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Intrinsic Religiosity and Adolescent Depression and Anxiety: The Mediating Role of Components of Self-Regulation

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ABSTRACT

Intrinsic Religiosity and Adolescent Depression and Anxiety:
The Mediating Role of Components of Self-Regulation

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This study examined the possible mediating role of the emotional, behavioral, and cognitive components of self-regulation as they relate to adolescent intrinsic religiosity and the internalizing problems of teen depression and anxiety. The sample included 459 adolescent respondents from one wave of the Flourishing Families Project, an ongoing longitudinal study. Through the use of Structural Equation Modeling, results showed that cognitive self-regulation partially mediated the relationship between intrinsic religiosity and adolescent depression. Additionally, emotional self-regulation, but not behavioral self-regulation was found to be negatively linked with both depression and anxiety. These findings provide clinicians with greater direction when working with depressed or anxious teens who also have a religious/spiritual framework.

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Introduction

Interest in the topic of adolescent religiosity has grown sharply in recent years (Benson, Roehlkepartain, & Rude, 2003; King & Roeser, 2009; Smith & Denton, 2005) due to increasing empirical support for the benefits of religiousness among all age groups. In fact, numerous studies have found religiosity to be strongly correlated with positive outcomes in adolescence (e.g. Jansen, Motley, & Hovey, 2010; Lambert, Fincham, Braithwaite, Graham, & Beach, 2009) such as gratitude (Tsang, Schulwitz, & Carlisle, 2012), empathy (Emmons & Kneezel, 2005), higher GPA (Butler-Barnes, Williams, & Chavous, 2012), prosocial behaviors (Forliti & Benson, 1986; Furrow, King, & White, 2004) and better mental (Cotton, McGrady, & Rosenthal, 2010) and physical health (Rew & Wong, 2006). Furthermore, research findings demonstrate that religiosity is consistently and inversely correlated with a number of negative youth outcomes (i.e., substance abuse, promiscuity, delinquency; Ji, Perry, & Clarke-Pine, 2011; Kasen, Wickramaratne, Gameroff, & Weissman, 2012; Krause, 2009; Wills, Gibbons, Gerrard, & Brody, 2003). Taken together, research on religiosity during adolescence shows a clear correlation with multiple facets of healthy functioning.

Although research continues to grow that highlights a clear association between religiosity and healthy functioning, studies that specifically examine religiosity and the internalizing outcomes of teen depression and anxiety yield mixed results (e.g. Abdel-Khalek & Lester, 2012; Ji, Perry, & Clarke-Pine, 2011). One proposed reason for the lack of consistency in these findings is that religiosity indirectly influences teen depression and anxiety through other mechanisms (King & Roeser, 2009), or that other mediating variables would more accurately explain the association. Self-regulation has been proposed as one potentially mediating variable

between adolescent religiosity and the outcomes of depression and anxiety (McCullough & Willoughby, 2009).

Although many studies examine self-regulation generally, almost no research exists that closely examines the several components of self-regulation (i.e., emotional, behavioral, and cognitive) as potential mediators of religiosity and the internalized problem outcomes of depression and anxiety. Thus, the purpose of the current study is to examine the possible mediating influence of the three components of self-regulation. These aspects of self-regulation might better explain the relationship between religiosity and internalized outcomes (i.e., depression and anxiety) for an adolescent population.

Literature Review

Religiosity has been defined in a myriad of ways, and much of social science literature uses the terms spirituality and religiosity synonymously. Peterson and Seligman (2004) use the terms interchangeably and refer to religiousness and spirituality as the "beliefs and practices that are grounded in the conviction that there is a transcendent (nonphysical) dimension of life" (p 600). Others researchers seek to separate the two terms and refer to religiosity as adherence to beliefs and practices of organized religion, whereas spirituality refers more to the personal relationship that one has with the transcendent (Luckoff, Lu, & Turner, 1992). For purposes of the current study, religiosity refers to the influence that religion and spirituality have on an adolescent's life and identity that also provides meaning in life and impact on decision-making (Lewis, Shevlin, McGuckin, & Navrtil, 2001).

Multiple theories help to explain the association between religiosity and adolescent mental health outcomes (Levin, 2010). From a biological perspective, researchers posit the existence of "spiritual" centers within the brain that are "hard-wired" connections which

influence behavior, affect, and even immunity (e.g., Beauregar & O'Leary, 2007; Newberg, D'Aquila, & Rause, 2001). It follows that those religious neural pathways, when activated, have the potential to influence psychological well-being. Additionally, Flannelly and Galek (2010) proposed the Evolutionary Threat Assessment Systems Theory (ETAS), which has its underpinnings in evolutionary and neurological research. They posit that threat assessments, or judgments about whether the immediate environment is dangerous or safe, are the most important questions faced by humans. They submit that "the prefrontal cortex interacts with the basal ganglia and limbic system in making threat assessments and that the prefrontal cortex is the vehicle through which beliefs affect the assessment of threat" (p.341). Their view of religion's influence on depression or anxiety would be explained in that religion affects the way a human makes threat assessments, and then this then influences the way neural pathways function within the brain that ultimately influence mental health outcomes.

In contrast, other researchers have used attachment theory to propose that God can serve as a secure attachment figure which would then lead to increased psychological well-being (Kirkpatrick & Shaver, 1990). More specifically, Kirkpatrick & Shaver (1990) argued that a secure attachment with God provides security in a world of insecurity. They also noted that "much like an infant's primary caregiver, God may serve as a secure base and as a safe haven of safety and comfort for believers" (Kirkpatrick & Shaver, 1992, p. 267). It follows that this secure attachment would be associated with positive mental health outcomes.

Religiosity and Internalized Youth Outcomes

Depression and anxiety are both important outcomes that have been studied in relation to religiosity. Research postulates that religion's sense of community, belonging, and connectedness promote positive mental health outcomes (Pearce, Little, & Perez, 2003) – which

would include a decrease in depression and anxiety. Many studies often examine depression and anxiety together due to a high occurrence of comorbidity (Brady & Kendall, 1992; Essau, 2003) and also because each is characterized as a common internalizing behavior (Liu & Lewis, 2011). As depression and anxiety are significant problems during adolescence (Beesdo, Knappe, & Pine, 2009; Quiroga, Janosz, Bisset, & Morin, 2013; Saluja et al, 2004) a close examination of the mediating effect of religiosity is merited.

 Self-regulation. Self-regulation can be broadly defined as an individual's capacity to regulate or control his or her own emotions, thoughts, and behaviors (Peterson & Seligman, 2004). Researchers have theorized that self-regulation, much like a muscle, after exertion can be depleted of strength (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Vohs & Heatherton, 2000). However, over the course of time, with regular exercise and exertion, self-regulation can also be strengthened (Muraven, Baumeister, & Tice, 1999). It follows that certain preceding events, traits, and circumstances would then help an individual to exercise and strengthen the attribute of self-regulation. Religiosity is one potential variable that has been proposed to play a role in the development of self-regulation (for a review see McCullough & Willoughby, 2009). Additionally, several theorists have also posited that struggles with regulation and emotion are central to most forms of psychopathology (Berking & Wupperman, 2012; Bradley, 2000; Chaplin & Cole, 2005). This mediating pathway, from religiosity to self-regulation and then to the outcomes of depression and anxiety, might help to more accurately explain the correlations between religiosity and teen depression and anxiety.

 As stated in the introduction, self-regulation has been found to be comprised of three main components: emotional, behavioral, and cognitive self-regulation (Graziano, McNamara, Geffken, & Reid, 2011; Novak & Clayton, 2001). Simply stated, emotional self-regulation refers

to the ability to manage or control and appropriately express emotions (Caprara et al., 2010). Additionally, Jacob, Thomassin, Morelen, and Suveg (2011) explain that emotional regulation includes "an awareness of an emotional experience, the ability to appraise the context surrounding the emotional experience, and the modification of the expression of the emotion to the social context demands" (p. 171). Examples of good emotional self-regulation include not getting frustrated or upset easily, controlling one's temper, or not losing control over one's feelings (Novak & Clayton, 2001). On the other hand, behavioral self-regulation refers more to the ability to concentrate, focus on tasks, and regulate bodily reactions like fidgeting or bouncing (Novak & Clayton, 2001). Lastly, cognitive self-regulation, according to Scott et al. (2008), is comprised of both goal representations and self-efficacy appraisals. In other words, teens who exhibit a high degree of cognitive self-regulation are likely evaluate themselves, set goals, and make plans to reach their goals (Novak & Clayton, 2001).

Religiosity and self-regulation. Several researchers have theorized concerning the association between religiosity and self-regulation. In particular, McCullough and Willoughby (2009) propose that religiosity promotes the development of self-regulation by influencing and sanctifying goal selection. They also suggest that religion enhances self-monitoring and builds self-regulatory strength through a sense of community and religious rituals. Additionally, Koole, McCullough, Kuhl, and Roelofsma (2010) posit that "maintaining a religious standard often means that individuals must endure considerable discomfort and forsake many pleasurable experiences" (p.95). In theory, this continuous diligence to religious commitments might then naturally lead one to practice better self-control because of a consistent effort to regulate thoughts, emotion, and behavior.

Multiple studies show a positive relationship between religiosity and self-regulation (Ahmed, 2009; Geyer & Baumeister, 2005; Koole et al., 2010; Watterson & Giesler, 2012). In illustration, McCullough and Willoughby (2009), in their comprehensive review of the relevant literature, found twelve studies that examined the relationship between religiosity and self-control, a term often used interchangeably with self-regulation. Of the twelve studies examined, eleven showed a positive relationship between the two variables, highlighting a consistent and positive correlation between the two variables.

Although findings consistently demonstrate a positive correlation between religiosity and self-regulation, no research exists that delineates the unique ways in which religiosity might impact specifically the emotional, behavioral, or cognitive components of self-regulation. Thus, more research is needed about how religiosity might differentially affect the sub-types of self-regulation. Although a dearth of research exists for religiosity and aspects of self-regulation, inferences can be made from some of the general trends in the research. For example, cognitive self-regulation primarily deals with goal-directed thoughts while also being cognizant of future consequences to actions (Novak & Clayton, 2001). Based on this conceptualization, it is purported that religiosity is tied to self-regulation because religion helps people to prioritize and sanctify their goals (McCullough & Willoughby, 2009; Mohoney, Pargament, et al., 2005). In this sense religiosity could augment a person's cognitive component of self-regulation. Still, research is needed that carefully examines religiosity and its correlation to the different aspects of self-regulation. Thus, one purpose of the current study is to more closely examine the relationship between religiosity and the emotional, behavioral, and cognitive components of self-regulation.

Self-regulation and depression. A host of research has been conducted which has consistently noted a negative correlation between self-regulation and depression (e.g., Caprara, Gerbin, Paciello, Di Guinta, & Pastorelli, 2010; Flett, Panic, & Hewitt, 2011; Scott et al., 2008). However, less is known about the specific components of self-regulation (emotional, behavioral, and cognitive) and how those each play a specific part in the correlation to depression. Nevertheless, a close examination of the relevant literature provides clues that might help to explain each of the emotional, behavioral, and cognitive pathways that affect depression.

Firstly, the emotional component of self-regulation might be largely responsible for the inverse association with depression. For instance, Caprara et al. (2010) found that self-efficacy, a key component of self-regulation, related with youth's ability to cope with negative emotions and appropriately express emotions. This emotional piece of self-regulation was then found to be significantly and negatively correlated with depression. Also, the ability to manage both negative and positive emotional states has been found to be negatively correlated with depression in adolescence (Fry et al., 2012). Overall, the emotional aspect of self-regulation seems to show a clearly inverse relationship to depression.

Almost no research has been conducted that specifically mentions behavioral regulation as it relates to depression. The few studies that address the behavioral component of self-regulation contain either children or older adult samples (e.g., Feng et al., 2008; Grigsby, Kay, Kowalksy, & Kramer, 2011; Jensen, Engel, & Schwartz, 2006). However, these limited studies do provide evidence that behavioral regulation is also negatively correlated with depression. Given the relatively few studies on the topic, more research is necessary to understand the relationship between behavioral self-regulation and depression.

Lastly, research on the cognitive aspect of self-regulation provides evidence that it may also be an important component that is negatively correlated with depression. Again, two of the main aspects of cognitive self-regulation are appraisals of self-efficacy and goal representations (Scott et al., 2008). Bandura (1997) proposed that both of these components relate to overall mental health but more specifically to depression. In illustration, self-efficacy judgments, a key component of cognitive self-regulation, have a strong link with depression (Ryan & Deci, 2000). In sum, it follows that all three components of self-regulation would be negatively correlated with depression, but the extent to which each of these components play a role in this relationship is unknown.

  Self-regulation and anxiety. Very limited research examines the correlation between self-regulation and anxiety. Few differences are found between depression and anxiety as they relate to self-regulation. For example, a key study concerning emotion regulation by Suveg et al., (2009) found that measures like poor emotional awareness, lack of emotion regulation, and negative emotion experience all did not significantly differ in their relation to either of their two outcomes - anxiety and depression. However, the study found two differences – both frequency of emotions and somatic symptom reactivity were more strongly correlated with anxiety than depression. It then follows that emotional self-regulation might have an especially strong correlation with anxiety. Also, because differences are rarely found for self-regulation as it relates to anxiety and depression, one could also posit that both behavioral and cognitive regulation follow similar correlations for both depression and anxiety. Consequently, all three aspects of self-regulation are likely to be inversely related to anxiety, but the correlation may be especially strong for emotional self-regulation specifically.

Self-Regulation as a Mediator

Much like religiosity, self-regulation is related to multiple positive outcomes such as better academic performance (Kitsantas, 2002), enhanced social skills (Mischel, Shoda, & Peake; 1988), healthier dietary intake and increased physical activity (Wills, Isasi, & Mendoza, 2007), and greater resilience (Wills & Bantum, 2012). It has also been shown to be inversely related to negative outcomes like externalizing behaviors (Eiden, Coles, Schuetze, & Colder, 2013), alcohol consumption (Pearson, Kite, & Henson, 2013), and substance use problems (Wills, Pokhrel, Morehouse, & Fenster, 2011). However, very few studies examine youth self-regulation, in its role as a mediator, by breaking the construct down into its key elements (i.e., emotional, behavioral, cognitive; Graziano, McNamara, Geffken, & Reid, 2011; Novak & Clayton, 2001).

As research mounts highlighting the clear relationship between self-regulation and healthy functioning, more focused studies are being conducted that explore the possible mediating effects of self-regulation (e.g. Doan, Fuller-Rowell, & Evans, 2012; Ning & Downing, 2012). Recent research has shown that self-regulation, as a whole, effectively mediates the relationship between variables across multiple domains. Studies have found that self-regulation significantly mediates the relationship between variables such as parenting behaviors and school adjustment (Lee, Yu, & Choi, 2012), and learning behaviors and academic achievement (Ning & Downing, 2012). Other research findings indicate that self-regulation mediates the relationships between variables pairs such as family functioning and externalizing behaviors (Hardaway, Wilson, Shaw, & Dishion, 2012) and parenting and prosocial behaviors (Padilla-Walker & Christensen, 2011). Taken together, this research provides evidence that self-regulation is important and effective in explaining the association between many variables.

Less is known about how self-regulation might mediate the relationship between religiosity and youth outcomes. Desmond, Ulmer, and Bader (2013) found that adolescent's self-control partially mediated the relationship between religiosity and the negative youth outcomes of drinking and smoking. Furthermore, it has been found that self-regulation partially mediates the relationship between religiosity and unprotected intercourse for young males (Kogan, Brody, Chen, & DiClemente, 2011). These two examples highlight a mediation model for self-regulation in-between religiosity and various externalizing problems, however; further research is necessitated that examines this mediating relationship for the internalizing problems of depression and anxiety.

Gender, Income, Race, and Age Differences

As research on religiosity expands, gender differences are being explored in more depth. Specifically, studies on adults consistently show that women report higher levels of intrinsic religiosity (Molock & Barksdale, 2013). Additionally, Elliasen, Taylor, and Lloyd (2005) found that religiousness tended to protect adult women against depression more than men. Even in adolescence it has been found that girls report greater intrinsic religiosity than boys (e.g., Henry, Plunkett, Robinson, Huey, & McMichael, 2009; Houltberg, Henry, Merten, & Robinson, 2011). It is purported that girls may also attribute greater meaning to intrinsic religiosity which provides a protective buffer against internalizing problems like depression and anxiety (Gilligan, 1982).

Although females are more likely to report being intrinsically religious, they are twice as likely to report having higher levels of depression and anxiety (McLaughlin, Xuan, Subramanian, & Koenen, 2011; Turner & Lloyd, 1999).This disparity between males and females begins as early as adolescence (McLaughlin et. al, 2011). For example, Alloy (2007) found that during early adolescence girls begin to outnumber boys in levels of depressive

symptoms by a ratio of 2 to 1. It follows that since gender differences are common for levels of religiosity and for the internalizing problems of anxiety and depression during adolescence, a close examination is also merited for the current study.

Research also shows several other sociodemographic variables that also highlight differences in religiosity, depression, and anxiety. For example, Elliasen et. al (2005) found that lower socioeconomic populations had higher reports of depression. Additionally, they found that Caucasians reported lower levels of depression when compared to African American and also Hispanics who had the highest levels of depression. However, African Americans and Hispanics report significantly higher levels of religiosity (Elliasen et. al, 2005). Furthermore, a comprehensive review of the relevant literature on depression and anxiety also highlights fluctuations over the life-course (Nandi, Beard, & Galea, 2009). Since differences have been found for these sociodemographic items the current study uses them as control variables.

Sociodemographic differences are not as evident in relation to self-regulation. For example, trait measures of self-regulation do not generally yield gender differences (Tangney, Baumeister, & Boone, 2004). However, women have been found to use more emotion regulation strategies than men (Nolen-Hoeksmen, 2012). Additionally, research has postulated that self-regulation increases with age (Gwyther & Holland, 2012) and that self-regulation can even differ by race and ethnicity (Jackson & Knight, 2006). In sum, research on religiosity, self-regulation, and depression/anxiety highlights several socioeconomic factors that point to essential differences. Thus, the current study closely examines gender while controlling for income, race, and age differences.

Hypothesis

The purpose of the current study is to understand the mediating role of the behavioral, emotional, and cognitive components of self-regulation as they relate to adolescent intrinsic religiosity and the internalizing problems of depression and anxiety. The relationships that will be assessed in this study are displayed in figure one.

Insert figure one about here

It is hypothesized that higher levels of intrinsic religiosity will be correlated with higher levels of each behavioral, emotional, and cognitive self-regulation. These components of self-regulation will, in turn, more accurately and significantly predict the relationship between the intrinsic religiosity and the youth outcomes of depression and anxiety. More specifically, the current study hypothesizes that:

1) The direct relationships between intrinsic religiosity and both depression and anxiety will be significant and negative.

2) The direct relationship between intrinsic religiosity and each of the components of self-regulation (emotional, behavioral, and cognitive) will all be significant and positive.

3) The pathways from teen intrinsic religiosity to depression and anxiety will all be mediated, at least in part, by emotional, behavioral, and cognitive self-regulation.

4) The three aspects of self-regulation will all be inversely correlated with depression and anxiety. Emotional regulation will have the strongest correlation with depression and anxiety.

5) Lastly, internal religiosity will have a more protective effect for girls than for boys as it relates to depression and anxiety as mediated by the several components of self-regulation.

Method

Participants

The data for this study come from the Flourishing Family Project (FFP), an ongoing longitudinal study. The participants for this study were taken from wave 3 of the FFP, a longitudinal study of inner-family life involving families with a child between the ages of 10 and 17. Ninety-six percent of the respondents from wave 1 also participated in the study at wave 3. Wave 3 included 459 child respondents, with 155 from single parent families and 325 from two-parent families (*M* age of child = 13.47, *SD* = 1.17 for single-parent; *M* age = 13.24, *SD* = 0.99 for two-parent). Fifty-three percent of adolescent children from single-parent families and 50.5% from two-parent families were female. For teens of single-parent families, 47.8% were European American, 29.0% of were African American, and 18% of children were from other ethnic groups or were multiethnic. For teens of two-parent families, 77.9% of children were European American, 5.4% of children were African American, 16.7% of children were from other ethnic groups or were multiethnic.

Procedure

Participant families for the FFP were interviewed during the first eight months of 2007 for Time 1, and two consecutive years following (between May and August of 2008: wave 2, and May and August of 2009: wave 3). Families were primarily recruited using a purchased national telephone survey database (Polk Directories/InfoUSA). All families with a child between the ages of 10 and 14 living within target census tracts were judged eligible to participate in the FFP. Of the 692 eligible families contacted, 423 agreed to participate, resulting in a 61% response rate.

Measures

    Self-regulation. The child's ability to regulate negative emotions and disruptive behavior, and to set and attain goals was assessed using a modified 13-item measure as self-reported by the children and also the parents report of the child. (Novak & Clayton, 2001). This 13-item scale included three subscales: 5 items measuring emotional self-regulation, 4 items measuring behavioral self-regulation, and 4 items measuring cognitive self-regulation. The emotional self-regulation latent construct was measured using 5 indicators with a factor loading ranging from .44 to .78. Behavioral self-regulation was measured using 4 indicators with a factor loading ranging from .59 to 91. Thirdly, cognitive self-regulation was also measured using 4 indicators that loaded from .51 to .80. Responses ranged from 1 (never true) to 4 (always true). Higher scores represent greater ability to regulate negative emotion/behavior/thoughts and to reach goals. Sample items for the emotional self-regulation scale included "I have a hard time controlling my temper" and "I get upset easily." Sample items for the behavioral self-regulation scale included "I get distracted by little things" and "I have a hard time sitting still during important tasks." Sample items for the cognitive self-regulation scale included "I develop a plan for all my important goals" and "I think about the future consequences of my actions." Novak and Clayton (2001) found reliability coefficients for the child self-report to be .95 (emotional subscale), .94 (behavioral subscale) and .96 (cognitive subscale). The reliability coefficients for the current sample were found to be .82 for boys and .83 for girls (emotional subscale, .83 for boys and .85 for girls (behavioral subscale), .75 for boys and .70 for girls (cognitive subscale).

    Intrinsic religiosity. Adolescent religiosity was measured using items from the Santa Clara Strength of Religious Faith Questionnaire (Lewis, Shevlin, McGucklin, & Navrtil, 2001). Items that represented intrinsic religiosity were selected from this original scale. Adolescents

responded to 3 questions based on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The latent construct of intrinsic religiosity was measured using three indicators that loaded from .92 to .96 Sample questions include, "My faith is an important part of who I am as a person" and "my faith impacts many of my decisions." Higher scores indicate greater perceived religious influence on identity, meaning, and life decisions. Lewis et al. (2001) found reliability to be .93 for the overall scale and the Cronbach's Alpha coefficient for the current sample was found to be .95 for boys and .94 for girls in this study for the reduced scale.

Depression. The adolescent's depression was assessed using the 20-item self-report CES-DC: Center for Epidemiological Studies Depression Scale for Children (Weissman, Orvaschel, & Padian, 1980). After conducting a factor analysis four of the original items that did not load at .40 or higher were removed which resulted in a 16-item depression scale for the current study. The latent construct was formed using 16 indicators which loaded from .48 to .81. Participants responded by rating the degree to which they have experienced each item in the past week, with a Likert-type response scale ranging from 1 (not at all) to 4 (a lot). Higher scores indicate greater depressive symptoms. Sample items included, "I felt down and unhappy," and "I wasn't able to feel happy, even when my family or friends." For the current sample, the Cronbach's Alpha reliability coefficient was found to be .83 for boys and .90 for girls.

Anxiety. Child's anxiety was assessed using the six-item generalized anxiety disorder subscale from the Spence Child Anxiety Inventory (Spence, 1998). The latent construct of anxiety was measured using 6 indicators that loaded from .63 to .76. Participants responded using a 4-point Likert scale ranging from 0 (never) to 3 (always) with higher scores reflecting greater levels of anxiety. Sample items included, "I worry a lot about things," and "When I have

a problem my heart beats really fast." For the current sample, the Cronbach's Alpha reliability

coefficient was found to be .83 for boys and .83 for girls.

Income. The control variable of family income was calculated from a single item asked

at wave 4 to the parents of the teens: "What is your present annual income combined with that of

your partner?" If teens belonged to a single parent household the parent responded to the item:

"What is your present annual income?" Parents responded with a fill-in-the-blank reply. Previous

waves (1-3) of data used a categorical response option so the continuous variable at wave 4 was

selected to provide increased accuracy.

Race. The control variable of youth race was asked in an item to the parents at wave 1.

Parents responded to an item labeled "Child's race" to which they chose from one of 6 response

categories: 1=European American, 2=African American, 3=Hispanic, 4=Asian American,

5=Other, or 6=Multi-ethnic. The 6 items were recoded into 2 variables: 0=European American

and 1=non-European American.

Proposed Data Analysis

Structural equation modeling will be utilized to explore the relationships between

intrinsic religiosity as mediated by the sub-types of self-regulation in relation to the youth

outcomes of depression and anxiety. Analysis of Structure (AMOS) software (Arbuckle, 2010)

will be used to assess the relationships. The hypothesized model (Figure 1) will first be

examined, controlling for family SES, race, and child age. Second, the resultant model will then

be examined, using group comparisons, to determine whether the model and, more specifically,

the path coefficients differed by child gender. Group comparisons (by the use of AMOS)

following the procedure set out by Bollen (1989) will fit the data separately for each group and

then we will be using a chi-square difference test to examine the question of group equivalence.

This is done by first establishing a "baseline" or unconstrained model, referred to as "hypothesis of form" or "H-form", in which all parameters are unconstrained. Using H-form as comparison, the model will be run again with the path coefficients constrained to be invariant between groups, and the chi-squares for the two models will be compared. If the chi-square difference test is found to be significant, this indicates a group difference (e.g., males versus females) in the nature of the relationships between intrinsic religiosity, self-regulation, and youth outcomes.

Results

Descriptive Statistics

Means and standard deviations of all variables are reported in Table 1. T-test results demonstrated significant gender differences for three variables: emotional self-regulation, depression, and anxiety. Bivariate correlations were also calculated for all variables for both boys and girls (see Table 2). Intrinsic religiosity was not significantly correlated to the outcomes of depression or anxiety for either boys or girls. Correlations were in the expected direction between intrinsic religiosity and emotional self-regulation, behavioral self-regulation, and cognitive self-regulation; but the only significant pathway was between intrinsic religiosity and cognitive self-regulation for boys (.269, $p < .01$) and for girls (.189, $p < .01$). Most correlations for self-regulation sub-types were found to be significant and negatively correlated with the outcomes of depression and anxiety for both boys and girls. As an exception, cognitive self-regulation was not significantly related to anxiety for either boys or girls but was significantly correlated with depression for girls only (-.236, $p < .01$).

Measurement Model

Using Analysis of Structure (AMOS) software (Arbuckle, 2010) a measurement model was first constructed with latent constructs including emotional self-regulation, behavioral self-

regulation, emotional self-regulation, depression, and anxiety. Each latent construct was measured using its items as indicators. Emotional self-regulation included five indicators, behavioral self-regulation included four indicators, cognitive self-regulation also included 4 indicators, depression included 16 indicators, and anxiety included 6 indicators (for factor loading ranges see measures section). The original measurement model fit was $X^2 = 1227.5$, $df = 675$, $p < .001$), with CMIN/DF=1.82, with CFI = .91 and RMSEA = .050. To test for group differences by gender of the youth, multi-group models were estimated and compared using X^2 difference tests. Factor loadings were examined by comparing a baseline model where factor loadings were unconstrained or free to vary across gender to a fully constrained model where all factor loading were considered equal across gender. Comparing the unconstrained model with the fully constrained model resulted in a significant decrease in model fit (X^2 difference (29) = 56.7, $p < .01$) which suggests measurement variance by factor loadings as a function of gender. By constraining individual factor loadings paths to be equal one at a time it was found that depression loaded higher for girls (.67) than for boys (.61). Thus, the final measurement model was estimated by constraining all factor loadings to be equal across gender, except for depression. On the basis of all comparisons, this measurement model resulted in the best fit, ($X^2 = 1709.8$, $df = 1062$, $p < .001$), with CMIN/DF=1.61, with CFI = .91 and RMSEA = .035, and all factor loadings were statistically significant at ≥ 0.45.

Structural Model

A structural model was then formed which looked at intrinsic religiosity as a predictor of youth depression and anxiety as mediated by the three parts of self-regulation: emotional, behavioral, and cognitive (Figure 2). Family income, child age, and race were used as control variables. To test for group differences by gender, a series of multigroup comparisons were

estimated and compared using X^2 difference tests. Structural paths were examined by comparing an unconstrained model where paths were free to vary across gender with one where paths were constrained to be equal across gender. By comparing all structural paths of the fully unconstrained model to the fully constrained model there was no significant difference found. After constraining each individual path at a time and comparing it to the fully unconstrained model one significant decrease in model fit was found for the pathway between cognitive self-regulation and depression (X^2 difference (1) = 7.44, $p < .01$). This suggests measurement variance by gender for this specific pathway. Specifically, this pathway was significant for girls ($\beta = -.271$, $p < .001$) but insignificant for boys ($\beta = -.039$). Thus, the best model fit was one constrained to be equal by gender for all structural pathways except for the pathway between cognitive-self-regulation and depression which was left unconstrained. The resultant model was within acceptable standards ($X^2 = 2206.9$, $df = 1468$, $p < .001$), with CMIN/DF=1.50, with CFI = .91 and RMSEA = .032.

Direct and Indirect (Mediating) Relationships

Even after controlling for age, race, and income, several important relationships were found in the model. Research hypothesis one was not confirmed: the direct pathways between intrinsic religiosity and the outcomes of depression (boys: $\beta = .061$, girls: $\beta = .036$) and anxiety (boys: $\beta = -.021$, girls: $\beta = -.019$) were found to be insignificant. The second research hypothesis was partly conferment: a significant pathway was found between intrinsic religiosity and cognitive self-regulation (boys: $\beta = .263$, $p < .001$; girls: $\beta = .278$, $p < .001$), but relationships were found to be insignificant between religiosity and both emotional self-regulation (boys: $\beta = .020$, girls: $\beta = .017$) and behavioral self-regulation (boys: $\beta = .072$, girls: $\beta = .064$). Research hypothesis three was also confirmed in part: one significant indirect effect existed for girls from

intrinsic religiosity to cognitive self-regulation (β = .278, p < .001) and depression (β= -.280, p<
.001; Sobel= -1.94 for one-tailed p < .06, and two-tailed p = .05) (Sobel, 1982). Contrary to the
original hypotheses, no significant indirect pathways existed between intrinsic religiosity and
emotional or behavioral self-regulation and the outcomes of depression and anxiety for boys or
girls. Research hypothesis four was also partly confirmed: the path between emotional self-
regulation and depression (boys: β = -.332, p < .001; girls: β = -.222, p < .001) was significant
and also for emotional self-regulation and anxiety (boys: β = -.275, p < .001; girls: β = -.281, p <
.001). There was a significant path between cognitive self-regulation and depression for girls (β
= -.280, p < .001) but not for boys (β = -.030) and an insignificant path between cognitive self-
regulation and anxiety (boys: β = -.054, girls: β = -.046). No significant paths were found
between behavioral self-regulation and the outcomes of depression (boys: β = -.128, girls: β = -
.085) and anxiety (boys: β = -.136, girls: β = -.137).

Regarding the control variables (race, family income, age), several significant pathways
were found in relation to the sub-types of self-regulation and the outcomes of depression and
anxiety. A significant pathway was found between child age and anxiety for girls only (β = .168,
p < .05). Also for girls, a significant pathway was found between child race and emotional self-
regulation (β = -.171, p < .05). For boys, the only significant path was between youth age and
behavioral self-regulation (β = -.149, p < .05). All other pathways for the control variables were
insignificant.

Discussion

The main purpose of the current study was to examine the possible mediating role of the
emotional, behavioral, and cognitive components of self-regulation as they relate to adolescent
intrinsic religiosity and the internalizing problems of teen depression and anxiety. It was

hypothesized that higher levels of intrinsic religiosity would be correlated with higher levels of behavioral, emotional, and cognitive self-regulation. As theorized, these components of self-regulation would, in turn, be significant factors in predicting the inverse relationship between intrinsic religiosity and the youth outcomes of depression and anxiety. Results revealed several important relationships.

Intrinsic Religiosity and the Outcomes of Depression and Anxiety

The first hypothesis of the current study was that intrinsic religiosity would be significantly and negatively correlated with depression and anxiety, but results did not confirm this hypothesis. Several potential explanations exist for not finding this association. As stated in the introduction, Koenig et al. (2001) proposed two reasons for the lack of consistency in the findings between religiosity and mental health outcomes. The first was a methodological explanation in which the samples studied are rarely randomly chosen and the populations can vary widely in their level of religiosity. The current study examined a population that widely differed in levels of intrinsic religiosity, so future studies might seek to examine more homogenously religious samples in an effort to rule out methodological error. The second reason by Koenig et al. (2001) was rooted in the way each study greatly varied in their way of defining religiosity, but that intrinsic religiosity seemed to more consistently correlate with mental health outcomes. The current study aimed to examine these relationships using a measure of intrinsic religiosity but results were nonetheless non-significant. The non-significant finding seems to contradict the biological, Evolutionary Threat Assessment Systems (ETAS), or attachment theories which all seek to explain the association between religiosity and mental health. However, these theories all have intermediate pathways that better explain the proposed association. For example, attachment theory proposes that religion helps an individual to form a

relationship with God, and that this secure relationship, in turn, becomes the real catalyst for maintaining positive mental health outcomes (Kirkpatrick & Shaver, 1990). Although the current study did not find a direct relationship between intrinsic religiosity and the internalizing problems of depression and anxiety, it did find a partially mediating pathway that better clarifies the association.

Intrinsic Religiosity and the Components of Self-Regulation

Out of the three proposed direct positive associations between intrinsic religiosity and the emotional, behavioral, and cognitive components of self-regulation, only one significant association was found between intrinsic religiosity and cognitive self-regulation. This aligns well with both the biological and ETAS theories that propose cognitive or brain functioning as primarily responsible for changes in affect. For example, a biological perspective submits that the brain has "spiritual centers" and that these cognitive neural pathways, which are activated by religiosity, affect mental health outcomes (Beauregar & O'Leary, 2007; Newberg, D'Aquila, & Rause, 2001). This cognitive pathway, from intrinsic religiosity to cognitive self-regulation becomes central in understanding one specific way in which religiosity affects self-regulation. This finding also highlights a unique contribution that intrinsic religiosity may not augment the emotional or behavioral components of self-regulation.

Emotional, Behavioral, and Cognitive Regulation as Mediators

It was posited that all three of the components of self-regulation would mediate the relationship between intrinsic religiosity and teen depression and anxiety; however, results showed that the only indirect relationship of significance was between intrinsic religiosity and adolescent depression as partially mediated by cognitive self-regulation. In contrast, neither emotional nor behavioral self-regulation was found to mediate the relationship between internal

religiosity and the outcomes of anxiety and depression. This highlights a unique contribution to the value of intrinsic religiosity as it relates specifically to cognitive regulation and then to depression.

One possible explanation for the significant indirect relationship between intrinsic religiosity, cognitive self-regulation, and depression could lay in McCullough and Willoughby's (2009) assertion that religiosity promotes the development of self-regulation by influencing and sanctifying goal selection. This goal oriented thinking, a key aspect of cognitive self-regulation (Novak & Clayton, 2001), might be perpetuated by a religious person's tendency to not only set and make plans for achieving goals, but to also have goals that are sanctified in their purpose. It follows that this cognitive aspect then becomes, at least in part, an explanatory factor for a decrease in teen depression. This assertion is consistent with literature which highlights a clearly negative relationship between the cognitive aspect of self-regulation and decreases in depression (Bandura, 1997; Ryan & Deci, 2000).

Emotional, Behavioral, and Cognitive Regulation and Depression and Anxiety

Another unique contribution of the current study is that all three components of self-regulation were analyzed in their relationship to both depression and anxiety. Results found several unique relationships. Out of the three aspects of self-regulation, emotional self-regulation was the strongest link to both teen depression and anxiety. In contrast, behavioral self-regulation was not significantly related to either depression or anxiety, and cognitive self-regulation was significantly correlated with depression only.

For example, Suveg et al. (2009) found that measures like poor emotional awareness, lack of emotion regulation, and negative emotion experience were all significantly and positively related to both depression and anxiety. Additionally, they found that emotional self-regulation

also has a unique potential to affect anxiety specifically. Likewise, the current study found the strongest inverse correlation to be between emotional self-regulation and anxiety ($\beta = -.384$, $p < .001$).

Gender Differences

It was also hypothesized that internal religiosity would have a more protective effect for girls that for boys. The current study confirmed this hypothesis but only for the relationship between internal religiosity, cognitive self-regulation, and depression. This finding is consistent with Elliasen et. al (2005) where they found that religiosity tended to provide a greater protective effect against depression for women than for men. This also follows the proposition by Gilligan (1982) who stated that girls attribute greater meaning to intrinsic religiosity with then creates the buffer for internalizing problems.

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Clinical Implications

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Two important clinical implications can be drawn from the findings of the current study. The first applies to therapists working with female adolescents who present with depression. When these clients have a religious/spiritual background it would be important to direct this resource into discussions that especially highlight the cognitive aspect of self-regulation. For example, religious/spiritual based discussion about goal oriented thinking, evaluations of self-efficacy, and goal sanctification might be especially effective in reducing depressive symptoms for teens who can work, at least in part, from a religious/spiritual paradigm.

Secondly, for teens that are presenting with depression or anxiety it would be especially important to work in the emotional aspect of self-regulation. Several examples of working in the emotional self-regulation realm might include helping teens to identify emotions, recognize emotional triggers, and cope with strong emotions. More specifically, Suveg et al (2009) propose

that youth need to learn and practice how to "identify, label, and appreciate the causes and consequences of emotion." (p. 391). For example, an Emotion-focused Cognitive Behavioral Therapy (Suveg, 2006) approach begins each session by having the therapist and child both discuss how they are feeling, how he or she knows how they are feeling that particular emotion, and why they are feeling that way. Other approaches seek to enhance awareness and control of emotion through recognizing bodily cues to emotion and also use deep breathing/relaxation exercises to help regulate emotion (Allen, Tsao, Seidman, Ehrenreich-May, & Zeltzer, 2012). In essence, any work to help teens to be aware of and regulate their emotions might help to more significantly reduce symptoms of both depression and anxiety. In contrast, it is possible that therapeutic interventions aimed at increasing either cognitive or especially behavioral regulation might not reduce depression and anxiety symptoms.

Limitations

The current study is not without limitations. Primarily, our measure for the latent variable of intrinsic religiosity included only three items. Future research should include a more comprehensive measure that would be a more accurate gauge for intrinsic religiosity. Additionally, the current sample was not necessarily a very religious population and responses did not indicate a normal distribution for teens in regards to intrinsic religiosity. It is possible that by measuring religious populations that results might more accurately describe the several pathways from mediation to the outcome variables. Furthermore, all measures in the current study were obtained through self-report. Future research might more accurately describe the several pathways if the measures about teens are obtained through more than one avenue. Also, the current study is a cross-sectional analysis and future research should examine the nature or these relationships longitudinally.

Conclusion

This study examined the possible mediating role of the emotional, behavioral, and cognitive components of self-regulation as they relate to adolescent intrinsic religiosity and the internalizing problems of teen depression and anxiety. Through the use of SEM, results showed that cognitive self-regulation partially mediated the relationship between intrinsic religiosity and adolescent depression. Additionally, emotional self-regulation, but not behavioral self-regulation was found to be negatively linked with both depression and anxiety. These findings provide clinicians with greater direction when working with depressed or anxious teens who also have a religious/spiritual framework.

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Table 1

Means (Standard Deviations) for Religiosity, Self-Regulation, Depression, and Anxiety

	Boys (*n*=216)	Girls (*n*=226)	T-tests
Religiosity	2.29 (1.09)	2.44 (1.04)	*t* = -1.45
Emotional Self-Regulation	3.04 (0.67)	2.79 (0.73)	*t* = 3.76***
Behavioral Self-Regulation	2.44 (0.79)	2.47 (0.81)	*t* = -0.35
Cognitive Self-Regulation	2.96 (0.62)	3.08 (0.56)	*t* = -1.95
Depression	1.34 (0.49)	1.64 (0.76)	*t* = -4.95***
Anxiety	1.34 (0.50)	1.02 (0.60)	*t* = -4.64***

 * *p* < .05
 ** *p* < .01
*** *p* < .001

Table 2

Bivariate Correlations

	R	ESR	BSR	CSR	D	A
Religiosity (R)		.048	.102	.269**	.072	.019
Emotional Self-Reg (ESR)	.006		.322**	.161*	-.307**	-.339**
Behavioral Self-Reg (BSR)	.040	.389**		.044	-.207**	-.202**
Cognitive Self-Reg (CSR)	.189**	.175**	.189**		-.007	-.047
Depression (D)	-.008	-.310**	-.143*	-.236**		.337**
Anxiety (A)	-.095	-.348**	-.260**	-.095	.541**	

Note: correlations for boys are above diagonal, girls below diagonal
*. *p*< 0.05. ** *p*< 0.01.

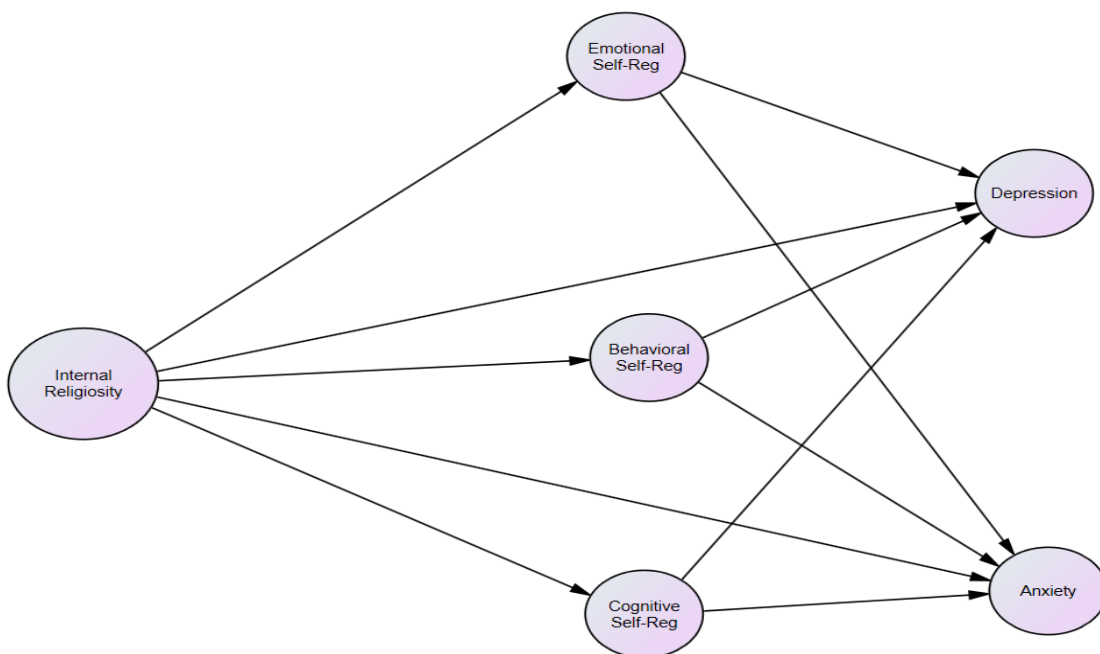Figure 1

Structural Pathways for the Proposed Model
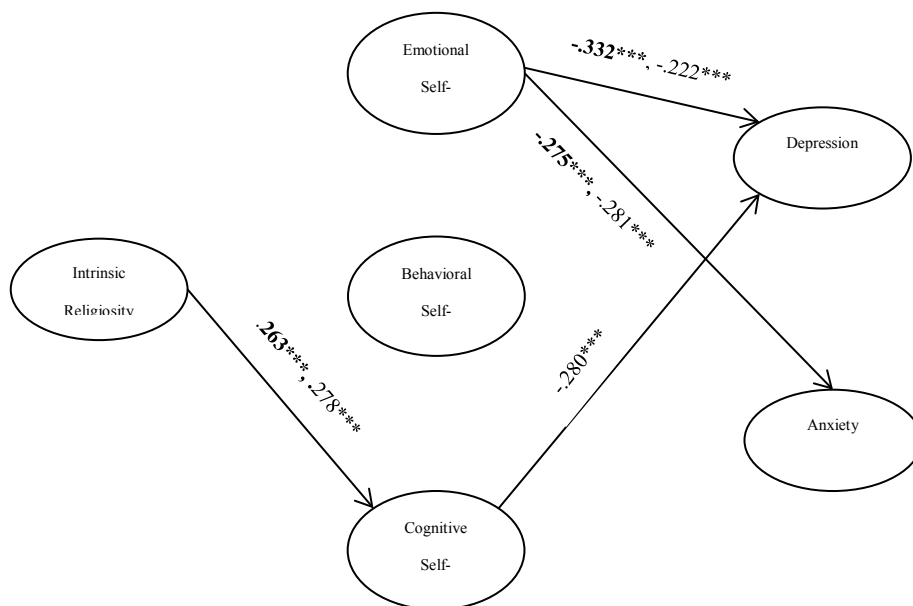
Figure 2

Significant Pathways for the Final Structural Model

X^2 = 2206.9*, df*=1468*, p*< .001, CMIN/DF=1.50, CFI= .9, RMSEA= .032

p < .001***, **Boys** (bolded), Girls (unbolded)