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The depression distress amplification model in adolescents: A longitudinal examination of anxiety sensitivity cognitive concerns, depression and suicidal ideation

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ABSTRACT

Adolescents with comorbid anxiety and depression are at significantly increased risk of suicide. The recently proposed depression distress amplification model appears to have promise for explaining the relations between anxiety, depression, and suicidality, but it has not been tested in adolescents. Participants were 524 adolescents followed over two years. Baseline data for the current report were collected by trained interviewers while the adolescents were in eighth grade. Data were obtained in the same manner when the adolescents were in tenth grade. Baseline anxiety sensitivity cognitive concerns significantly predicted suicidal ideation two years later, above and beyond baseline suicidal ideation and depression. Further, consistent with the depression distress amplification model, anxiety sensitivity cognitive concerns interacted with depressive symptoms to predict suicidal ideation. This report extends the empirical and theoretical support for a relationship between anxiety sensitivity cognitive concerns and suicidality.

Completed and attempted adolescent suicides have a major impact on the public health care system (Burke et al., 2010; Eaton et al., 2010). According to recent data reported by the Centers for Disease Control, suicide is the third leading cause of death in individuals 10–24 years of age and attempted suicides among adolescents increased 20% from 2009 to 2011 (CDC, 2013). Further, the rate of suicide increases drastically across adolescence, from .86 deaths per 100,000 in 12 year olds to 7.31 deaths per 100,000 in 17 year olds (CDC, 2013). Kessler, Borges, and Walters (1999) reported that age-of-onset for suicidal ideation and suicide attempts rapidly increase from about the age of 12 years, peaking around the age of 16 years. Given the consequences of suicide-related behavior in adolescents, the identification of risk factors for adolescent suicidal ideation is an important area for further research.

Diagnosis of a psychiatric disorder has been implicated as an important risk factor for suicide attempts as well as suicidal ideation in adolescents (Beautrais, Joyce, & Mulder, 1998; Fergusson, Woodward, & Horwood, 2000). However, research exploring the impact of anxiety on suicidal ideation in adolescents is limited. Hill, Castellanos, and Pettit (2011) recently

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summarized extant work in this area in an attempt to determine whether anxiety acts as a causal agent for suicide attempts and suicidal ideation. Hill et al. (2011) reported that anxiety was associated with suicidal ideation across several studies (Ruchkin, Schwab-Stone, Koposov, Vermeiren, & King, 2003; Woods, Silverman, Gentilini, Cunningham, & Grieger, 1991). However, they also reported that other studies did not find a link between anxiety and suicidal ideation (D'Eramo, Prinstein, Freeman, Grapentine, & Spirito, 2004; Goldston et al., 1996). There were also mixed findings as to whether the relation between anxiety and suicidal ideation is robust when depression and other forms of psychopathology, demographic variables, or both are covaried (Ghaziuddin, King, Naylor, & Ghaziuddin, 2000; Prinstein, Boergers, Spirito, Little, & Grapentine, 2000; Steer, Kumar, & Beck, 1993; Valentiner, Gutierrez, & Blacker, 2002).

Despite the generally equivocal findings in this area, one thing seems to be consistent; anxiety in the presence of comorbid depression appears to be associated with elevated suicidality in adolescents. An epidemiological study of 1420 youth (ages 9–16 years) found that comorbid anxiety and depression was one of the strongest predictors of suicide risk (Foley, Goldston, Costello, & Angold, 2006). Another study of adolescent suicide attempters found high rates of anxiety disorders among those with a past suicide attempt. A closer look at these findings reveals this is likely due to anxiety and depression comorbidity, as 95% of adolescents with an anxiety disorder who attempted suicide had a comorbid depressive disorder (Pawlak, Pascual-Sanchez, Raë, Fischer, & Ladame, 1999). Hill et al. (2011) concluded that children and adolescents presenting with a coexisting mood and anxiety disorder may be at a higher risk of suicidal behaviors than those with either a mood or anxiety disorder individually. Examining cognitive vulnerability factors that are associated with anxiety, depression, and suicide may elucidate this phenomenon.

Anxiety sensitivity, a cognitive vulnerability factor related to a number of psychological conditions, is also associated with elevated suicidality (Capron, Cougle, Ribeiro, Joiner, & Schmidt, 2012; Capron, Fitch, et al., 2012; Schmidt, Woolaway-Bickel, & Bates, 2001). Anxiety sensitivity reflects fear of anxiety and panic related sensations or a "fear of fear" (Reiss, Peterson, Gursky, & McNally, 1986) and is made up of three subfactors related to fear of physical, cognitive, and social consequences of anxiety (Zinbarg, Barlow, & Brown, 1997). Global anxiety sensitivity amplifies distress responses in the context of general stress and anxiety symptoms (Taylor, 2003). Most research on anxiety sensitivity has focused on the relationship between anxiety sensitivity and panic attacks and panic disorder (Schmidt, Lerew, & Jackson, 1997; Schmidt, Zvolensky, & Maner, 2006). However, other research has shown a relationship between anxiety sensitivity and non-anxiety conditions such as depression (Taylor, Koch, Woody, & McLean, 1996) and substance use disorders (Lejuez, Paulson, Daughters, Bornovalova, & Zvolensky, 2006; Schmidt, Buckner, & Keough, 2007; Zvolensky et al., 2006).

The cognitive concerns subfactor of anxiety sensitivity appears to account for the relationship between anxiety sensitivity and suicide. Anxiety sensitivity cognitive concerns refer specifically to fears of cognitive dyscontrol or mental incapacitation. AS cognitive concerns differ from negative affect because they represent a fear of some negative affect symptoms (i.e. depersonalization, racing thoughts, lack of concentration) versus the symptoms themselves. In addition, AS physical concerns and AS social concerns are most strongly associated with anxiety psychopathology (Olatunji & Wolitzky-Taylor, 2009). However, anxiety sensitivity cognitive concerns are the only AS subfactor that uniquely predicts mood disorders (Naragon-Gainey, 2010; Tull & Gratz, 2008). In emerging empirical work, anxiety sensitivity cognitive concerns have been associated with elevated suicidal ideation in patients with panic disorder (Schmidt et al., 2001), clinical outpatients (Capron, Fitch, et al., 2012), air force cadets (Capron, Cougle, et al., 2012), individuals with HIV (Capron, Gonzalez, Parent, Zvolensky, & Schmidt, 2012) and cigarette smokers (Capron, Blumenthal, et al., 2012). In addition, early evidence suggests this relationship is cross-cultural (Capron, Kotov, & Schmidt, 2013) and that anxiety sensitivity reduction programs may reduce suicide risk (Capron, Norr, Raines, Zvolensky, & Schmidt, 2014; Schmidt, Capron, Raines, & Allan, 2014).

Although extant research indicates a consistent association between anxiety sensitivity cognitive concerns and suicidality in adults, there has been no empirical work investigating this relationship in adolescents. Further, despite findings that comorbid anxiety and depression place adolescents at greater risk for suicide related behaviors, mechanisms explaining this risk have not been tested. The recently proposed *depression distress amplification model* (Capron, Lamis, & Schmidt, 2014; Capron, Norr, Macatee, & Schmidt, 2012) may explain the interplay between anxiety and depression that creates elevated suicidal risk in adolescents.

The depression distress amplification model (Capron, Norr, et al., 2012) explains how depressive symptoms may be amplified by anxiety sensitivity cognitive concerns. Anxiety sensitivity cognitive concerns appear to predispose individuals to show increased distress in the context of aversive physical and mental *mood* symptoms. In the depression-distress amplification model, suicidal ideation is considered a symptom of depression corresponding to the severity of the depression. Just as anxiety sensitivity increases distress responses in the context of uncomfortable physical sensations (Schmidt, Maner, & Zvolensky, 2007), the depression-distress amplification model posits that anxiety sensitivity cognitive concerns amplify distress brought on by the uncomfortable sensations experienced in the context of emerging or existing dysphoria (e.g. lack of concentration, insomnia, anhedonia). Suicidal ideation emerges when the distress caused by the amplified depression reaches severe levels. This model has been evaluated in college students (Capron et al., 2014) and adult outpatients (Capron, Norr, et al., 2012); findings suggest the model predicts suicidal ideation above and beyond theoretically relevant covariates. Further, depression amplification appears to be specific to anxiety sensitivity cognitive concerns (Capron, Norr, et al., 2012).

There are a number of gaps/limitations in the current literature on the relations among anxiety, depression, and suicidality in adolescents. Primarily, there has been no previous research on the role of anxiety sensitivity cognitive concerns in adolescent suicidality. Extant work indicates elevated anxiety sensitivity cognitive concerns are associated with increased psychopathology (Taylor et al., 1996), and anxiety sensitivity cognitive concerns have been repeatedly found to be related to