



Avoidance mediates the relationship between anxiety and depression over a decade later



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ABSTRACT

Anxiety and depression are often highly correlated with each other. To explain this connection, the present study examined the longitudinal relationship between earlier anxiety and later depression, using avoidance as a mediator and trauma as a moderator. Participants ($N=6504$ adolescents) completed baseline measures of anxiety and depression, a measure of avoidance one year later, a measure of trauma six to eight years later, and a measure of depression 12–14 years later. Analyzed with structural equation models, the results showed that anxiety predicted later depression, and this relationship was partially mediated by avoidance. The relationship between avoidance and depression was not moderated by trauma. Together, these findings suggest that anxiety may influence later depression through avoidance, and this relationship remains unaffected by experiencing a traumatic experience.

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1. Introduction

Anxiety and depressive disorders are frequently comorbid with one another, yielding lifetime prevalence estimates from 16 to 50% (Angold, Costello, & Erkanli, 1999; Seligman & Ollendick, 1998). Seventy-three percent of persons with major depression have comorbid lifetime anxiety disorders, whereas 27–77% of those with a principal diagnosis of an anxiety disorder develop a lifetime diagnosis of depression (Brown, Campbell, Lehman, Grisham, & Mancill, 2001). In comparison to those with pure diagnoses, individuals with comorbid anxiety and depressive disorders experience greater chronicity and severity of each diagnosis; poorer work and psychosocial functioning; lower perceived quality of life; and a heightened risk of suicide (Brown, Schulberg, Madonia, Shear, & Houck, 1996; Kessler et al., 1998; Olfson et al., 1997; Pfeiffer, Ganoczy, Ilgen, Zivin, & Valenstein, 2009; Sherbourne, Wells, Meredith, Jackson, & Camp, 1996). Hence, a greater understanding of the mechanisms behind this comorbidity is imperative.

Concurrent anxiety and depression are highly correlated with one another (r ranges .45–.73) when measured on a continuum (Bjelland, Dahl, Haug, & Neckelmann, 2002; Cannon & Weems, 2006; Morgan, Wiederman, & Magnus, 1998; Norton, Cosco, Doyle, Done, & Sacker, 2013; Watson, Weber, et al., 1995). Based on

this high correlation, anxiety and depression are often conceptualized as slightly variant manifestations of the same underlying phenomena with a shared diathesis (Barlow & Campbell, 2000; Clark & Watson, 1991; Grunhaus, 1988; Kendler, 1996; Kendler, Neale, Kessler, Heath, & Eaves, 1992). The research on the concurrent focus of anxiety and depression has yielded several highly related models including Clark and Watson's (1991) tripartite model, Barlow's (1988) hierarchical model of anxiety and depression, Mineka, Watson, and Clark's (1998) integrative hierarchical model of anxiety and depression, and Watson's (2005) revised hierarchical model of anxiety and depressive disorders. Fundamentally, each of these prominent models suggests that both anxiety and depression are best represented by the same underlying construct, termed negative affect.

Despite the high concurrent relationships between anxiety and depression, these hierarchical models also allow for anxiety and depression to be distinguished from one another. Specifically, across each of the predominant models, arousal is characteristic of anxiety but not depression, and anhedonia (lack of positive affect) is consistent with depression but not anxiety (Barlow, 1988; Clark & Watson, 1991; Mineka et al., 1998; Watson, 2005). The ability to distinguish between anxiety and depression has also gained empirical support as arousal and fear are associated with anxiety, but not depression; and anhedonia is associated with depression but not anxiety (Barlow, Chorpita, & Turovsky, 1996; Bjelland et al., 2002; Brown et al., 2001; Cannon & Weems, 2006; Chorpita, Albano, & Barlow, 1998; Clark & Watson, 1991; Morgan et al., 1998; Tellegen,

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1985; Watson, Weber, et al., 1995). Thus, despite these predominant models' higher order structure, anxiety and depression can be reliably distinguished from each other.

The evidence used to support the models of shared symptomatology derives overwhelmingly from concurrent correlations between anxiety and depression using factor analyses (Brown, Chorpita, & Barlow, 1998; Chorpita et al., 1998; Clark, Beck, & Stewart, 1990; Joiner, 1996; Jolly, Dyck, Kramer, & Wherry, 1994; Jolly & Kramer, 1994; Watson, Clark, et al., 1995). However, all research in support of negative affect to date is fundamentally unable to rule out alternative explanations for these findings. Specifically, these methodologies are not able to address the potential relationships between anxiety and depression predicting one another over time (e.g. one way to rule out this alternative explanation is through a longitudinal factor model, which has never before been conducted in this domain).

The limitations of the shared symptomatology models are further highlighted by the literature on the temporal precedence of anxiety and depression. Research on temporal precedence reliably shows that current anxiety significantly predicts later depression (see Jacobson & Newman, 2012a for a meta-analysis). Using continuous measures of anxiety and depression, researchers found that anxiety positively predicted depression with correlations ranging from $r = .16$ to $.45$ (without controlling for earlier depression). Further, the hazards ratio range for those with an anxiety disorder to develop a later depressive disorder is 1.49–7.1 (Jacobson & Newman, 2012a). Additionally, anxiety predicts depression across years (Wilson & Hayward, 2005), months (Lockefer & De Vries, 2012), weeks (Wittchen, Becker, Lieb, & Krause, 2002), days (Jacobson & Newman, 2012b; Starr & Davila, 2012a, 2012b; Swendsen, 1997), and hours (Jacobson & Newman, 2012b; Swendsen, 1998). Although third variables still need to be ruled out, this research suggests that anxiety may be a risk factor for depression, and this longitudinal relationship may explain shared symptomatology models (as levels of anxiety predicting depression may appear to occur at the same time point if only measured once across a retrospective period of time).

Despite the vast literature demonstrating that anxiety predicts later depression, only three studies have examined this within a prospective mediational analysis, and hence examined possible mechanisms of how high anxiety leads to increased depression. Firstly, Joiner, Katz, and Lew (1999) examined negative life events and reassurance-seeking as mediators between anxiety and depression; however, these authors did not find that either variable significantly mediated the relationship. Likewise, Ceyhan (2009) studied whether locus of control and problem-solving skills mediated the relationship between earlier anxiety and later depression, but neither variable mediated the relationship. Moitra, Herbert, and Forman (2008) examined behavioral avoidance as a mediator between social anxiety and depressive symptoms over the course of treatment and found that behavioral avoidance partially mediated the relationship. However, the effects of this study may have been due to the order of treatment techniques in the therapies (e.g. anxiety was targeted first, followed by avoidance, followed by depression). Although some mediational variables have been tested, the mechanism through which anxiety might affect later depression is currently unknown in naturalistic settings.

Avoidance is a promising mechanism for explaining the naturalistic longitudinal relationship between anxiety and depression (Moitra et al., 2008). Anxiety is considered an uncomfortable state of physiological activation elicited by a perceived external threat (Nesse & Williams, 1996), and persons who experience anxiety limit their exposure (avoid) to these perceived threats to reduce their levels of discomfort. However, avoiding feared circumstances may also reduce one's exposure to both positive and corrective experiences. For example, if one avoids a social event due to social

anxiety, one may not experience social support. Similarly, if someone has agoraphobia and is afraid of leaving his/her house, he or she may not experience the positive physical and psychological health outcomes of nature (Hartig et al., 2011). A lack of such positive life experiences has been shown to coincide with increased depression (Harris & Curtin, 2002; Spinhoven et al., 2011). Thus, depression may develop from increased pessimism and hopelessness about the future due to a skewed sense of reality based on one's exposure to fewer positive events. Although no studies have examined anxiety, depression, and avoidance together longitudinally in a naturalistic setting, research has shown that previous levels of anxiety predict future levels of avoidance (Rinck et al., 2010), and past avoidance predicts later depression (Brewin, Reynolds, & Tata, 1999; Cloninger, Svrakic, & Przybeck, 2006; Plant & Devine, 2003; Wittchen, Kessler, Pfister, Höfler, & Lieb, 2000). Thus, in the current study, avoidance was examined as a possible mediator of anxiety and later depression.

Further, trauma may moderate the relationship between avoidance and depression. Those who regularly cope without avoidance may naturally employ real-life exposure hierarchies (Richard & Lauterbach, 2011). Consequently, the ability to cope with daily stressful events may help one to cope with trauma and enhance one's self-efficacy in dealing with traumas. However, those who employ avoidance behaviors to cope with life events may not learn to deal with distress (Tryon, 2005). For these persons, experiencing a traumatic event may be similar to the initial distress associated with the beginning of flooding therapy (exposure to individuals' most feared event) without the prolonged exposure to teach them that they can cope with their distress (Sundel & Sundel, 2004). Based on the theory that individuals employing avoidance may be more likely to react to trauma with hopelessness and with the belief that they will never have control over their lives otherwise, we hypothesized that trauma may moderate the relationship between avoidance and depression (Alloy, Kelly, Mineka, & Clements, 1990). Accordingly, we will investigate trauma as a moderator between avoidance and depression.

The current study investigated the relationship between anxiety and depression over time to examine whether avoidance mediated the relationship between anxiety and depression, and whether trauma moderated the relationship between avoidance and depression. This study used a nationally representative longitudinal sample beginning in adolescence and carrying through to early adulthood. We hypothesized that (1) anxiety would predict later depression 12–14 years later; (2) anxiety and depression would be mediated by avoidance, such that anxiety would predict positively avoidance one to two years later and avoidance would predict depression 10–13 years later; and (3) the relationship between avoidance and depression would be moderated by trauma, such that experiencing a trauma five to six years after the avoidance would significantly increase the positive relationship between avoidance and depression.

2. Method

2.1. Participants

The participants for this study were collected through the National Longitudinal Study of Adolescent Health (Add Health) public use dataset (Harris & Udry, 2013). There were four waves of data collection: the first occurred during 1994–1995; the second occurred during 1995–1996; the third wave occurred during 2001–2002; and the fourth wave occurred during 2007–2008. The data was collected through interviews with participants. The first wave of participants ($N = 6504$, 48% male, M age = 16.04, 66% Caucasian, 25% African American, 1% American Indian, 4% Asian/Pacific

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