An examination of subtypes of inclusive depressive symptoms across female and male low-income Latino and Black adolescents

Stephanie M. Ernestus

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AN EXAMINATION OF SUBTYPES
OF INCLUSIVE DEPRESSIVE SYMPTOMS
ACROSS FEMALE AND MALE LOW-INCOME
LATINO AND BLACK ADOLESCENTS

by

Stephanie M. Ernestus

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Abstract

The current study examined the developmental patterns of nine depression symptoms (including traditional, masculine, and somatic symptoms of depression) in a sample of low-income, urban African American and Hispanic youth at early (10-12) and late (16-19) adolescence, and examined differences between males and females depressive profiles at each stage. Additionally, this study identified predictors of latent class membership (ethnic group and stress) at each time point. For this secondary analysis of data, a total of 610 early adolescents were selected from the Welfare, Children, and Families: A Three-City Study (Cherlin, 1999; Cherlin et al., 2001), which reduced to 453 late adolescents 6 years later. Four classes were identified for each of the four Latent Class Analyses conducted. Latent class composition was relatively stable over time, with boys demonstrating non-clinical depression, externalizing, and mixed classes of depression, and girls demonstrating non-clinical depression, mixed, and severe mixed patterns of depression symptoms at early and late adolescence. Stress was only a significant covariate for girls (with increasing stress predicting increasing likelihood of membership in the more severe mixed classes, but lowering the probability of membership in the other classes); ethnic group did not predict class membership in any analysis. Developmental changes in specific symptom endorsement were seen for both sexes. The results of this study indicate that there are distinct patterns of symptoms in at-risk, low-income minority children when depression is examined using non-traditional variables. Overall, this study suggests that there are common patterns of depression that change over development and are influenced by diverse factors to create differences between males and females. Identifying these common patterns of depression in developmentally-appropriate ways and understanding risk factors for these patterns are important for determining the most appropriate treatment for each individual.
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Introduction

Depression is a costly, debilitating illness that impacts approximately 16% of the United States population in a given year (Kessler et al., 2003). Symptoms of depression often begin in childhood and adolescence and persist in some form for most of a person’s life (Richards, 2011). Depression has been linked to many factors including stressors such as neighborhood instability and negative life experiences (Burcusa & Iacono, 2007; Hammen, 2005; Paykel, 2003; Metheson et al., 2006). In early adolescence, there is a sharp increase in the prevalence of depression. Also, during early adolescence sex differences begin to appear (Essau et al., 2000; Hankin and Abramson, 2001; Twenge and Nolen-Hoeksema, 2002; Wade, Cairney, & Pevalin, 2002). In addition to differences in prevalence, course, and outcomes between men and women (Essau, Lewinsohn, Seeley, & Sasagawa, 2010), male and female adolescents also show different symptoms of depression, with male depression being more characterized by aggression, substance use, and irritability (Angst, Gamma, Gastpar, Lépine, Menedewicz, & Tylee, 2002; Cochran & Rabinowitz, 2000) and female depression being more characterized by somatic symptoms and depressed mood (Delisle, Beck, Dobson, Dozois, & Thombs, 2012; Fu-I and Wang, 2008). One likely explanation for gender differences found in symptom patterns and prevalence is that men and women may manifest “depression” with different patterns of symptoms or subtypes, with males being more likely to demonstrate a “masculine depression” (Martin, Neighbors, & Griffith, 2013) and females a “somatic depression” (Silverstein, Edwards, Gamma, Ajac-Gross, Rossler, & Angst, 2012). However, these putative subtypes are not usually included in traditional clinical and research conceptualizations of depression, and thus the question has arisen whether different subtypes of depression may account for the differences seen in presentation and prevalence. If there are different subtypes of depression, it is also
unclear whether these subtypes remain stable as children develop. The present study aimed to examine the developmental patterns of depression symptoms (including traditional, masculine, and somatic symptoms of depression) for an archival sample of low-income, urban minority youth.

The project had three specific aims. As a part of aim one, this study identified subgroups (latent classes) of young adolescents with different depressive symptom classes at age 10-12 and again 6 years later. Specifically, this study examined whether common symptom patterns identified in early adolescence (10-12 years) change in late adolescence (16-18 years). Secondly, this study also examined whether the same symptom patterns at these two ages differ for boys and girls. Finally, predictors of subgroup membership (i.e. stressful life events, ethnic group) were identified at time 1 and time 3 (6 years later).

What is Depression?

The fifth edition of the American Psychological Association’s Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) defines depression, or Major Depressive Disorder (MDD), as consisting of symptoms that significantly interfere with a person’s daily functioning, including depressed or irritable mood and loss of interest or pleasure in all, or nearly all, previously pleasurable activities. In traditional conceptualizations of depression, depressed individuals will show changes in appetite, weight, sleep, psychomotor activity, and energy levels while frequently reporting feelings of worthlessness or guilt, difficulty making decisions and concentrating, and/or recurrent thoughts of death or suicide (American Psychiatric Association, 2013).

Depression is a costly and debilitating illness that impacts 9.8% of individuals around the world (Andrade et al., 2003), and the prevalence rate of depression appears to be increasing
Depression has been ranked as one of the single most burdensome diseases in the world for several related reasons. First, depression is highly prevalent and recurrent, has a high relapse rate, early age of onset, and causes serious impairment (Richards, 2011). In addition, many people never fully recover from depression, and may show residual and sub-clinical symptoms for much of their lives (Richards, 2011). Moreover, depression can socially, economically, and psychologically impact the person affected as well as their family members. In addition to affecting the depressed person and his/her family, depression can have high monetary costs for the greater society (Richards, 2011).

**The Development of Depression**

Depression occurs in individuals of all ages, and often begins in childhood. The likelihood of onset of Major Depression increases markedly with puberty at which time genetic and environmental risk factors of depression become increasingly influential (Kendler, Gardner, & Lichtenstein, 2008). Depression is highly heritable (Kendler, Gardner, & Lichtenstein, 2008). Genetic risk factors including those related to monoaminergic neurotransmission (such as the serotonin transporter promoter region; 5-HTTLPR) and overactivation of the hypothalamic-pituitary axis have also been examined in relation to depression (see Levinson, 2006 for a review). Broadly, these factors are proposed to provide a heritable risk that makes a person more likely to experience negative affect and neuroticism, which in turn may increase his or her likelihood for specific disorders such as MDD (Levinson, 2006). Genetic risk factors account for more of the variance in depression and anxiety symptoms at age 8-9 than at ages 19-20, supporting the increasing influence of environment on depression in older children (Kendler, Gardner, & Lichtenstein, 2008).
Stressful life events also contribute to the increased risk for depressive symptoms throughout the lifespan (Burcusa & Iacono, 2007; Hammen, 2005; Paykel, 2003). Interpersonal stressors are linked to the onset of major depression in adolescents (Carter and Geber, 2011). Stressful life events account for approximately 75% of the variance associated with an onset of major depressive episode (Kendler, Karkowski, & Prescott, 1999). Stressful life events also predict recurrence of depression (Burcusa & Iacono, 2007; Paykel, 2003). In addition to stressful life events predicting depressive symptoms, depression also recursively predicts the increase of stressful life events (Liu & Alloy, 2010). This is particularly true for dependent stressful life events (the occurrence of which is influenced by the characteristics of the individual) rather than independent, or fateful stress (i.e., uncontrollable stressors; see Liu & Alloy, 2010 for a review). However, other stressful life characteristics have also been linked to depression. One study found that “stressed” neighborhoods (characterized by high neighborhood instability and low resources) contributed to the likelihood of depression above and beyond the influence of individual-level sociodemographic factors (Metheson et al., 2006).

The influences of biology and environment likely interact to increase an individual’s risk for depression. Several genetic factors have also been investigated to examine their interactions with environmental influences in predicting the risk of depression over the lifetime (particularly stress; see Levinson, 2005 for a review). The majority of the research on this topic has focused on monoaminergic candidate genes including the serotonin transporter gene-linked polymorphic region (5-HTTLPR). In their landmark study, Caspi and colleagues (2003) found that genetic variation in the 5-HTTLPR gene interacted with stressful life events to predict the experience of depression. However, evidence for this interaction has been mixed, with a recent meta-analysis finding no evidence that the 5-HTTLPR gene predicted depression alone or in interaction with
stressful life events (Risch et al., 2009). Several explanations for these mixed findings have been proposed including false positives on the one hand (Rische et al., 2009) and low power on the other hand (Levinson, 2005). In addition to this diathesis-stress model of risk, research also supports a model wherein certain individuals have a greater biological-sensitivity-to-context and may be more influenced by the environment in general and not just by stressful life events (see Belsky and Pluess, 2009 for a review). Many studies have implicated specific heritable influences in this biological-sensitivity-to-context (plasticity). For example, Mills-Koonce and colleagues (2007) found that affective problems in 3-year-old children carrying the CRD2 A1 plasticity allele were more influenced by sensitive mothering from 6-12 months than their peers. There is also evidence for the interaction between an individual’s heritable risk and the environment that may potentially account for the emergence of depression in adolescence. Specifically, research indicates that developing brain regions implicated in depression may be maximally sensitive to environmental stressors during certain periods (including adolescence; see Anderson & Teicher, 2008 for a review). For example, in adolescence, a shorter duration of stressful events for adolescents (compared to a longer duration in childhood) may predispose exposed individuals to depression because of the late-maturing prefrontal cortex (Anderson & Teicher, 2008).

In addition to changes in depression prevalence rates and changes in risk factors as individuals develop, symptom presentation also changes through development. While the DSM-5 uses the same criteria to identify depressive disorders in all age groups (American Psychiatric Association, 2013), depression often presents differently in children and adolescents when compared to adults. The DSM-5 acknowledges this difference by identifying symptoms such as somatic complaints, irritability, and social withdrawal as being particularly common in children
with MDD (American Psychiatric Association, 2013). Patterns of depressive symptoms change throughout development. For example, Fu-I and Wang (2008) found that when compared to clinically depressed children (5–9 years), clinically depressed adolescents (10–17 years) are characterized more by depressed mood, lower self-esteem, and difficulty concentrating. Patterns of depressive symptoms also continue to change through adolescence. Kovacs, Obrosky, and Sherrill (2003) found that reduced appetite, negative body image, and hypersomnia become increasingly likely from early to late adolescence.

**Depression in Men and Women**

As children get older, sex differences in the prevalence and presentation of depression appear. Starting in early adolescence between the ages of 12 and 14, at approximately the same time as the increase in overall prevalence rates of depression, women become more likely to experience depression compared to men (Essau et al., 2000; Hankin and Abramson, 2001; Wade et al., 2002; Twenge and Nolen-Hoeksema, 2002). The greatest increase in gender differences in prevalence rates occurs between ages 15 and 18 (Essau et al., 2000; Hankin et al., 1998). Women continue to show higher prevalence rates and more depressive symptoms than men throughout the lifespan until individuals reach their mid-sixties, when the difference between depressed affect becomes similar across genders (Sutin, Terracciano, Milaneschi, An, Ferrucci, & Zonderman, 2013). Overall, lifetime prevalence of affective disorders is twice as high in women as men (Kessler et al., 1994; Nolen-Hoeksema, 1987), and for all ages these gender differences are more evident in the prevalence rate of MDD than for presentations of depression that do not meet the full criteria for MDD (Angst et al., 2002).

The prevalence and symptom variations that emerge in adolescence also lead to differences in the experience of depression for men and women. Recently, Essau and colleagues
(2010) examined a sample of individuals with Major Depressive Disorder at adolescence and again at age 30 to identify gender differences in the developmental course, onset, duration, and number of depressive episodes of MDD. Compared to males, females had higher incidence of MDD and a more chronic course. In addition, females had longer episodes of depression than their male peers (Essau et al., 2010). For both males and females, earlier age of onset was significantly related to more episodes. However, lower onset age predicted a worse course of depression only in females (Essau et al., 2010). There is additional evidence to suggest the heritability of major depression was higher in women than in men, and that some genetic risk factors for depression are gender-specific (Kendler et al., 2008; Kendler, Gardner, Neale, & Prescott, 2001). For example, some research has suggested that depression may be more heritable for women, and that the genetic risk factors for depression are correlated but not entirely the same for men and women (Kendler et al., 2001). Researchers have suggested that these differences in genetic heritability may be because men develop depression through an “externalizing pathway” (substance use and antisocial personality disorder) while women develop depression through an “internalizing pathway” (anxiety and depression) and that these two pathways are heritable through different genetic influences (Kendler et al., 2001).

While women show more major depressive episodes, higher instances of major depressive disorder diagnoses, and overall longer duration of episodes, men are less likely to seek help for their depression than women (Essau, Lewinsohn, Seeley, & Sasagawa, 2010; Grigoriadis & Robinson, 2007; Möller-Leimkühler, 2001). Men are also more likely to demonstrate co-occurrence of depression with substance use. For example, the National Epidemiologic Survey on Alcoholism and Related Conditions found that 40.5% of men with a history of major depression had an alcohol use disorder, and 17.2% had a drug use disorder.
(Hasin et al. 2005). In the presence of a comorbid disorder, such as a substance use disorder, men demonstrate longer duration of depressive episodes than women (Essau et al., 2010).

For both the DSM-5 and ICD-10, the symptom criteria for MDD are the same for males and females (APA, 2013; WHO, 1992), which assumes that despite the well-documented differences in the prevalence, course, comorbidity, and age of onset between genders, the symptom presentation of depression is equivalent across genders. However, there are indications that depression might be best described by different patterns of symptoms for males and females. These symptom-pattern differences emerge at approximately the same time that the other gender differences that are seen with depression such as differences in prevalence rates (Cole et al., 2002; Ge, Conger, & Elder, 2001; Nolen-Hoeksema, Larson, & Grayson, 1999).

Differences in symptom presentation are often studied in adolescent clinical populations with individuals who meet diagnostic criteria for a major depressive disorder. In general, depressed females are more likely than their male peers to report somatic symptoms (Delisle et al., 2012). Fu-I and Wang (2008) found that depression in female adolescents was characterized more by lower self-esteem, while depression in males was characterized by decreased concentration. The presence of gender-based differences in cognitive symptoms of depression has been documented among both female adults and adolescents. Females endorse higher overall scores that emphasize cognitive symptoms of depression than males on the Beck Depression Inventory (BDI; Beck et al., 1961; Ambrosini et al., 1991; Roberts, Lewinsohn, & Seeley, 1991). In yet another study, Bennet and colleagues (2005) found that in a sample of adolescents who met the criteria for MDD, girls reported more guilt and body image dissatisfaction, higher levels of sadness/depressed mood, self-disappointment, self-blame, feelings of failure, concentration problems, difficulty working, fatigue, and health worries than depressed boys. In contrast,
depressed boys had higher clinician ratings of anhedonia, depressed mood in the morning, and morning fatigue. In addition, for males, self-reported anhedonia was more predictive of concurrent depression for boys than girls. Thus, this study’s results indicated that depressed female adolescents are more prone to exhibit some cognitive and somatic symptoms of depression than are depressed boys in clinical settings (Bennett, Ambrosini, Kides, Metz, & Rabinovich, 2005).

There is also evidence for similar gender differences in the symptom presentation of depression in non-clinical populations. In a study on depressive symptoms in a community based sample of adolescents, males more frequently reported symptoms such as social withdrawal, insomnia, and somatic preoccupation, whereas females tended to endorse crying, body image distortion, self-blame, self-dislike, and loss of appetite (Baron & Joly, 1988). Similar results were found in a sample of mildly to moderately depressed 18 and 19 year-old students (Hammen & Padesky, 1977). In addition, men may demonstrate their depressive symptoms by coping through activity and consumption of alcohol while women cope through emotional release and religion (Angst et al., 2002).

**Possible Explanations for Sex Differences in Depression**

As researchers have provided evidence that these symptom and prevalence rate differences are unlikely to be the result of measurement bias (Van de Velde, Bracke, Leveque, Meuleman, 2010), increasing attention has been placed on why these differences may occur. Many reasons for the emergence of sex differences in adolescent depression have been posited. Among the possible explanations are the interaction of gender socialization, social and hormonal mechanisms, and stressful events associated with adolescence (Cyranowski et al., 2000). Higher rates of depression in women have been attributed to women being more willing to talk about
their feelings (making them more likely to admit to being depressed and for clinicians to recognize symptoms of depression), socialization factors that discourage feelings of sadness in men, or that women’s symptoms are more readily diagnosed as depression than men’s symptoms (Grigoriadis & Robinson, 2007). Gender-related self-concepts and social norms of female and male behavior may shape the experiences of and responses to depression (Nolen-Hoeksema et al., 1999). Gendered learning and gender norms, which become more salient during adolescence, may influence men’s and women’s willingness and ability to report symptoms of depression, creating the sex differences that emerge at that time (Addis, 2008).

One particularly notable theory that explains these sex differences is the Gendered Responding Framework (Addis, 2008). This framework argues that females and males learn to respond differently to negative affect due to different socialization processes and that the ways that people respond to initial negative affect may influence which types of more severe symptoms are likely to emerge (Addis, 2008). This framework fits within the larger context of gender-role theories of emotion regulation, which collectively posit that women use more internally focused, passive emotion-regulation strategies such as rumination while men are more likely to engage in suppression and avoidance through activities such as alcohol use (Nolen-Hoeksema, 2012; Tamres et al., 2002). For example, Addis (2008) posits that there is significant evidence that young boys and young girls are taught different lessons about emotion regulation and emotional expression from family members and peers, which may influences how they express feelings of distress. Illustratively, young boys are often encouraged not to cry or demonstrate emotions of sadness, while demonstrations of anger and aggression are more supported (Addis, 2008). In contrast, expressions of anger and aggression are punished in girls, while sadness and rumination is encouraged (Addis, 2008). Rumination has been posited to
explain sex differences in the symptom pattern and prevalence of depression between women and men. Rumination, an extensively studied and common component of depression, is an emotion-regulation strategy whereby a person focuses attention on his/her own distress and negative experiences (Nolen-Hoeksema, 2012). Rumination has been posited to be a transdiagnostic risk factor that underlies a diverse range of psychopathologies including depression, anxiety, and substance use (Nolen-Hoeksema & Watkins, 2011). Findings from a meta-analysis of 10 studies with a combined sample of over 2,000 participants found that women reported being more likely to ruminate when distressed than men (Tamres et al., 2002).

Rumination has been shown to be a significant mediator of anxiety and depression for women but not for men (Nolen-Hoeksema, 2012). In contrast, men’s greater tendency to turn to alcohol as a coping mechanism in response to negative emotions, rather than rumination, may explain the higher levels of alcohol use in depressed men (Nolen-Hoeksema, 2012; Rutledge & Sher, 2001; Timko et al., 2005). This may indicate that men avoid negative emotions through drug use, or alternatively engage in more angry rumination than women in response to negative emotions. Angry rumination is associated with an increase in angry feelings and thoughts and more aggressive behaviors and alcohol use (Nolen-Hoeksema, 2012). A study by Jose and Brown (2008) found that gender differences in rumination appear one year earlier than gender differences in depression, supporting the important role of rumination in the development of sex differences in depression.

Symptom pattern differences in depression, including men’s greater use of alcohol, may also be explained by different levels of effortful control in males and females. Effortful control is a regulative temperamental factor that describes an individual’s ability to regulate his or her response to environmental stimuli (Else-Quest et al., 2006). Studies of children consistently find
girls show greater effortful control than boys, with large effect sizes for sex (see meta-analysis by Else-Quest et al. 2006). One consequence of low effortful control may be that males are more likely to engage in impulsive, reward-seeking behaviors in response to negative emotions. Some studies suggest that the relationship between depressive affect and later alcohol use is stronger for men than women, indicating that men may be more likely to seek the rewarding effects of alcohol in response to negative emotions (Carney et al. 2000, Hussong et al. 2001, Swendsen et al. 2000). Effortful control appears to have a clear impact on the development of psychopathology (e.g., depression) in children and adolescence, but the mechanisms by which effortful control may exert its impact is still unknown (Muris & Ollendick, 2005).

In addition, sex differences in the prevalence of depression may also be linked to stressful life events. The Elaborated Cognitive Vulnerability-Transactional Stress Theory proposed by Hankin and Abramson (2001) argues that predisposing factors (including genetic and personality factors) can interact with negative events to contribute to initial experiences of distress and negative affect. This relationship is moderated by cognitive vulnerability factors, including dysfunctional attitudes and negative inferential style, to lead to the experience of greater depression. Differences between men and women at each of these steps may account for sex differences in depression and the late emergence of these differences (Hankin & Abramson, 2001). Adolescent girls report more stressors than adolescent boys and are more likely to experience interpersonal stressors (Hankin, Mermelstein, & Roesch, 2007), leading them to have greater risk from exposure to negative events. In addition, there are likely sex differences in how stress impacts an individual. Illustratively, a study by Brummett and colleagues (2008) found that the 5-HTTLPR genotype and stressful life circumstances interacted to affect depression vulnerability, but in women the s/s genotype conferred increased risk while in men the l/l
genotype conferred increased risk. Overall, there appears to be a positive-feedback cycle whereby girls experience greater exposure (and reactivity) to stress, which, when combined with their greater cognitive vulnerability to depression (through different emotion-regulation strategies), increases the likelihood of depressive symptoms after adolescence when gender-specific developmental factors become salient (Hankin & Abramson, 2001). Furthermore, these depressive symptoms, in turn, generate even more stressful life events (Hankin and Abramson, 2001). Research has largely supported this theory, overall demonstrating that girls have more dependent stress that is reciprocally linked to depression compared to boys (Liu & Alloy, 2011).

There are clear differences in the expression and prevalence of depression in men and women. However, we currently lack a clear understanding of why these differences emerge. In addition, at this time it is unclear how sex and gender relates to depression across developmental stages and as the potential factors discussed above become influential. Ignoring sex systematically disregards the ways that experiences of and responses to depression are shaped by gender-related influences (Nolen-Hoeksema et al., 1999). Additional research is needed to understand the role of sex during a child’s development, and to understand how sex may be associated with holistic presentations, and subtypes, of depression.

Another Explanation: Subtypes of Depression

A possible explanation of the sex differences found for symptom patterns and prevalence is that men and women may manifest “depression” in different ways as a result of the influences discussed above (Martin, Neighbors, & Griffith, 2013). This explanation reflects an increasing acknowledgement that the same construct can present differently, and this has led to an increasing need to understand if the construct of “depression” is expressed in identifiable patterns of symptoms (also known as subtypes). Reflecting this, research has begun to move
from a focus on understanding differences in discrete symptoms to understanding the holistic way that psychological disorders can manifest.

The fact that there may be different subtypes of depression can help explain the difference in prevalence rates of depression. One possible explanation for the sex differences in rates of depression is that depression in men may be underestimated due to a “male” (also “male-typed” or “masculine”) variant of depression that is characterized by irritability, aggression, and substance use (Cochran & Rabinowitz, 2000). Similar to the Gendered Response Framework, the concept of male depression centers around the idea that men display the underlying construct of depression with symptoms that are appropriate with traditional conceptualizations of masculinity but that are not included in traditional depression criteria. Currently, psychiatric classifications underemphasize or do not include the role of anger, aggressiveness, and hostility in unipolar depression, although they are included in symptoms of other mood disorders (i.e. bipolar classifications; Biondi et al., 2005; Pasquini et al., 2004; Painuly et al., 2005). Currently, two scales exist to evaluate the presence of “masculine” depression symptoms in individuals: The Gotland Male Depression Scale (GS; Zierau, Bille, Rutz, & Bech, 2002) and the Masculine Depression Scale (MDS; Magovcevic & Addis, 2008). Both of these scales include symptoms proposed in the literature as externalizing symptoms of depression in men including irritability, anger, aggression, sleep disturbance, alcohol and/or drug abuse, risk-taking behavior, hyperactivity, stress, and loss of interest in pleasurable activities (Martin, Neighbors, & Griffith, 2013). Studies using these scales have demonstrated that a substantial number of adults and older adolescents can be categorized as demonstrating a masculine subtype of depression (Möller-Leimkühler, Heller, & Paulus, 2007).
Research suggests that when taking into account the symptoms demonstrated by males with depression, the sex differences in prevalence rates disappear. Martin, Neighbors, and Griffith (2013) conducted a secondary data analysis to explore whether sex disparities in adult depression prevalence rates disappear when alternative symptoms are included with traditional depression symptoms. The researchers created two scales, the first with male-type depression symptoms and the second with gender-inclusive symptoms consisting of both of masculine depression symptoms and traditional symptoms of depression. In contrast with established depression prevalence rates, the researchers found that more men than women reported having masculine depression (21.9% of women and 25.3% of men). Furthermore, there were no prevalence rate differences found using the gender-inclusive scale. Finally, the study found that while men were likely to endorse many of the traditional depression symptoms, they were more likely to endorse masculine depression symptoms (Martin et al., 2013). Other studies have also found that symptoms of male-type depression may not only be found in males but also in females. Illustratively, Möller-Leimkühler and Yücel (2010) found that females had higher levels of male depression than males. This is also supported by research demonstrating an externalizing pathway to depression (through substance use, conduct problems) for both men (Kendler, Gardner, & Prescott, 2006) and women (Kendler, Gardner, & Prescott, 2002). Furthermore, this research is also consistent with previous literature demonstrating the common occurrence of externalizing symptoms in adolescents with depression. Herman and colleagues (2007) used latent profile analysis to examine profiles of co-occurring symptoms in a population of 423 adolescents aged 12-17 who had been diagnosed with MDD. The authors found that the most common pattern of co-occurring symptoms was depression with co-occurring oppositional/conduct disordered behaviors (32% of individuals; Herman, Ostrander, Walkup,
This pattern of depression occurring with externalizing behaviors was more common than all other patterns (including depressive symptoms alone), and was equally prevalent in males and females (Herman et al., 2007). This finding supports the understanding that there is likely a subtype of depression that is characterized by the co-occurrence of depression and externalizing symptoms.

In addition to the externalizing or male-typed depression, a type of depression characterized by higher levels of somatic symptoms may represent another subtype of depression and may also account for some of the observed sex differences in reports of depression. Somatic-type depression is often defined as traditional criteria for depression (i.e. sadness, worthlessness, etc.) plus at least three of the following symptoms: disordered eating, poor body image, insomnia, fatigue, headaches, and unexplained breathing difficulty (Silverstein et al., 2012). Commonly, researchers and clinicians examining somatic depression focus on the symptoms of excessive physical fatigue, overeating and over-sleeping (Angst et al., 2006).

Females tend to demonstrate more somatic depressive symptoms compared to men (Angst et al., 1984, 2002; Bennett et al., 2005; Carter et al., 2000; Ernst and Angst, 1992; Khan et al., 2002; Kornstein et al., 2000b; Scheibe et al., 2003; Silverstein, 2002; Young et al., 1990; Moskvina et al., 2007). In studies of both adolescents (Silverstein, Caveres, Perdue, & Cimarolli, 1995) and adults (Angst et al., 2006; Silverstein, Clauson, Perdue, Carpman, & Cinarolli, 1998; Silverstein, Cohen, & Kasen, 2006; Silverstein et al., 2012) the prevalence of somatic depression among females was two to three times that among males, but there was little or no sex difference in the prevalence of ‘pure depression’ (i.e. all depressions other than somatic depression). Thus, this somatic-type depression, which is more common in females, may account for these differences seen between the sexes.
The consideration of these subtypes is important, as the use of only “traditional” symptoms may not only account for the sex differences seen in depression, but also limit our understanding of the true nature of depression. A significant limitation in the literature is that previous studies often do not include all depression subtypes in studies that examine sex differences. For example, in the study of depressed adolescents conducted by Bennett and colleagues (2005) discussed above, adolescents who showed primarily irritable symptoms of depression were not included. This selection bias may have potentially eliminated a particular subset of individuals who manifest symptoms in this way, and limits our understanding of the true presentation of sex differences in depression. Furthermore, there is limited research on holistic symptom profiles in children and almost no research on the development of these profiles. Thus, there is a striking need for additional information regarding the development, emergence, and influence of difference symptom profiles as a part of understanding sex differences in depression.

Variation in Depression Across Racial and Ethnic Groups

In addition to the increasing interest given to the presentation of depression across sexes, interest in the experience and presentation of depression in different ethnic and racial groups has also become a topic of interest to researchers. Overall, research suggests that non-White minority youth (African American, Hispanic, Asian, and other) have higher rates of depression than their White peers (Rushton, Forcier, & Schectman, 2002). However this research has been plagued with inconsistencies (Perreira, Deeb-Sossa, Harris, & Bollen, 2005; Vega & Rumbaut, 1991). Racial and ethnic differences have been found in the prevalence and symptomatology of internalizing disorders in many research studies. Racial/ethnic differences in the prevalence and symptom presentation of depression (Blazer, Kessler, McGonagle, & Swartz 1994; Kessler et al.,
have been demonstrated in many studies using adult samples. For example, some studies have found that African Americans have the lowest rates of depression of any subgroup in the United States (Kessler et al., 1994; Kessler, Chiu, Demler, & Walters, 2005). In youth, research has demonstrated conflicting findings, with some research demonstrating that Hispanic American youth have the highest levels of depression compared to other ethnic groups (Gore & Aselthine, 2003; Twenge & Nolen-Hoeksema, 2002), whereas in other studies African Americans have this highest rates compared to other groups (Gore & Aselthine, 2003; Garrison et al., 1990). Brown, Meadows and Elder (2007) found that there was a decreasing level of depression symptoms in all groups as youth transitioned from young adulthood to adulthood; however, this decline was steeper for Hispanic and Asian youth, who began with the highest levels of depression symptoms. This study found that by adulthood, the symptom level for minority groups (Black, Asian, and Hispanic youth) converged, but remained higher than for their White peers (Brown, Meadows & Elder, 2007). A second study found that overall, Black, Hispanic, and Asian adolescents experience higher levels of depression symptoms early in life, largely due to their greater exposure to childhood stress and stressful life events, and that Black and Latino adolescents also react more depressively to exposure to stress than their White peers (Adkins, Wang, & Elder, 2009). One important limitation of the extant research is that specific developmental paths and sociocultural influences of these racial/ethnic differences in depression have not been adequately explored. In part, this may be because the majority of the research studies have been conducted with primarily, or entirely, European American samples. In addition, studies that have examined ethnic/racial differences have been primarily conducted within adult populations, limiting the investigation of the role of ethnicity/race as development occurs. For example, Smith and colleagues (2008) examined symptom endorsement between adult men and
women and found that while the symptom endorsement during the ‘worst ever’ depressive symptoms was very similar, overall women had an earlier age of onset, a higher number of symptoms, and a higher number of episodes. However, the entire sample consisted of adult individuals who identified as Caucasian. Most of the studies on the development of psychopathology have been conducted in primarily European American children (similar to the studies of adults).

The increasing interest in the experience and presentation of depression in different ethnic/racial groups has also placed an emphasis on the importance of examining individuals in poverty. Minority children are overrepresented in the at-risk, low socioeconomic status (SES) population, with over 70 percent of children in low-income families belonging to ethnic/racial minority groups (Addy & Wight, 2012). This is important, as low SES creates multiple environmental risk factors associated with psychopathology (Anderson & Mayes, 2010). Low-income children experience less social support, are exposed to more family turmoil, and are more likely to live in neighborhoods that are dangerous and offer lower quality municipal services. Consequently, low-income children are particularly in need of studies that can help with the identification of the unique presentations and risk factors of psychopathology (Evans, 2004). As minority children are more likely to experience poverty, they are also more likely to experience poverty-influenced risk factors then their majority peers (Addy & Wight, 2012). The interaction of environmental and social conditions that minority youth are more likely to be exposed to may predispose those youth to negative outcomes (Ramos, Jaccard, & Guílamo-Ramos, 2003), yet minority youth are underrepresented in the literature. Research has shown that salient risk factors such as dangerous neighborhoods, exposure to violence, and delinquent peers, are all linked to low SES, and as a result poverty may impact ethnic/racial minority children at multiple levels.
and may combine to create increased and complex risks for depression (Simons et al., 2002). Research suggests that stress accounts for more variance in the prevalence and depression trajectories in minority youth, and particularly in African American and Hispanic Youth (Brown, Meadows & Elder, 2007; Adkins, Wang, & Elder, 2009). Consequently, when investigating the development of depression in at-risk youth, it is important to examine the unique impact of risk on the development of ethnic/racial minority groups without using a ‘one model fits all’ approach.

**How Do We Study Depression?**

There are two methodological approaches used to study psychopathology. The first, a variable-focused approach, is characterized by the use of multivariate statistics to investigate links between individual constructs and variables (Masten, 2001). These variable-based statistical analyses include multiple regression and ANOVA, and focus on changes in variables (Luthar, 2006). For example, a variable-focused analysis may examine how changes in one variable (such as stress) are related to changes in another variable (such as depression). This model can maximize statistical power and is best for searching for different links between predictors and outcomes (Masten, 2001). However, as a result of this approach’s focus on variables, variable-centered approaches often overlook the picture of the individual as a whole in favor of examining their specific qualities in isolation. Furthermore, variable-centered analyses assume a homogenous group, in that everyone in the group is the same, which may not always be accurate (Collins & Lanza, 2010). In research on depression, this approach is used to examine specific symptom or disorder prevalence, or to predict depression onset. For example, Smith and colleagues (2006) explored whether discrete variables (symptom endorsement, number of episodes, age of onset, etc.) were predicted by another variable (sex). Variable-centered
approaches have been used in an attempt to examine symptom presentation of depression. In a study by Verhoeven and colleagues (2013), the researchers looked at the factor invariance of the Center for Epidemiologic Studies of Depression Scale (CES-D) in adolescents. Verhoeven, Sawyer and Spence (2013) used confirmatory factor analysis, which is a taxometric procedure that is aimed at the explication of mutually exclusive underlying classes or groups of classes and assumes that the observable variable is continuous rather than categorical, and assumes that the latent structure is continuous rather than categorical in nature. They found that the factor structure of depression generally mirrored that found in adults, and that the factor structure fit the data for both males and females. Gender differences related to the functioning of the items existed on several items (‘I had crying spells’; ‘I felt that I could not shake off the blues’; ‘I felt that everything I did was an effort’; ‘People were unfriendly’). However, a limitation of this study is that Confirmatory Factor Analysis (CFA) is more concerned with the structure of variables (i.e. their correlations) than the true underlying picture of how depression appears in adolescents (i.e. the latent taxonomic structure).

In order to better examine the question of how depression manifests and develops, researchers utilize the second main model of examining psychopathological phenomenon: a person-focused approach (Masten, 2001). This approach works to keep variables in their naturally occurring configurations, and thus can better capture patterns that function in the real lives of people when compared to the variable-centered alternative (Masten, 2001). While this approach can make it more difficult to examine specific links and explanatory processes to be targeted in interventions (Masten, 2001), it can better allow for the examination of naturally-occurring patterns symptom. One type of person-centered analysis that has particular promise for examining the patterns of depression is a Latent Profile Analysis or Latent Class Analysis.
LPA and LCA are person-centered methods that focus on common patterns of factors within individuals (Muthén and Muthén, 2002), with the premise that covariation among symptoms can be explained by the latent variable (e.g. subtypes of depression; Lanza, Flaherty, & Collins, 2003). For example, Herman and colleagues (2007) used LPA to examine subtypes and comorbidity in a sample of adolescents. They found that there were 5 distinct classes or subtypes, the most common of which (32%) was characterized by inattention, psychosomatic symptoms, and social problems. They concluded that considering these symptoms using this method allowed for a better understanding of the true, complicated picture of depression in adolescence.

**The Current Study**

The current study was guided by the Elaborated Cognitive Vulnerability-Transactional Stress Theory proposed by Hankin and Abramson (2001) and the Gendered Response Framework (Addis, 2008) discussed above. Specifically, I propose that exposure to stressful life events combines with an individual’s general vulnerability to increase an individual’s negative affect (specifically depression). Furthermore, I posited that this negative affect is demonstrated in different ways for boys and girls, leading men to demonstrate more aggressive and externalizing symptoms and women to demonstrate more traditional and somatic symptoms when exposed to stressful life events. In addition, consistent with both of these models, I proposed that these sex differences emerge after late childhood/early adolescence, when a variety of biological, psychological, and social developmental factors become salient.

The major aim of this study was to examine the presentation and development of depression over time, and so this study used two of the waves of the *Welfare, Children, and Families: A Three-City Study* (Cherlin, 1999; Cherlin et al., 2001). This dataset contained
information from a large, diverse sample of urban youth in San Antonio, Boston, and Chicago across three waves of data (approximately 6 years), and included a diverse array of psychosocial information reported by the child and the primary caregiver.

This study used a set of gender-inclusive depressive symptom indicators to allow for the understanding of different subtypes of depression for males and females. In the selection of the gender-inclusive symptoms for use in analyses, traditional depression indicators based on current diagnostic criteria (DSM-5; American Psychiatric Association, 2013) were selected in addition to masculine-depression items that have been shown to be relevant in the literature on that subtype (e.g. Magovcevic & Addis, 2008; Martin, Neighbors, & Griffith, 2013; Zierau, Bille, Rutz, & Bech, 2002).

When examining the development of sex differences in psychopathology, the timing of the study is particularly important as the expression and prevalence of depression in males and females changes with age. In their study of adolescents, Mezulis and colleagues (2011) found that naturally occurring profiles of psychopathological symptoms were distinguished more frequently by number rather than type (internalizing vs externalizing). In addition, they found that there were no classes in which there were significantly more girls than boys. However, this analysis was conducted when the individuals were 11 to 13 years old (Mezulis et al., 2011), and may not represent the differences between males and females that typically occur between ages 13 to 15 (Hankin et al., 1998). The present study examined patterns of gender-inclusive depressive symptoms at two time points (early and late adolescence) in an effort to best capture the change in symptoms profiles and sex differences that emerge as a child moves early to late adolescence (Essau et al., 2000; Fu-I & Wang, 2008; Hankin et al., 1998; Hankin and Abramson, 2001; Kovacs, Obrosky, & Sherrill, 2003; Twenge & Nolen-Hoeksema, 2002; Wade et al., 2002).
For this reason, a sample was selected from the *Welfare Children and Families: A Three City Study* dataset, which contains low-income males and females who were age 10-12 at wave 1 (and age 16-18 at wave 3).

In addition, this study identified predictors of latent profile membership (sex, ethnic/racial group, and stressful events) at each time point. Due to the critical need to understand the experience and development of depression in minority youth, this study used only individuals whose caregivers identified their children as African American or Hispanic. As discussed above, person-centered approaches can be used to capture the picture of symptom profiles as they occur naturally; as a result, person-centered approach (latent transition analyses) were used to model the heterogeneity in depressive classes in early and late adolescence.

**Hypotheses**

The project’s hypotheses were:

1. Based on previous research that the stability of psychological disorders is low across developmental stages (Fu-I & Wang, 2008; Kovacs, Obrosky, & Sherrill, 2003) and is particularly low as children transition from early adolescence/pre-puberty and thereafter, symptom classes will be different in number and/or composition at ages 10-12 and ages 16-18. Following previous literature, I hypothesized that patterns identified at early adolescence would be distinguished by number of symptoms rather than type, while the patterns identified after puberty at ages 16-18 would demonstrate 5 classes: no depression, traditional symptom depression, masculine depression, somatic depression, and elevation on all symptoms.
2. As sex differences emerge after puberty (Essau et al., 2000; Hankin and Abramson, 2001; Wade et al., 2002; Twenge and Nolen-Hoeksema, 2002), and are most pronounced after age 13 (Essau et al., 2000; Hankin et al., 1998), I hypothesized that sex differences in symptom classes would be present at the third wave (16-18) but not the first (10-12). In the third wave, I hypothesized that women would be more likely to be in the traditional and somatic depression profile groups, while men would be more likely to demonstrate masculine or no depression.

3. Based on previous research that illustrates the importance of stressful life events throughout development, I predicted that higher levels of current stressful life events would be significantly related to membership in a depressed subgroup (i.e. classes with high levels of depressive symptoms such as classes indicating traditional depression, masculine depression, or somatic depression) for both sexes. Due to the limited research regarding the relationship of stressful life with specific subtypes (i.e. masculine-type depression and somatic-type depression) no predictions regarding which depressive subtype is predicted could be made.

4. Currently, there is limited research on the development of depressive classes or profiles in African American and Hispanic adolescents. Thus, no specific hypotheses were made regarding possible differences in the presentation or development of depression for the specific ethnicities.
Method

Participants

This study was a secondary analysis of data from the Welfare, Children, and Families: A Three-City Study (Cherlin, 1999; Cherlin et al., 2001). The Three City Study was designed to examine the effects of welfare reform on children and their families living in low-income urban neighborhoods in Boston, Chicago, and San Antonio. Three waves of data were collected and two were used in this study. The first wave was collected between March and December 1999, the second wave followed approximately 18 months later between September 2000 and June 2001, and the third wave of data collection took place between February 2005 and January 2006. In this study, the first and third waves of data were be used to provide a view of development over 6 years and at two developmentally distinct time points. The Three-City Study recruited participants using a household-based, stratified-random sampling procedure in order to obtain a sample of low-income children and their families. The investigators used door-to-door screening interviews to first identify families that met pre-established sampling criteria with respect to income, ethnic/racial group, and child’s age. From the eligible families, a random sample, using predetermined sampling rates, was selected to participate in the survey portion of the study. (See Winston et al., 1999 for further sampling procedure and recruitment details.) Trained field interviewers administered the survey to the participants in their homes, which took approximately 2.5 hours. A total of 2,402 children participated at wave 1 (ages 0-4 and 10-14) and 1,944 at wave 3 (ages 5-10 and 15-20). The guidelines set by the Society for Research in Child Development’s Ethical Standards for Research with Children (1990–1991) were followed. Approval from the University at Albany, State University of New York’s Institutional Review Board was obtained for use of this dataset.
The present study was based on data from a subset of adolescents who were age 10-12 at the first wave of collection and whose parents identified them as Spanish, Latino, or Hispanic, or Black or African American. Children whose caregivers identified them as Caucasian/White or Other were excluded for three reasons. First, lack of research on ethnic minority youth makes it important that these populations be examined more closely. Second, there were far fewer participants of European decent (Non-Hispanic White: 6.56%) than of other descents (Non-Hispanic Black = 43.46%, Hispanic, any race = 48.21%, Other = 1.75%) in the original sample. Finally, individuals from different ethnicities were not equally spread among the three cities (no Non-Hispanic White individuals participated in the study in San Antonio). Finally, due to some items of stress being related to maternal factors, adolescents were selected who were living at home at wave 1 and wave 3 of data.

**Measures**

**Depression Symptoms.** Nine depressive symptoms or indicators were used at each time point. Depression symptom selection was based on: a) previous literature on traditional symptoms of depression, and on traditional DSM-5 criterion, b) literature review on alternative symptoms of depression, and symptoms included masculine and somatic symptoms subtypes of the in the GS and MDS depression scales, and c) the availability of those symptoms in the Three-City Study Dataset measured the same way at both time points. Similar to the study by Martin, Neighbors, and Griffith (2013), items were chosen based on availability throughout the entire dataset, and not limited to items from one scale. This is important, as items measuring somatic, masculine, and traditional depression symptoms were not all available from one scale at both time points.
Prior to analyses, all items were dichotomized to indicate the presence or absence of a symptom. This allowed for the creation of classes of depressive symptoms rather than assessing severity, and is consistent with clinical methods of establishing depressive diagnoses on number, rather than severity, of symptoms. For example, the DSM-5 currently lists the presence of 5 of 9 symptoms indicating the presence of a Major Depressive Episode (American Psychiatric Association, 2013).

**Aggression.** Aggression may present as an externalizing symptom of depression in men and has been included in male-typed depression inventories (Magovcevic & Addis, 2008; Zierau et al., 2002) and in studies examining the prevalence of male depression (Martin, Neighbors, & Griffith, 2013). Aggression was measured at Wave 1 and Wave 3 by youth self-report. This item came from the Delinquency Scale of the Three Cities Dataset. This scale was adapted for the study using the National Longitudinal Study of Youth (NLSY; Borus et al., 1982) and the Youth Deviance Scale (Gold, 1970; used by Steinberg, Mounts, Lamborn, & Dornbusch, 1991). This item asked “In the past 12 months, how often have you gotten into a physical fight?” and answer on a 4-point Likert scale (1= never; 4 = often). This item is similar to the anger/attack and irritability constructs used in the Martin, Neighbors, and Griffith (2013) gender-inclusive depression scale. This item was recoded so that 1 will be coded as absence of symptom (0) and other responses (2-4) will be coded as presence of symptom.

**Alcohol use.** Drug and alcohol use is also conceptualized as a masculine-typed symptom of depression in men, and also has been included in male-typed depression inventories (Magovcevic & Addis, 2008; Zierau et al., 2002) and in studies examining the prevalence of male depression (Martin, Neighbors, & Griffith, 2013). Alcohol use has been proposed to be one way that men may demonstrate their depressive symptoms (Angst et al., 2002). Alcohol use was
measured at Wave 1 and Wave 3 by youth self-report. This item will come from the Delinquency Scale of the Three Cities Dataset. This scale was adapted for the study using the National Longitudinal Study of Youth (NLSY; Borus et al., 1982) and the Youth Deviance Scale (Gold, 1970; used by Steinberg, Mounts, Lamborn, & Dornbusch, 1991). In this item, youth are asked “In the past 12 months, how often have you gotten drunk?” and answer on a 4-point Likert scale (1= never; 4 = often). This item was recoded so that never (1) was coded as absence of symptom (0) and other responses (2-4) was coded as presence of symptom.

**Risk-taking behavior.** Risk-taking behavior has been included as a masculine-typed symptom of depression in men, and is used in male-typed depression inventories (Magovcevic & Addis, 2008; Zierau et al., 2002) and in studies examining the prevalence of male depression (Martin, Neighbors, & Griffith, 2013). Risk-taking behavior was measured at Wave 1 and Wave 3 by youth self-report. This item came from the Delinquency Scale of the Three Cities Dataset. This scale was adapted for the study using the National Longitudinal Study of Youth (NLSY; Borus et al., 1982) and the Youth Deviance Scale (Gold, 1970; used by Steinberg, Mounts, Lamborn, & Dornbusch, 1991). In this item, youth are asked “In the past 12 months, how often have you gotten in trouble with the police?” and answer on a 4-point Likert scale (1= never; 4 = often). This item was recoded so that never (1) was coded as absence of symptom (0) and other responses (2-4) was coded as presence of symptom.

**Difficulty breathing.** Unexplained difficulty breathing has been included as a somatic-typed symptom of depression (Silverstein et al., 2012). Difficulty breathing was measured using an item that asks the subjects how often they experience “trouble getting your breath” within the past 7 days. This item came from the Brief Symptom Inventory-18’s (BSI-18) somatization dimension. The BSI-18 is a psychological assessment instrument that is used to screen for
elevation on reported depressive, anxious, and somatic symptom dimensions that has been shown to be valid and reliable in diverse samples (Derogatis, 2001). The BSI-18 asks individuals to self-report how often they have experienced symptoms of anxiety, somatization, and depression within the past 7 days. This inventory uses a 5-point Likert scale ranging from “Not at all” to “Extremely”. This item was recoded so that not at all (1) was coded as absence of symptom (0) and other responses (2-5) was coded as presence of symptom.

**Weakness.** Excessive physical fatigue is conceptualized as a somatic-symptom of depression by researchers, and is found more frequently in females (Angst et al., 2006; Silberstein et al., 2012). Feelings of weakness were measured using an item that asks the subjects how often they experience “feeling weak in parts of your body” within the past 7 days. This item came from the Brief Symptom Inventory-18’s (BSI-18) somatization dimension, and was recoded so that not at all (1) was coded as absence of symptom (0) and other responses (2-5) was coded as presence of symptom.

**Faintness.** Excessive physical fatigue is conceptualized as one of the somatic-symptom of depression by researchers, which are found more frequently in females (Angst et al., 2006; Silberstein et al., 2012). Feelings of “faintness or dizziness” was measured by an item on the Brief Symptom Inventory-18’s (BSI-18) somatization dimension, and again was recoded so that not at all (1) was coded as absence of symptom (0) and other responses (2-5) was coded as presence of symptom.

**Anhedonia.** Anhedonia, or loss of interest in previously enjoyable activities, is a symptom of depression listed in the traditional DSM criteria (American Psychiatric Association, 2013). Anhedonia has been found to be more characteristic of depression in males when using traditional symptoms (Bennett et al., 2005). Anhedonia was measured using an item from the
Brief Symptom Inventory-18 (BSI-18), specifically where participants rate how much they have been “feeling no interest in things.” Again, this item was recoded so that not at all (1) was coded as absence of symptom (0) and other responses (2-5) was coded as presence of symptom.

**Depressed mood.** Depressed mood, or “feeling blue”, is an item that was recorded from an item in the Brief Symptom Inventory-18 (BSI-18) that was used to indicate the experience of sadness. Depressed mood is one of the key symptoms of depression in traditional symptom inventories (American Psychiatric Association, 2013), but has been shown to be more reflective of depression in women (Bennet et al., 2005).

**Worthlessness.** “Feelings of worthlessness” is an item from the Brief Symptom Inventory-18 (BSI-18) that coincides with DSM-5 criteria and traditional diagnostic conceptualizations of depression (American Psychiatric Association, 2013) and was again recoded for use in this study. Feelings of worthlessness and guilt are more likely to be seen in women than men (Bennet et al., 2005; Fu-I & Wang, 2008).

**Stress.** Consistent with theory and previous research on stress, stressors were defined as an external factor that may cause a stress response (Lohman, Stewart, Gunderson, Garask, & Eisenmann, 2009) and chosen based on previous literature demonstrating each factor as a stressor. Stress influences were measured at the individual, family, and neighborhood level. These factors were selected based on: 1) availability in the dataset; 2) previous research on stress influences in this sample; 3) research demonstrating the ability of the factors to induce or inhibit their personal characteristics in the literature. Each variable was dichotomized, and then summed to create a total stress scores.

This technique was used by Lohman and colleagues (2009) to examine the relationship between stressors and adolescent obesity in the Three Cities Study sample. Lohman and
colleagues used a variety of stress items at the mother and family level including the four variables included in this study. First, social support is a composite variable made of 4 items where the child’s mother was asked to indicate that if they have people to 1) help care for children 2) provide small favors 3) provide emergency loans and 4) provide emotional support. For each social support question, individuals indicated if they had enough, too few, or no one to provide social support. For use in the stress item, the item was dichotomized such that lower than median scores were coded as 0 and higher than median scores were coded as 1.

The second stress variable, financial strain, was measured by a five-item scale adapted from Conger, Ge, Elder, Lorenz and Simons (1994). The items assessed how often mothers reported they had experienced financial difficulties such as not having enough money for housing, food, and clothing. Because response options differed across the five items, the composite score was computed by taking the mean of the standardized items. Higher scores reflect higher levels of perceived financial strain; the item was dichotomized such that lower than median scores were coded as 0 and higher than median scores were coded as 1.

The third indicator in the stress composite was Maternal Psychological Distress. Maternal psychological distress was measured with the global severity index of the Brief Symptom Inventory-18 (BSI-18; Derogatis, 1988), which assesses symptoms of depression, anxiety, and somatization. Mothers were asked to rate each of the items on a scale ranging from 0 not at all to 4 extremely. The global severity index was then transformed into t-scores. Consistent with the clinical utility of the scale, mothers with a t from 65-70 are considered to have elevated psychological distress and those with a t higher than 70 are considered to have clinically significant levels of maternal psychological distress. For the stress composite, the item
was dichotomized so that scores below 65 were coded as 0 and scores higher than 65 scores were coded as 1.

Finally, the fourth stress indicator is Neighborhood Problems. Neighborhood problems were measured with an 11-item scale adapted from the Philadelphia Family Management Study (Furstenberg, Cook, Eccles, Elder, & Sameroff, 1999). Mothers were asked about the extent to which they found conditions such as unemployment, abandoned houses, burglaries and thefts, and gangs to be problems in their neighborhoods. Respondents rated these problems from 1 (no problem) to 3 (a big problem). Neighborhood problems score was based on the sum of the 11 items, with higher scores reflecting more neighborhood problems. Neighborhood problems was then dichotomized such that lower than median scores were coded as 0 and higher than median scores were coded as 1.

*Weighting Variable.* In the original study, certain groups (e.g. those on welfare, families below the poverty line, single mothers) were oversampled, and the lack of random sampling threatens the generalizability of any results. The use of analytic sampling weights allows for the data to generalize outside of the sample to a larger group of individuals in low-income areas with an income below 200 percent of the poverty line. Thus, sampling weights were constructed by the original study designers to reflect and account for clustering, stratification, and non-response. As per recommendations from the study designers, specific child weights that adjust for the number of age-eligible children in the household (since only one child was selected per household) were used. The original study weights assigned larger values to households in cities with higher populations because these households had a smaller likelihood of being selected than did households in cities with lower populations. However, following recommendations from the original study authors (Cherlin, 1999; Winston et al., 1999) who considered the differences in
population size to be arbitrary, these weights were re-normalized after data cleaning to give equal weight to the data from each city. Renormalization was necessary, as the study did not use the entire sample. Renormalization of the sample weights happened in the following way: 1) the sum of all the original sampling weights within a city was divided by the average number of respondents in that city (1/3 the entire sample size) to get the mean weight for individuals in each city, 2) the original sampling weight for each individual was divided by the mean weight for each city to create the renormalized weight for each individual.

**Data Analytic Plan**

To identify the latent classes of gender-inclusive depressive symptoms across two time points four Latent Class Analyses (LCA) were utilized. LCA are person-centered methods that can be used to identify subgroups of individuals within a sample who have different symptom patterns (Collins & Lanza, 2010). The fundamental premise of these analyses is that the covariation among manifest variables (symptoms) can be explained by the latent variable (subtypes of depression; Lanza, Flaherty, & Collins, 2003). LCA model the relationship between discrete, or bivariate, observed variables and a discrete latent variable. Thus, this type of analysis will be used to test the hypothesis that different symptom patterns will be identified at Wave 1 compared to Wave 3 (hypothesis 1), and between girls and boys (hypothesis 3). The LCA were conducted using MPlus 7.11 (Muthén & Muthén, 2012). All other analyses were conducted using SPSS.

The following steps were taken to conduct the LCA (Collins & Lanza, 2010, Meeus et al., 2010). First, descriptive statistics were examined for each variable in the analyses. Next, the number of latent classes was determined at each time point using the bivariate indicators (depression symptoms). These analyses were used to identify the ideal LCA class solution.
Finally, the covariates were included in the LCA model using the classes that were identified from the LCA. The addition of the covariates allowed for the examination of the different classes and their relationship with stress (hypothesis 3) and their relationship with ethnic group (hypothesis 4). These steps were taken separately for males and females at each time point for a total of 4 analyses. During all steps after data cleaning, the weighted variable was be used to account for sampling rates.

**Determining number of latent classes.**

When considering the fit of a statistical model and choosing from among several competing models, decisions about model evaluation and selection are based on a combination of statistical criteria, parsimony, and interpretability (Collins & Lanza, 2010). First, the use of statistical criteria involves the identification of multiple indicators of fit to determine the optimal number of latent classes. Traditionally, the model fit is first determined by starting with a 2-class solution, and increasing the number of classes until the model no longer converges or the models are nonsensical (Collins & Lanza, 2010). The fit of each of the models is compared to determine the optimal number of classes. With latent class models, there are multiple statistical indicators of model fit that are used in combination with substantive theory to decide on a best fitting model. Although many fit indices from both information criteria and likelihood-based tests are traditionally used in the literature, in my analyses more weight was given to Bayesian Information Criterion (BIC; Schwartz, 1978) and the sample-size-adjusted BIC (ABIC; Sclove, 1987), because recent simulation studies suggest that the BIC and adjusted BIC provide the most reliable indicators of true model fit (Nylund, Asparouhov, & Muthén, 2007). While research would suggest that the Bootstrap Likelihood Ratio Test (BLRT; McLachlan & Peel, 2000) is one of the best indicators for determining the optimal number of classes (Nylund, Asparouhov, &
Muthén, 2007), this test is not available with weighted analyses. When using information criteria to assess model fit, when all other factors are equal, the lowest value of a given indicator identifies the preferred model (Collins & Lanza, 2010). In addition to using fit indices, model fit was also assessed by considering parsimony, such that when other factors are the same in representing the data accurately, a simpler model is preferred over a more complex model (Collins & Lanza, 2010). Finally, interpretability was considered, by examining estimated item-response probabilities for each of the identified models, to ensure that the model chosen can be clearly interpreted (Collins & Lanza, 2010).

**Treatment of outliers and non-normality.**

The risk of non-normality and outliers in this data set is small as the depression items were dichotomized prior to analyses, and the stress variable was composed of similarly dichotomized variables. The stress item was examined for non-normality; at wave 1, the stress item had a skewness of .35 (SE = 0.10) and kurtosis of -.53 (SE = 0.20), and at wave 3 a skewness of .29 (SE = 0.11) and kurtosis of -.59 (SE = 0.23). Thus, overall, the results demonstrated that the stress item was within normal limits at both time points, and there were no influential outliers (min=0, max=4).

**Power.**

Results of a simulation study showed that the there are several indicators that can be utilized in a study to allow for adequate power under a variety of different models and sample sizes. One study (Nylund, Asparouhov, & Muthén, 2006) identified that the BLRT indicator has the best power; for example, with a sample size of 200 using the BLRT indicator and categorical outcomes, the power was .84 for LCA analyses to detect a 4-class model with 10 items, a complex structure (without any distinguishing items), and unequal classes. The power increased
to 1.00 with a sample size of 500 and the same structure. However, the authors noted that the BLRT indicator is unable to account for complex survey design and the use of weights, and suggested using the BIC as a primary indicator for analyses, noting that it was able to identify the correct model 100% of the time with an 8-item simple structure and 200 people and 99% of the time with 15 item-simple structure and 200 people. For the 10 item, complex structure class model discussed above, the power was .74 with 200 participants, but increased to 1.0 with 500 individuals. Thus, the sample size in the present research should be sufficient for the model analyses. As the proposed model at both time points has 9 items, and I am predicting 4 classes at each time point, and the sample consists of over 300 boys and 300 girls at wave 1 and over 200 girls and 200 boys at wave 3, power should greatly exceed the power of .74 found in the most complex modeling discussed above.

**Results**

**Data Cleaning**

The original dataset contained 2404 participants. First, this data set was reduced by selecting only those who were ages 10, 11, and 12 at wave 1 (identified by computing their age based on the child’s birthdate). This left 739 participants. Next, only those individuals who were identified as Non-Hispanic Black or Hispanic, Any Race were selected ($n = 664$). The participants were then reduced again to select those who also self-identified as being 10, 11, and 12 years old. This left a total of 644 participants. Finally, because variables related to caregiver well-being and stress were used as stress items, individuals were removed from the study if they were not living with their caregiver at wave 3. This resulted in a total of 620 participants (at wave 1) who were Black or Hispanic youth aged 10-12 at wave 1 ($M = 10.96, SD = .82$), and 15-18 at wave 3 ($M = 16.41, SD = .92$) who were living with their parents. Of these cases, 6 were
eliminated for missing data (1 girl, 5 boys). When the dataset was split, this created datasets with 309 girls and 301 boys at wave 1. Through attrition, at wave three there were 246 girls and 207 boys. Chi-square analyses indicated that the group who had remained in the study for the third wave did not differ on ethnicity ($\chi^2 (1, N = 615) = 1.57, p = .21$) or city of residence ($\chi^2 (2, N = 615) = .49, p = .78$) from those who dropped out at wave 3. In addition, individuals who dropped out of the study did not differ from those who remained in the study on endorsement of any of the 9 depression items at wave 1 including Worthlessness ($\chi^2 (1, N = 594) = .02, p = .89$), Depression ($\chi^2 (1, N = 604) = .24, p = .63$), Anhedonia ($\chi^2 (1, N = 594) = .53, p = .47$), Breathing ($\chi^2 (1, N = 604) = .96, p = .33$), Weakness ($\chi^2 (1, N = 597) = 1.96, p = .16$), Faintness ($\chi^2 (1, N = 602) = 3.18, p = .07$), Alcohol ($\chi^2 (1, N = 610) = .00, p = .99$), Anger ($\chi^2 (1, N = 609) = .10, p = .75$), or Risky Behavior ($\chi^2 (1, N = 609) = 1.16, p = .28$). However, girls were more likely to continue to the third wave than boys were ($\chi^2 (1, N = 615) = 14.37, p < .001$). There was no difference in attrition based on age at wave 1 ($F (2, 617) = 1.78, p = .17$). There was no difference in attrition based on stress at wave 1 ($t (609) = -.55, p = .58$). The number of people who endorsed each Latent Class Indicator can be found on Table 1 and the means and standard deviations of the stress item are found in Table 2. [INSERT TABLE 1] [INSERT TABLE 2]

**Number of Classes Identification**

**Girls Wave 1.** Models consisting of two up to seven classes were estimated. Table 3 shows the number of parameters estimated, the log likelihood statistic, the degrees of freedom, the AIC, BIC, and ABIC. The AIC, BIC, and ABIC are shown in Figure 3. As the figure shows, the AIC and ABIC continued to go down after more latent classes were identified, but generally leveled off after four classes, while the BIC began increasing after the third class. Examination of models with five or more classes demonstrated that there were classes with small numbers
(model with five classes had a class with 12 people, while the model with six classes had 2 classes with 12 people, etc), had poor homogeneity of variance when compared to the models with 4 or fewer classes. Thus, based on the data presented in Table 3 and Figure 3, along with an examination of the interpretation of the resultant latent classes through the estimated probabilities, a four-latent-class model of symptoms was chosen for this group. As can be seen in Table 4, the four-class model was well differentiated, with very little overlap between classes.

[INSERT TABLE 3] [INSERT TABLE 4] [INSERT FIGURE 2]

**Boys Wave 1.** Models consisting of two up to seven classes were estimated. Table 5 shows the number of parameters estimated, the log likelihood statistic, the degrees of freedom, the AIC, BIC, and ABIC. The AIC, BIC, and ABIC are displayed in Figure 4. As shown there, the AIC continued to go down after more latent classes were identified, whereas the BIC remained relatively constant until four classes, when it began increasing. The ABIC clearly identified 4 as the optimal number of classes. Thus, based on the data presented in Table 5 and Figure 4, along with an examination of the interpretation of the resultant latent classes through the estimated probabilities, a four-latent-class model of symptoms was chosen for this group. As can be seen in Table 6, the four-class model was well differentiated, with very little overlap between classes.  [INSERT TABLE 5] [INSERT TABLE 6] [INSERT FIGURE 4]

**Girls Wave 3.** As with wave 1, models consisting of two up to seven classes were estimated. Table 7 shows the number of parameters estimated, the log likelihood statistic, the degrees of freedom, the AIC, BIC, and ABIC. The AIC, BIC, and ABIC are plotted in Figure 5. As the figure shows, the AIC and ABIC continued to go down after more latent classes were identified, until they leveled off after five classes. In contrast, The BIC remained relatively constant as more classes were added until an increase began at four classes and became more
apparent at class five. Thus, based on the data presented in Table 7 and Figure 5, along with an examination of the interpretation of the resultant latent classes through the estimated probabilities, a four-latent-class model of symptoms was chosen for this group. As can be seen in Table 8, the four-class model was well differentiated, with very little overlap between classes.

Boys Wave 3. Models consisting of two up to seven classes were estimated. Table 9 shows the number of parameters estimated, the log likelihood statistic, the degrees of freedom, the AIC, BIC, and ABIC. The AIC, BIC, and ABIC are given in Figure 6. As the figure shows, the AIC and ABIC continued to go down after more latent classes were identified, but generally leveled off after five classes. The BIC leveled off for three and four classes, and then began to increase noticeably for five, six, and seven classes. Though this group had a class with \( n = 6 \) individuals, this solution replicated the classes found in boys wave 1, and had groups that appeared significantly homogenous. Thus, based on the data presented in Table 9 and Figure 6, along with an examination of the interpretation of the resultant latent classes through the estimated probabilities, a four-latent-class model of symptoms was chosen for this group. As can be seen in Table 10, the four-class model was well differentiated, with very little overlap between classes.

Interpretation of Latent Class Structure

Interpreting the overall Latent Class Models, the covariates were included in the LCA model using the identified number of classes for each group. To achieve replication of the best log likelihood value, the random starts and stops were increased to 2000 starts and 20 stops uniformly for all groups.
Girls Wave 1. As can be seen in the estimated item probabilities presented in Table 11 and Figure 7, individuals in class 1 \((n = 32)\) endorsed symptoms of anhedonia, weakness, faintness, and symptoms of anger, and so are classified as a Mixed class. Individuals in class 2 \((n = 175)\) did not have a high probability of endorsing any of the items, and so were identified as a Non Clinical Class. Individuals in class 3 \((n = 44)\) endorsed symptoms of breathing difficulties and weakness, and so are in a Somatic Depression Class. Individuals in Class 4 \((n = 58)\) had the same symptoms as the Mixed class with the addition of depression, and so are identified as a Severe Mixed Class.

For the covariates, an examination of parameter constraints indicated that Stress significantly covaried with the classes overall (Wald’s \(\chi^2\) (1) = 8.22, \(p < .05\)). As can be seen in Figure 8 the probability of being in the non-clinical class initially increases before decreasing as stress increases. For the somatic symptom class, the probability remains about the same overall as stress increases. The probability of the mixed symptom class decreases sharply and then stabilizes at 0 (no probability) as stress increases, while the probability of belonging to the severe mixed class increases as stress decreases. For ethnic group, an examination of parameter constraints with Wald’s test could not be conducted as a parameter was fixed in the model estimation, an indication that there is no covariate relationship with ethnic group. [INSERT TABLE 11] [INSERT FIGURE 7] [INSERT FIGURE 8]

Boys Wave 1. As can be seen in the estimated item probabilities presented in Table 12 and Figure 9, individuals in class 1 \((n = 97)\) endorsed symptoms of anhedonia, weakness, and symptoms of anger, and so are classified as a Mixed class. Individuals in class 2 \((n = 19)\) endorsed anhedonia, weakness, and faintness, and so were classified as a Depression Only Class. Individuals in class 3 \((n = 137)\) did not have a high probability of endorsing any of the items, and
so were identified as a Non-Clinical Class. Individuals in Class 4 \((n = 49)\) has a high probability of endorsing symptoms of anger, and so were identified as an externalizing only class.

For the covariates, an examination of parameter constraints indicated that neither stress (Wald’s \(\chi^2 (1) = 1.80, p = .18\)) nor ethnic group (Wald’s \(\chi^2(1) = .61, p = .43\)) significantly covaried with the classes overall. [INSERT TABLE 12] [INSERT FIGURE 9]

**Girls Wave 3.** As can be seen in the estimated item probabilities presented in Table 13 and Figure 10, individuals in class 1 \((n = 50)\) endorsed symptoms of anhedonia, weakness, and faintness and so are classified as a Depressed Class. Individuals in class 2 \((n = 29)\) endorsed symptoms of depression, anhedonia, weakness, faintness, alcohol use, and anger, and so are identified as a Severe Mixed class. Individuals in class 3 \((n = 132)\) did not have a high probability of endorsing any of the items, and so were identified as a Non-Clinical Class. Individuals in Class 4 \((n = 34)\) endorsed symptoms of anhedonia and alcohol use, and so are classified as a Mixed class.

For the covariates, an examination of parameter constraints indicated that Stress significantly covaried with the classes overall (Wald’s \(\chi^2 (1) = 4.21, p < .05\)). As can be seen in Figure 11 the probability of being in the non-clinical class initially increases slightly as stress increases. For the depressed symptom class, the probability of membership decreases as stress increases. The probability of membership in the mixed symptom class decreases as stress increases, whereas the probability of belonging to the severe mixed class increases as stress decreases. However, for ethnic group, an examination of parameter constraints indicated that ethnic group (Wald’s \(\chi^2 (1) = .21, p = .65\)) did not significantly covary with the classes overall. [INSERT TABLE 13] [INSERT FIGURE 10] [INSERT FIGURE 11].
**Boys Wave 3.** As can be seen in the estimated item probabilities presented in Table 14 and Figure 12, individuals in class 1 (n = 6) endorsed symptoms of Worthlessness, Depression, difficulty breathing, weakness, and alcohol use and so are identified as a mixed class. Individuals in class 2 (n = 84) endorsed symptoms of anger and alcohol use and so are identified as an externalizing class. Individuals in class 3 (n = 48) endorsed symptoms of depression and anhedonia and so are identified as a Depressed Class. Individuals in Class 4 (n = 69) did not have a high probability of endorsing any of the items, and so were identified as a Non Clinical Class.

For the covariates of stress and ethnic group, an examination of parameter constraints with Wald’s test could not be conducted as two parameters were fixed in the model estimation, an indication that there is no covariate relationship with ethnic group or stress. [INSERT TABLE 14] [INSERT FIGURE 12]

**Discussion**

This study used a person-centered approach, Latent Class Analysis, to identify subtypes or patterns of depression in high-risk Black and Latino girls and boys in early and late adolescence and the relationship of those patterns with risk factors of stress and ethnic group. Indicators of depression chosen included non-traditional symptoms of depression in order to best identify variations in depression that may have been overlooked due to traditional conceptualizations of depression. The results of this study are discussed below.

**Boys**

The results showed that boys had the same 4 classes at both waves. In early adolescence as well as middle adolescence, there was a non-clinical class, a Depression class, an Externalizing class, and Mixed Class. The presence of the non-clinical class, the depression class,
and the externalizing class was consistent with the first hypothesis, however the number of classes (four) was lower than predicted (five), and the mixed class, which was made of depression and externalizing/masculine symptoms, was also not predicted. There was no support for a separate somatic subtype. Indeed, overall, the results of this study suggest that symptoms of depression were not clearly delimitated into pure subtypes (i.e. depression only, somatic only) for boys, but the subtypes or patterns in symptoms that do appear are similar in structure at waves 1 and 3.

Of these classes for boys, the non-clinical class was the largest at wave 1, but the externalizing class was the largest class at wave 3. Indeed, of the four latent class analyses conducted, it was only the group of older boys (boys at wave 3) that the non-clinical class was not the most common class. It is possible that boys in the non-clinical group at Wave 1 moved to another symptom group, such as the externalizing group, at wave 3. Future studies should examine this idea by looking at how these specific classes might change from early adolescent to middle adolescence.

The type of symptoms adolescents endorsed differed from early adolescence to middle adolescence. Specifically, symptoms of depression and alcohol use were not endorsed by any group at wave 1 when youth were early in adolescence, but were both endorsed at wave 3 when you were in middle adolescence; depression was endorsed by the mixed class and the depressed class, and alcohol use was endorsed by the mixed and externalizing classes. In addition, somatic symptoms of depression were endorsed at wave 1 in early adolescence, but not in middle adolescence. This result may also be due to the numerous social and gendered influences that have been posited to inform sex differences in depression. For example, younger boys may be more likely to endorse symptoms of weakness and faintness when they are younger, before
gendered learning and gender norms about masculinity become most salient (Addis, 2008, Nolen-Hoeksema et al., 1999). These influences related to gendered learning and gender norms may teach boys lessons about what emotional expression would be socially and culturally acceptable, and influence boys’ willingness and ability to report symptoms of depression that include stereotypically female experiences of weakness and faintness (Addis, 2008).

**Girls**

Results for girls suggested again there were four latent classes or symptom patterns. However, the classes for girls were even less indicative of clear symptom subtypes (i.e. traditional, masculine, or somatic) than for boys, but rather showed two different mixed profiles, and thus less supportive of the study’s first hypothesis than even for boys. These four classes seemed to indicate that there are different severities of symptoms of distress. For girls at both early adolescence and middle adolescence, there was a non-clinical class, which was the most prevalent class at both waves. In addition, at both waves there was a Mixed symptom class that consisted of depressive symptoms and externalizing symptoms, and Severe Mixed class, which consisted of the endorsement of more symptoms overall. The presence of the severe mixed class and mixed class in consistent with previous research that argues that subtypes of depression are frequently distinguished by number rather than type (Mezulis et al., 2001). Finally, there was a 4th group at both waves. At wave 1 (i.e., early adolescence), this class was a Somatic Class, in which individuals endorsed breathing difficulties and weakness. At wave 3 (i.e., middle adolescence), girls in this class endorsed weakness, faintness, and anhedonia. Due to the similarity of these classes, it is likely that both classes represent a similar class of individuals who are only showing internalizing symptoms of depression.
Individual symptom endorsement at early adolescence compared to middle adolescence was also interesting for girls. Somatic symptoms were endorsed in classes at both early and late adolescence; this is consistent with research that women are likely to endorse somatic symptoms when depressed (Bennett, et al., 2005). Alcohol use was not endorsed in early adolescence, but was endorsed by both mixed depression groups in late adolescence. This likely represents changes in symptoms that reflect developmentally-appropriate changes in typical behavior (Duncan, Duncan & Strycker, 2006).

Another interesting symptom level result was that, for girls at both early and late adolescence, the depression item was only endorsed by the severe mixed group, and not by the depressed or mixed groups. This is a distinct difference from the clear depression subtypes that were predicted. Instead, this result suggests that symptoms of depression are mixed overall, supporting the argument for heterogeneity of subtypes with mixed symptoms, which could have different clinical implications.

**General Discussion**

Overall, this study makes the argument against pure subtypes of symptoms and instead supports arguments for different common patterns of mixed symptom presentation. Although boys did demonstrate more clear differentiation of symptom patterns, the presence of the mixed class for boys argues against the idea of clear differentiation of subtypes of depression. Further, the classes identified for girls were more diffuse and not clearly differentiated. These results make the argument against the subtype model of depression and instead suggest that there are common symptom patterns that frequently include a mixture of traditional, somatic, and externalizing symptoms of distress. This finding supports the use of person-centered approaches when examining depression rather than variable-centered approaches. These mixed classes of
symptoms, if unexamined with a person-centered approach such as an LCA, could explain the high levels of diagnostic co-occurrence, which is a common critique of sorting people into categories such as with a variable-approach (Widiger & Samuel, 2005). For example, if seeing a female patient who falls into the severe mixed class, that patient might be categorized with depression as well as an externalizing disorder such as disruptive behavior disorder or conduct disorder. However, the use of a person-centered approach to assessment would allow for the accurate conceptualization of the client’s symptoms and allow for a more holistic examination of their distress.

Some symptoms indicative of anhedonia were demonstrated by boys and girls at both early and late adolescence. However, changes in the presentation of depression were also apparent as children moved from early to late adolescence. This study hypothesized that sex differences in depression presentation would emerge by late adolescence, and not be present in early adolescence. The differences in subtypes that were predicted were not supported in this study. The number and composition of subtypes were the same at both waves for both boys and girls separately. However, there were differences in the specific symptoms that were present at each wave. For boys specifically, changes in how depression was manifested were apparent. At early adolescence, the depression class was characterized by symptoms of anhedonia, weakness, and faintness, while at late adolescence the depressed class endorsed symptoms for depression and anhedonia. It is noteworthy that at early adolescence depression was not endorsed, whereas weakness and faintness were endorsed. The finding that somatic symptoms were common presentations of depression in pre-adolescent boys might seem in contrast to previous research that demonstrated that somatic symptoms were more common in women (Bennett, et al., 2005). However, this result may provide further evidence that previous research on symptom
differences did not consider developmental changes in expression as gender influences become salient (Addis, 2008, Nolen-Hoekeisma et al., 1999). Specifically, as somatic symptoms were not endorsed by boys in early adolescence, but were endorsed by girls in both stages, it is possible that the differences found in previous studies did not examine these differences in early adolescents, and thus the difference found does not acknowledge changes in symptoms as children develop. For girls, the somatic symptoms also were stand-alone in early adolescence, and combined with a symptom of anhedonia in late adolescence. It is likely that girls who were in the somatic subtype were the same as those who were in the depression subtype at late adolescence, and thus also started demonstrating anhedonia in addition to the somatic symptoms as they aged. This likely confirms that somatic symptoms of depression can be used as indicators of depression at both early and late adolescence in females (Angst et al., 2006; Silverstein, Caveres, Perdue, & Cimarolli, 1995; Silverstein, Cohen, & Kasen; Silverstein et al., 2012), a finding that should be confirmed in future research.

A strength of this study is that considering symptoms variation from this person-centered approach, rather than from a categorical, variable-centered approach, allowed for developmental influences in symptom endorsement to become apparent. For example, alcohol use was more likely to be a symptom of distress in late adolescence for both boys and girls, which likely reflects developmental changes in the expression of that distress that mirror developmentally appropriate increases in alcohol use behavior (Duncan, Duncan, & Strycker, 2006).

The influences of risk factors as predictors of depression were conflicting. The hypothesis that higher stress would be significantly related to membership in a depressed subgroup for both sexes was only partially supported. Stress was overall related to symptom classes only for girls, for whom it was significantly related at both early and late adolescence, but
was not related to symptom class in boys at either time period. Interestingly, the results of this study demonstrated that the likelihood of a girl belonging to the depressed class decreased in likelihood with increasing stress. Similarly, the probability of belonging to the mixed class also decreased as stress increased. However, the probability of membership in the severe mixed class increased as stress increased; thus, it is likely that one of the distinguishing factors between the two mixed classes is how much stress an individual is under. This explanation is consistent with research on stress, which has demonstrated that increasing stress is associated with increased severity and incidence of depression (Ge, Conger, and Elder, 2001; Hammen, 2005; Paykel, 2003). While unexpected, this finding is consistent with The Elaborated Cognitive Vulnerability-Transactional Stress Theory (Hankin & Abramson, 2001), which argues that girls experience more stress and are more reactive to that stress than their male peers. In addition, this finding also confirms previous research that female youth are more sensitive to childhood stress and stressful life events (Adkins, Wang, & Elder, 2009; Bown, Meadows, & Elder, 2007; Meadows, Brown, & Elder, 2006).

While stress was a significant predictor of class membership, at least for females, there was no overall relationship of ethnic group with class membership, and no clear individual patterns that emerged in either boys or girls. As a result, it cannot be clearly predicted that individuals in certain ethnic and racial minority groups are at higher risk for certain classes, types, or profiles of depression. Overall, this is consistent with the conflicting findings on the relationship between ethnic group and depression in minority youth (Perreira, Deeb-Sossa, Harris, & Bollen, 2005; Vega & Rumbaut, 1991). The present study suggests that while some minority groups might be at higher risk for distress or depression overall (Brown, Meadows, Elder, 2007), they are not demonstrating different patterns, or classes, within depression.
Another interpretation of this finding is that for low-income African American and Latino American adolescents in the present study race/ethnicity did not make a difference. Instead, it may be the case that racial/ethnic differences are found when minority individuals are compared to White individuals. This suggestion is consistent with some previous research (Brown, Meadows & Elder, 2007) that has found that the differences in depression between minority groups is minimal, but minorities do differ from their White peers on depression.

**Clinical Implications**

Overall, the results of this study create several clinical impressions. First, this study suggests that clinicians should consider that during assessment willingness to discuss and endorse symptoms will likely differ due to influences related to gender, age, and culture. For example, clinicians may find that despite experiencing similar distress, girls will endorse somatic symptoms of depression throughout adolescence, while boys may not endorse some symptoms (such as somatic symptoms) as they age, due to gendered and social influences and expectations. However, it is also important for clinicians to note that both boys and girls will likely show symptoms that indicate a mixed presentation, and should complete a thorough assessment of functioning to get a clearer idea of the spectrum of presentation. During assessment, clinicians would also want to use developmentally-appropriate indicators of distress; for example, the use of alcohol could be added to the assessment as this study is consistent with previous studies that indicate that alcohol use commonly occurs with other symptoms of distress particularly in older teens (e.g.: Baker, Piper, McCarthy, & Fiore, 2004; Fergusson, Boden, & Horwood, 2011; O’Neil, Conner, & Kendall, 2011). Finally, clinicians may want to be particularly mindful of stress influences in girls, as this study supports previous research on the effects of stress for girls (Adkins, Wang, & Elder, 2009; Bown, Meadows, & Elder, 2007; Hankin & Abramson, 2001;
Meadows, Brown, & Elder, 2006), indicating that stress influences are likely related to the presentation of various symptom patterns.

**Limitations and Future Research**

This study has many strengths, including its longitudinal design, the multiple reporters on the various variables (depression items measured by the children, stress items measured through the mother), and the unique use of a person-centered approach to examine the nature of depression. The person-centered nature of the Latent Class Analysis allowed this study to capture more of the complexity of depression in children, and the specific risk factors that may predict membership in the classes. However, this study also has some limitations. One of the biggest potential drawbacks of this study is that due to the person-centered nature of the LCA, the results do not establish specific ways of identifying these individuals using specific variables. Future research studies should examine ways of assessing depression broadly, and focus on developing ways to identify individuals that focuses on clinical utility in determining best treatment. For example, researchers should identify how these different classes may lend themselves to different treatment protocol (e.g. the use of behavioral activation or CBT), and identifying empirical methods of determining which treatment is most appropriate.

Another limitation of this study is that it utilized longitudinal data crossectionally, examining the different waves of data as if they were separate samples. Future research should work to examine development by taking advantage of methods of examining classes longitudinally. For example, the use of a Latent Transition Analysis could identify the movement between the subtypes over time to better examine class changes through development (Lanza & Collins, 2003). This type of analysis could be used to examine the possibility discussed previously that boys in the non-clinical group in early adolescence moved to another symptom
group, such as the externalizing group, in late adolescence, and examine predictors of those moves. Additionally, it would also be possible to identify if the girls in the somatic subtype of depression in early adolescence are the same as the girls who were in the depression subtype in late adolescence. Thus, this type of analysis might be particularly illuminating to expand on this study, and likely particularly useful to examine class movement as the type of subtypes did not vary over time.

This study examined depression in early and late adolescence. Additional research is needed to examine outcomes over longer periods of time in order to expand upon these findings. Future research should expand upon this to examine time points in earlier childhood and early adulthood in order to get a clearer picture of the longitudinal nature of development and depression.

While these results examined number of symptoms of depression as a method of examining depression types, it did not examine impairment, and thus cannot identify severity of the symptom classes on the child’s life. For example, whereas for girls there were classes with fewer (Mixed class) and more (Severe Mixed class) symptoms, this study cannot make statements about the actual impairment of these symptoms on the child’s life. Although it seems unlikely, it is possible that the children in the mixed class may actually have more impairment on their daily life than children in the other classes, and so may be in more need of treatment. Future research should consider including measures of impairment to examine if different classes cause different levels of impairment, and thus are differentially in need of services.

**Conclusion**

The present results indicate that there are distinct patterns of symptoms in at-risk low-income minority children when depression is examined using non-traditional variables. While it
was apparent that negative affect is demonstrated in different ways for boys and girls, the results were not as clear as men demonstrating more externalizing and women more somatic symptoms of depression. Instead, it appears that for both sexes, symptoms of all types (including externalizing symptoms) occur commonly in different patterns for depression. Although there were no changes in the classes from early to late adolescence, there were differences in which symptoms were endorsed within the classes. These results also provide support for the claim that exposure to stressful life events combines with an individual’s general vulnerability to increase distress in girls, but not for boys. Overall, this study suggests that there are common patterns of depression that change over development, and are influenced by different factors to create differences between sexes. Identifying patterns of depression in developmentally-appropriate ways is important in order to target those individuals and best provide appropriate treatment. More research is needed to identify how factors in the lives of high-risk youth can come together to create diverse presentations of outcomes in order to best understand how to identify and treat those individuals.
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Appendix

*Table 1: Endorsement of Latent Class Items*

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<tbody>
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<td></td>
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<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
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<td>Depression</td>
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<td>55</td>
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<td>Anhedonia</td>
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<td>Weakness</td>
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<td>Faintness</td>
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<td>Anger</td>
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<td>64</td>
<td>70</td>
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<td>Risky Behavior</td>
<td>16</td>
<td>35</td>
<td>23</td>
<td>63</td>
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<tr>
<td>n</td>
<td>309</td>
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<td>207</td>
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</table>
Table 2: Means and Standard Deviations of Stress Variable

<table>
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<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
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<tr>
<td>Stress</td>
<td>1.52 (1.08)</td>
<td>1.46 (1.07)</td>
<td>1.41 (1.00)</td>
<td>1.51 (1.06)</td>
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<td>n</td>
<td>309</td>
<td>301</td>
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<td>207</td>
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</table>
Table 3: Fit Statistics of Latent Classes for Girls at Wave 1.

<table>
<thead>
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<th>ABIC</th>
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<tbody>
<tr>
<td>2</td>
<td>2532.794</td>
<td>2603.727</td>
<td>2543.467</td>
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<tr>
<td>3</td>
<td>2450.698</td>
<td>2558.965</td>
<td>2466.989</td>
</tr>
<tr>
<td>4</td>
<td>2428.631</td>
<td>2574.231</td>
<td>2450.359</td>
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<tr>
<td>5</td>
<td>2406.108</td>
<td>2589.042</td>
<td>2433.633</td>
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<tr>
<td>6</td>
<td>2391.651</td>
<td>2614.918</td>
<td>2427.794</td>
</tr>
<tr>
<td>7</td>
<td>2390.475</td>
<td>2648.075</td>
<td>2429.235</td>
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</tbody>
</table>
Table 4: Average Latent Class Probabilities for Most Likely Latent Class Membership (Row) by Assigned Latent Class (Column) for Girls at Wave 1

<table>
<thead>
<tr>
<th></th>
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<th>4</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<td>0.02</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>2</td>
<td>0.01</td>
<td>0.93</td>
<td>0.03</td>
<td>0.02</td>
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<td>0.00</td>
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<td>0.92</td>
<td>0.04</td>
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<td>0.03</td>
<td>0.00</td>
<td>0.96</td>
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Table 5: Fit Statistics of Latent Classes for Boys at Wave 1.

<table>
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<th>ABIC</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>2332.942</td>
<td>2403.628</td>
<td>2343.369</td>
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<tr>
<td>3</td>
<td>2294.337</td>
<td>2402.226</td>
<td>2310.252</td>
</tr>
<tr>
<td>4</td>
<td><strong>2259.192</strong></td>
<td><strong>2404.284</strong></td>
<td><strong>2230.595</strong></td>
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<tr>
<td>5</td>
<td>2238.881</td>
<td>2421.176</td>
<td>2265.772</td>
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<tr>
<td>6</td>
<td>2227.790</td>
<td>2447.289</td>
<td>2260.169</td>
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<tr>
<td>7</td>
<td>2222.253</td>
<td>2478.955</td>
<td>2260.12</td>
</tr>
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</table>
**Table 6:** Average Latent Class Probabilities for Most Likely Latent Class Membership (Row) by Assigned Latent Class (Column) for Boys at Wave 1

<table>
<thead>
<tr>
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<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.95</td>
<td>0.00</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>0.03</td>
<td><strong>0.97</strong></td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>0.05</td>
<td>0.00</td>
<td><strong>0.94</strong></td>
<td>0.02</td>
</tr>
<tr>
<td>4</td>
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<td>0.13</td>
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Table 7: Fit Statistics of Latent Classes for Girls at Wave 3.

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<th>Number of Classes</th>
<th>AIC</th>
<th>BIC</th>
<th>ABIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2279.832</td>
<td>2347.264</td>
<td>2287.028</td>
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<tr>
<td>3</td>
<td>2246.335</td>
<td>2349.258</td>
<td>2257.319</td>
</tr>
<tr>
<td>4 <strong>2211.220</strong></td>
<td><strong>2349.634</strong></td>
<td><strong>2225.992</strong></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2187.902</td>
<td>2361.807</td>
<td>2206.462</td>
</tr>
<tr>
<td>6</td>
<td>2185.559</td>
<td>2394.954</td>
<td>2207.906</td>
</tr>
<tr>
<td>7</td>
<td>2190.954</td>
<td>2435.84</td>
<td>2217.089</td>
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</table>
Table 8: Average Latent Class Probabilities for Most Likely Latent Class Membership (Row) By Assigned Latent Class (Column) for Girls at Wave 3

<table>
<thead>
<tr>
<th></th>
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<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.03</td>
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<tr>
<td>2</td>
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<td>0.99</td>
<td>0.00</td>
<td>0.05</td>
</tr>
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<td>0.02</td>
<td>0.00</td>
<td>0.98</td>
<td>0.00</td>
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<td>4</td>
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<td>0.05</td>
<td>0.00</td>
<td>0.99</td>
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Table 9: Fit Statistics of Latent Classes for Boys at Wave 3.

<table>
<thead>
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<th>Number of Classes</th>
<th>AIC</th>
<th>BIC</th>
<th>ABIC</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>1969.757</td>
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<td>1974.615</td>
</tr>
<tr>
<td>3</td>
<td>1888.584</td>
<td>1987.907</td>
<td>1895.998</td>
</tr>
<tr>
<td>4</td>
<td>1855.434</td>
<td>1989.007</td>
<td>1865.405</td>
</tr>
<tr>
<td>5</td>
<td>1838.925</td>
<td>2006.748</td>
<td>1851.453</td>
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<tr>
<td>6</td>
<td>1839.174</td>
<td>2041.246</td>
<td>1854.258</td>
</tr>
<tr>
<td>7</td>
<td>1829.257</td>
<td>2065.578</td>
<td>1846.898</td>
</tr>
</tbody>
</table>
Table 10: Average Latent Class Probabilities for Most Likely Latent Class Membership (Row) By Assigned Latent Class (Column) for Boys at Wave 3

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>0.00</td>
<td>0.94</td>
<td>0.01</td>
<td>0.04</td>
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<td>3</td>
<td>0.00</td>
<td>0.08</td>
<td>0.89</td>
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<td>4</td>
<td>0.00</td>
<td>0.04</td>
<td>0.00</td>
<td>0.96</td>
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</table>
Table 11: Estimated Item Probabilities by Class for Girls at Wave 1

<table>
<thead>
<tr>
<th>Item</th>
<th>Class 1 Mixed</th>
<th>Class 2 Non-Clinical</th>
<th>Class 3 Somatic</th>
<th>Class 4 Severe Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worthlessness</td>
<td>0.000</td>
<td>0.014</td>
<td>0.429</td>
<td>0.459</td>
</tr>
<tr>
<td>Depression</td>
<td>0.530</td>
<td>0.098</td>
<td>0.360</td>
<td><strong>0.659</strong></td>
</tr>
<tr>
<td>Anhedonia</td>
<td><strong>0.637</strong></td>
<td>0.097</td>
<td>0.090</td>
<td><strong>0.800</strong></td>
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<tr>
<td>Breathing</td>
<td>0.113</td>
<td>0.076</td>
<td><strong>1.000</strong></td>
<td>0.152</td>
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<tr>
<td>Weakness</td>
<td><strong>0.605</strong></td>
<td>0.057</td>
<td><strong>0.683</strong></td>
<td><strong>0.788</strong></td>
</tr>
<tr>
<td>Faintness</td>
<td><strong>0.974</strong></td>
<td>0.085</td>
<td>0.055</td>
<td><strong>0.666</strong></td>
</tr>
<tr>
<td>Alcohol</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.254</td>
</tr>
<tr>
<td>Anger</td>
<td><strong>0.641</strong></td>
<td>0.279</td>
<td>0.287</td>
<td><strong>0.664</strong></td>
</tr>
<tr>
<td>Risky Behavior</td>
<td>0.000</td>
<td>0.007</td>
<td>0.000</td>
<td>0.260</td>
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</tbody>
</table>

n | 32 | 175 | 44 | 58
Table 12: Estimated Item Probabilities by Class for Boys at Wave 1

<table>
<thead>
<tr>
<th>Item</th>
<th>Class 1 Mixed</th>
<th>Class 2 Depressed</th>
<th>Class 3 Non-Clinical</th>
<th>Class 4 Externalizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worthlessness</td>
<td>0.322</td>
<td>0.00</td>
<td>0.023</td>
<td>0.000</td>
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<tr>
<td>Depression</td>
<td>0.257</td>
<td>0.16</td>
<td>0.085</td>
<td>0.330</td>
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<tr>
<td>Anhedonia</td>
<td>0.603</td>
<td><strong>1.00</strong></td>
<td>0.065</td>
<td>0.015</td>
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<tr>
<td>Breathing</td>
<td>0.326</td>
<td>0.00</td>
<td>0.009</td>
<td>0.260</td>
</tr>
<tr>
<td>Weakness</td>
<td><strong>0.605</strong></td>
<td><strong>1.00</strong></td>
<td>0.071</td>
<td>0.048</td>
</tr>
<tr>
<td>Faintness</td>
<td>0.221</td>
<td><strong>1.00</strong></td>
<td>0.033</td>
<td>0.507</td>
</tr>
<tr>
<td>Alcohol</td>
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<td>0.00</td>
<td>0.000</td>
<td>0.042</td>
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<tr>
<td>Anger</td>
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<td>0.06</td>
<td>0.159</td>
<td><strong>0.824</strong></td>
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<tr>
<td>Risky Behavior</td>
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<td>0.000</td>
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<tr>
<td>n</td>
<td>97</td>
<td>19</td>
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Table 13: Estimated Item Probabilities by Class for Girls at Wave 3

<table>
<thead>
<tr>
<th>Item</th>
<th>Class 1 Depressed</th>
<th>Class 2 Severe Mixed</th>
<th>Class 3 Non-Clinical</th>
<th>Class 4 Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worthlessness</td>
<td>0.414</td>
<td>0.525</td>
<td>0.005</td>
<td>0.210</td>
</tr>
<tr>
<td>Depression</td>
<td>0.578</td>
<td>0.712</td>
<td>0.178</td>
<td>0.268</td>
</tr>
<tr>
<td>Anhedonia</td>
<td><strong>0.755</strong></td>
<td><strong>0.943</strong></td>
<td>0.000</td>
<td><strong>1.000</strong></td>
</tr>
<tr>
<td>Breathing</td>
<td>0.493</td>
<td>0.198</td>
<td>0.073</td>
<td>0.000</td>
</tr>
<tr>
<td>Weakness</td>
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<td><strong>0.701</strong></td>
<td>0.031</td>
<td>0.000</td>
</tr>
<tr>
<td>Faintness</td>
<td><strong>0.684</strong></td>
<td><strong>0.688</strong></td>
<td>0.092</td>
<td>0.000</td>
</tr>
<tr>
<td>Alcohol</td>
<td>0.128</td>
<td><strong>0.654</strong></td>
<td>0.122</td>
<td><strong>0.836</strong></td>
</tr>
<tr>
<td>Anger</td>
<td>0.001</td>
<td><strong>0.930</strong></td>
<td>0.249</td>
<td>0.289</td>
</tr>
<tr>
<td>Risky Behavior</td>
<td>0.001</td>
<td>0.550</td>
<td>0.010</td>
<td>0.064</td>
</tr>
<tr>
<td>n</td>
<td>50</td>
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<td>34</td>
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</table>
Table 14: Estimated Item Probabilities by Class for Boys at Wave 3

<table>
<thead>
<tr>
<th>Item</th>
<th>Class 1 Mixed</th>
<th>Class 2 Externalizing</th>
<th>Class 3 Depressed</th>
<th>Class 4 Non-Clinical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worthlessness</td>
<td>1.000</td>
<td>0.007</td>
<td>0.268</td>
<td>0.014</td>
</tr>
<tr>
<td>Depression</td>
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<td>0.008</td>
<td>0.644</td>
<td>0.000</td>
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<tr>
<td>Anhedonia</td>
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<td>0.708</td>
<td>0.269</td>
</tr>
<tr>
<td>Breathing</td>
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<td>0.009</td>
<td>0.319</td>
<td>0.000</td>
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<tr>
<td>Weakness</td>
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<td>0.191</td>
<td>0.585</td>
<td>0.000</td>
</tr>
<tr>
<td>Faintness</td>
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<td>0.000</td>
<td>0.537</td>
<td>0.018</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1.000</td>
<td>0.738</td>
<td>0.478</td>
<td>0.000</td>
</tr>
<tr>
<td>Anger</td>
<td>0.000</td>
<td>0.618</td>
<td>0.389</td>
<td>0.038</td>
</tr>
<tr>
<td>Risky Behavior</td>
<td>0.000</td>
<td>0.508</td>
<td>0.284</td>
<td>0.000</td>
</tr>
<tr>
<td>n</td>
<td>6</td>
<td>84</td>
<td>48</td>
<td>69</td>
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</tbody>
</table>
Figure 1: Model of Proposed Latent Class Analysis at Early Adolescence
Figure 2: Model of Proposed Latent Class Analysis at Late Adolescence

- Worthlessness Time 2
- Depressed Mood Time 2
- Anhedonia Time 2
- Faintness Time 2
- Weakness Time 2
- Difficult Breathing Time 2
- Risk-Taking Time 2
- Alcohol Use Time 2
- Aggression Time 2

Class Time 2

Racial-Ethnic Group

Stress Composite Time 2
Figure 3: Fit Statistics of Latent Classes for Girls at Wave 1
Figure 4: Fit Statistics of Latent Classes for Boys at Wave 1
Figure 5: Fit Statistics of Latent Classes for Girls at Wave 3
Figure 6: Fit Statistics of Latent Classes for Boys at Wave 3

![Graph showing fit statistics for latent classes with numbers of latent classes ranging from 2 to 7, and fit indices including AIC, BIC, and ABIC.](image-url)
Figure 7: Estimated Item Probabilities by Class for Girls at Wave 1
Figure 8: Estimated Item Probabilities of Class Membership by Stress for Girls at Wave 1
Figure 9: Estimated Item Probabilities by Class for Boys at Wave 1

- Mixed
- Depressed
- Non-Clinical
- Externalizing

Probability of Item Endorsement

Wordlessness, Depression, Anhedonia, Breathing, Weakness, Faintness, Alcohol, Anger, Risky Behavior
Figure 10: Estimated Item Probabilities by Class for Girls at Wave 3
Figure 11: Estimated Item Probabilities of Class Membership by Stress for Girls at Wave 3
Figure 12: Estimated Item Probabilities by Class for Boys at Wave 3

Probability of Item Endorsement

Worthlessness, Depression, Anhedonia, Breathing, Weakness, Faintness, Alcohol, Anger, Risky Behavior

MIXED
Depressed
Externalizing
Non-Clinical