. The measure of general health, derived from Wave 4, was coded such that 1 = poor, 2 = fair, 3 = good, 4 = very good, and 5 = excellent.

Number of sick days

A measure of the consequences of ill health is employed in order to provide a comprehensive assessment of respondent health. During the Wave 4 interviews, respondents were asked to indicate the number of days, in the past 30 days, that they had been absent from school or work as a result of a health-related problem. The number of sick days measure was coded such that 0 = never, 1 = a few times, 2 = about once a week, 3 = almost every day, 4 = every day.

STDs

An item tapping sexual health was generated from a series of questions inquiring whether respondents had ever been diagnosed with any of the following 14 sexually transmitted diseases/infections: chlamydia, gonorrhea, trichomoniasis, syphilis, genital herpes, genital warts, hepatitis B (HBV), human papilloma virus (HPV), pelvic inflammatory disease (PID), cervicitis or mucopurulent cervicitis (MPC), urethritis, vaginitis, HIV infection or AIDS, or any other sexually transmitted disease/infection. Each of these items was derived from the Wave 4 interview and was coded dichotomously where, 0 = no and 1 = yes. The sexual health items were then summed together to create the sexually transmitted disease/infection (STDs) index where higher values indicate a greater number of sexually transmitted diseases or infections.

Diseases

An overall measure of disease diagnoses was generated by summing together all of the individual health-related items outlined above. The diseases index is coded such that higher values indicated a greater number of diseases diagnosed.

Chronic diseases

The individual health-related items were also employed to create the chronic diseases index. In line with definitions provided by the World Health Organization (www.who.int/topics/noncommunicable_diseases; accessed April 16, 2014) the chronic diseases index was created by summing the following six individual health-related items: asthma, cancer, diabetes, high blood pressure, high cholesterol, and heart disease. Higher values on the chronic diseases index indicate a greater number of diagnoses on the six constituent health-related items.

Neurological disorders[3]

Employing the remaining individual health items, a measure of neuropsychological disorders was created. Following multiple lines of evidence from the medical and psychological sciences indicating that ADD/ADHD, anxiety, depression, epilepsy, migraines, stuttering, and tinnitus are related to neuropsychological malfunctioning, we summed these items together to create the neurological disorders index (Büchel & Sommer, 2004; Hiller & Goebel, 1999; Jacoby, Snape, & Baker, 2005; Johnston-Wilson et al., 2000; Mantella et al., 2007; Nigg, 2010; Song, Vanneste, Schlee, Van de Heyning, & Ridder, 2013; Wessman, Terwindt, Kaunisto, Palotie, & Ophoff, 2007). The neurological disorders index is coded such that higher values indicate a greater number of diagnosed neuropsychological disorders.

Control variables

In order to account for potentially confounding effects of numerous aspects of respondents' lives, a variety of control variables were employed in the multivariate analyses. There is an abundance of evidence illustrating that people with higher scores on measures of psychopathy engage in greater amounts of criminal behavior (DeLisi, 2009; DeLisi et al., in press; Hare, 1996) and that those who engage in high levels of criminal behavior tend to have poorer health (Bennett & Brostoff, 1997; Moffitt, 1993; Moffitt et al., 2011). Consequently, in order to account for the differential effect of involvement in the criminal justice system we include two separate control variables related to criminal justice processing. During the Wave 4 interviews respondents were asked to report if they had (1) ever been arrested, and (2) ever been incarcerated (i.e., spent time in a jail, prison, juvenile detention center or other correctional facility). Both of these measures were coded dichotomously where 0 = no and 1 = yes. The extant literature also indicates that those with poor self-regulation skills tend to exhibit signs of ill health (Moffitt et al., 2011; Nedelec & Beaver, 2014). As a result, we follow the lead of past researchers (Beaver, 2011; Boisvert, Boutwell, Barnes, & Vaske, 2013; Nedelec & Beaver, 2014) and include a measure of self-control derived from 23 items asked during the Wave 1 and Wave 2 interviews. The low self-control index was created by summing these 23 items ($\alpha = .81$) and was continuously coded where higher values indicate poorer levels of self-regulation. Following the literature on health (Deaton, 2003; Furnée, Groot, & Pfann, 2010), we account for the effect of socioeconomic status with two measures: personal income (derived from Wave 4) and respondents' parents' income (derived from the Wave 1 parent in-home interviews). Both of these items were z-transformed prior to the analyses. The final three control variables are age in years (obtained from Wave 4), race (dichotomously coded where 0 = nonwhite and 1 = white; derived from Wave 1), and sex (dichotomously coded where 0 = female and 1 = male; derived from Wave 4). Sensitivity analyses indicated that there was no multicollinearity among the variables included in the models.

Analytical Strategy

The analyses followed a series of steps. First, we produced descriptive statistics on all of the study variables including an examination of the average differences between males and females. Second, we produced bivariate associations between the PPT measure, the health-related items, the health indexes, and the control variables. Third, we examined the relationship between PPT and the health-related outcome measures using multivariate regression analyses (logistic regression for the individual health item and OLS regression for the health indexes). The large sample size in the current study allows for the use of regression techniques despite violating the assumption of a normally distributed

error term (McClendon, 1994). In determining statistical significance in the multivariate models, we employed the 95% confidence intervals (displayed for each model) associated with the various coefficients. As a reminder, the multivariate analyses assess the relationship between PPT and the health-related outcomes while controlling for the effects of the various control variables (i.e., ever arrested, ever incarcerated, low self-control, age, race, sex, personal income, and parents' income).

Results

The summary statistics for the study variables are presented in Table 1. As illustrated, the majority of the sample reported their race as white (approximately 64%) and was comprised of approximately 53% females and 47% males. The average age of respondents in the study sample was about 29 years. Also presented in Table 1 are the results of the assessment of average differences between males and females. Although there was no statistically significant difference between the sexes on the PPT measure, there was difference across a number of the health items. In terms of the individual health items, females reported higher instances of diagnoses for six of the 13 items: asthma, cancer, diabetes, anxiety, depression, and migraines (see Table 1). Females also reported a lower average level of general health, a greater number of days of work or school missed due to illness[4], a greater number of STDs, a greater number of neurological disorder diagnoses, and a greater number of diagnosed diseases overall (see Table 1). Due to these differences the bivariate and logistic analyses were differentiated by sex, and sex was included as a control variable in the OLS regression models.

The first set of analyses is displayed in Table 2 which illustrates the bivariate associations between PPT, the health-related measures, and the control variables. The findings presented in Table 2 indicate that the PPT measure was associated with each of the individual health items and all of the health indexes in a statistically significant manner. The pattern of association was almost identical for females and males, with just two differences in terms of statistical significance (cancer and epilepsy). Also displayed in Table 2 are the associations between the control variables and the health-related outcomes. As indicated, each of the control variables is statistically associated with one or more of the health-related outcomes. Additionally, the PPT measure is statistically associated with all of the control variables save for sex. Given these observed associations and the findings of the extant literature discussed above, the control variables were included in the multivariate analyses employed in the final analytical step.

Table 3 displays the results of the logistic regression analyses examining the association between PPT and the individual health items for the full sample, females, and males. The findings presented in Table 3 indicate that PPT was predictive of a diagnosis of diabetes for the full sample, females, and males. Additionally, higher levels of PPT were associated with a diagnosis of high blood pressure as well as a diagnosis of high cholesterol for the full sample, a diagnosis of high blood pressure for males, and a diagnosis of high cholesterol for females. While PPT was statistically associated with only three of the six chronic disease items, it was associated with all but one of the seven neurological disorders. Higher levels of PPT were predictive of a diagnosis of ADD/ADHD, anxiety, depression, migraines, stuttering, and tinnitus for the full sample (see Table 3) even after controlling for the effect of involvement with the criminal justice system, levels of self-control, age, race, sex, personal income, and parents' income. More specifically, for each level of increase in the PPT measure there was a corresponding 4% increase in the likelihood of a diagnosis of ADD/ADHD, a 5% increase in the likelihood of a diagnosis of anxiety, a 6% increase in the odds of a diagnosis

Table 1
Summary statistics for all study variables for the full sample, females, and males

	Full Sample			Females			Males			*t*-value[†]
	Mean (%)	SD	Range	Mean (%)	SD	Range	Mean (%)	SD	Range	
PPT	56.73	9.5	23-107	56.84	9.3	24-107	56.60	9.7	23-99	1.55
Health Items										
Asthma	.15 (14.8)	.36	0-1	.17 (16.7)	.37	0-1	.13 (12.7)	.33	0-1	7.06**
Cancer	.01 (1.3)	.11	0-1	.02 (1.9)	.14	0-1	.01 (.59)	.08	0-1	7.47**
Diabetes	.03 (2.8)	.17	0-1	.03 (3.4)	.18	0-1	.02 (2.2)	.15	0-1	4.66**
High blood pressure	.11 (10.6)	.31	0-1	.09 (8.6)	.28	0-1	.13 (12.8)	.33	0-1	-8.49**
High cholesterol	.08 (8.1)	.27	0-1	.07 (7.4)	.26	0-1	.09 (8.9)	.29	0-1	-3.46**
Heart disease	.01 (.78)	.09	0-1	.01 (.84)	.09	0-1	.01 (.71)	.08	0-1	.92
ADD/ADHD	.05 (4.9)	.22	0-1	.03 (3.4)	.18	0-1	.07 (6.7)	.25	0-1	-9.36**
Anxiety	.12 (11.7)	.32	0-1	.16 (15.7)	.36	0-1	.07 (7.0)	.26	0-1	16.96**
Depression	.15 (15.3)	.36	0-1	.21 (20.5)	.40	0-1	.10 (9.5)	.29	0-1	19.24**
Epilepsy	.01 (1.4)	.12	0-1	.02 (1.5)	.12	0-1	.01 (1.2)	.11	0-1	1.59
Migraines	.14 (14.2)	.35	0-1	.20 (19.7)	.40	0-1	.08 (8.0)	.27	0-1	21.02**
Stuttering	.04 (4.2)	.20	0-1	.03 (3.0)	.17	0-1	.06 (5.5)	.23	0-1	-7.60**
Tinnitus	.06 (6.3)	.24	0-1	.06 (5.7)	.23	0-1	.07 (7.0)	.26	0-1	-3.48**
Health Indexes										
General health	3.66	.92	1-5	3.62	.92	1-5	3.70	.91	1-5	-5.27**
Number of sick days	.22	.57	0-4	.25	.59	0-4	.19	.55	0-4	6.93**
STDs	.34	.71	0-7	.49	.84	0-7	.17	.47	0-6	27.90**
Chronic diseases	.38	.65	0-5	.39	.65	0-5	.38	.65	0-4	1.03
Neurological disorders	.58	.94	0-6	.70	1.0	0-6	.45	.83	0-6	16.48**
Diseases	.96	1.3	0-10	1.08	1.3	0-10	.83	1.1	0-9	12.83**
Control variables										
Ever arrested	.28 (28.1)	.45	0-1	.17 (17.1)	.38	0-1	.41 (40.7)	.49	0-1	-33.83**
Ever incarcerated	.15 (15.3)	.36	0-1	.08 (7.9)	.27	0-1	.24 (23.7)	.43	0-1	-27.91**
Low self-control	85.90	13.5	40-167	86.00	13.6	40-155	85.77	13.3	43-167	.69
Age	29.09	1.7	25-34	29.01	1.7	25-34	29.19	1.7	25-34	-6.50**
Race	.64 (63.4)	.48	0-1	.63 (62.8)	.48	0-1	.64 (64.1)	.48	0-1	-1.74
Sex	.47 (46.8)	.50	0-1	–	–	–	–	–	–	–
Income	.00	.99	-.78-21.4	-.13	.86	-.78-21.4	.15	1.1	-.78-21.4	-17.30**
Parents' income	.01	.98	-.89-18.5	.02	1.1	-89-18.5	.01	.89	-.89-18.5	.46
N (range)	6,647 - 15,584			3,653 - 8,295			2,994 - 7,289			

Notes: All variables are from Wave 4 (race and parents' income are from Wave 1; Low self-control is from waves 1 and 2); Income and parents' income are z-transformed variables; Race: 0 = nonwhite, 1 = white; Sex: 0 = female, 1 = male; SD: Standard deviation; PPT: psychopathic personality traits.
* $p < .05$, ** $p < .01$.
† Mean difference (female - male); two-tailed.

Table 2
Bivariate associations between psychopathic personality traits (PPT), health-related outcomes, and the control variables

	PPT			Control Variables (Full Sample)							
	Full Sample	Males	Females	Arrested†	Incarcerated†	LSC	Age	Race†	Sex†	Income	Parents' Income
PPT	–	–	–	.09**	.10**	.32**	.02*	-.02**	-.01	-.10**	-.09**
Health Items											
Asthma	.03**	.03*	.04**	.04*	.02	.03*	-.05**	.01	-.11**	-.04**	.02*
Cancer	.02*	.01	.03**	.03	-.03	.03*	-.01	.13**	-.27**	-.01	-.01
Diabetes	.06**	.05**	.07**	-.05	-.04	.01	.03**	-.05	-.12**	-.03**	-.03**
High blood pressure	.08**	.09**	.07**	.06**	.06**	.03**	.03**	-.08**	.14**	-.02	-.01
High cholesterol	.03**	.03**	.03*	-.07**	-.07**	-.01	.06**	.04*	.06**	.01	.01
Heart disease	.03**	.03*	.03**	.04	.10*	.01	.02*	-.01	-.04	-.02*	-.02
ADD/ADHD	.10**	.11**	.08**	.21**	.22**	.09**	-.02*	.31**	.20**	-.02**	-.03**
Anxiety	.16**	.15**	.18**	.06**	.04*	.10**	-.03**	.28**	-.28**	-.06**	.01
Depression	.21**	.19**	.24**	.07**	.09**	.14**	-.03**	.24**	-.30**	-.07**	.01
Epilepsy	.05**	.02	.07**	.04	.06	.01	-.01	.08*	-.05	-.03**	-.02
Migraines	.09**	.09**	.09**	-.05**	-.04	.03**	-.01	.13**	-.33**	-.06**	-.01
Stuttering	.13**	.15**	.11**	.09**	.13**	.08**	.01	-.10**	.17**	-.03**	-.02*
Tinnitus	.11**	.09**	.13**	.08**	.10**	.05**	.01	.09**	.07**	-.02**	-.03**
Health Indexes											
General health	-.26**	-.23**	-.29**	-.07**	-.08**	-.19**	-.02	.07**	.04**	.09**	.09**
Number of sick days	.11**	.12**	.11**	.02**	.03**	.04**	-.01	-.01	-.06**	-.03**	-.01
STDs	.05**	.03*	.06**	.09**	.07**	.08**	-.03**	-.15**	-.22**	-.03**	-.02*
Chronic diseases	.09**	.09**	.09**	.01	.01	.04**	.02*	-.01	-.01	-.04**	.01
Neurological disorders	.25**	.25**	.26**	.05**	.06**	.15**	-.03**	.14**	-.13**	-.09**	.01
Diseases	.24**	.23**	.25**	.04**	.04**	.14**	-.01	.10**	-.10**	-.09**	.01

Notes: All variables are from Wave 4 (race and parents' income are from Wave 1; Low self-control is from waves 1 and 2); Income and parents' income are z-transformed variables; Race: 0 = nonwhite, 1 = white; Sex: 0 = female, 1 = male; PPT: psychopathic personality traits; Health items are dichotomous; Health indexes are continuous/count.
* $p < .05$, ** $p < .01$.
† Tetrachoric correlation employed between these control variables and the dichotomous health items.

of depression, a 3% increase in the likelihood of reporting a diagnosis of migraines, a 5% increase in the likelihood of experiencing problems with stuttering, and a 4% increase in the odds of reporting symptoms of tinnitus. The pattern for both males and females was almost identical to that displayed for the full sample.

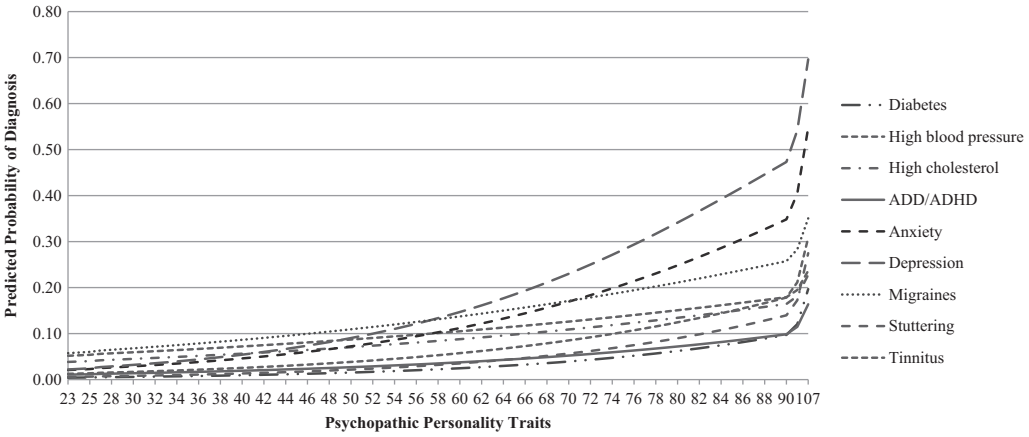
In order to more clearly illustrate the pattern of these results, the predicted probabilities of a diagnosis of the individual health items as a function of the PPT measure are displayed in Fig. 1 (full sample), Fig. 2 (males), and Fig. 3 (females). Notably, the predicted probabilities were estimated with the control variables (ever arrested, ever incarcerated, age, race, sex, personal income, and parents' income) set to their means and only those associations which were statistically significant (see Table 3) are displayed. The findings presented in the figures illustrate a common pattern: a general increase in the probability of a diagnosis across the values of the PPT measure with a sharp increase near the upper bounds of PPT. In other words, while there was a general increase in the likelihood of diagnosis for the various health items there was a much higher increase for those respondents scoring the highest on the measure of psychopathic personality.

The final set of analyses employed multivariate regression models wherein the health indexes were regressed on the PPT measure and the control variables for the full sample of respondents. The results of these analyses are presented in Table 4. In order to highlight the independent effect of PPT the coefficients associated with the control variables are also displayed. Additionally, the statistically significant standardized coefficient (β) with the greatest value in each model is in bold. As illustrated, the PPT item was statistically associated with reduced perceptions of general health, an increased number of missed days of school or work due to illness, an increased number of chronic disease diagnoses, an increased number of diagnoses of neurological disorders, and an increased number of disease diagnoses overall (see Table 4). Finally, the standardized coefficient associated with PPT had the greatest value (in bold) in four of these five models (general health; chronic diseases; neurological diseases; and diseases overall).

Table 3
Logistic regression models examining the associations between psychopathic personality traits (PPT) and the health-related items for the full sample, females, and males

	Full Sample				Females				Males			
	b	OR	SE	95%CI	b	OR	SE	95%CI	b	OR	SE	95%CI
Chronic Diseases												
Asthma	-.01	.99	.01	-.01,.01	.00	1.00	.01	-.01,.01	-.01	.99	.01	-.02,.01
Cancer	.01	1.01	.01	-.02,.04	.01	1.01	.02	-.03,.04	.01	1.01	.03	-.04,.06
Diabetes	.05*	1.05	.01	.03,.07	.04*	1.04	.01	.02,.06	.06*	1.07	.02	.03,.09
High blood pressure	.02*	1.02	.01	.01,.03	.02	1.02	.01	.01,.03	.02*	1.02	.01	.01,.03
High cholesterol	.02*	1.02	.01	.01,.04	.03*	1.03	.01	.02,.05	.02	1.02	.01	-.00,.03
Heart disease	.02	1.02	.02	-.02,.05	.01	1.01	.03	-.04,.06	.02	1.03	.03	-.02,.07
Neurological Disorders												
ADD/ADHD	.03*	1.04	.01	.02,.05	.04*	1.04	.01	.01,.06	.03*	1.03	.01	.01,.05
Anxiety	.05*	1.05	.01	.04,.06	.05*	1.05	.01	.04,.06	.05*	1.05	.01	.03,.07
Depression	.06*	1.06	.01	.05,.06	.05*	1.06	.01	.04,.07	.06*	1.06	.01	.04,.07
Epilepsy	.02	1.02	.01	-.01,.05	.02	1.02	.02	-.02,.06	.02	1.02	.02	-.03,.07
Migraines	.03*	1.03	.01	.02,.04	.03*	1.03	.01	.02,.04	.02*	1.02	.01	.01,.04
Stuttering	.05*	1.05	.01	.03,.07	.04*	1.04	.01	.02,.06	.06*	1.06	.01	.04,.08
Tinnitus	.04*	1.04	.01	.03,.06	.05*	1.05	.01	.03,.07	.04*	1.04	.01	.02,.05

Notes: All models control for ever arrested, ever incarcerated, low self-control, age, sex, race, income, and parents' income; CI: confidence intervals.
* 95% CI does not include zero (i.e., * $p < .05$).



Notes: Predicted probabilities were estimated with ever arrested, ever incarcerated, low self-control, income, parents' income, age, race, and sex set to their means. Included in this figure are only those diagnoses which were statistically significant in the logistic regression models (see Table 3).

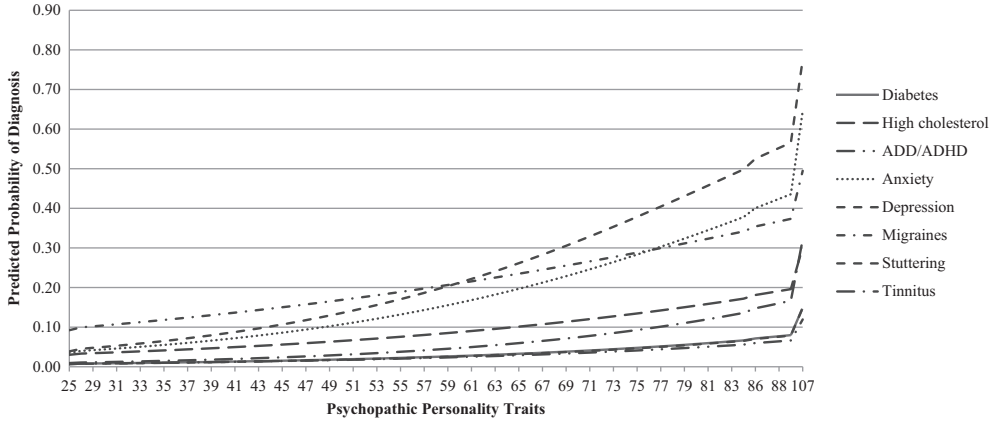
Fig. 1. Predicted probabilities for health-related diagnoses across scores on the psychopathic personality traits index for the full sample. *Notes*: Predicted probabilities were estimated with ever arrested, ever incarcerated, low self-control, income, parents' income, age, race, and sex set to their means. Included in this figure are only those diagnoses which were statistically significant in the logistic regression models (see Table 3).

Discussion

The negative consequences associated with psychopathy and psychopathic personality traits have been well documented and include a wide range of diverse outcomes. To date, however, relatively little research had examined the possibility that psychopathic personality traits might be associated with health-related outcomes in early adulthood. The current study addressed this gap in the literature by analyzing the association between psychopathic personality traits and thirteen health outcomes in a nationally representative sample of males and females. The results of the analyses revealed significant associations between psychopathic personality traits and some of the health outcomes. Specifically, higher scores on the psychopathic personality traits scale were associated with a significant reduction in general health and significant increases in chronic diseases, neurological disorders, and diseases. Additional analyses revealed that higher scores on psychopathic personality traits were associated with an increased odds of diabetes, high blood pressure, high cholesterol, and an assortment of neurological disorders. Although there were some differences between males and females, the general pattern of results was similar and underscored a significant association between psychopathic personality traits and negative health outcomes.

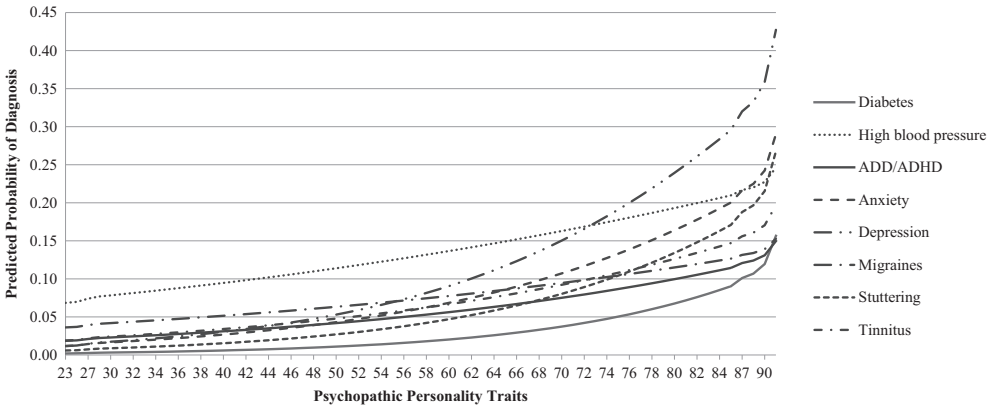
These significant associations provide some of the first evidence tying psychopathic personality traits to health outcomes. While a first step, it is important that future research examine this association in closer detail and try to unpack the mechanisms that are at play and that are able to account for how and why psychopathic personality traits might produce health consequences. For instance, perhaps lifestyle choices, criminal involvement, incarceration, or even low socioeconomic status are involved in this association. We should note, though, that we explored whether some of these variables, such as income, are involved in the psychopathic personality traits-health association, but did not detect any consistent results. A more concerted effort using different samples that include measures of all potential mediators, however, could go a long way to shedding some light on the precise ways in which psychopathic personality traits contribute to an increased health burden.

While this study provides the first evidence linking psychopathic personality traits to a wide range of negative health outcomes, the findings should be viewed cautiously because of a number of limitations. First, the measure of psychopathic personality traits was developed



Notes: Predicted probabilities were estimated with ever arrested, ever incarcerated, low self-control, income, parents' income, age, and race set to their means. Included in this figure are only those diagnoses which were statistically significant in the logistic regression models (see Table 3).

Fig. 2. Predicted probabilities for health-related diagnoses across scores on the psychopathic personality traits index for females. *Notes*: Predicted probabilities were estimated with ever arrested, ever incarcerated, low self-control, income, parents' income, age, and race set to their means. Included in this figure are only those diagnoses which were statistically significant in the logistic regression models (see Table 3).



Notes: Predicted probabilities were estimated with ever arrested, ever incarcerated, low self-control, income, parents' income, age, and race set to their means. Included in this figure are only those diagnoses which were statistically significant in the logistic regression models (see Table 3).

Fig. 3. Predicted probabilities for health-related diagnoses across scores on the psychopathic personality traits index for males. *Notes*: Predicted probabilities were estimated with ever arrested, ever incarcerated, low self-control, income, parents' income, age, and race set to their means. Included in this figure are only those diagnoses which were statistically significant in the logistic regression models (see Table 3).

from the five-factor-model of personality and not from a standardized measure of psychopathy, such as the Psychopathy Checklist- Revised (PCLR; Hare, 2003). While this measure of psychopathic personality traits has been used previously and it has been shown to have predictive validity and relatively strong psychometric properties (Beaver, Barnes, May, & Schwartz, 2011), it is possible that there is something unique about this measure. Whether the association between psychopathic personality traits and health would be detected with different measures awaits future research. Second, the health-related outcomes were measured largely through self-reports which necessarily raises questions about the accuracy of such reports. It is possible, for example, that some respondents had high cholesterol, but were unaware of it. As a result, replication studies are needed to determine whether the pattern of results reported here would be observed with more objective measures of health outcomes. Third, the Add Health data only followed participants into their late 20s and early 30s. Given that the current focus was on health-outcomes, using a relatively young age of respondents will reduce the number of participants who have actually developed any serious health outcomes. The statistically significant associations that did emerge, therefore, are capturing health problems that surface relatively early in the life course. Future studies should seek to replicate these findings on samples that include a much longer duration of the life course and that include participants who are significantly older.

Few topics garner as much attention as health, particularly the development of health problems relatively early in the life course. While mounds of research have linked certain lifestyles and certain behaviors to health problems, there has been comparatively less research examining the health outcomes associated with certain personality traits. The results of the current study clearly reveal that psychopathic personality traits increase the risk of health problems in early adulthood. More research is needed to be devoted to the psychopathic personality traits-health nexus so that a better understanding of the mechanisms that account for this association can be identified. In doing so, it may be possible to implement certain strategies that can ultimately be used to reduce the health burden for people who score relatively high on measures of psychopathic personality traits.

Table 4
Multivariate associations between psychopathic personality traits (PPT) and the health indexes for the full sample (OLS regression models)

	General Health			Number of Sick Days†			STDs			Chronic Diseases			Neurological Disorders			Diseases		
	b	β	SE	b	IRR	SE	b	β	SE	b	β	SE	b	β	SE	b	β	SE
PPT	-.02* (-.02,-.02)	**-.20**	.01	.02* (.01,.03)	1.02	.01	-.00 (-.00,.00)	.02	.01	.01* (.01,.01)	**.07**	.01	.02* (.02,.02)	**.21**	.01	.03* (.02,.03)	**.19**	.01
Arrested	-.05 (-.12,.02)	-.03	.04	.08 (-.11,.26)	1.07	.09	.23* (.17,.28)	.14	.03	-.01 (-.06,.04)	-.01	.03	.10* (.03,.17)	.05	.03	.09 (-.00,.19)	.03	.05
Incarcerated	-.06 (-.15,.03)	-.02	.05	.14 (-.09,.37)	1.15	.12	-.01 (-.08,.06)	-.01	.04	-.02 (-.09,.04)	-.01	.03	.06 (-.03,.15)	.02	.05	.04 (-.09,.16)	.01	.06
LSC	-.01* (-.01,-.01)	-.12	.01	-.00 (-.01,.01)	1.00	.01	.01* (.01,.01)	.05	.01	.00 (-.00,.01)	.01	.00	.01* (.01,.01)	.07	.01	.01* (.00,.01)	.06	.01
Age	-.01 (-.02,.01)	-.01	.01	-.01 (-.05,.03)	.99	.02	-.00 (-.02,.01)	-.01	.01	.00 (-.01,.01)	.01	.01	-.00 (-.02,.01)	-.00	.01	.00 (-.02,.02)	.00	.01
Race	.10* (.05,.15)	.05	.03	.00 (-.13,.13)	1.00	.07	-.24* (-.28,-.20)	-.16	.02	-.01 (-.05,.02)	-.01	.02	.26* (.21,.31)	.13	.03	.25* (.18,.31)	-.11	.03
Sex	.05* (.01,.10)	.03	.02	-.29* (-.42,-.16)	**.75**	.07	-.36* (-.40,-.33)	**-.26**	.02	.01 (-.02,.05)	.01	.02	-.29* (-.34,-.24)	-.16	.02	-.28* (-.34,-.21)	.09	.03
Income	.05* (.02,.07)	.05	.01	-.17* (-.28,-.06)	.85	.06	.01 (-.01,.03)	.01	.01	-.02* (-.04,-.01)	-.03	.01	-.04* (-.07,-.01)	-.04	.01	-.06* (-.10,-.03)	-.05	.02
Parents' income	.05* (.02,.07)	.05	.01	.01 (-.05,.06)	1.01	.03	.02 (-.01,.03)	.03	.01	.01 (-.01,.03)	.02	.01	.01 (-.01,.03)	.01	.01	.02 (-.01,.05)	.02	.02
N	5,576			5,563			5,502			5,576			5,576			5,576		

Notes: All variables are from Wave 4 (race and parents' income are from Wave 1; Low self-control is from waves 1 and 2); Income and parents' income are z-transformed variables; Race: 0 = nonwhite, 1 = white; Sex: 0 = female, 1 = male; 95% confidence intervals in parentheses; PPT: psychopathic personality traits; IRR: incident rate ratio; LSC: low self-control; 'Arrested' and 'Incarcerated' refer to whether the respondent was ever arrested or incarcerated; for ease of readability the greatest statistically significant Beta or IRR coefficient value for each model is in bold.
* 95% CI does not include zero (i.e., * $p < .05$).
† Poisson regression model.

Appendix A. Items included in the psychopathic personality traits (PPT) index

The items below were preceded by the following question, "How much do you agree with each statement about you as you generally are now, not as you wish to be in the future?". The items were coded such that 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, and 5 = strongly disagree.

1. I sympathize with others' feelings
2. I get angry easily*
3. I am not interested in other people's problems*
4. I often forget to put things back in their proper place*
5. I am relaxed most of the time
6. I am not easily bothered by things
7. I rarely get irritated
8. I talk to a lot of different people at parties
9. I feel others' emotions
10. I get upset easily*
11. I get stressed out easily*
12. I lose my temper*
13. I keep in the background*
14. I am not really interested in others*
15. I seldom feel blue
16. I don't worry about things that have already happened
17. I keep my cool
18. I go out of my way to avoid having to deal with problems in my life*
19. When making a decision, I go with my 'gut feeling' and don't think much about the consequences of each alternative*
20. I live my life without much thought for the future*
21. Other people determine most of what I can and cannot do*
22. There are many things that interfere with what I want to do*
23. There is really no way I can solve the problems I have*

*Indicates that the item was reverse-coded so that higher scores represent higher levels of psychopathic personality traits.

Appendix B. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.jcrimjus.2014.05.005.

Notes

1. The measure of psychopathy employed in the current study is one that is based on the conceptualization of psychopathy as a personality trait that is continuously, rather than dichotomously, distributed (Lynam et al., 2005). Consequently, we employ the phrase "psychopathic personality traits" (PPT) to indicate this conceptualization.

2. In an assessment of the predictive validity of the PPT index we conducted bivariate analyses between the PPT index and three measures of criminal behavior derived from the Wave 4 interview. The first measure, a 13-item summative index of self-reported criminal behavior, was significantly associated with the PPT index for the full sample ($r = .14$, $p < .0001$, $N = 14{,}133$), females ($r = .15$, $p < .0001$, $N = 7{,}420$), and males ($r = .15$, $p < .0001$, $N = 6{,}713$). Second, the PPT index was associated with having ever been arrested in the full sample ($r = .09$, $p < .0001$, $N = 15{,}548$), females ($r = .08$, $p < .0001$, $N = 8{,}282$), and males ($r = .10$, $p < .0001$, $N = 7{,}266$). Finally, the PPT index was also significantly associated with having ever been incarcerated for the full sample ($r = .10$, $p < .0001$, $N = 15{,}566$), females ($r = .09$, $p < .0001$, $N = 8{,}288$), and males ($r = .13$, $p < .0001$, $N = 7{,}278$). Thus, the PPT index employed in the current study matches theoretical and past empirical expectations in terms of its relationship with criminal offending (i.e., the PPT index has strong predictive validity).

3. The diseases index, the chronic disease index, and the neurological disorders index are employed herein as overall measures of disease or disorder *diagnoses* and not as measures of an underlying factor or construct.

4. An anonymous reviewer suggested that the greater number of missed days of work or school for females may have been due to the effect of pregnancy. We conducted post-hoc analyses to assess the potential influence of pregnancy and found that neither being pregnant during the time of the interview, ever being pregnant, nor the number of times the respondent was ever pregnant had any effect on the association between PPT and the number of days of school or work missed in the past 30 days for females (results available upon request).

References

Balia, S., & Jones, A.M. (2008). Mortality, lifestyle and socio-economic status. *Journal of Health Economics*, *27*, 1–26.

Batty, G. D., Mortensen, E. L., Nybo Andersen, A.M., & Osler, M. (2005). Childhood intelligence in relation to adult coronary heart disease and stroke risk: evidence from a Danish birth cohort study. *Paediatric and Perinatal Epidemiology*, *19*, 452–459.

Beaver, K. M. (2011). The effects of genetics, the environment, and low self-control on perceived maternal and paternal socialization: Results from a longitudinal sample of twins. *Journal of Quantitative Criminology*, *27*, 85–105.

Beaver, K. M., Barnes, J. C., May, J. S., & Schwartz, J. A. (2011a). Psychopathic personality traits, genetic risk, and gene-environment correlations. *Criminal Justice and Behavior*, *38*, 896–912.

Beaver, K. M., Rowland, M. W., Schwartz, J. A., & Nedelec, J. L. (2011b). The genetic origins of psychopathic personality traits in adult males and females: Results from an adoption-based study. *Journal of Criminal Justice*, *39*, 426–432.

Bennett, C. P. W., & Brostoff, J. (1997). The health of criminals related to behavior, food, allergy and nutrition: A controlled study of 100 persistent young offenders. *Journal of Nutritional & Environmental Medicine*, *7*, 359–366.

Black, D. W., Baumgard, C. H., Bell, S. E., & Kao, C. (1996). Death rates of 71 men with antisocial personality disorder: A comparison with general population mortality. *Psychosomatic*, *37*, 131–136.

Boisvert, D., Boutwell, B. B., Barnes, J. C., & Vaske, J. (2013). Genetic and environmental influences underlying the relationship between low self-control and substance use. *Journal of Criminal Justice*, *41*, 262–272.

Bond, J., Dickinson, H. O., Matthews, F., Jagger, C., & Brayne, C. (2006). Self-rated health status as a predictor of death, functional and cognitive impairment: A longitudinal cohort study. *European Journal of Ageing*, *3*, 193–206.

Brissette, I., Leventhal, H., & Leventhal, E. A. (2003). Observer ratings of health and sickness: Can other people tell us anything about our health that we don't already know? *Health Psychology*, *22*, 471–478.

Büchel, C., & Sommer, M. (2004). What causes stuttering? *PLoS Biology*, *2*, 0159–0163.

Campbell, M.A., Porter, S., & Santor, D. (2004). Psychopathic traits in adolescent offenders: An evaluation of criminal history, clinical, and psychosocial correlates. *Behavioral Sciences & the Law*, *22*, 23–47.

Deaton, A. (2003). Health, inequality, and economic development. *Journal of Economic Literature*, *41*, 113–158.

Degenhardt, L., & Hall, W. (2012). Extent of illicit drug use and dependence, and their contribution to the global burden of disease. *Lancet*, *379*, 55–70.

DeLisi, M. (2009). Psychopathy is the unified theory of crime. *Youth Violence and Juvenile Justice*, *7*, 256–273.

DeLisi, M., Angton, A., Vaughn, M. G., Trulsom, C. R., Caudill, J. W., & Beaver, K. M. (2014s). Not my fault: Blame externalization is the psychopathic feature most associated with pathological delinquency among confined delinquents. *International Journal of Offender Therapy and Comparative Criminology* (in press).

Edens, J. F., Campbell, J. S., & Weir, J. M. (2007). Youth psychopathy and criminal recidivism: A meta-analysis of the psychopathy checklist measures. *Law and Human Behavior*, *31*, 53–75.

Ford, J., Spallek, M., & Dobson, A. (2008). Self-rated health and a healthy lifestyle are the most important predictors of survival in elderly women. *Age and Ageing*, *37*, 194–200.

Fox, K., Merrill, J. C., Chang, H., & Califano, J. A. (1995). Estimating the costs of substance abuse to the Medicaid hospital care program. *American Journal of Public Health*, *85*, 48–54.

Fulton, J. J., Marcus, D. K., & Payne, K. T. (2010). Psychopathic personality traits and risky sexual behavior in college students. *Personality and Individual Differences*, *49*, 29–33.

Furnée, C. A., Groot, W., & Pfann, G. A. (2010). Health and income: A meta-analysis to explore cross-country, gender and age differences. *The European Journal of Public Health*, *21*, 775–780.

Gunnell, D., Magnusson, P. K., & Rasmussen, F. (2005). Low intelligence test scores in 18 year old men and risk of suicide: Cohort study. *BMJ*, *330*, 167–172.

Hadley, J. (2003). Sicker and poorer - the consequences of being uninsured: A review of research on the relationship between health insurance, medical care use, health, work, and income. *Medical Care Research and Review*, *60*, 3S–75S.

Hare, R. D. (1996). Psychopathy: A clinical construct whose time has come. *Criminal Justice and Behavior*, *23*, 25–54.

Hare, R. D. (2003). Hare Psychopathy Checklist-revised (PCL-R). *Technical Manual* (2nd ed.). Multi-Health Systems, Incorporated.

Harpur, T. J., Hare, R. D., & Hakstian, A.R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, *1*, 6–17.

Harris, K. M., Florey, F., Tabor, J., Bearman, P. S., Jones, J., & Udry, J. R. (2009). *The National Longitudinal Study of Adolescent Health: Research Design.* Chapel Hill, NC: Carolina Population Center, University of North Carolina [WWW Document] http://www.cpc.unc.edu/projects/addhealth/design.

Harris, K. M., Halpern, C. T., Smolen, A., & Haberstick, B. C. (2006). The national longitudinal study of adolescent health (Add Health) twin data. *Twin Research and Human Genetics*, *9*, 988–997.

Harris, G. T., Rice, M. E., Hilton, Z., Lalumière, M. L., & Quinsey, V. L. (2007). Coercive and precocious sexuality as a fundamental aspect of psychopathy. *Journal of Personality Disorders*, *21*, 1–27.

Hiller, W., & Goebel, G. (1999). Assessing audiological, pathophysiological, and psychological variables in chronic tinnitus: A study of reliability and search for prognostic factors. *International Journal of Behavioral Medicine*, *6*, 312–330.

Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior*, *38*, 21–37.

Jacoby, A., Snape, D., & Baker, G. A. (2005). Epilepsy and social identity: The stigma of a chronic neurological disorder. *The Lancet Neurology*, *4*, 171–178.

Johnston-Wilson, N. L., Sims, C. D., Hofmann, J., Anderson, L., Shore, A.D., Torrey, E. F., et al. (2000). Disease-specific alterations in frontal cortex brain proteins in schizophrenia, bipolar disorder, and major depressive disorder. *Molecular Psychiatry*, *5*, 142–149.
Kastner, R. M., & Sellbom, M. (2012). Hypersexuality in college students: The role of psychopathy. *Personality and Individual Differences*, *53*, 644–649.
Krueger, P.M., & Chang, V. W. (2008). Being poor and coping with stress: Health behaviors and the risk of death. *American Journal of Public Health*, *98*, 889–896.
Lee, W. E., Wadsworth, M. E. J., & Hotopf, M. (2006). The protective role of trait anxiety: A longitudinal cohort study. *Psychological Medicine*, *36*, 345–352.
Lynam, D. R. (2002). Psychopathy from the perspective of the Five Factor Model. In P. T. Costa, & T. A. Widiger (Eds.), *Personality disorders and the five-factor model of personality* (pp. 325–350) (2nd ed.). Washington, D.C.: American Psychological Association.
Lynam, D. R., Caspi, A., Moffitt, T. E., Raine, A., Loeber, R., & Stouthamer-Loeber, M. (2005). Adolescent psychopathy and the Big Five: Results from two samples. *Journal of Abnormal Child Psychology*, *33*, 431–443.
Malow, R. M., Dévieux, J., Rosenberg, R., Nair, M., McMahon, R., Brown, E. J., et al. (2007). Antisocial psychopathy and HIV risk among alcohol and other drug (AOD) abusing adolescent offenders. *American Journal of Infectious Diseases*, *3*, 230–239.
Mantella, R. C., Butters, M.A., Dew, M.A., Mulsant, B. H., Begley, A. E., Tracey, B., et al. (2007). Cognitive impairment in late-life generalized anxiety disorder. *American Journal of Geriatric Psychiatry*, *15*, 673–679.
McClendon, M. J. (1994). *Multiple regression and causal analysis*. Long Grove, IL: Waveland Press, Inc.
McGinnis, J. M., & Foege, W. H. (2003). Mortality and morbidity attributable to use of addictive substances in the United States. *Proceedings of the Association of American Physicians*, *111*, 97–181.
McNaughton, S. A., Wattanapenpaiboon, N., Wark, J.D., & Nowson, C. A. (2011). An energy-dense, nutrient-poor dietary pattern is inversely associated with bone health in women. *The Journal of Nutrition*, *141*, 1516–1523.
Miller, H. V., Barnes, J. C., & Beaver, K. M. (2011). Self-control and health outcomes in a nationally representative sample. *American Journal of Health Behavior*, *35*, 15–27.
Moffitt, T. E. (1993). Adolescence-limited and life-course persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, *100*, 674–701.
Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., et al. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences*, *108*, 2693–2698.
Müller, M., Kowalewski, R., Metzler, S., Stettbacher, A., Rössler, W., & Vetter, S. (2013). Associations between IQ and alcohol consumption in a population of young males: A large database analysis. *Social Psychiatry and Psychiatric Epidemiology*, *48*, 1993–2005.
Mykletun, A., Bjerkeset, O., Øverland, S., Prince, M., Dewey, M., & Stewart, R. (2009). Levels of anxiety and depression as predictors of mortality: The HUNT study. *The British Journal of Psychiatry*, *195*, 118–125.
Nedelec, J. L., & Beaver, K. M. (2014). The relationship between self-control in adolescence and social consequences in adulthood: Assessing the influence of genetic confounds. *Journal of Criminal Justice*, *42*, 288–298.
Nigg, J. T. (2010). Attention-Deficit/Hyperactivity disorder: Endophenotypes, structure, and etiological pathways. *Current Directions in Psychological Science*, *19*, 24–29.
Odgers, C. L., Caspi, A., Broadbent, J. M., Dickson, N., Hancox, R. J., Harrington, H., et al. (2007). Prediction of differential adult health burden by conduct problem subtypes in males. *Archives of General Psychiatry*, *64*, 476–484.
Patrick, C. J., Hicks, B.M., Kruegar, R. F., & Lang, A.R. (2005). Relations between psychopathy facets and externalizing in a criminal offender sample. *Journal of Personality Disorders*, *19*, 339–356.
Piquero, A.R., Daigle, L. E., Gibson, C., Piquero, N. L., & Tibbetts, S. G. (2007). Research Note Are Life-Course-Persistent Offenders At Risk for Adverse Health Outcomes? *Journal of Research in Crime and Delinquency*, *44*, 185–207.
Piquero, A.R., Farrington, D. P., Nagin, D. S., & Moffitt, T. E. (2010). Trajectories of offending and their relation to life failure in late middle age: Findings from the Cambridge Study in Delinquent Development. *Journal of Research in Crime and Delinquency*, *47*, 151–173.
Room, R., Babor, T., & Rehm, J. (2005). Alcohol and public health. *Lancet*, *365*, 519–530.
Shepherd, J. P., Shepherd, I., Newcombe, R. G., & Farrington, D. (2009). Impact of antisocial lifestyle on health: Chronic disability and death by middle age. *Journal of Public Health*, *31*, 506–511.
Single, E., Rehm, J., Robson, L., & Truong, M. V. (2000). The relative risks and etiolofig fractions of different causes of death and disease attributable to alcohol, tobacco and illicit drug use in Canada. *Canadian Medical Association Journal*, *162*, 1669–1675.
Single, E., Robson, L., Rehm, J., & Xi, X. (1999). Morbidity and mortality attributable to alcohol, tobacco, and illicit drug use in Canada. *American Journal of Public Health*, *89*, 385–390.
Smith, T. W. (2006). Personality as risk and resilience in physical health. *Current Directions in Psychological Science*, *15*, 227–231.
Smith, S. S., & Newman, J. P. (1990). Alcohol and drug abuse-dependence disorders in psychopathic and nonpsychopathic criminal offenders. *Journal of Abnormal Psychology*, *99*, 430–439.
Song, J. J., Vanneste, S., Schlee, W., Van de Heyning, P., & Ridder, D.D. (2013). Onset-related differences in neural substrates of tinnitus-related distress: The anterior cingulate cortex in late-onset tinnitus, and the frontal cortex in early-onset tinnitus. *Brain Structures and Functions*, 1–14.
Swogger, M. T., Conner, K. R., Meldrum, S.C., & Caine, E. D. (2009). Dimensions of psychopathy in relation to suicidal and self-injurious behavior. *Journal of Personality Disorders*, *23*, 201–210.
Todd, J., Armon, C., Griggs, A., Poole, S., & Berman, S. (2006). Increased rates of morbidity, mortality, and charges for hospitalized children with public or no health insurance as compared with children with private insurance in Colorado and the United States. *Pediatrics*, *188*, 577–585.
Vachon, D.D., Lynam, D. R., Loeber, R., & Stouthamer-Loeber, M. (2012). Generalizing the nomological network of psychopathy across population differing on race and conviction status. *Journal of Abnormal Psychology*, *121*, 263–269.
Vaughn, M. G., & DeLisi, M. (2008). Were Wolfgang's chronic offenders psychopaths? On the convergent validity between psychopathy and career criminality. *Journal of Criminal Justice*, *36*, 33–42.
Vaughn, M. G., DeLisi, M., Beaver, K. M., Perron, B. E., & Abdon, A. (2012). Toward a criminal justice epidemiology: Behavioral and physical health of probationers and parolees in the United States. *Journal of Criminal Justice*, *40*, 165–173.
Walsh, Z., Allen, A.C., & Kosson, D. S. (2007). Beyond social deviance: Substance use disorders and the dimensions of psychopathy. *Journal of Personality Disorders*, *21*, 273–288.
Wessman, M., Terwindt, G. M., Kaunisto, M.A., Palotie, A., & Ophoff, R. A. (2007). Migraine: A complex genetic disorder. *The Lancet Neurology*, *6*, 521–532.
Whalley, L. J., & Deary, I. J. (2001). Longitudinal cohort study of childhood IQ and survival up to age 76. *BMJ*, *322*, 1–5.
Wiebe, R. P. (2003). Reconciling psychopathy and low self-control. *Justice Quarterly*, *20*, 297–336.
Wright, J., Beaver, K., Delisi, M., & Vaughn, M. (2008). Evidence of negligible parenting influences on self-control, delinquent peers, and delinquency in a sample of twins. *Justice Quarterly*, *25*, 544–569.
Wu, T., & Barnes, J. C. (2013). Two dopamine receptor genes (*DRD2* and *DRD4*) predict psychopathic personality traits in a sample of American adults. *Journal of Criminal Justice*, *41*, 188–195.