Gender Differences in the Determinants of Distress, Alcohol Misuse, and Related Psychiatric Disorders

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Abstract

This study examines why women exhibit higher rates of psychological distress and affective and anxiety disorders whereas men report more problems with alcohol and alcohol-related disorders. Using two waves of panel data from 5,001 respondents to the National Co-morbidity Survey, confirmatory factor analysis and structural equation modeling are utilized to compare the stress process of distress, alcohol misuse, and meeting the diagnostic criteria for affective, anxiety, and alcohol-related disorders according to access to resources and exposure to stressors. Theories of emotional socialization, self-salience, and gender roles are applied to interpret gender differences in the determinants of mental health outcomes. The results reveal that gender role theory fits best for models of psychological distress and affective and anxiety disorders, whereas emotional socialization and self-salience theories fit best for models of alcohol intake and alcohol-related disorders. The implications of these results and directions for future research on gender differences in mental health are discussed.

Keywords

gender, distress, substance use/abuse, stress process

Why do women have higher levels of psychological distress and higher incidence of affective and anxiety disorders whereas men have higher rates of alcohol misuse and greater incidence of alcohol abuse and dependence? This article addresses this question by applying stress process theory to an analysis of the differential effects of financial hardship and work-related stressors on men and women's mental health. Two theoretical approaches are applied and compared: (1) theories of gender differences in emotional socialization and self-salience that generate internalizing behaviors in women and externalizing behaviors in men and (2) gender role differences in identity wherein men are more vulnerable to stressors related to the breadwinner role and women are more vulnerable to stressors related to family roles. These possibilities are tested analyzing National

Co-morbidity Survey (NCS) data from a panel sample of 5,001 adults interviewed first between 1990 and 1992 and then again between 2000 and 2001, when they were 25 to 69 years old.

BACKGROUND

The stress process model (Pearlin et al. 1981) examines the influences of socially structured exposure to stressors and access to social and

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psychological resources on well-being. Stress is defined as a state of imbalance resulting from environmental demands (stressors) that challenge an individual's capacity to cope (Lazarus 1966; Menaghan 1983; Pearlin 1983). The experience of stress in turn can lead to poor mental health (Thoits 2010; Turner, Wheaton, and Lloyd 1995).

Most of the literature on the outcomes of the stress process focuses on psychological well-being versus distress or depression (Caspi, Bolger, and Eckenrode 1987; Pearlin et al. 1981; Turner and Lloyd 1999). Since women tend to be more distressed than men (Bebbington 1996; Elliott 2001; Griffin et al. 2002; Kessler et al. 2003; National Center for Health Statistics 2007), researchers may have erroneously concluded that women are more vulnerable to stress than are men. Scholars have argued in favor of assessing multiple outcomes of the stress process so as not to underestimate the effects of stress on mental health, especially for men (Aneshensel, Rutter, and Lachenbruch 1991; Horwitz, Raskin White, and Howell-White 1996; Rieker and Bird 2005). Men may respond to stress more often by abusing alcohol, as is suggested by their higher rates of alcohol-related disorders (Grant et al. 1994; Grant and Harford 1995; Kessler et al. 1997). Therefore, this study simultaneously estimates predictors of psychological distress and alcohol misuse and related disorders, focusing on the potential for gender differences in their complex etiologies.¹ For the sake of simplicity, psychological distress and affect and anxiety disorders from here on shall be referred to as *distress* whereas alcohol intake, alcohol abuse, and alcohol dependence will be referred to by *alcohol misuse*.

Emotional distress and alcohol misuse may be functionally equivalent responses to stress that vary by gender (Simon 2002) and that represent differences in gender socialization causing women to exhibit more internalizing problems, namely, holding in negative emotions and turning them against themselves, and men to exhibit more externalizing problems, namely, acting out negative emotions via unhealthy behaviors such as alcohol misuse (Rosenfield, Vertefuille, and McAlpine 2000). One aspect of gender socialization is learning which emotions or behaviors are considered acceptable (Hoschschild 1979; Thoits 1989), and it is considered more appropriate for women to display distress, anxiety, and depression and for men to engage in substance abuse (Nolen-Hoeksema and Hilt 2006; Simon 2002). Another aspect of gender socialization is learning how to value oneself in

relation to others. Self-salience theory argues that women respond to stress with more internalizing disorders such as depression because they are socialized to value others more than themselves, put others' needs before their own, blame themselves for other people's problems, and view themselves as relatively insignificant (Rosenfield et al. 2000; Rosenfield, Lennon, and White 2005; Ruble et al. 1993). Men, in contrast, are socialized to put themselves first, thereby increasing their likelihood of acting out, such as by drinking excessively without regard for its impact on other people, in search of short-term pleasure that appears to be in their self-interest (Rosenfield et al. 2005). In sum, gender role theories of emotional socialization and self-salience, as well as longstanding documentation of gender differences in distress and alcohol misuse, strongly suggest that women will tend to respond to stressors by becoming more distressed, anxious, and depressed, whereas men may respond by drinking too much.

In addition to exhibiting different outcomes to stress, men and women may be differentially vulnerable to stressors when those stressors are tied to gender roles. For example, men may be more vulnerable to stressors in the workplace because they tend to judge their self-worth in terms of their success in the public sphere, whereas women may be more vulnerable to stressors associated with their familial roles because they judge themselves in terms of their relationships with others and their ability to take care of them (Ruble et al. 1993). For example, married women are more vulnerable to becoming distressed as a result of marital and parental strain whereas married men are more vulnerable to alcohol misuse in response to financial hardship (Simon 1998). Furthermore, men tend to report more stress related to financial issues even though they earn significantly more than women, whereas women tend to report more stress in the realms of personal relationships and parenting (Denton, Prus, and Walters 2004) even though women are generally more satisfied with their social relationships than are men (Fuhrer and Stansfeld 2002). Physiological response to stressors also varies by gender, wherein men are more likely to experience increases in cortisol production in response to achievement-related challenges, whereas women experience more increases in cortisol in the face of social rejection (Stroud, Salovey, and Epel 2002).

Financial hardship is a stressor that causes distress (McDonough and Walters 2001; Mirowsky

and Ross 2001) and substance use (Brennan, Schuute, and Moos 1999; Droomers et al. 1999; Moos et al. 1989; Mossakowski 2008). Women tend to have more financial hardship in the form of lower household income because compared to men, they are more likely to be single parents and earn less for the same amount and type of work (Blau and Khan 2007). Financial hardship may cause more distress in women and more alcohol misuse in men to the extent that women and men exhibit gender-appropriate responses to stress. Alternatively, financial hardship may cause more distress *and* more alcohol misuse in men because men perceive themselves as failing to fulfill the traditionally male role as provider when money is tight (Simon 1998).

Stressors on the job such as interpersonal conflict and high strain are associated with greater psychological distress (Bultmann et al. 2002; Vermeulen and Mustard 2000) and stress-induced drinking (Cooper, Russell, and Frone 1990). Job conditions have differential effects on mental health by gender, increasing demoralization in women and alcohol misuse in men (Lennon 1987), in keeping with gender socialization arguments. However, men may be more vulnerable to becoming distressed *and* to alcohol misuse as a result of stressful working conditions because problems at work once again reflect on their failure to succeed in the role as family provider. Similarly, women may be more vulnerable to distress and alcohol misuse in response to interpersonal stressors such as marital strain (although stressors that are typically more salient to women are not tested in the current study).

In sum, emotional socialization and self-salience theories posit sometimes opposing expectations from gender role theory regarding gender differences in vulnerability to stressors: (1) Men and women will respond to the same stressor in gender-typical ways, with men tending to abuse alcohol and women tending to become distressed, versus (2) men and women will respond in differing degrees to the same stressor dependent on whether it is related to a typically feminine versus masculine social role. Because the analyses presented here only include stressors that are typically more salient to men, namely, financial hardship and job stressors, this article cannot fully test the two expectations against one another. However, it can assess whether male-typical stressors increase alcohol misuse *and* distress more so in men than

women or if male-typical stressors increase alcohol misuse more in men and distress more in women.

Stress process theory also identifies resources that protect mental health directly and indirectly through their capacity to combat stressors and attenuate the relationship between stress and illness (Pearlin 1999; Pearlin et al. 1981). Mastery (or sense of control) and self-esteem were identified as resources in the original stress process model (Pearlin et al. 1981). People who are exposed to stressors such as financial hardship are better able to protect their mental health when they can harness their sense of control over life circumstances (Price, Choi, and Vinokur 2002) and shore up a sense of positive self-regard despite their situation (D'Ercole 1988; Turner and Lloyd 1999), although financial hardship itself can undermine both (Krause, Jay, and Liang 1991). Mastery and self-esteem tend to be higher among men than women (Mirowsky and Ross 1989b; Rosenfield et al. 2000; Turner and Roszell 1994), which explains in part why women have higher average distress.

Psychological distress and alcohol misuse may be understood as discrete categories of psychiatric diagnoses that are either present or absent or as continua of problems that vary from nonexistent to very severe. Reliance on diagnostic categories alone likely misrepresents the full effects of stress on health because it overlooks the impact of stress on those who fall shy of a clinical diagnosis but still have substantial problems (Mirowsky and Ross 1989a). Nonetheless, stress may well affect the likelihood of meeting the diagnostic criteria for affective or anxiety disorders versus alcohol-related disorders differently for women and men just as it affects these outcomes when conceptualized as continua. Given the unique nature of the NCS panel data set, this study will examine mental health outcomes conceived of as both continua and as categories.

The stress process model emphasizes the effects of socially structured stressors and resources on mental health, namely, social causation. Cumulative adversity can occur when social factors cause mental health problems to take root, which in turn increase exposure to stressors, leading to stress proliferation (Hatch 2005; Pearlin et al. 2005). For example, mental illness has been shown to render success on the job challenging and job tenure brief (Haiyi et al. 1997).

Thus, this study examines the influence of mental health status on future exposure to stressors as

Figure 1. Conceptual model of the determinants of mental health

Time 1 confirmatory factor analysis (CFA) measures covary and exogenous observed variables covary.

well as the influence of resources and stressors on mental health.

The conceptual model guiding the analyses is presented in Figure 1 and the purpose of the analysis is to determine how the pathways depicted in the model vary between men and women. Concepts that are measured with confirmatory factor analysis are indicated by ovals whereas concepts that are estimated with observed variables are indicated by rectangles. On the far left of the figure are concepts that are exogenous to the model, namely, not predicted by other factors and allowed to covary. Mental health outcomes (i.e., distress, alcohol misuse, and related psychiatric disorders) are assessed at Time 1 and Time 2, and their stabilities over time between them are depicted by p_1 and p_2 . Cross-lagged effects of Time 1 mental health measures on Time 2 measures are numbered p_3 (Time 1 distress on Time 2 alcohol misuse) and p_4 (Time 1 alcohol misuse on Time 2 distress). Stressors (i.e., financial hardship and job stressors) are also estimated at both times and their stability over time is represented by p_5 .

The influence of baseline social-structural position and mental health status on future exposure to

stressors is represented by p_6 , p_7 , and p_8 . Social causation effects are represented by the influence of resources, p_9 and p_{10} (dimensions of self-concept, which were only assessed at Time 1), and stressors, p_{11} and p_{12} , on distress and alcohol misuse, respectively. The influence of other social statuses at Time 2 (marital and employment), education, and age on mental health is represented by p_{13} and p_{14} . Finally, the residual covariance between outcomes is indicated by p_{15} .

According to theories of emotional socialization and self-salience, p_{11} (from stressors to distress) should be greater for women whereas p_{12} (from stressors to alcohol misuse) should be greater for men. However, to the extent that the stressors measured in this model are more salient to men's identities than to women's, paths p_{11} and p_{12} may both be greater for men. In addition, being employed, a role that may be more salient to men's identity than to women's, may reduce mental health problems more for men than for women, or its effects may be outcome specific, such that it reduces alcohol misuse for men and distress for women. Similarly, being married may be more salient to women's identity than to men's, thereby

being more protective for women than men, or it may reduce distress more for men and alcohol misuse more for women.

More specifically, theories of emotional socialization and self-salience will be supported to the extent that lack of resources and the presence of stressors increase distress and related disorders more so for women and increase alcohol misuse more so for men. In addition, these theories will be supported if being married or employed reduces distress and related disorders more for men and reduces alcohol misuse more so for women. In contrast, gender role theory will be supported if stressors tied to the male gender role increase distress more so for men, if being married reduces distress more so for women, and if being employed reduces alcohol misuse more so for men. Finally, both theories will be supported if stressors increase alcohol misuse more for men than for women, if being married is associated with reduced alcohol misuse for women, and if being employed is associated with reduced distress for men.

DATA AND METHODS

Data

Data for this study are from 4,968 of 5,001 individuals who were interviewed once in 1990-1992 and again in 2001-2002 (33 cases were missing on all variables used in the analyses). The first wave constitutes the Baseline National Co-morbidity Survey (Kessler 1990-1992), which includes in-person interview data from a stratified, multistage area probability sample of the noninstitutionalized civilian population age 15 to 54 of the 48 contiguous states of the United States. The baseline NCS response rate was 82.6 percent and the sample size was 8,098. A subsample of 5,877 completed a supplemental survey that included many detailed measures of stressors and resources used in these analyses. The subsample included all respondents age 15 to 24, all respondents who met the criteria for a lifetime *Diagnostic and Statistical Manual of Mental Disorders (DSM)* III-R disorder, and a random subsample of the remainder (Swendsen et al. 2010). In the 2001-2002 follow-up (NCS-2), 5,001 of the 5,877 (85 percent) were reinterviewed (166 had died).

A primary purpose of the NCS was to estimate the prevalence of mental illness in the general population of the United States. This was accomplished

by training nonclinicians to administer modified versions of the Composite International Diagnostic Interview (CIDI; World Health Organization 1990) resulting in diagnosis of *DSM-III-R* disorders in Time 1 using version 1.1 (Robbins et al. 1988) and *DSM-IV* disorders in Time 2 via version 3.0 (Kessler and Ustun 2004). The comparability of diagnoses resulting from the CIDI and those that would have been reached in a clinical mental health interview was established by blind clinical reappraisal interviews with probability subsamples of NCS (Spitzer et al. 1992) and NCS-2 (First et al. 2002) respondents.

Methods of Analysis

Software. Mplus 6.12 software was used to estimate measurement and structural equation models of the data (Muthén and Muthén 1998-2007). All analyses are based on the 4,968 panel sample and are weighted to correct for differential probabilities of selection and nonresponse bias at both waves. Continuous dependent variables are estimated with linear regression, and dichotomous dependent variables are estimated with probit regression. Owing to the clustering of sample respondents into geographic regions, standard errors and χ^2 statistics for all analyses are estimated with the maximum likelihood robust method (MLR) for linear regression and the weighted least squares robust method (WLSMV) for probit regression. MLR and WLSMV are robust to non-normality and nonindependence of observations and utilize a sandwich estimator (Asparouhov 2005).

Model fit. Because the χ^2 test of overall model fit is not reliable for large samples, model fit of confirmatory factor analysis (CFA) and structural equation modeling (SEM) models was assessed by alternative measures of absolute fit, root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR; for models with continuous outcomes), and weighted root mean square residual (WRMR; for models with categorical outcomes). RMSEA is the average of the residuals between the sample covariance and the estimated model, and values less than .06 indicate an acceptable model fit. The SRMR and the WRMR are the weighted average difference between the sample covariance and the estimated model and have no penalty for model complexity, unlike fit indices such as the

Comparative Fit Index (CFI). A SRMR value less than .08 is considered good fit (Hu and Bentler 1999), and an WRMR of less than .9 is considered a good fit (Yu 2002). The Yuan-Bentler modified χ^2 statistic was used to test the relative fit of gender-invariant versus gender-variant models (Satorra and Bentler 2001).

Measurement. Observed control variables include dummy variables for being employed and for being married or living with a partner. Age was measured in years. Education was measured by total number of years of formal schooling completed. Job stressors, measured at Time 1 and at Time 2, was a count variable of up to three stressful experiences on the job over the past 12 months, including a major scare of losing one's job, ongoing stressors on the job, and ongoing problems getting along with coworkers.

The quantity/frequency estimate of alcohol consumption was measured differently across the two waves of data. At Time 1, respondents were asked the *greatest* number of drinks consumed in one day, which was multiplied by the number of days on which the respondent had that many drinks. At Time 2, respondents were asked the *average* number of drinks consumed in a day, which was multiplied by the number of days a person drank that year. Both figures were divided by 100 to reduce their variance so as to allow the structural equation models to converge.

Psychiatric diagnoses were measured by dichotomous variables. All affective and anxiety disorders² were merged into one variable indicating the presence or absence of at least one affective or anxiety disorder, whereas alcohol-related disorders were merged into a dummy variable indicating the presence or absence of alcohol abuse or alcohol dependence.

All other concepts were measured with multiple items using confirmatory factor analysis, a method that distinguishes shared variance among a set of items from idiosyncratic residual variance that is unique to a single item or shared between some items but not others, thereby reducing measurement error in the latent variables (Long 1983). The distress scale originally consisted of 14 items indicative of depression and anxiety that are similar to the Center for Epidemiologic Studies Depression Scale (CES-D) and that have demonstrated reliability and predictive validity (McWilliams, Cox, and Enns 2003). Mastery was not directly measured, but locus of control was assessed with the short form of the Levenson (1973) scale. Internal locus

of control is similar to mastery, and external locus of control reflects the belief that life experiences are controlled by powerful others, fate, or chance (Lefcourt 1976). Self-esteem was measured with the Rosenberg self-esteem scale (Rosenberg 1989). Financial hardship was measured with four items reflecting the extent to which the respondent had difficulty paying his or her bills and meeting his or her (or family's) needs and whether or not a major drop in income or a major ongoing expense had commenced in the past 12 months.

In order to make gender comparisons of path coefficients linking CFA models in the larger structural equations model, it was necessary to establish that the latent variables had the same meaning to men and to women, namely, that the factor loadings were gender invariant such that the CFA model had metric invariance (Little and Slegers 2005). Metric invariance was determined by fixing the factor loadings to be equal by gender and comparing the CFA model fit (with the χ^2 difference test) to the same model in which the factor loadings were free to vary by gender. Items that were not gender invariant were systematically eliminated until metric invariance was achieved. Time invariance of factor loadings for identical models measured at both Time 1 and Time 2 was established with the same method.

Structural equation modeling. The structural equation models were built in keeping with the conceptual model portrayed in Figure 1. Two structural equation models were estimated: one for psychological distress and alcohol intake and one for affective and anxiety disorders and alcohol-related disorders. In both cases, the residuals for the two dependent variables were allowed to covary. The χ^2 difference test was used to compare each model when all pathways were constrained to be equal by gender versus when all pathways were free to vary (Satorra and Bentler 2001). Both models fit significantly better when all pathways were estimated separately by gender. Therefore, the final results present distinct pathways for women and for men. In order to determine which pathways varied significantly by gender, interaction terms between gender and each predictor were tested one at a time in a pooled model of men and women. Those that were significant when tested individually were regressed in one model, and only those that retained significance are indicated as gender variant in the results.

Missing data. Mplus estimates CFA and SEM models from the variance/covariance matrix,

Table 1. Measurement of Observed Variables

	Minimum	Maximum	Mean		Standard deviation	
			Males	Females	Males	Females
Demographic characteristics						
Married or living with a partner*	0	1	75 percent	70 percent		
Employed*	0	1	86 percent	77 percent		
Age, in years	25	69	44.05	44.31	10.49	10.75
Education	1	17+	13.42	13.50	2.67	2.27
Number of job stressors over the past 12 months						
Summary scores						
Time 1*	0	3	.56	.41	.77	.70
Time 2	0	3	.33	.35	.65	.64
Alcohol intake						
Time 1, number of drinks per year/100*	0	93.81	5.31	1.77	11.41	5.81
Time 2, number of drinks per year/100*	0	87.60	2.70	.98	6.31	3.35
Psychiatric diagnoses						
Time 1, alcohol abuse or dependence*	0	1	14 percent	5 percent		
Time 2, alcohol abuse or dependence*	0	1	7 percent	3 percent		
Time 1, affective and/or anxiety disorder*	0	1	17 percent	31 percent		
Time 2, affective and/or anxiety disorder*	0	1	22 percent	32 percent		

*Gender difference in means is statistically significant, $p < .05$.

which is estimated from all available data using pairwise deletion. Invalid missing data are very minimal in the NCS panel sample, such that all covariances are estimated with a minimum of 97 percent complete data, and most from 99 percent to 100 percent complete data. Individuals who were not employed and therefore missing data for job stressors were coded zero (no job stressors), and employment status was controlled in all analyses.

FINDINGS

The majority of men and women were married or living with a partner and also employed, though in both cases the percentage was significantly higher for men than for women (see Table 1). The mean age of men and women was about the same because the upper age in the sample was capped at 54 at Time 1. Education levels were very

similar for both genders, indicating that on average, men and women had completed some college. Men exhibited substantially more job stressors than women at Time 1, whereas there was no gender difference at Time 2. As expected, men drank significantly more drinks per year (on average) than women and were more likely to meet the diagnostic criteria for alcohol-related disorders, whereas women were more likely to meet the criteria for affective or anxiety disorders, all at Time 1 and at Time 2.

Table 2 presents the gender-invariant confirmatory factor analysis models for distress, financial hardship, locus of control, and self-esteem, including the individual items used to measure each concept. The first item for each CFA model is designated as the reference indicator that sets the metric for the remaining items, all of which had significant factor loadings on the underlying concepts. The gender-invariant CFA model for distress includes just 4 items from the original 14-item scale

because 10 items did not have gender-invariant factor loadings, yet the model fits well and the alpha reliability for the Time 1 and Time 2 models (when treated as additive scales) is .79. Furthermore, the correlation between the 4-item scale and the original 14-item scale is .93 at both Time 1 and Time 2 for women and for men when estimated separately. All 4 items were retained for the financial hardship scales, but two models of financial hardship are presented because of slight yet statistically significant differences in factor loadings between Time 1 and Time 2.

Both self-concept factors were only measured at Time 1. Gender invariance could only be established for external locus of control (with all four of original items, $\alpha = .79$). Unlike mastery or internal locus of control, which are conceived of as resources, external locus of control is expected to be a liability that may undermine effortful coping in the face of stressors owing to the belief that life is uncontrollable and any coping efforts will fail. The gender-invariant self-esteem model retained four of the five original items ($\alpha = .79$). All CFA models fit the data well within conventional guidelines for overall model fit. Because intercepts were found to vary significantly by gender, it was not possible to compare means of the CFA models by gender. However, *t*-tests were computed to compare means for simple additive scales using the same items that found women to have higher distress and greater financial hardship at Time 1 and Time 2 and lower self-esteem at Time 1 (the gender difference in external locus of control was nonsignificant).

Table 3 presents the coefficients from the structural equation models of psychological distress and alcohol intake. Coefficients that are bold-faced and italicized were found to be different for males and females according to interaction tests with gender conducted with the pooled sample. Instances in which a given coefficient is only significantly related to the outcome in question for one gender are pointed out in the text, yet the reader should bear in mind that if the coefficients in question are not bold-faced and italicized, the gender interaction term with the given predictor was not significant when tested with the pooled sample. Therefore, these gender differences should be interpreted as more suggestive than definitive.

The overall fit for the gender-variant model presented in Table 3 is within conventional limits (RMSEA = .033, SRMR = .060). The residuals for both dependent variables were correlated for

women but not for men. The first two dependent variables presented in Table 3 are the two stressors measured at Time 2 and predicted by their Time 1 counterparts (which in both cases are significant). In addition, both stressors were regressed on distress and alcohol intake at Time 1 to determine whether having mental health problems leads to greater stress exposure over time. The results indicate that psychological distress is a statistically significant predictor of future exposure to on-the-job stressors for men but not for women. In addition, education is associated with a reduced likelihood of financial hardship for men and women but is not related to future on-the-job stressors for either gender.

The third dependent variable is psychological distress at Time 2. Distress is stable over time but is not dependent upon earlier levels of alcohol intake. Self-esteem is significantly and negatively related to distress for women only. Financial hardship and on-the-job stressors predict increased distress for both genders. The influence of job stressors on distress is significantly stronger for men than for women according to the interaction test in the pooled model. Being married or partnered significantly and negatively predicts distress for men only, and this gender difference is also statistically significant according to the interaction test. Being employed protects both genders against distress, but age and education are not related to distress for either gender.

Alcohol intake is the fourth dependent variable in the model and is stable over time for both genders. Only one other variable is significantly related to alcohol intake for women, whereas four other predictors are significantly related to alcohol intake for men, and in each case, the gender difference was found to be significant according to interaction tests with the pooled model. Having a more external locus of control is associated with increased alcohol intake for men but not for women. Being married or partnered predicts reduced alcohol intake for men only, as does being employed. Age is associated with reduced alcohol intake for both genders but more strongly for men than for women.

Turning now to the determinants of meeting the diagnostic criteria for an affective and/or anxiety disorder versus an alcohol disorder (see Table 4), the overall model fit was within conventional limits according to the RMSEA (.039) but not the WRMR (3.312), suggesting that the conceptual model may apply better to mental health outcomes measured as

Table 2. Confirmatory Factor Analysis (CFA) Models

	Root mean square error of approximation	Standardized root mean square residual	CFA factor loading
Distress	.038	.029	
During the past 30 days, how often did you: (1 = never, 2 = rarely, 3 = sometimes, 4 = often)			
Feel blue?			1.000
Feel hopeless about the future?			.867***
Feel everything was an effort?			.997***
Feel exhausted for no good reason?			.913***
Financial hardship, Time 2	.027	.027	
Enough money to meet your needs? (1 = more than enough, 2 = just enough, 3 = not enough)			1.000
Difficulty paying bills (1 = not at all difficult, 2 = not very difficult, 3 = somewhat difficult, 4 = very difficult)			1.711***
Major reduction in family income in past 12 months (0 = no, 1 = yes)			1.162***
Major unexpected expense in past 12 months (0 = no, 1 = yes)			.304***
Financial hardship, Time 1			
Enough money to meet your needs? (1 = more than enough, 2 = just enough, 3 = not enough)			1.000
Difficulty paying bills (1 = not at all difficult, 2 = not very difficult, 3 = somewhat difficult, 4 = very difficult)			1.612***
Major reduction in family income in past 12 months (0 = no, 1 = yes)			1.242***
Major unexpected expense in past 12 months (0 = no, 1 = yes)			.366***
External locus of control, Time 1 (1 = not true at all, 2 = a little true, 3 = somewhat true, 4 = very true)	.033	.021	
When I get what I want, it is usually because I am lucky			1.000
Often, there is no way I can protect myself from bad luck			1.736***
I believe that chance or luck plays an important role in my life			1.916***
It is not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune			2.698***
Self-esteem, Time 1 (1 = not true at all, 2 = a little true, 3 = somewhat true, 4 = very true)	.024	.024	
On the whole, I am satisfied with myself			1.000
At times I think I am no good at all			1.691***
I wish I could have more respect for myself			1.836***
All in all, I am inclined to feel that I am a failure			1.161***

Table 3. Structural Equation Model of Gender Differences in the Determinants of Psychological Distress and Alcohol Intake Mediated by Stressors

	Financial hardship ₂			On-the-job stressors ₂			Psychological distress ₂			Alcohol intake ₂		
	Men		Women	Men		Women	Men		Women	Men		Women
	b	SE	b	b	SE	b	b	SE	b	b	SE	b
Psychological distress ₁	.039	.047	.007	.034	.158***	.036	.054	.029	.417***	.064	.313***	.053
Alcohol intake ₁	.003	.004	.013	.012	-.007	.005	.016	.010	.008	.005	.001	.015
Financial hardship ₁	.770***	.126	.618***	.083								
On-the-job stressors ₁					.100***	.025	.148***	.028				
Years of education ₁	-.015*	.007	-.034***	.007	.011	.007	-.010	.008				
Working for pay ₁	-.059	.037	-.011	.030								
Self-esteem ₁									-.050	.103	-.157*	.073
External locus ₁									.012	.080	.140	.100
Financial hardship ₂									.303***	.049	.361***	.058
On-the-job stressors ₂									.208***	.032	.122***	.034
Married/partnered ₂									-.192***	.045	-.062	.050
Working for pay ₂									-.296***	.063	-.136***	.044
Age ₂									-.001	.002	.000	.000
Years of education ₂									.007	.007	-.001	.010
Model fit												
Root mean square error of approximation = .033												
Standardized root mean square residual = .060												

Unstandardized linear regression coefficients are presented. Subscripts ₁ and ₂ indicate Time 1 and Time 2. Boldface, italicized coefficients indicate a significant gender difference at the .05 level or below.
p* < .05. *p* < .01. ****p* < .001.

[illegible]
$$**p < .05. \quad **p < .01. \quad ***p < .001.$$

continua rather than as diagnostic categories. The residuals for both dependent variables were correlated for men and women.

The stabilities of financial hardship and on-the-job stressors are once again positive and significant in each case. Meeting the criteria for an affect or anxiety disorder at Time 1 predicts greater financial hardship for both genders but is only significantly associated with increased on-the-job stressors for men, a difference that was confirmed by an interaction test. However, having an alcohol disorder at Time 1 predicts significantly greater financial hardship and more on-the-job stressors at Time 2 for women only, although only the latter difference was confirmed by an interaction test. Years of education predicts reduced financial hardship for both genders and increased on-the-job stressors for men only.

Moving to the determinants of having an affect or anxiety disorder, the stability over time of these disorders was significant for both genders. However, having an alcohol disorder at Time 1 was significantly and positively related to having an affective or anxiety disorder at Time 2 only for men. Self-esteem was negatively associated with affective/anxiety disorders, whereas financial hardship and on-the-job stressors were positively associated with the same, in each case for both genders. Being married was negatively associated with the dependent variables for both genders, whereas being employed was negatively related to them for women only, a gender difference confirmed by an interaction test. Finally, age was negatively related to affect/anxiety disorders for men only, and education was unrelated to them for both genders.

Lastly, the final model presents the predictors of having an alcohol-related disorder. Time 1 affect/anxiety disorders are unrelated to alcohol disorders at Time 2, but having an alcohol disorder is stable over time for both genders, but significantly more so for women than for men. Self-esteem is negatively associated with having an alcohol disorder for women but not for men. Financial hardship was positively associated with this outcome for both genders, but on-the-job stressors were only significantly related to alcohol disorders for men. Finally, age was negatively associated with having an alcohol-related disorder, but also only for men.

DISCUSSION

The purpose of this study was to explain why women have higher levels of psychological distress

and higher incidence of affective and anxiety disorders whereas men have higher rates of alcohol intake and greater incidence of alcohol abuse and dependence. Theories of emotional socialization, self-salience, and gender roles were drawn upon both to predict and explain the results. Emotional socialization and self-salience suggest that the outcomes of the stress process depend upon gender and would predict that stressors increase distress more for women than for men and that stressors predict alcohol misuse more for men than for women. Similarly, to the extent that the process is cyclical, distress should predict future stress exposure more for women than for men, and alcohol misuse should predict future stress exposure more for men than for women. Finally, resources should protect men more than women from distress and protect women more than men against alcohol misuse. Gender role theory, in contrast, predicts that gender differences in the effect of stressors on mental health depend more upon the stressor than the outcome: Stressors and statuses that are tied to the masculine gender role are expected to increase distress *and* alcohol misuse more for men than for women. Similarly, stressors and statuses that are tied to the feminine gender role are expected to increase distress *and* alcohol misuse more for women than for men.

Four findings of gender differences in the stress process that were identified in this article are consistent with emotional socialization and self-salience, and three of them involve alcohol misuse. One of the three findings regarding alcohol misuse meets the strictest criteria for gender variance, and that is the influence of external locus of control on alcohol intake, which is significant only for men. In other words, the lack of personal sense of control, conceptualized here as the absence of a key resource, increases the risk of alcohol misuse for men only. In addition, stressors on the job are positively associated with alcohol-related disorders for men only, and self-esteem is negatively associated with alcohol-related disorders for women only. Although these two gender differences were not confirmed by statistical interaction tests, they are suggestive of the interpretation that alcohol misuse is primarily a masculinized response to the stress process.

There is one gender difference in the determinants of distress that is consistent with emotional socialization and self-salience: Being married appears to protect against distress for men only, suggesting that one reason why women tend to

have higher rates of distress than men is that they do not gain the same mental health advantage from marriage as do men.

A different set of four findings of gender differences in this study was consistent with gender role theory, and in this case, three of the four involved distress and related disorders. First, the influence of on-the-job stressors on distress is greater for men than for women, suggesting that men are more vulnerable than women to problems at work in terms of becoming distressed. In other words, even though women tend to have higher rates of distress than men overall, stressors that are intertwined with the successful implementation of the masculine gender role, at least those involving employment, are more distressing to men than to women. In addition, this process appears to be cyclical because baseline distress predicts future exposure to job stressors for men only, as does meeting the diagnostic criteria for affective or anxiety disorders at Time 1, although these gender differences did not meet the strictest statistical criteria.

In contrast, one gender difference supportive of gender role theory involves alcohol misuse. Specifically, being employed reduces alcohol intake for men only, again perhaps because having a job is more central to men's than to women's identity and therefore is more protective of their mental health regardless of the outcome under consideration.

Some of the findings of gender differences in the stress process did not support any of the theories put forth in this study, such as those involving employment and marital statuses. According to gender role theory, being employed should be more protective of men's than women's mental health regardless of the outcome. Alternatively, if the effect of being employed is gender specific, it should protect men more from distress and women more from alcohol misuse. However, this study found that being employed protects women (but not men) from meeting the diagnostic criteria for affective and anxiety disorders, suggesting that the gender divide in these types of mental disorders would be even greater if fewer women were employed. Similarly, the theories invoked in this article suggest that being married should either protect men more from distress and women more from alcohol misuse or should protect women more than men from either outcome of the stress process. However, this study found that being married is associated with reduced alcohol intake for men

only, suggesting that alcohol misuse would be even greater among men if fewer of them enjoyed the protective benefits of marriage.

Two other findings of gender differences did not support any theory, both involving the influence of having an alcohol disorder on future exposure to stressors. Women who met the criteria for alcohol-related disorders at Time 1 were exposed to significantly more financial hardship and on-the-job stressors at Time 2, whereas theoretical expectations associated with emotional socialization, self-salience, and gender role theory would have predicted that the opposite would be true. This unexpected finding may have occurred because when women (and possibly men as well) suffer from gender-atypical conditions, they may be particularly vulnerable to their long-term effects on stress exposure because as women, their alcohol problems are perceived to be deviant such that they receive less social support to cope with them.

Across the board, the mental health consequences of financial hardship are not gender specific, given that for both genders, financial hardship is associated with increased levels of all the mental health problems under consideration with the exception of alcohol intake. Thus, financial hardship appears to undermine multiple dimensions of mental health for men and women alike, perhaps because of its potential to pose a chronic threat to one's very survival on a daily basis.

The set of findings that being married reduces distress, alcohol intake, and alcohol-related disorders for men but not for women is consistent with what once was considered a social fact established by Bernard (1982). Even though being married may be more salient to women's identities than to men's, women may benefit less psychologically from marriage than men because they still tend to carry out more of the housework and childcare than married men (Lee and Waite 2005). Men may benefit more from marriage because they find their wives to be socially supportive whereas women tend to rely more on their female friends than their husbands for social support (Fuhrer and Stansfeld 2002). Married women may also bear a higher "cost of caring" (Kessler, McLeod, and Wethington 1985; Turner and Avison 1989), such as by devoting more of their energies tending to the needs of others (including their husbands) than do men.

Because dimensions of self-concept integral to the stress process model were only measured at Time 1, it was not possible to model the

contemporaneous effects of resources and stressors on mental health, let alone their interactive effects. Nonetheless, one aspect of self-concept stood out as a risk factor for increased alcohol intake over time for men. According to this study, the tendency to locate fate outside of their hands leads men over time to drink more, a behavior that ironically has the effect of undermining their self-control. External locus of control may be particularly risky for men because it is antithetical to masculinity, since "strong" men are supposed to take control of situations and solve problems. Therefore, men who believe they have little control over important events in their lives may use alcohol to block out this troubling sense of powerlessness. It is also notable that external locus of control does not predict distress for either gender, perhaps because people who locate control externally are more adept at assigning responsibility for their own failures to something other than themselves, an attribution style that has been demonstrated to protect psychological well-being (Heider 1958; Kelley 1967).

This study, despite having the benefit of longitudinal panel data, has its limitations. Having two waves of data 10 years apart is much better than having only a cross-section of data, yet three waves of data would have enabled a more definitive test of selection and causation effects regarding stress and mental health. The 10-year span is also rather broad, leaving much unknown about respondents' lives during the interim. Another limitation of the study involves the challenge of establishing gender-invariant measurement models. Although confirmatory factor measurement models are more precise than additive indices, some constructs assessed in the NCS, such as social support versus conflict from family and friends, simply are not gender invariant and therefore could not be included in the type of analyses presented herein. As a result, it was not possible to apply gender role theory to the influence of stressors typically associated with the feminine gender role. In addition, it was necessary to drop 10 of the 14 items from the distress scale in order to establish gender invariance, although the 4-item scale was highly correlated with the original and had an acceptable Cronbach's alpha level.

Although the overall model of continuous outcomes (i.e., distress and alcohol intake) fit the data, the model of gender differences in the determinants of psychiatric disorders related to distress and alcohol intake did not meet all the criteria for overall model fit. This may be because the model

did not contain indicators of extreme stress such as traumatic life events that might be necessary to explain who meets the relatively more stringent criteria for having a mental disorder. It may also be because unmeasured biological factors influence the development of psychiatric disorders more so than they influence continua of distress and alcohol intake across the general population. It also could be because limiting the range of the dependent variable to capture only those on the most severe end of the continuum underestimates the full impact of the stress process on mental health. Future research on gender differences in alcohol misuse should make use of continuous measures of symptoms of alcohol abuse and dependence similar to those used to measure distress so as to capture greater variation in alcohol misuse than is possible with the diagnostic measures. Such symptom scales might reflect the problematic consequences of alcohol misuse more directly than frequency/quantity measures or dichotomous diagnostic variables.

Despite these limitations, this study has a number of strengths. Having panel data, albeit 10 years apart, made it possible to isolate the influence of stressors on mental health by controlling for earlier levels of stressors and mental health (and by extension, all causes of stressors and mental health at Time 1). The panel data also made it possible to test the process of cumulative adversity including not just the influence of stressors on mental health but the influence of mental health status on future stress exposure, both of which could have only been inferred from cross-sectional data. And despite the impossibility of establishing gender-equivalent measures of certain constructs, the measurement models that were included were carefully constructed to ensure that they represented the same phenomena for women and men. Thus, it can be concluded with confidence that the gender differences that did emerge in the structural equation models reflect differences in effects, not in the phenomena themselves.

Future efforts to collect survey data on gender differences in social factors and mental health would benefit from following a panel sample for three waves of data that measure a full array of stressors and resources at each wave. With such data, models of reciprocal effects (lagged or contemporaneous) might be identifiable, which would provide a more definitive test of how the cycle of cumulative adversity operates and how it may explain gender differences in mental health. In addition, direct measures of individuals' identity

hierarchies would reveal the extent to which gender-typical identity salience continues to prevail in the twenty-first century and how it operates in the determination of gender differences in mental health.

CONCLUSION

In conclusion, this study has demonstrated several examples of how stressors and resources impact men's and women's mental health in different ways, offering a partial explanation for why women tend to have higher rates of distress whereas men have higher rates of alcohol misuse. Although women are more distressed than men, men appear to respond to stressors and resources by becoming more or less distressed at least as much as women, and in some cases more so. Therefore, the gender gap in distress and related disorders cannot be accounted for by the notion that distress is a female-typical response to the stress process. Rather, the gender gap most likely results from continuing social advantages that are afforded to men, such as their lower levels of financial hardship. In contrast, gender differences in alcohol misuse do suggest that it is, for the most part, a male-typical response to the stress process. Thus, these findings do bear out the argument that research focusing solely on distress probably underestimates the impact of stress on mental health for men. In conclusion, psychological distress and alcohol misuse are serious problems, detracting substantially from quality of life for women and for men, and merit ongoing attention as researchers continue to search for more comprehensive explanations of these socially patterned responses.

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NOTES

1. Men are also more likely than women to abuse other substances such as illicit drugs. However, the prevalence of drug abuse is much lower than alcohol abuse, and the determinants of drug abuse may vary from those of alcohol abuse; thus, this article focuses on alcohol misuse and related disorders.

2. Affective disorders included bipolar disorder, major depression, dysthymia, and mania whereas anxiety disorders included agoraphobia, general anxiety disorder, panic attack, panic disorder, post-traumatic stress disorder, simple phobia, and social phobia.

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