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# Differences in the developmental patterns of depression with and without additional somatic symptoms



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#### ABSTRACT

Depression accompanied by somatic symptoms ("somatic" depression) has been found to differ from depression without the additional symptoms ("pure" depression) in their gender ratio, their association with measures of perceived gender inequality taken from both respondents and their parents, and in their response to pharmacological treatment. Further evidence of the distinction between the two syndromes might come from differential patterns of development. Data on the annual incidence of new cases of depression exhibited by a representative sample of respondents aged 12–19 came from the National household survey on drug use and health. Between early adolescence (ages 12–14) and late adolescence (ages 15–19), female respondents exhibited a much larger increase in somatic depression than in pure depression. Males did not exhibit the same pattern. These results further support the hypothesis that somatic and pure depressions are two distinct disorders.

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#### 1. Introduction

There has been a long history of distinguishing disorders that involve depressed affect, particularly between disorders thought to be endogenous and those thought to be non-endogenous/psychosocially based (Parker et al., 2010; Shorter, 2007). Several authors have suggested that major depression as currently defined in the DSM encompasses multiple distinct disorders (Kendler et al., 2013). Some have distinguished between depression involving several somatic symptoms and depression involving primarily non-somatic symptoms (Kendler et al., 2013; Nardi et al., 2013; Sharpley and Bitsika, 2013). Bohman et al. (2010) found that respondents exhibiting depression with many somatic symptoms reported high levels of disruptive behavior and multiple stressful relationships. Patton et al. (2000) found the number of somatic symptoms to be related to the severity and duration of depression.

Evidence exists suggesting that depression accompanied by somatic symptoms ("somatic depression") may be rooted psychosocial factors related to gender roles, whereas depression in the absence of much somatic symptomatology ("pure depression") may not. Women exhibit higher prevalence of somatic depression but not of pure depression than men (Halbreich and Kahn, 2007) including in studies of large epidemiologic samples that use the same criteria for somatic depression that are used in the study described here (Silverstein, 1999; 2002; Silverstein, et al., 2013). Furthermore,

several studies have found somatic, but not pure, depression to be related to women's perceptions of gender inequality. Young women who scored high on scales measuring their beliefs that men lead better lives than women (Silverstein et al., 1995), that their fathers showed a preference for males (Silverstein, et al., 1998), or that their mothers felt limited by being female (Silverstein et al., 1995, 1998) reported high prevalence of somatic depression. Women who did not score high on these scales and men reported much lower prevalence of somatic depression. All three groups reported similar prevalence of pure depression.

In addition, women's reports of somatic depression were found to be related to reports made by their parents of attitudes toward gender that might be expected to bother many contemporary women who aspire to more equal treatment than was historically given to females. One study found fathers' reports of believing in the superiority of males to be related to their daughters' reports of somatic depression (Silverstein and Lynch, 1998). In another study (Silverstein and Blumenthal, 1997), the reports of somatic depression made by female high school students, but not their reports of pure depression, were related to reports made by their mothers of feeling limited by their gender. In fascinating contrast, the young women's reports of pure depression, but not their reports of somatic depression, were related to their mothers' reports of depression, once the mothers' reports of feeling limited by their gender were held constant. One interpretation that might be made of this result is that somatic depression is rooted in psychosocial forces while pure depression may be rooted more strongly in genetic, endogenous forces. Consonant with this hypothesis, in the Star\*D study of response to treatment, somatic depression

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responded less well than did pure depression to biologically-based treatment with Citalopram, Bupropion, Citalopram, Lithium, Mirtazapine, Nortriptyline, Sertraline, Thyroid, and Venlafaxine (Silverstein and Patel, 2011).

Thus, somatic and pure depressions have been found to differ not only in their symptomatology, but also in the gender ratio of who exhibits the two syndromes, in their relationship to psychosocial measures associated with recognition of gender inequality, and in their response to pharmacological treatment, suggesting that two syndromes that are both labeled as major depression may actually be distinct disorders. Another indication that the two might be distinct might come from differences in their patterns of development.

Indications that somatic depression may be particularly likely to arise during adolescence come from several sources. Many studies discussed above have found that the higher prevalence among women of somatic depression is responsible for most of the gender difference in the prevalence of depression, which has often been reported to appear during adolescence (Nolen-Hoeksema and Girgus, 1994; Wade et al., 2002). Many studies on the higher prevalence of somatic depression among females compared to males and on the relationship between somatic depression and the recognition of gender inequality were done on teenagers (Silverstein et al., 1995; 1997; 1998). Furthermore, somatic depression has been found to be related to young women's perceptions of gender inequality, which has been found to increase during adolescence. Neff et al. (2007) asked early, middle, and late adolescents whether they thought men or women had more influence in politics and in business, and which gender received more recognition in these pursuits. As the respondents, both female and male, matured from early through late adolescence, they increasingly recognized the gender inequality in favor of men that exists. Given the links found between the recognition of gender inequality and somatic depression, it might be predicted that compared to the development of pure depression, the development of somatic depression would exhibit a larger increase among females from early to late adolescence. There is no reason to predict that the same pattern would be exhibited by men. Thus, the hypothesis tested here is that the incidence of somatic depression increases more during adolescence than does pure depression among females but not necessarily among males. The objective is to provide additional evidence that somatic and pure depressions are two distinct disorders.

#### 2. Methods

#### 2.1. Subjects

The data for the study are from a systematic sample of the United States in the National household survey on drug use and health, 2004. Sampling was stratified based upon the size of the state in which the respondents resided but the analyses described here are unweighted. Within state, specially trained listers visited areas and compiled addresses and persons were selected from addresses using a handheld computer. A staff of approximately 700 field investigators collected the data directed by senior staff members. Respondents received \$30 for participation. (Further details of the sampling methods used are available at http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/27521?q=gender+and+mental+health&search Source=icpsr-landing). A total final sample of 67,760 interviews was obtained for the 2004 survey. Strategies for ensuring high rates of participation resulted in a weighted screening response rate of 91% and a weighted interview response rate of 77%. Analyses reported here were on 20,557 respondents below 20 years old.

#### 2.2. Measures

The study included items used to measure DSM-IV (American Psychiatric Association, 2000) depression from the Composite International Diagnostic Interview Short Form (CIDI-SF) (Kessler et al., 1998). The CIDI is widely used in epidemiologic studies done by the NIH or WHO. In addition to assessing

respondents' experience of a major depressive episode during the past year, the survey assessed respondents' episodes during previous years, allowing measurement of the annual incidence of new cases of depression for all respondents aged 12 (youngest age measured) through 19. As in earlier studies based upon DSM criteria, somatic depression was defined as reporting depression plus all three of the somatic criteria for depression, appetite and sleep problems and fatigue, and pure depression was defined as meeting criteria for depression but not reporting all three of the somatic criteria.

#### 2.3. Analyses

The definitions of early adolescence as ages 12–14 and late adolescence as 14–19 were based upon definitions used by Unicef (2011) and the United States Department of Education, (2005). Respondents who had developed depression during the past year were divided into those who reported somatic versus pure depression. These were compared for early versus late adolescents using  $2\times2~\chi^2$  analyses with continuity correction. Separate analyses were performed for female and male respondents. Male and female respondents were divided into those who had not developed depression, those who had developed pure depression, and those who had developed somatic depression and compared using  $2\times3~\chi^2$  analyses.

#### 3. Results

As in many previous studies, the higher incidence of depression among females compared to males  $(\chi^2 (2,555)=492.45, p<0.001)$  was due almost entirely to a large gender difference in somatic depression (females 10.7% and males 3%), not to a small difference in pure depression (females 2.8% and males 2.3%).

In order to insure that the differences reported here between early and late adolescence are due to changes in the relative incidence of somatic compared to pure depression, not simply to changes in the overall incidence of depression, the statistical analyses did not include non-depressed respondents. The incidence rates of these respondents are reported simply to allow readers to understand what the overall incidence of somatic and pure depression is. As shown in Tables 1 and 2, from early to late adolescence, the incidence of new cases of somatic depression increased among females from 7.4% to 13.3% while the incidence of pure depression among females in early (2.5%) and late (3.0%) adolescence were quite similar. Thus, from early to late adolescence the proportion of new cases of depression that developed among females that met criteria for somatic depression increased from 75.1% to 81.6% ( $\chi^2$  (1,1362)=7.34, p < 0.008).

The pattern was different for males (Table 2). The incidence of somatic depression among males increased somewhat during adolescence (early 2.2% and late 3.5%) but the incidence of pure depression increased slightly more (early1.3% and late 3.1%). As a result, the 53.1% of new cases of depression among late adolescent males made up of somatic depression was actually significantly lower than the 63% among early adolescent males ( $\chi^2$  (1,553)= 4.17, p < 0.05). As predicted, somatic depression increased during adolescence compared to pure depression among females, but not among males.

In order to further investigate the interplay between gender, age and somatic versus pure depression, a multiple logistic regression was performed on the depressive subtype using gender, early

**Table 1**Female respondents in the National Household Survey on Drug Use and Health who developed pure or somatic depression during early versus late adolescence.

	Non-Depressed	Pure depression	Somatic depression
Early adolescence	4004 (90.1%)	109 (2.5%) (24.9%) of depressed (75.1%)	329 (7.4%)
Late adolescence	4769 (83.8%)	170 (3.0%) (18.4%) of depressed (81.6%)	755 (13.3%)

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