ABSTRACT: **Background:** Theory and empirical evidence suggest that economic contraction predicts increased incidence of psychological disorder. The extent to which this relation can be causally attributed to the economic experiences of individuals remains uncertain. **Methods:** We critically examine literature concerning the impact of economic contraction, measured at the individual or ecological level, on four mental health outcomes (depression, suicide, substance abuse, and antisocial behavior) from the past two decades. **Results:** In the studies that best establish causality, research indicates a moderate but significant adverse effect of job loss on individual depression symptoms, but the net population effect remains speculative. For suicide and antisocial behavior, individual- and ecological-level studies converge to suggest a moderate positive association with economic contraction. Although some research on substance abuse suggests procyclical effects, the majority indicate that job loss significantly increases the risk of heavy drinking and symptoms of alcohol abuse. For all outcomes, various characteristics of the population or the specific economic exposure studied can modify the overall association. **Conclusions:** The studies reviewed suggest that adverse economic transitions predict increased mental health.
health problems, particularly depression, suicide, and substance abuse. The strength of the association, particularly when measuring the response of populations to contracting economies remains unclear.

The current economic downturn is among the deepest to strike the international community since the Great Depression. With so many facing job loss and financial reversals, we believe it useful to review the accumulated evidence concerning the relation between economic contraction and mental health. The popular press frequently reports individual examples of a rise in mental illness associated with the worsening economy (e.g., [1]), but only future empirical studies can ascertain whether incidence increased during this period. Much effort, however, has been expended on investigating the economy–mental health relation throughout past decades, and this research can help inform our understanding of what to expect for the duration of the current recession and beyond.

Mental disorders represent a substantial burden of disease worldwide. A recent review of the international literature on the economic consequences of mental illness concludes that direct treatment costs for these illnesses accounts for between 1 percent and 2 percent of total national health-care costs in the United States, Europe, and the United Kingdom. Once indirect costs are added in, the estimate for total costs is considerably higher [2]. In addition to the often devastating psychological and social effects of mental illness, psychiatric disorders can have significant consequences for physical health. Depression and other affective disorders have repeatedly been shown to increase risk for cardiovascular disease and stroke [3–6], while alcohol abuse is associated with liver disease and certain kinds of cancer [7]. In 2001, the World Health Organization highlighted the urgency of finding effective prevention and treatment for mental disorders and called for a significant increase in funding for research investigating the causes, courses, and outcomes of these illnesses [8].

The literature includes many reports suggesting that economic adversity, at both the individual and population levels, may contribute to the onset of mental disorders. Although that evidence has been reviewed over the years [9–15], the magnitude of the current economic contraction, a wealth of new research, and limitations of previous reviews provide the impetus for us to comprehensively reexamine the field. More than 80 original-research studies assessing the relation between various measures of economic contraction and mental health have been published since 1991 (when the last comprehensive review of the field was published [9]), more than one-half of them since 1999. In contrast to much of the earlier work, many of these recent studies have incorporated longitudinal designs, controls for important confounding variables, and sophisticated statistical techniques that together should allow for improved estimates of the nature of the association.

We provide a rigorous assessment of the recent literature concerning the impact of economic contraction on four main mental health outcomes: major depression and anxiety disorders, suicide, substance abuse, and violence/antisocial behavior.
We focus on studies published since 1990 and primarily discuss those using a longitudinal design, because such studies provide the best opportunity for elucidating whether economic contraction leads to poor mental health or vice versa (i.e., reverse causation).

We organize this article into several sections starting with a discussion of the two principal categories into which we have separated the literature: those that use individuals as the unit of analysis and those that use populations. We then provide a brief overview of the theoretical models explicit or implicit in the literature. We next describe our methods for selecting and reviewing the articles included in this study and, in the subsequent section, we present our findings. We organize the findings into four subsections corresponding to our outcomes of interest, and within each subsection we separately discuss analyses at the individual and population levels.

**Individual-Based and Ecological Studies**

Building on the example of frequently cited reviews of the health effects of economic insecurity [9, 11], we organize our review using two broadly defined objective measurements of economic contraction based on the level of analysis. In this literature, individual-level analyses measure economic contraction as experienced by individual people: therefore, in these studies, the unit of analysis is the person, and economic contraction refers to job loss, change from employment to underemployment, transfer into the welfare system, or alternatively, gain of new employment. In contrast, ecological analyses use population aggregates to measure the association over time between economic contraction, operationalized primarily as the unemployment rate, and incidence of a relevant mental health outcome.

Individual and ecological approaches measure different processes, and both have utility. Public health professionals and clinicians can use the findings from individual-level studies to identify the mechanisms by which economic contraction affects mental health and to identify at-risk individuals. Associations found in individual-level studies may, however, arise from reverse causation. Data typically used in individual-level studies cannot rule out the possibility that preexisting mental illness caused the adverse change in economic circumstances. Predisposition to mental illness or abnormal behavior often begins in childhood [16], creating antecedents that may influence an individual’s probability of getting hired, fired, or responding adversely to economic adversity.

Epidemiologists and psychologists have long been wary of ecological analysis [17] because they fear that naïve readers will infer that an association between two characteristics of a population (e.g., the incidence of unemployment at time $t$ and of mental illness at $t+n$) implies that individuals who experienced the independent variable (i.e., not working but looking for work) also exhibited the dependent variable (i.e., mental illness). No fallacy, however, follows if research consumers
use ecological analyses to anticipate changes in incidence that predictably follow changes in unemployment. As described in the following discussion, such estimates can inform policy formation by anticipating the “net effect” of mechanisms, triggered by economic contraction, that either increase or decrease the incidence of the dependent variable.

Ecological and individual studies can, when they yield similar results, complement each other in that the strength of one compensates for the weakness of the other. Finding similar associations in individual and ecological studies increases confidence in the inference that economic contraction causes observed increases in incidence of illness, because “reverse causation and the ecological fallacy cannot survive both” [9, p. 1148].

Theories and Pathways

Theory suggests that economic contraction may impact mental health through several pathways at the individual level [11]. Economic contraction may directly affect individuals by putting them out of work, causing them to lose income, and removing work-based social networks. These losses, in turn, increase psychosocial and material stress, and they strain nonwork-based social relationships including those with spouses, partners, and other family. Contraction of the economy may also have direct effects on persons remaining employed, through restructuring of job routines and decreased job security and pay, coupled with increased hours and workload. Economic contraction may act on those not directly affected by unemployment through indirect effects such as loss of psychosocial assets, through social contagion pathways, or through decreased community resources. Finally, economic contraction may indirectly affect family members and dependents of job and income losers through family disruption or divorce.

Stress and coping theories have often been invoked as mediators of the relation between economic contraction and mental health. Job loss is often conceptualized as a stressful life event, challenging an individual’s ability to cope, both through financial strain and through the loss of the psychosocial benefits of work, which in some cases may induce negative changes in mental health. Aggregate unemployment may also increase stress among those not directly affected, for example, through changing the structure of work. However, remaining employed during a period of layoffs may inhibit behaviors considered aberrant, thereby reducing the risk of both layoff and mental health diagnosis.

One group of theories describes changes in the psychosocial environment associated with job loss, which then impact the mental health of job-losers. In Jahoda’s [18] functional model, employment provides not only the manifest function of income but also imparts latent functions such as structured time, social contact, and status. The loss of a job deprives the individual of these latent functions, provoking distress. Similarly, Warr [19] described environmental features or “vitamins” that
affect mental health, including social status, income, goals, and opportunity for control, among others. He claimed that job loss affects mental health by depleting these vitamins from an individual’s environment.

Other theories attribute the effects of job loss to the affected person’s understanding of its cause and to subsequent coping mechanisms. For example, frustration aggression theory [20, 21] has often been invoked to explain the link between job loss and increased risk of violence [22–24]. This theory suggests job loss, due to slack demand for labor rather than poor performance, creates frustration, because the experience interferes with goal attainment and may be perceived as unfair. Such circumstances induce frustration, and a fraction of those who become frustrated cope through aggression. Therefore, antisocial behavior can be induced or provoked by job loss. Similarly, alcohol and other substance use can serve as a coping mechanism in response to stressful experiences. Both initiation and relapse of substance abuse are thought to be influenced by stress [25].

Rising unemployment also affects those who remain employed. Frustration aggression theory includes inhibitory mechanisms such as expectation of punishment, which act to reduce deviant behavior, including aggression, substance use, and other behaviors associated with mental illness. Being laid off is one such punishment, the threat of which increases internal regulation of behavior. Therefore, among those remaining employed during economic contraction, the fear of layoffs may inhibit deviant behavior, such that the incidence of violence, substance abuse, and mental illness decreases among those who do not lose their jobs [22]. Consequently, the net effect of economic contraction at the population level may be less than that expected from increases among job-losers, because of the countervailing decreases among the employed.

Persons frustrated by job or income loss need not aggress overtly against others. They may, rather, become less tolerant of the petty or noisome deviance of others they encounter in the community [26, 27]. For example, the functional capacity of individuals presented for civil commitment increases when the economy contracts, indicating a context-dependent threshold for mental health diagnosis [26]. Therefore, the increase in diagnosed mental illness may not result entirely from increases in incidence but also from a changing standard of diagnosis or tolerance.

We focus our review solely on the effects of economic events on mental health, independent of the context of noneconomic stressors. However, reciprocal relations have been identified, such that the experience of undesirable economic events increases the likelihood of experiencing subsequent noneconomic stressful events [28]. This effect suggests that the relation between economic contraction and mental health may be more complex than most research indicates [28]. Additional complications arise when considering the transmission of stress from the job-loser to family members and spouses. For example, a husband’s job loss may increase psychological distress in his wife as severely as do adverse events that she experiences directly. Therefore, a focus on job-losers only may underestimate the mental health effects of economic contraction [29].
Methods

The most recent comprehensive literature review in this field that we know of appeared in 1991 [9]. Accordingly, we restrict our review to articles appearing since 1990 and refer the reader to Brenner [30], Catalano [9], Dooley, Fielding, and Levi [11] and Jin, Shah, and Svoboda [13] for an overview of the research prior to this date. We identify articles for potential inclusion in the review using reference tracing from key studies, the Web of Knowledge online citation tracking tool, and electronic searches of computerized databases using relevant keywords.

Major works used for reference tracing include Catalano [9], Dooley et al. [11] and Brand, Levy, and Gallo [31]. Key word searches in the online databases Web of Knowledge, PubMed, and PsycINFO combined the economy-related terms economic insecurity/security, unemployment, job loss, economy, and layoff with outcome-specific keywords, including mental health, depression, anxiety, major depressive disorder, affective disorder, substance abuse, alcohol abuse, violence, and antisocial behavior. All English-language titles identified during the search period (February 2009–June 2009) were reviewed. The resulting list was then filtered through abstract and full-text review to identify the studies of most relevance.

We include studies if they use either (a) ecological-level data with a longitudinal or repeated cross-sectional design, (b) individual-level data with a longitudinal design, or (c) cross-sectional data, if the authors presented plausible arguments for guarding against reverse causation and other significant confounding. Studies meeting these criteria must have also attempted to measure either true prevalence of disorder (via a representative sample or ecological-level data) or diagnosed but not necessarily treated disorder. Intervention studies are only included if they analyze policy-level interventions (e.g., statewide re-employment programs or unemployment benefits) as the treatment. We exclude studies that use socioeconomic status as the exposure of interest, because such research does not address the question of how contraction of the economy affects mental health. We additionally exclude studies that do not include a comparison group, have a small sample size (<50), or do not meet other minimum standards of internal and external validity (including consistent and objective measurement of both exposure and outcome across comparison groups, control for well-established confounding variables, high rate of follow-up, and minimal selection and information bias).

Two independent reviewers assessed article titles and abstracts to select those to be included in the review. Articles of indeterminate quality or relevance were discussed until agreement on inclusion was reached.

Results

Approximately 1,200 studies were identified through PubMed, PsycInfo, and the other sources described. More than 1,100 studies were excluded because they did not meet the inclusion criteria, leaving 67 empirical studies included in the final
review: 29 on depression/anxiety, 14 on suicide, 16 on substance abuse, and 8 on violence/antisocial behavior (see Table 1). Twenty-eight percent of the studies used ecological-level longitudinal data, and 72 percent used individual-level longitudinal data. Study sample sizes for individual-level analyses ranged from 200 to over 2 million.

**Depression/Anxiety**

The impact of adverse economic experiences on depressed mood is one of the most consistent findings in the economy-health literature. Dozens of studies have found statistically significant associations between negative economic transitions and depression, although a few researchers have reported finding no effect [32, 33]. The great majority of these studies are at the individual level; we identified no ecological-level articles examining depression that met our inclusion criteria. While findings from most individual-level studies suffer from the possibility of uncontrolled confounding by reverse causation, a few careful and rigorous studies have surmounted these difficulties and provide reasonably unbiased estimates of effect.

Measuring severity of disorder by self-reported symptoms remains controversial [9], and only psychiatric assessment instruments based on the *Diagnostic and Statistical Manual* (DSM) series, such as the Composite International Diagnostic Interview Schedule, Diagnostic Interview Schedule, and Structured Clinical Interview for DSM–IV Axis I Disorders, permit diagnosis of distinct mental disorders. How conservative researchers should be in their conclusions about the nature of the economy–depression association depends on one’s view of the clinical importance of nonspecific psychological morbidity [34]. While subclinical depression and anxiety do not generally cause substantial functional impairment [35], such “demoralization” is emotionally distressing and may predispose people to other adverse physical and mental health outcomes. Accordingly, we review studies using both kinds of psychological assessment instruments and do not substantially differentiate between the interpretations of their findings.

**Individual-Level Studies**

Research at the individual level has converged on the finding that economic contraction poses a significant risk for depression symptoms. Analyzing two large
longitudinal surveys, Burgard, Brand, and House [36] used self-reported data on the reasons for job losses, as well as the timing of the job losses and acute negative health events, to discriminate between health-related job losses and other involuntary job losses. They showed that losing a job for reasons unrelated to health significantly increased participants’ risk for depressive symptoms even after controlling for labor force experience, mental ability, and socioeconomic variables. In a smaller scale study using a sample of Mexican-Americans, Catalano, Aldrete, Vega, Kolody, and Aguilar-Gaxiola [37] found that odds of suffering a first-ever episode of clinical depression in the six months before the survey was more than five times higher (odds ratio [OR] = 5.7) among those who had lost jobs 7 to 12 months before the survey. Several other studies have also found evidence of increased depression and anxiety symptoms resulting from job loss, with ORs averaging somewhat under 2.0, even after controlling for mental health status at previous survey waves [38–43]. However, without detailed information about the chronology of symptoms and unemployment, these researchers could not rule out the possibility that an unmeasured intrawave onset of depression or underlying vulnerability to mood disorder caused the subsequent job loss. While all of these studies did reaffirm previous evidence that reverse causation is an important factor in shaping labor market engagement [33, 44, 45], the consistency of their support for a causal relation between economic contraction and depression is noteworthy.

A variety of more specific permutations of the economy–depression relation have also been investigated. Some researchers have focused on how one type of economic change (usually job loss) might affect different subgroups, such as men versus women. We designate this type of study as population characteristics research. Another group of researchers have focused on how different types of economic exposures, such as layoffs versus plant closings, might affect a population. We designate this type of study exposure characteristics research.

Population characteristics. Many of the early studies in this literature focused on men, as the researchers were assessing the effects of job losses or layoffs among blue-collar factory workers, who were chiefly male [9, 13]. However, women are far more likely to be diagnosed with depression in the general population [35], and researchers have noted the value of understanding whether job loss affects men and women differently [40]. Many studies either statistically control for sex, restrict their analyses to either men or women, or do not examine sex differences even when possible, apparently assuming that sex is a confounder without testing to determine whether it does, in fact, confound the results. However, results from several studies indicate that sex can act as an effect modifier on the effect of economic adversity.

Some authors have found evidence that men are more psychologically affected by job loss than are women [46, 47]. Brand et al. [31] found that men but not women were significantly more likely to report depression as a result of being laid off. These authors suggested that differences in social and economic roles may explain this variation: Men may have more attachment to the labor force and greater psychosocial needs for re-employment, particularly as they approach retirement, than...
do older women. However, the impact of sex appears to be inconsistent. Brand et al. also found that among workers who lost their jobs as a result of plant closings, only women reported significantly increased depression symptoms. Likewise, Mandal and Roe [42], using the same population as Brand et al. but with different methods and an updated data set, reported that women were more distressed by any job loss than were men. Many other studies report no heterogeneity between men and women in analyses of the effect of job loss on psychological distress or of the effect of depressive symptoms on subsequent employment status [40, 41, 43, 48, 49]. Depressed men may also encounter more intense selection processes than do depressed women, forcing them to depart more frequently from or remain out of the labor force [50].

Age has also been suggested as an important factor in the relation between employment status and mental health. As reviewed by Breslin and Mustard [38], cross-sectional data indicate that psychological distress brought on by job loss may be worse in middle-aged and older adults than in young adults, perhaps due to the more serious financial and family responsibilities borne by older workers. Using longitudinal data, Breslin and Mustard found support for this hypothesis, reporting that becoming unemployed was associated with significantly higher distress levels and borderline significant levels of clinical depression among older adults. No relation was found among young adults. A few studies have found that young adults (generally in school-leaver samples) did not experience increased risk of depression symptoms with unemployment (e.g., [32]), but others have found that becoming unemployed significantly predicted symptoms in young people [41, 51, 52]. Longitudinal studies of older adults have consistently reported that losing a job increases risk for psychological distress [31, 42, 53].

Lastly, a few studies have examined whether race interacts with the economy–depression relation. Both African-Americans and Hispanics have lower rates of depression and most anxiety disorders compared to whites [54, 55] but are more likely to be unemployed and to occupy low-paying positions. Catalano et al. [37] found that Mexican-Americans in a Fresno, California sample were significantly more likely to be clinically depressed after losing a job, while Rodriguez, Allen, Frongillo, and Chandra [56] reported that current unemployment was not related to depression in African-Americans, after controlling for previous depression. The relation was significant in whites.

Exposure characteristics. Although involuntary job loss is the most widely recognized form of adverse employment change, persons with unstable or inadequate employment (involuntary part-time or underpaid employment) make up an increasingly large percentage of the workforce [40, 57] and may also be at risk for psychological distress. Generally, studies have reported that the levels of psychological distress associated with unstable/inadequate employment lie somewhere between those linked with satisfactory employment and unemployment. Dooley, Prause, and Ham-Rowbottom [40], who conducted some of the earliest work in this area using the National Longitudinal Survey of Youth (NLSY) sample, reported that shifting
from stable employment to inadequate employment predicted a similar level of significantly increased risk for depression symptoms \((b = 0.67)\) as did losing a job \((b = 0.84)\), even controlling for mediating variables and previous depression [40]. Likewise, Bjarnason and Sigurdardottir [48] reported that moving beyond unemployment to secure employment was associated with significantly less psychological distress, while moving to temporary employment was associated with an intermediate level of distress. Using the British Whitehall cohort, researchers found that insecure re-employment after job loss predicted increased psychiatric distress (OR = 1.4), albeit to a lesser extent than did unemployment (OR = 2.2) [58]. Exposure to chronic job insecurity is often associated with the worst psychiatric outcomes [53, 59]. In a sample of unemployed NLSY adults, however, having found any kind of employment—adequate or inadequate—by a subsequent survey wave was associated with less depression [50]. Re-employment has been shown to significantly reduce depression symptoms in a number of other studies as well, including in a series of studies using a randomized controlled jobs training intervention program [60–62]. Such evidence suggests that, in general, inadequate or insecure employment is detrimental to mental health but that having any kind of employment is protective compared to the significantly increased risk associated with job loss.

Length of unemployment has proven to be a less consistent factor in predicting depression symptoms. Any additive effects observed in the long-term unemployed may result in part from confounding by health selection, as trait characteristics predisposing an individual to depression would be expected to influence persistently labor market engagement. Alternatively, financial strain and other stressors intensify with duration of unemployment, potentially increasing stress-related depressive symptoms. One study of British men reported that after excluding men with a measure of preexisting depression tendencies from the sample, accumulated unemployment remained a statistically significant risk factor for symptoms of anxiety and depression (risk ratio \([RR] = 1.63)\), although recent unemployment was associated with the highest risk \([RR] = 2.10)\) [51]. In a recent meta-analysis, McKee-Ryan, Song, Wanberg, and Kinicki [14] found that the long-term unemployed had much lower levels of well-being than did the short-term unemployed. However, some researchers have found no relation between length of unemployment and depression symptoms [38, 52], while others found a protective effect of long-term unemployment, at least among white men [56]. Such findings may reflect the positive response [14] or eventual psychological adaptation [38] to unemployment in a subset of the population.

Most studies exploring the differential effects of distinct types of job displacement (layoffs vs. plant closings) have restricted their analyses to economic or somatic outcomes or have lacked appropriate control groups, undermining the validity of their conclusions (see [13] and [31] for reviews). As discussed previous, Brand et al. [31] examined the effects of these two job displacement types using the Health and Retirement Survey and found strong effect modification by sex. The conflicting theoretical rationales and paucity of empirical data on this relation encourage further research in the area.
Ecological-Level Studies

The dearth of ecological analyses is unfortunate, as it constrains the strength of conclusions drawn from research on depression and economic contraction. Several studies of this type were conducted prior to 1990; some found that economic conditions did not predict depressive symptoms—either directly or through increased stressful life events—and others reporting that economic contraction did predict symptoms of psychological distress (see [9] for a review). Such inconsistencies and the general lack of empirical data call out for further research investigation. The metrics used in measuring depression, however, preclude ecological analyses of the effects on incidence in the general population, as treated disorder is only measured at the aggregate level. The “net effect” of economic contraction on depression symptoms remains unknown at this point.

Conclusions and Limitations

Evidence from the individual-level literature strongly indicates that economic contraction increases risk for psychological distress, specifically symptoms of depression. While not consistent in all groups across all exposure types, losing a job or transitioning to employment in an insecure job appears to increase depressed mood at twice the rate experienced by those remaining stably employed. This effect is remarkably robust across dozens of studies. Nevertheless, the magnitude of the effect is moderate, and many studies’ estimates are undoubtedly inflated by unmeasured reverse causation processes. The possibility also exists that a subset of the population with predisposition to psychological problems is responsible for much of the observed effect, a hypothesis generally untested.

We offer several additional caveats about findings from the individual-level literature on depression/anxiety. Most surveys necessarily entail long time intervals between survey waves, often of two years. As previously noted, this risks misclassification of depression episodes as resulting from, rather than causing, job loss. Nearly 20 percent of depressive episodes last longer than 24 months and close to 40 percent longer than 6 months [63]; more severe episodes are more likely to precipitate job termination. It is also possible that the intervals result in underestimates of the effect of job losses unrelated to health, if short-term depressive episodes are missed. Lastly, control for mediating factors varies widely among studies, and the literature offers no consensus on which mechanisms are primarily responsible for the pathway between economic contraction and depression.

Suicide

As with many negative health outcomes, suicide rates are consistently found to be higher among the unemployed than among the employed [64, 65]. Unemployment
may increase the likelihood of suicide because (a) it precipitates increased risk for problems such as mental illness, marital stress, or financial strain, which can then lead to suicide; (b) it heightens vulnerability to suicidal tendencies by magnifying the impact of other stressful life events; or (c) it is confounded by a third variable that independently predicts both unemployment and suicide risk. Distinguishing among these effects has posed a challenge for researchers dating to Durkheim in the late nineteenth century [66].

**Individual-Level Studies**

Longitudinal cohorts have been assembled in a variety of countries (including the United States, New Zealand, the United Kingdom, Denmark, Italy, and Pakistan) to assess the role of individual-level economic factors in suicide risk. Such cohorts are frequently drawn from random samples of government vital statistics records; the accumulated body of results therefore includes highly representative samples from diverse populations. Typically, these individual-level data sets include information on participants’ sex, age, socio-economic factors, marital status, and employment status, and more infrequently, history of mental health problems and exposure to stressful life events. Because multiple measurements of the various risk factors are only rarely available, competing tests of the three hypotheses previously discussed are generally impossible.

These studies find that unemployment is a moderate but significant risk factor for suicide, with reported relative risk magnitudes varying between 1.35 and 3.0. We identify just three individual-level studies that adjust for previous mental health status. In a population-based case-control study of suicide victims in Denmark, Mortensen, Agerbo, Erikson, Qin, and Westergaard-Nielsen [67] found that unemployment increased the risk of suicide by 35 percent, after controlling for previous mental illness serious enough to necessitate hospital admission, as well as for education, family structure, and income. The authors concluded that unemployment accounts for 3 percent of suicides, but given that the analyses could not control for the impact of milder mental health problems, this percentage may be an overestimate. Blakely, Collings, and Atkinson [68] employed sensitivity analyses to assess the extent of confounding by mental illness in their population-based cohort of New Zealand adults. Their best estimate of the relative risk of suicide for unemployed persons, controlling for mental health, marital status, and socioeconomic variables, was 1.88. This figure represented a 47 percent reduction in excess relative risk from the unadjusted estimate. Likewise, results from a longitudinal study of psychiatric outpatients showed that unemployment was significantly associated with suicide (adjusted hazard ratio [HR] = 2.56) [69]. Findings from several other studies support the idea that unemployment significantly increases risk for suicide, but did not adjust for the mental health status of study participants [70–72].
Ecological-Level Studies

Aggregate time-series research on suicide and parasuicide (i.e., apparent attempts to commit suicide that are intentionally or unintentionally unsuccessful) has increased greatly since 1990 and now includes analyses conducted in a wide range of populations. Improvements in data quality and statistical methods have resulted in a number of highly rigorous studies. Most of this work adjusts for multiple confounding variables, including rates of divorce, marriage, birth, alcohol use, and labor force participation. The research also includes analyses assessing effects spanning both normal economic cycles and sharp, unexpected economic shocks. These factors—along with the diversity of the populations examined—strengthen the validity and generalizability of the findings.

Suicide rates have been found to correlate positively with the unemployment rate or other markers of economic contraction in the United Kingdom [73], the United States [74], Russia [75, 76], Japan [77], and other Asian countries [78]. Increases in the suicide rate have been particularly striking in the aftermath of severe economic crises. In Japan, Hong Kong, and Korea, suicide rates jumped between 39 percent and 45 percent after the financial crisis of 1998, apparently due in large part to the resulting steep rise in unemployment rather than to changes in the divorce rate or other factors [79]. Suicide rates in Russia also sharply increased in the aftermath of the 1998 economic collapse [75, 76]. This research did not specifically analyze the unemployment rate, instead hypothesizing that the increase in suicides and other deaths was due in part to the general economic chaos, including loss of job security, rapid currency devaluation, hyperinflation, and political and economic uncertainty [76]. Coefficients for the effect size of unemployment on suicide across normal economic cycles tend to be smaller but remain significant [73, 74, 77]. Some studies have, however, reported negative findings as well. Platt, Micciolo, and Tansella [78] found that change in the suicide rate across 18 regions of Italy was unrelated to change in the unemployment rate, and Hintikka, Saarinen, and Viinamaki [80] reported that suicide mortality in both men and women was negatively related to unemployment in Finland from 1985–1990. However, unemployment in the Italian study consistently increased over the study period, leaving no empirical experimentation with which to assess the effects of declining unemployment. Likewise, the Finnish study period may not have been long enough to draw firm conclusions about the nature of the unemployment–suicide relation in that population. All other studies reviewed used data spanning at least 21 years.

Population characteristics. Analyses that stratify by age and sex allow for more in depth investigation and demographic-specific conclusions. In general, women commit suicide less frequently than do men [81], and evidence from both ecological-level and individual-level data suggest that unemployment is a more potent predictor of the suicide among men [68, 73–75, 77, 78], perhaps due to men’s greater attachment to the labor force [38]. However, other results from individual-level data are more mixed. In Blakely et al.’s [68] study, effect modification by sex occurred
only among adults between the ages of 18 and 24; unemployed men and women between the ages of 25 and 64 demonstrated similar magnitudes of increased risk. Lewis and Sloggett [72] reported no interaction by sex in their estimates of the unemployment–suicide association, whereas Kposowa [71] found that unemployed women were significantly more likely to commit suicide than were unemployed men (although unemployment predicted suicide risk in both groups).

Additionally, theory suggests that losing a job may be more psychologically detrimental for those with heavy financial and familial responsibilities, such as middle-aged adults. Although some research at the ecological level has reported that suicide rates among working-age adults are indeed more adversely affected by unemployment than are rates among younger and elderly groups [76, 78], other studies have found that older adults are more affected [73]. Most individual-level studies reviewed adjusted for age in their statistical models without examining its role as an effect modifier, leaving the evidence inconclusive.

**Conclusions and Limitations**

Convergence of research at both the individual and ecological levels indicates that economic contraction acts as a moderately sized but important causal risk factor for suicide. The consistency and cross-cultural replication of the findings suggest economic contraction to be nearly universal in its role as a severe psychological stressor. The pathways between unemployment and suicide remain poorly elucidated but implicate mental illness. To what extent such mental illness is newly incident and directly caused by job loss is uncertain, as even the best individual-level data typically use mental health measurements that predate employment status measurements. Future work should aim to identify these mechanisms better and consider potential intervention programs in at-risk populations.

**Substance Abuse**

The literature on the effect of the economy on substance use, while substantial, offers conflicting findings due to different economic exposures studied and different measures of substance use. The most commonly studied substance has been alcohol, although several studies have examined the effect of the economy on illicit drug use. Although alcohol consumption or drug use, particularly at young ages, may reflect risk of future dependence [82], these outcomes do not necessarily reflect mental health problems. Therefore, although studies of alcohol consumption are also included in this review, we draw particular attention to the studies using psychiatric assessment instruments such as the DSM and the Diagnostic Interview Schedule.

**Individual-Level Studies**

*Exposure characteristics.* The strongest evidence for the effect of the economy on substance use comes from individual-level, prospective studies that control
for previous substance use or abuse. Several studies have examined the effect of different economic transitions, using strong assessment instruments rather than simply self-reported consumption. Data from the Epidemiologic Catchment Area Study shows that job loss increases the incidence of clinically significant alcohol abuse (DSM-III criteria for current alcohol abuse or dependence), controlling for history of the disorder (OR = 6.05). However, people remaining employed amid high unemployment are at reduced risk of alcohol abuse. This study found no effect of loss of income without job loss [83]. Another longitudinal study using the NLSY found that adverse changes in employment predicted increased heavy drinking among previous heavy drinkers (OR > 4.0) as well as increased symptoms of alcohol abuse or dependence (OR = 2.21) [84].

Receiving welfare while working, rather than finding sufficient employment, may also increase the risk of substance use. Women working and receiving welfare experience higher odds of heavy drinking, compared to full-time employed women (OR = 3.37), adjusting for previous alcohol use [85].

Reemployment or favorable employment change has also been studied prospectively. Among a community sample of unemployed adults in Norway, Claussen [86] found that reemployment was associated with a lower risk of developing harmful drinking habits (identified using the Alcohol Use Disorder Identification Test), compared to those remaining unemployed. Having a DSM-III diagnosis of alcohol disorder at baseline was associated with a strong selection effect, as none of the individuals with alcohol dependence regained employment during the study. Favorable employment change, either from unemployment or from underemployment, was found to have protective effects in the NLSY [87]. Among individuals with a history of binge drinking, favorable employment change resulted in decreased odds of binge drinking one year later. Changing from unemployment to underemployment was associated with a 91 percent decreased odds of later binge drinking, whereas change from unemployment to employment and from underemployment to employment were associated with 87 percent and 71 percent reduction in the odds of later binge drinking, respectively.

The relation between unemployment and substance use may not remain constant over time following job loss. Rather, one study has found that the risk of drinking correlated positively with time since job loss: Three or more years of involuntary unemployment increased the risk of heavy drinking, controlling for baseline heavy drinking and poverty status (OR = 1.47 for 3–4 years of involuntary unemployment; OR = 1.66 for 5 or more years) [88]. Another study found that short-term unemployment predicted reduced alcohol use but that long-term unemployment led to increased use, although alcohol dependence and alcohol problems did not correlate with employment status [89].

Population characteristics. Several studies have attempted to identify the effect of the economy on substance abuse within population sub-groups. To date, these studies have focused primarily on different age groups. Teenagers and young adults form one subgroup of interest. Arkes [90] found an effect of the economy on...
teenagers in the NLSY. The state unemployment rate showed a positive association with self-reported marijuana and cocaine use among both men and women of white and African-American ethnicity, and some evidence supported a countercyclical effect on alcohol use as well. The economy appeared to affect women and African Americans most strongly. Teenagers were more likely to sell drugs in a weak economy as well. However, this study did not assess substance abuse or dependence, focusing instead on self-reported frequency of use. A study of 17- to 20-year-old Norwegians found no effect of unemployment on volume of alcohol consumed, adjusting for prejob loss drinking and lifestyle covariates such as friends’ drinking behavior. However, frequency of marijuana use increased following unemployment, adjusting for baseline use [91]. A nationally representative survey in the United States found increased prevalence of use of cigarettes, marijuana, and prescription drugs among unemployed 35 year olds, adjusting for substance use in high school [92]. Although this study, part of the Monitoring the Future Study, was a panel design, this analysis does not adjust for recent substance use and may suffer from problems of selection.

Older workers have also received particular attention. Gallo, Bradley, Siegel, and Stanislav [93], as part of the Health and Retirement Survey, found an increased risk for the onset of drinking among older workers who suffer involuntary job loss (OR = 2.01), with most individuals changing from no drinking to light consumption. Controlling for baseline problem drinking and baseline consumption, Gallo et al. found no effect of job loss on alcohol consumption. Perreira and Sloan [94], also using the Health and Retirement Survey, found that retirement increases the risk of heavy drinking, controlling for history of problem drinking. However, no other type of employment transition predicted a change in alcohol use.

Ecological-Level Studies

The ecological studies examining the effect of macroeconomic change on substance use most commonly identify procyclical effects of the economy on alcohol consumption, such that a contracting economy results in reduced consumption at the ecological level. Ruhm [95] found a negative relation between the state-level unemployment rate and both per capita liquor consumption and vehicle fatalities over the time period 1975–88, with hard liquor responding most strongly to the macro economy. Using improved statistical methods and a time span including four economic cycles (1970–95), Freeman [96] reproduced these results several years later for the outcome of state-level alcohol consumption. These authors concluded that substance use decreases during economic contraction because of lowered income.

Two ecological studies have used data from the Behavioral Risk Factor Surveillance System (BRFSS) to examine the relation between economic cycles and the prevalence of drinking behaviors over time. Because the BRFSS consists of repeated cross-sectional assessments, these studies can only draw inference at the
ecological level. Ruhm [97] attempted to replicate his earlier findings using the BRFSS (1987–99). Despite finding no effect of the macro economy on drinking participation, Ruhm found that among drinkers the number of drinks consumed and the probability of drunk-driving showed procyclical variation. Heavy drinkers decreased to moderate use during economic downturns, presumably due to an income effect. Adding unemployment to the model did not change the results. In an exception to the procyclical results, Dee [98] used BRFSS data from 1984–95 and found that economic downturn is associated with a decrease in overall consumption but an increase in prevalence of binge drinking, especially among those who remain employed. Dee observed this same effect in all sex, race, and age strata, but the effect was strongest among men and women ages 18–24. The counter-cyclical binge drinking finding supports the stress mechanism, rather than the income effect.

Conclusions and Limitations

Economic downturn and job loss often lead to increased substance use at the individual level, although some evidence exists of procyclical effects at the population level. Future studies attempting to provide evidence for an effect of macroeconomic change on individual behavior should evaluate the effect of changes in the economic climate, while holding constant individual-level economic transitions such as job loss. However, the studies of macroeconomic effects reviewed lack strong measurements of individual-level economic events and do not follow individuals over time. In addition, these studies do not explicitly measure alcohol dependence or symptoms of alcohol abuse, so they may not reflect mental disorder.

The evidence from well-controlled individual-level prospective studies indicates that individuals suffering involuntary job loss or layoff are at increased risk of alcohol abuse or increased heavy drinking. These studies also support a selection effect, in which those with alcohol problems are more likely to be laid off or less likely to become reemployed. However, favorable employment change shows promise for prevention of alcohol-related disorders.

Although studies attempt to control for history of substance use and abuse, past behavior may not fully capture an underlying propensity for substance abuse. Even some individual-level studies cannot always identify the exact temporal sequence of job loss and alcohol behavior change—for instance, if both changes took place between waves of the survey. Therefore, the temporal ordering of exposure (i.e., job loss) and changes in substance use must be specified clearly.

Finally, the findings at the individual level and the population level at first glance appear to contradict one another. However, these studies do not measure the same outcome: Individual-level studies mostly examine clinically diagnosed alcohol abuse, while the existent population-level studies typically measure total consumption (which includes nonproblem drinking). Further ecological studies of alcohol dependence and substance abuse would be useful to ensure comparable outcomes at both levels of analysis. The countervailing effects of economic contraction on
those who lose their jobs versus those who remain employed help to explain this discrepancy. Although the risk of alcohol use increases among job losers, the decreased risk among the large proportion of the population remaining employed would lead to a net decrease in risk at the ecological level. Future studies should attempt to integrate state- or national-level economic change with individual-level job transitions for a more robust picture of these relations. In addition, the lack of focus on mechanisms such as stress, coping, or change in the nature of social interactions may lead to the lack of consistency even within the individual-level studies. Therefore, further attempts to measure and identify the mechanisms by which economic contraction affects substance use will help to clarify the risks.

Violence/Antisocial Behavior

Individual-Level Studies

Among studies that have investigated the effect of job loss on violence, only one meets our standard of longitudinal data. Using longitudinal data from the Epidemiologic Catchment Area (ECA) survey and measuring the outcome with the DIS, Catalano, Dooley, Novaco, Wilson, and Hough [99] found that suffering a layoff increased the likelihood of violence among people not violent at initial interview (OR = 5.97). However, remaining employed in an industry experiencing high rates of layoffs reduced violent behavior. Finally, they found strong evidence of selection, as violent people were nearly 16 times more likely to be laid off than nonviolent people.

Ecological-Level Studies

Several ecological studies have used time-series methods to explore the relation between weekly unemployment insurance claims and antisocial behavior, using civil commitment for danger to others as the outcome. The results indicate a quadratic relation, providing evidence of provocation effects (i.e., an increase in the incidence of violence following increased layoffs) and then inhibition effects (i.e., reduced incidence of violence as layoffs continue to rise) for both men and women in San Francisco, as well as men in Pennsylvania, with a three-week lag [22, 23]. These findings were replicated in Florida for men with a one- to three-week lag [100].

Researchers have also hypothesized that child maltreatment responds to economic conditions. Ecological studies have found associations between increased child abuse, neglect, and foster home placements and economic conditions. Catalano, Lind, Rosenblatt, and Attkisson [101] conducted a time-series study of the relation between the seasonally adjusted unemployment rate in California and the monthly count of foster home placements in the state and identified both provocation and inhibition effects. These results imply that rising unemployment increases the likelihood of foster home placement, but then the likelihood peaks and declines as
unemployment continues to rise. Using state-level fixed effects methods, Paxson [102] found that a decrease in state welfare benefit levels was associated with an increased risk of foster home placements. Gillam [103] found positive correlations between male unemployment and physical abuse of children at the local level, using an individual-level case-cohort study. Another study also found that children whose mothers were unemployed for at least 21 weeks in the previous year experienced increased odds of being hospitalized for abuse or neglect (OR = 1.3) [104].

Conclusions and Limitations

Both the individual and ecological studies suggest that economic contraction increases the risk of violence among those becoming unemployed. However, evidence also exists that the inhibition effect may also be at work at high levels of labor market contraction. Therefore, the net effect of economic contraction on violence appears smaller than the extrapolated effect on job losers. Future studies should investigate the effects of economic contraction on other types of violence, such as domestic violence or arrests for assault, using longitudinal designs. Additional clarification of the mediators (e.g., stress, changes in social networks or family structure, alcohol use) of this relation would help advance the field.

Conclusion

We conclude that the contraction of an economy has a detrimental effect on the mental health of the population it supports. The evidence is particularly robust for suicide and symptoms of depression, while remaining strong for substance abuse and moderate for antisocial behavior. Economic contraction appears to significantly predict risk of these outcomes independent of hypothesized mediators such as financial insecurity and marital problems, although more research is needed to elucidate mediation pathways. These effects appear mostly stable across demographic groups, although some indication exists that among job losers, men are at higher risk for suicide and older adults are at higher risk for depression. Research on all four outcomes also strongly supports the existence of significant reverse causation effects, and we caution that many of the studies reviewed may suffer from uncontrolled residual confounding from such processes. Findings from a few studies of depression and substance abuse also suggest that individuals with underlying predispositions to mental illness are those most likely to report symptoms after experiencing economic contraction, but additional research that separately examines these effects in psychiatrically vulnerable and resilient groups is needed.

Despite the overall strength of the studies reviewed in this article, the research on economic contraction and mental health suffers from notable gaps. The near total absence of longitudinal ecological-level studies on depression is one such deficiency. The literature on substance abuse could also benefit from further ecological-level studies, while that on antisocial behavior needs additional individual-level
research. Additional characteristics, such as baseline socioeconomic status, age, sex, and availability of unemployment insurance and job training, may modify the relation between economic contraction and mental health but have not been widely studied in the literature to date. The common practice of statistically adjusting for these variables, without examining their impact, has resulted in a lack of theoretical and empirical evidence on their role in moderating the economy–mental health association. Likewise, most reviewed studies did not examine the factors that may mediate the pathways between economic contraction and mental health outcomes. In general, those analyses that controlled for other stressful life events that may result from economic downturn (either on the individual or ecological level), such as divorce or changes in income, found that job loss or unemployment rates remained a statistically significant predictor of increased mental health problems, independent of these other events.

The net effect of economic contraction on populations cannot be reliably estimated from the individual-level findings currently available, and findings at the ecological level fail to agree on effects because, in part, researchers do not agree on methods. We, therefore, suggest that more individual-level research focus on how job loss affects the family members and former coworkers of the job loser. Such work would allow for better estimation of the net psychological effects of economic contraction on communities, if not labor markets or political jurisdictions.

Differences in country- or region-specific social and economic programs (e.g., adequacy of unemployment insurance, universal access to health insurance), as well as cultural norms regarding both responses to economic adversity and mental illness, will inevitably play a role in the impact of economic contraction on mental health. Such resources and cultural norms unquestionably affect both actual incidence of mental health outcomes in a population and the formation of relevant policy decisions. Very few of the reviewed studies discuss the generalizability of their findings given these differences in social and structural resources. Until more research is devoted to understanding how these resources and cultural values moderate the effect of economic adversity on mental health, any conclusions as to their impact must remain speculative.

Importantly, very few studies investigate the psychobiological mechanisms through which unemployment influences mental health [3]. The consistency of an observable effect over multiple mental health outcomes suggests that exposure to economic contraction may precipitate a generalized psychological vulnerability, which then interacts with individuals’ specific socio-environmental circumstances and biological propensities to give rise to a “diagnosable” condition. A better understanding of the physiological basis for economic contraction’s role in mental health would assist in the development of interventions and policies designed to alleviate the psychological suffering associated with job loss and other economic shocks.

The findings reviewed may have important implications for policymakers, particularly in light of the current economic circumstances. Unemployment rates have risen considerably during the latest economic crisis and will likely remain high.
The four primary mental health outcomes discussed here are serious conditions that constitute a significant economic burden, both in terms of health-care costs—more of which will be shifted onto publicly financed providers as employer-sponsored health insurance is lost along with employment—and in terms of lost productivity. Additional research into the effectiveness of existing interventions and programs would be useful [61, 62].

References


