Fear of violent crime and anxiety/depression among adolescents

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1. Introduction

Fear of crime has been defined in many ways; one of the broader, earlier definitions describes it as an emotional reaction exemplified by a sense of danger and anxiety related to a perception of physical harm. (Garofalo, 1981; Skogan & Maxfield, 1981) The fear response includes a series of physiological and psychological reactions that alert an individual to potential danger and allow individuals to prepare to respond to threats. (Ferraro & LaGrange, 2007; Garofalo, 1981; Marks & Nesse, 1994; Silberman, 1981) However, the occurrence of fear, while serving a purpose to protect oneself from danger, can be harmful if the resulting physiological and psychological processes remain unresolved. (Consedine & Moskowitz, 2007; Skogan & Maxfield, 1981; Warr, 2000) While the body's response to fear was mainly designed to deal with immediate short term threats (e.g., an animal attack), fear experienced today by many in the United States results from stressors that are chronic; thus, the resulting elevation of the fear response remains unresolved as a result of unremitting stressors and therefore, potentially injurious to those experiencing fear. Fear of neighborhood violence, for example, is generally not felt intermittently but is experienced repeatedly over time by those who live in areas where they feel unsafe.

Potential consequences of fear include behavioral health outcomes (Stafford, Chandola, & Marmot, 2007; Whitley & Prince, 2005) Fear of crime has been associated with poorer behavioral health (i.e., mental health and/or substance abuse) and cognitive functioning though causality has not yet been established. (Stafford et al., 2007) Specifically, fear has been associated with a greater incidence of depression, with one study showing that those in the top tertile of experiencing fear were 90% more likely to be depressed. (Stafford et al., 2007) The most severe experiences of fear (often for those with a history of prior victimization) have been associated with post-traumatic stress (Brewin, Andrews, & Rose, 2000).

Abstract

Fear of crime has been associated with mental health outcomes. Yet, causal relationships have not been established. We examined the relationship between fear and mental health while accounting for potential endogeneity. A sample of 2329 adolescents from the Project on Human Development in Chicago Neighborhoods dataset was analyzed to assess the effect of fear of neighborhood violent crime on anxiety/depression. Instrumental variable (IV) methods were used to address endogeneity. There is evidence that the estimated effect of fear on depressive symptoms does not suffer from endogeneity bias in single-equation models. Adolescents who were more fearful had higher anxiety/depression scores. In adjusted analyses, for each one unit increase in fear (in this case, a move from one level of fear to the next), anxiety/depression scores increased by 1.32 points. There is support for the hypothesis that fear of neighborhood violent crime caused an increase in anxiety/depression scores among adolescents. Many programs address exposure to violence as a potential cause of depression, however few address the fear of violent victimization as a cause. Interventions and services should address fear as a root cause of anxiety/depression among adolescents.

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Specifically for adolescents, fear has been associated with depression, anxiety, oppositional defiance disorder and conduct disorder. (Aneshensel & Saccoff, 1996; Duncan, 1996) These can all lead to reductions in overall quality of life and may form a framework for these children for continued behavioral health consequences into adulthood. (Sawyer et al., 2002)

Importantly, although fear has been associated with myriad behavioral health outcomes, a causal relationship between fear and these outcomes has not been established among adolescents. It is important to understand whether fear has a causal relationship with behavioral health outcomes because while fear of violent crime can lead to poor mental health outcomes, mental health issues can also lead to increased fear. This potential endogeneity bias needs to be addressed in order to establish causality. Without understanding the direction of the effect, it is not possible to develop interventions aimed at prevention. This paper uses an econometric technique designed to address endogeneity bias in order to test the hypothesis that increased levels of fear of crime lead to increased severity of anxiety/depression among adolescents.

2. Methods

2.1. Data source

Data were obtained from The Project on Human Development in Chicago Neighborhoods (PHDCN), a longitudinal study that includes four waves of data (i.e., baseline assessment and three follow-up waves) carried out from 1994 through 2001. (Earls, Brooks-Gunn, Raudenbush, & Sampson, 2002) Data were collected on adolescents, their families, schools, and neighborhoods to account for both individual characteristics and environmental attributes. Neighborhoods, blocks and residents were chosen using a three-stage sampling design to assure that the sample was representative of the city of Chicago. (Earls et al., 2002) Over 6000 children and adolescents in these neighborhoods were randomly selected to participate in the Longitudinal Cohort Study, which administered surveys to adolescents and their primary caregiver. For further details about the dataset, see Earls and Buka (1997).

2.2. Study sample

Data from Waves Two and Three of the Longitudinal Cohort Study were pooled for four age cohorts of adolescents ranging from almost 11–17 years of age to create a single sample. Adolescents were categorized as cohorts that were followed so the cohort group number represents the age that they were at first assessment and not at the current assessment, i.e., if they were enrolled at age 9 during Wave 1 then they were in “Cohort 9” but were approximately 11 years old in Wave 2 and 13 years old in Wave 3. Four different cohorts (Cohorts 9, 12, and 15 in Wave Two and Cohort 6 in Wave Three) were included in this analysis. Cohorts 9, 12, and 15 were asked the same questions in Wave Two that Cohort 6 was asked in Wave 3. However, these cohorts were not asked the same questions in both waves; thus, there were no repeated measures for the variables of interest in this study. These age cohorts were the only ones that had all measures available and allowed for an adequate sample size. The measures were not repeated for the available cohorts across waves, prohibiting longitudinal analysis. The final sample size was 2329.

2.3. Variables

The dependent variable was depressive symptoms, which was assessed using the Anxiety/Depression subscale of the Youth Self Report instrument. The Anxiety/Depression subscale of the Youth Self Report is a previously validated instrument for assessing depressive symptoms adolescents (Cronbach α = 0.84). (Achenbach, 1991; Achenbach, n.d.) This subscale consists of 13 items and was analyzed as a continuous variable with a range of zero to 26 (each item in the scale was ranked by the subject as either 0 = not true, 1 = somewhat or sometimes true, or 2 = very or often true). These symptoms are assessed for the previous six-month time period.

The regressor of interest is fear of neighborhood violent crime. Fear of violent crime, was measured with the following item asked of all respondents: “How afraid are you that you might be hurt by violence in your neighborhood?” Response categories were: not afraid, a little afraid, or very afraid. Fear of neighborhood violent crime was coded as a categorical variable (1 = Not afraid of neighborhood crime, 2 = A little afraid of neighborhood crime, 3 = Very afraid of neighborhood crime) but is treated as a continuous variable in the main analysis in order to analyze these data using a limited information maximum likelihood (LIML) model (see below). Covariates were chosen based on a literature review and development of a conceptual model (see Appendix A) and are listed in Table 1. These include caretaker depression, caretaker marital status, chronic condition/impairment, age cohort, exposure to violence, household income, how far the adolescent thinks they will go in school, caregiver reported quality of education, race/ethnicity, and sex.

2.4. Statistical analyses

To assess the impact of fear of violent crime on depression/anxiety, a single-equation linear regression model (ordinary least squares) was estimated first, to provide a baseline for comparison with subsequent instrumental variable (IV) estimation. It is difficult to assess causality in the absence of random assignment because of unobserved characteristics and the potential for reverse causality; (Blundell & Powell, 2003) if both directions of causality are theoretically possible as in this study, it is empirically impossible to determine whether the predictor of interest causes the outcome or the outcome causes the predictor simply by using an ordinary regression equation. Estimates from an ordinary least squares regression equation could therefore be biased if interpreted as causal estimates.

To address this concern, IV methods were used to assess the potential causal impact of fear of crime on depressive symptoms. An econometric technique known as instrumental variables (IV) can be used to show that the predictor of interest is causing the outcome rather than something unobservable causing the outcome, or that the outcome is causing the predictor of interest (i.e., reverse causality) if randomization is not possible. Thus, assuming IV assumptions are met, instrumental variables can be used to address potential bias caused by endogenous explanatory variables. (Greenland, 2000) A limited information maximum likelihood (LIML) model was used instead of two-stage least squares (2SLS) due to the fact that it performs better in smaller samples and in the presence of weak instruments. (Hahn, Hausman, & Kuersteiner, 2004; Baum, Schaffer, & Stillman, 2007) Although LIML does require the assumption of independently and identically distributed (i.i.d.) disturbances, it is statistically possible using LIML to generate efficient estimates with standard errors that are robust even if the data suffer from heteroskedasticity (non-constant variance), thereby violating the i.i.d. assumption.

2.5. Choice of instruments

In order to “identify” the causal effect of the endogenous regressor of interest, it is necessary to have variables in the model that meet certain assumptions. The most important assumptions that must be met by these variables, known as instruments, are that they must predict the endogenous regressor of interest (here, fear of crime) and cannot have a direct effect on the outcome of interest (mental health). Thus, in this paper, potential instruments are variables that predict fear of crime but do not have a direct effect on mental health. Instruments are allowed to have an indirect impact on mental health through fear, as valid instruments will influence fear and fear is hypothesized to affect behavioral
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