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Why Are Religiousness and Spirituality Associated with Externalizing Psychopathology? A Literature Review

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Abstract

This review explores the relation of religiousness and spirituality with externalizing psychopathology in adolescence given the heightened externalizing psychopathology during this developmental period. Utilizing a developmental psychopathology framework, previous literature is reviewed focusing on the diversity of pathways from religiousness and spirituality to externalizing psychopathology at multiple levels of analysis. Moreover, the pathways considered include both intraindividual factors (e.g., self-control, monitoring, delay discounting and time orientation, and neurobiological regulatory systems) and ecological factors (e.g., intergenerational transmission, parent-child relationships, and community relationships). These pathways are explored in light of theoretical viewpoints including social control theory, divine interaction theory, and the religious ecology model. Limitations of extant work are examined, including measurement and design issues, exploration of potential negative effects of religiousness and spirituality, and bias towards Western religions. Finally, future directions of research and clinical implications are discussed.

The identification and exploration of factors which may deter development of problem behaviors or provide a protective effect against them is crucial for informing intervention and prevention programs that aim to prevent psychopathology. Susceptibility to the development of externalizing psychopathology (EP), which is defined as under-controlled behaviors (Achenbach & Edelbrock, 1978) including antisocial/deviant behavior, hyperactivity, conduct problems, substance use, and risky sexual behaviors, is particularly acute during adolescent years (e.g., Casey, Jones, & Somerville, 2011; Steinberg, 2010). This susceptibility serves to heighten the need to examine ways by which such health-demoting problems can be discouraged from developing during this critical developmental period. As such, previous research has tabbed religiousness and spirituality (R/S) as an important predictor of EP in adolescents such that higher R/S are associated with lower EP; however, how these effects operate is poorly understood (McCullough & Willoughby, 2009). Therefore, the current review wifocus on elucidating factors through which higher R/S influence lower EP in adolescents. In doing so, well timed and targeted prevention and intervention during this critical developmental period may be informed by the constructs

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that interrupt negative or promote positive cascading developmental trajectories (Masten & Cicchetti, 2010) from R/S to EP.

The studies included in the current review are a result of searches in APA PsycNet, searches in Google Scholar, examination of citations made by these articles, as well as examination of articles that had cited these articles. The search terms included: religiousness, spirituality, externalizing psychopathology, and adolescence. We then sought to include as many relevant pieces of literature providing evidence regarding the relation between R/S and EP. We specifically sought to include studies that met the following criteria: 1) published in the English language, 2) examined the relation between R/S and EP of any type, and 3) examined adolescent samples (i.e., ages 10-25, Steinberg, 2014); however, in a few cases adolescent literature was not available and thus young adult literature was used in parallel support.

The Developmental Psychopathology Framework

The current review will operate from a developmental psychopathology perspective. First, general systems theory (Cicchetti 1999; Cicchetti & Rogosch, 1996; von Bertalanffy 1968) defines the principles of equifinality and multifinality. Equifinality refers to the principle that within any open system, a diversity of pathways may lead to the same outcome. That is, the same end state, such as EP, may be reached through a variety of different initial conditions and through different intermediate processes. Multifinality (Wilden, 1980) refers to the principle that any function may operate differently depending on the organization of its system. Diverse outcomes may result from the same source or intermediate process depending on additional components of the systems in which it is linked. A developmental psychopathology framework, then, acknowledges that the development of EP may unfold along different trajectories and that the same intermediate processes may culminate in diverse types of EP.

Consequently, a broad framework out of the organizational perspective (Cicchetti, 1993, 1999; Sroufe, 1997) best provides a theoretical orientation for development of EP. From this view, it is acknowledged that development is probabilistic in nature (Zucker, Fitzgerald, & Moses, 1995; Zucker & Gombert, 1986) and portrayed as a series of reorganizations between genetic, biological, behavioral, psychological, neural, and environmental systems as the individual grows which also relate in mutual and continuous transaction among each other (Sameroff & Chandler, 1975). Moreover, Masten and Cicchetti (2010) described developmental cascades as the cumulative consequences for development from the interactions and transactions occurring in developing systems resulting from spreading of effects across and within levels, domains, or systems. In this sense, individual processes are even more crucial to identify as they may have bidirectional and cumulative effects on other processes influencing the development of EP and may also directly influence a particular dimension of EP that cascades into additional dimensions of EP. For example, adolescent rule breaking and aggressive behavior (Scalco et al., 2014) as well as attention deficit and hyperactivity (Elkins, McGue, & Iacono, 2007) have been found to be associated with increased substance use. The cumulative effects of developmental cascades, then, could be seen as explaining why some problems early in life are predictive of widespread difficulties

later in life, such as a wide range of co-occurring EP. Based on these frameworks of developmental psychopathology, the current review seeks to simultaneously investigate multiple processes at different levels of analysis within and between individuals as well as multiple outcomes under the umbrella of EP (e.g., antisocial behavior, deviant behavior, hyperactivity, conduct problems, substance use, and risky sexual behaviors).

Externalizing Psychopathology in Adolescence

The growing literature and databases regarding the prevalence of EP across age groups consistently identify the overlapping periods of adolescence (ages 10-19; World Health Organization, 2015) and emerging adulthood (ages 18-25; Arnett, 2005) as periods characterized by a spike in these EP behaviors. Along such lines, Steinberg (2014) indicated that in recent years adolescence is beginning earlier and ending much later than previously and, thus, the conceptualization of adolescence as the teen years is increasingly outdated. Accordingly, we define adolescence in the current review as encompassing ages 10-25, which include emerging adults such as samples of university students. Trends are seen such that EP behaviors begin increasing in early adolescence and peak in middle to late adolescence. For example, United States crime data (including all types of offenses) indicated that 37% of all crimes were committed by individuals between the ages of 13 and 24, peaking between 18 and 22 (Federal Bureau of Investigation, 2013), despite the 13 to 24 age segment representing just under 17% of the population (US Census Bureau, 2013). This spike in criminal violations during the adolescent period represented a larger percentage of total crime than at any other age. This phenomenon is not limited to recent years as previous literature has similarly provided evidence of the overrepresentation of adolescents in crime data (e.g., Moffitt, 1993) and aggregated data from 1993-2001 reveal similar patterns of adolescent criminal offenses across these years (Federal Bureau of Investigation, 2003).

Additionally, adolescence has been identified as the most critical period for possible initiation of substance use and development of substance use problems (McCord, 1990). Adolescent substance use has been described as representing a major public health concern due to the potentially critical risky effects it may have on health and functioning (CDC, 2013a). In concert with the increase of criminal offenses beginning at age 13, most substance users begin during adolescence (Dodge et al., 2009). Indeed, 72% of American adolescents report having tried alcohol by age 18 (Johnston, O'Malley, Bachman, & Schulenberg, 2008) and 89% of adult smokers report having begun use at or before age 18 (Dodge et al., 2009). Similarly, risky sexual behaviors represent a significant hindrance to adolescent health (e.g., Mason et al., 2010). The late teen years into the twenties have been noted as a period when romantic and sexual relationships are most common as parental surveillance has decreased but there is still little normative pressure to enter into marriage (Arnett, 2004). As a result, sexual behavior becomes increasingly significant in relation to health and emotional risks (Zahran, Zach, Vernon-Smiley, & Hertz, 2007), including sexually transmitted infections and unwanted or unplanned pregnancy (CDC, 2013b). Taken together, previous studies strongly suggest that EP spikes during adolescence and create significant risks for individual's health and well-being during these years and beyond.

Definitions and Measurement of Religiousness and Spirituality

In the current review, we define religion as the search for significance in the ways that are related to the sacred (Pargament, 2007), whereas spirituality is defined as the search for the sacred including the discovery, maintenance, and transformation of an individual's approach to the sacred (Pargament & Mahoney, 2009). Notably, there is considerable overlap of the two constructs as a search for the sacred may occur within traditional, institutionalized religious settings or outside of it (Hernandez, Mahoney, & Pargament, 2014). However, spirituality does not necessarily require religiousness, though a genuine pursuit of religiousness does seem to require spirituality. Specifically, religious practices (e.g., rituals and communal participation) are most often performed with the intent of fostering spirituality, but there are ways to foster spirituality independent of these religious practices (e.g., private prayer or meditation). As a result, the nuanced and multidimensional natures of R/S have created measurement discrepancies in the current body of research and there lacks a consensus on the best way to define and measure the constructs. The constructs of R/S are at times completely separated, but at other times any distinction is ignored. The current review acknowledges the considerable overlap between R/S and largely draws conclusions which apply to both R/S; however, when findings may apply differentially between the two constructs, such discrepancies are noted.

From the measurement perspective, prior research on the link between R/S and health is limited in several important ways relating to how R/S have been measured. First, measures of R/S are often single-item measures and attendance in religious services is used most frequently (see Rew & Wong, 2006 for a review). Such single-item measures are problematic because R/S are best considered multidimensional, including aspects of behaviors, devotion, and beliefs (e.g., King & Hunt, 1975). Second, global R/S variables that combine multiple dimensions of R/S into a single summary score may also be limited in helping us understand why and how R/S affect adolescent outcomes because different dimensions of R/S beliefs and behaviors may relate differentially to the risk for EP. Commonly identified dimensions of R/S include personal religiousness (e.g., importance of faith), organizational religiousness (e.g., religious service attendance), and private practices (e.g., praying alone). Previous studies suggest the utility of the distinction between correlated yet independent aspects of R/S demonstrating that personal religiousness, but not organizational religiousness, was related to adolescent substance use directly (Walker, Ainette, Wills, & Mendoza, 2007) or indirectly via delay discounting (Kim-Spoon, McCullough, Bickel, Farley, & Longo, 2015).

We believe that focusing on only the general R/S factor or only the specific R/S factors makes it difficult to determine whether the results are due to the general factor of the R/S construct, the specific factors, or both. A recent study presenting the first attempt to test a bifactor model of religiousness related to adolescent substance use suggested the multidimensional nature of religiousness as well as the presence of a superordinate general religiousness factor directly explain the covariation among the specific factors including organizational and personal religiousness and religious social support (Kim-Spoon, Longo, & Holmes, 2015). Specifically, the prediction of substance use by the general religiousness factor was strong and negative which is consistent with previous literature. Additionally,

after partialling out the contribution of the general religiousness factor to substance use, organizational religiousness was inversely related to substance use, whereas personal religiousness and religious support had positive associations with substance use. Thus, the findings advocate the use of a general religiousness factor encompassing multiple, specific factors, and further suggests that researchers should consider controlling for the higher order general religiousness factor before examining the unique contributions of specific factors.

Third, examination not only of R/S per se, but also people's motivations for being religious or spiritual, is a high priority for advancing this research area. Based on self-determination theory (Deci & Ryan, 1985), Ryan and colleagues (1993) introduced a new conceptualization of religious orientation that accounts for religious internalization. When an individual internalizes a norm through *identification*, the norm is compelling and it feels personally chosen and valued. In contrast, when an individual internalizes a norm through *introjection*, s/he does so to avoid anxiety, guilt, or a loss of esteem in the eyes of others. Because behaviors that are regulated by introjection feel less volitional and may create greater conflict, introjected beliefs are less assimilated and the behaviors they motivate do not feel self-determined. Indeed, Holmes and Kim-Spoon (in press) found that identification of religious values were associated with lower levels of substance use among adolescents, whereas introjection of religious values were associated with higher levels of substance use even after controlling for the effects of general religiousness (measured by a composite of organizational and personal religiousness and private practices). Similarly, another study included an exploration in differences of hazardous alcohol use between three latent profiles of religiousness (Jankowski et al., 2015). The first profile included more intrinsically motivated religious college students, the second included intermediately motivated religious college students, and the third included more extrinsically motivated religious college students. The results indicated that more intrinsically motivated religious college students reported significantly lower hazardous alcohol use than the other two profile types. Taken together, the findings of these two studies highlight the need for taking into account people's motivations for being religious or spiritual when examining effects of R/S.

Furthermore, in the current literature, the lack of age-specific measures is problematic, considering the differences in cognitive developments across ages that may disallow for some young adolescents to conceptualize the abstract principles of R/S. Moreover, measures of adolescent religiousness, especially frequencies of attending religious services (i.e., organizational religiousness), may largely reflect attachment to parents or conformity to their wishes (Elifson, Peterson, & Hadaway, 1983). Although there has been some research on specifying religious and spiritual constructs for children (see Boyatzis, 2013 for a review), most researchers assess R/S using measures interchangeably between adolescents and older age groups which is a critical avenue for future research.

Finally, differences between religious creeds make it difficult to create measures that are inclusive of all religions, because some creeds are mutually exclusive. The current review, therefore, focuses largely on Western religions including Christianity, Judaism, and Islam due to their relatively comparable core philosophies and relatively high amount of publications written in English. Taken together, the current state of the study of R/S requires careful consideration for how R/S are measured and in what ecological context across

studies. Therefore, the current review explicates the nature of measurement for R/S in relevant studies to clarify any differential effects across the diverse measures of this complex construct while focusing on Western religion.

Theory Associating Religiousness and Spirituality with Externalizing Psychopathology in Adolescents

Extant literature provides strong evidence that adolescent R/S are related to positive health attitudes and behaviors in adolescence (see Cotton, Zebracki, Rosenthal, Tsevat, & Drotar, 2006; Rew & Wong, 2006 for reviews). The literature on R/S has a gap such that many studies lack a well-defined theoretical foundation (Koenig, 2008), which also only serves to further exacerbate the problem of measurement (Burris, Sauer, & Carlson, 2011). Limited literature has provided some theoretical framework that may allow for concrete and testable theories to develop regarding the relation between religiousness and health. For example, social control theory (Hirschi & Stark, 1969; Smith, 2003) posits that the religious community allows for parents to know their child's peer group and the parents of the children in their child's peer group. Consequently, the child experiences more adult oversight of their behaviors and internalization of adult norms for appropriate behavior (Coleman, 1988). As such, R/S may act as means of social control which may lead to the reduction of EP in adolescents. Although social control theory may not readily apply for spirituality or personal and private religiousness as they do not necessitate a formal institution or community, subtheories which operate within social control theory may help supplement areas in which social control theory may not seem readily applicable.

For example, a further clarification of social control theory is the religious ecology model (Stark, Kent, & Doyle, 1982) which was developed in consideration of the findings of Hirschi and Stark (1969) that perplexed researchers by showing that religious commitment was not related to delinquency. Stark and colleagues (1982) argued that Hirschi and Stark's null findings were a result of the religious ecology of the highly secularized western United States sample they used. They further showed that religious commitment did deter delinquent behavior in adolescents; however, religious commitment was only important when religious commitment was the norm in the community. In more secularized communities, religiously committed adolescents were no less delinquent than non-religious adolescents. Accordingly, Stark and colleagues concluded that religious convictions constrain delinquent behavior in adolescents, but only when those religious convictions are supported by their social environment. If religious conviction is not supported by the social environment, the personal religious conviction loses capacity to sanction the normative system. This finding has been recently supported by a study across 59 countries which found that religious individuals in regions of higher religiousness reported better health than those in regions which religiousness is not the social norm (Stavrova, 2015). As such, the importance of the community level religiousness for how religiousness takes root in a particular individual is demonstrated. The findings corroborating the religious ecology model further highlight social control theory's dependence on organizational or public measures of religiousness. That is, when an individual is part of a religious or spiritual community, those personal religious convictions are both supported and overseen by other

members of the community leading to less EP. The communal context, then, is a vital consideration for social control theory and the religious ecology model.

Furthermore, another theory which may supplement social control theory is divine interaction theory (Ellison, 1991). This theory posits that individuals may create relationships with the divine in a way similar to how they build social relationships. Instead of receiving guidance and solace from other individuals within an organized religious community, the individual may develop a similar relationship with a divine other in private. Much as the religious community functions, the divine being may provide a framework of meaning, purpose, identity, and morality. As a result, the divine being may exert a sense of oversight of appropriate behaviors which may also influence reduction of EP. The focal difference, however, is that the divine other may exert a form of oversight or control even without the need for the organized religious community (Norenzayan & Shariff, 2008). From this perspective, spirituality and personal and private religiousness can be regarded to operate in a way parallel to how organized religiousness operates within social control theory, even when no other human is present. Taken together, extant theories explain relatively consistent and robust associations between R/S with physical and mental health, including EP; however, the field would benefit from refining extant theories to specify when and how the effects of R/S operate.

Despite the lack of theoretical specification, research empirically examining the relation between R/S and EP in adolescence has largely been consistent in indicating that higher R/S are associated with lower EP. A seminal study of a US nationally representative sample of adolescents found that higher R/S (measured as religious importance and attendance) was associated with lower frequency of getting into fights, carrying weapons, drinking and driving, and substance use (Wallace & Forman, 1998). Similarly, other studies have found higher R/S are associated with lower delinquency, conduct problems, antisocial behavior, truancy, and crime (Johnson & Jang, 2010; Laird, Marks, & Marrero, 2011; Pearce, Jones, Schwab-Stone, & Ruchkin, 2003; Pirutinski, 2014; Salas-Wright, Vaughn, Hodge, & Perron, 2012; Sinha, Cnaan, & Gelles, 2007; Spivak, Fukushima, Kelley, & Jenson, 2011; Ulmer, 2010). Furthermore, higher R/S have been associated with lower risky sexual behaviors (Edwards, Fehring, Jarrett, & Haglund, 2008; Gyimah, Kodzi, Emina, Adjei, & Ezech, 2014; Nonnemaker, McNeely, & Blum, 2003; Sinha et al., 2007; also see Hernandez et al., 2014 for a review).

A large body of research has also noted the association between higher R/S and lower substance use and abuse including tobacco, alcohol, marijuana, and other illicit drugs (Brechtling & Carlson, 2015; Desmond, Ulmer, & Bader, 2013; Ford & Hill, 2012; Holmes & Kim-Spoon, 2015; Isralowitz & Reznik, 2015; Jankowski, Hardy, Zamboanga, & Ham, 2013; Jankowski et al., 2015; Kendler et al., 2003; Kim-Spoon, Farley, Holmes, Longo, & McCullough, 2014; Longest & Vaisey, 2008; Marsiglia, Ayers, & Hoffman, 2012; Mason & Spoth, 2011; Milot & Ludden, 2009; Razali & Kliewer, 2015; Sinha et al., 2007; Ulmer, Desmond, Jang, & Johnson, 2012; Unlu & Sahin, 2015; also see Chitwood, Weiss, & Leukefield, 2008 for a review). Taken together, it may be concluded that a robust association exists between R/S and EP such that R/S exert protective effects in adolescents. Less understood, however, are the processes by which R/S operate such effects

(McCullough & Willoughby, 2009). Therefore, the goal of the present review is to elucidate these processes from a developmental psychopathology framework and further identify when R/S may act as a protective factor.

Factors associating Adolescents' Religiousness and Spirituality with Externalizing Psychopathology

To date, most studies investigating the relation between adolescent R/S and EP have examined direct associations. These investigations do not provide the necessary lens that would allow for conclusions to be drawn about how EP emerges, recedes, remains, or changes over time in relation to or as a result of R/S. However, an emerging body of literature has focused on processes by which adolescent R/S affect outcomes such as EP. The current review, then, employs these studies to inform a developmental psychopathological view of the R/S to EP link and provide indications of effect sizes when available in original article or when. In Table 1, we present the summarized information of reviewed literature in order of relevant construct including measure of R/S, sample description, design, and findings. Notably, even standardized effect sizes are not directly comparable among studies using different covariates (Hedges, 2008). Therefore, these coefficients should be used merely to elucidate patterns among studies rather than direct comparison of magnitudes. Moreover, the magnitudes of the effect sizes should be relativistically interpreted in light of the clinical significance in the outcome. For example, Hedges (2008) indicated a small numerical value of effect size on an outcome like death may be extremely clinically important, whereas a larger numerical value of effect size on an outcome like discomfort may be far less consequential. The magnitudes and trends seen in the presently reviewed studies should be interpreted with these considerations in mind.

Given that processes that link adolescent R/S and EP necessarily work simultaneously and in conjunction to determine adolescent outcomes over time, multiple levels of assessment should be reviewed within an organization of intraindividual or ecological systems. As such, the current review helps to inform developmental trajectories through factors of psychopathologies which is aligned with the goals of the National Institute of Health's Research Domain Criteria (RDoC). Rather than beginning with clinical symptoms and working backwards, RDoC seek to start with the identification of intermediate factors across multiple levels of analysis that may lead to mental disorders when dysfunctioning (National Institute of Mental Health, 2015). To this end, proponents of the RDoC agenda have developed a matrix of psychopathology which allows for clear classification of factors which may be important for psychopathology and from what levels of analysis they may be investigated, ranging from genes and molecules to self-report and paradigms (<http://www.nimh.nih.gov/research-priorities/rdoc/research-domain-criteria-matrix.shtml>). The current review similarly includes multiple levels of analysis, first presenting intraindividual factors (e.g., self-control, monitoring, delay discounting and time orientation, and neurobiological regulatory systems) followed by ecological factors (e.g., intergenerational transmission, parent-child relationships, and community relationships).

Intraindividual Factors

Self-Control—Regulatory systems are critical for healthy developmental trajectories and have received recent attention in relation to R/S. Specifically, self-regulation has been proposed as a factor by which R/S may lead to healthy behaviors and outcomes (McCullough & Willoughby, 2009). This proposal has received theoretical attention within the strength model of self-control framework (Baumeister & Vohs, 2007). Presently, we define self-control as the effortful capacity for an individual to regulate emotions, thoughts, impulses, or other well-learned automatic behavioral responses (Baumeister, Vohs, & Tice, 2007) and use self-control and self-regulation interchangeably. Prior research suggests that self-control pulls from a unitary resource that can be exerted in one of the three response domains: cognitive, affective, and behavioral (Berkman, Graham, & Fisher, 2012). Reviews of functional neuroimaging studies also indicate that common brain regions, the right inferior frontal gyrus in particular, were implicated in self-control, no matter if the regulation was cognitive, affective, or behavioral in context (Berkman et al., 2012; Lopez, Vohs, Wagner, & Heatherton, 2015). Since R/S are frequently demanding of self-control resources (e.g., time commitments, tithing, and fasting), they strengthen self-control abilities for religious individuals which they may in turn employ in other domains (McCullough & Willoughby, 2009). In particular, higher self-control (which may be strengthened by R/S) has been found as a vital component for deterring delinquency and other symptoms of EP (e.g., Buker, 2011; Gottfredson & Hirschi, 1990).

Empirical evidence has provided support for operation of R/S via self-control. The earliest work demonstrated that higher religiousness (measured as religious membership, importance, and value) had an indirect effect on lower substance use, mediated through higher self-control after controlling for age, gender, parent education, and parent-child conflict in a sample of middle (indirect effect critical ratio = 5.17, $p < .0001$) and high school students (indirect effect critical ratio = 2.80, $p < .01$; Walker, Ainette, Wills, & Mendoza, 2007). Desmond and colleagues (2013) used data from the National Longitudinal Study of Adolescent Health (Add Health) and found that higher religiousness (measured via reports of organizational, personal, and private religious practices) was associated with higher later self-control. Higher self-control partially mediated the relation between higher religiousness and lower marijuana (indirect effect 5.2% of total effect) and alcohol use (indirect effect 5.6% of total effect) in adolescents after controlling for sex, age, race, and social class. Similarly, Pirutinsky (2014) found that higher religiousness (measured via personal religiousness) predicted decreased future criminal behaviors partially mediated by increased self-control (indirect effects 95% CI for $b^* = [-.19, -.11]$) in a sample of adolescents that had committed a serious criminal offense. Furthermore, another study found that self-control fully mediated (indirect effect $b^* = -.06$, $p < .001$) the relation between higher religiousness (measured by religious values, beliefs, and practices) and lower aggressive behavior in a sample of adolescents (Shepperd, Miller, & Smith, 2015).

Studies involving college students provide consistent findings with the studies based on middle and high school students. For example, higher self-control partially mediated the relation between higher religiousness (measured by organizational, personal, and private aspects of religiousness) and lower risky sexual behaviors (indirect effect 95% CI for $b = [.$

004, .03] for males, [.003, .03] for females) among college students after controlling for age (Vazsonyi & Jenkins, 2010). More recently, DeWall and colleagues (2014) reported a series of studies showing that (1) self-control mediated the link between higher religiousness (measured as a composite consisting of self-assessments of being a religious person, religious service attendance, and prayer) and lower alcohol use six weeks later among college students after controlling for the baseline levels of alcohol use and social desirability (indirect effect 95% CI for $b = [-.02, -.003]$) and (2) the mediated link between high levels of religious commitment and low levels of college students' alcohol use via self-control (indirect effect 95% CI for $b = [-.55, -.05]$), even after controlling for mindfulness, a non-religious mental state associated with self-awareness and contemplation.

Taken together, these studies lend credence to the idea that R/S may reduce EP in adolescence by promoting better self-control as proposed by McCullough and Willoughby (2009). Furthermore, there seems to be a developmentally cascading effect of self-control predicated by R/S, such that higher self-control deters a host of unhealthy behaviors in adolescence under the umbrella of EP. Nevertheless, the expected beneficial effects of R/S on EP through their promotion of self-control may not be so clear cut. There seems to be a significant contrast between the effects of R/S on self-control when motivation is considered. For example, Holmes and Kim-Spoon (in press) demonstrated that there is evidence religiousness motivated via identification (more intrinsic and personally meaningful) is indeed related to higher self-control and subsequently lower health-risk behavior (indirect effects 95% CI for $b^* = [-.28, -.03]$) and higher health-promoting behavior (indirect effects 95% CI for $b^* = [.02, .34]$) after controlling for sex, age, and income in a sample of adolescents. However, when religiousness is motivated via introjection (more extrinsic and used as a means for other approval) it is negatively related to self-control and in turn related to higher health-risk behavior (indirect effects 95% CI for $b^* = [.03, .20]$) and lower health-promoting behavior (indirect effects 95% CI for $b^* = [-.25, -.02]$). Thus the findings call for the need to consider the type of motivation a person has to be religious when determining the effects of religiousness by demonstrating varying relations between differing religious motivations and self-control.

Furthermore, some prior research indicates non-significant mediated effects of R/S on EP. For example, in a sample of early adolescents, Laird and colleagues (2011) demonstrated that higher religiousness (measured as both importance of religion and frequency of religious participation) was associated with lower self-control problems, which in turn were associated with higher antisocial behavior and higher rule-breaking behavior after controlling for sex, home structure, parent education, and ethnicity. However, upon closer examination, researchers failed to find significant indirect effects from religiousness to antisocial behavior through self-control problems (indirect effects 95% CI for $b^* = [-.09, .01]$ for importance of religion, 95% CI for $b^* = [-.10, .01]$ for religious attendance) and rule breaking behavior (indirect effects 95% CI for $b^* = [-.04, .01]$ for importance of religion, 95% CI for $b^* = [-.04, .01]$ for religious attendance). It was suggested the nonsignificant indirect effects may be a result of the operationalization of self-control as this study measured poor self-control, whereas other studies examining the effect of R/S on EP have measured good self-control. Poor versus good self-control have been conceptualized as

distinct constructs and have different antecedents (e.g., Block & Block, 1980; Rothbart & Bates, 1998; Wills & Stoolmiller, 2002). Therefore, the findings warrant future studies examining whether R/S are better at promoting good self-control rather than demoting poor self-control.

Monitoring—Self-monitoring is another intraindividual factor which may provide insight into the connection between R/S and EP. Specifically, R/S may influence monitoring of the self in a number of ways. First, within social control theory and the religious ecology model, R/S foster monitoring by others in the community which may in turn increase an individual's self-awareness, thus making them more conscious of their behavior, the possible consequences of their behaviors, and the discrepancies between their behaviors and their own standards for their behaviors (Kim-Spoon et al., 2014). Indeed, previous studies have demonstrated that an evaluative audience fosters increased self-awareness which leads to an individual comparing their own behavior to the relevant standard (Carver & Scheier, 1998). In this sense, the increase of monitoring by other people as a result of R/S will in turn increase self-monitoring. Subsequently, the increase in self-monitoring will foster higher self-control by emphasizing the need to keep one's behavior in line with one's standards and expectations. Such propositions have been empirically corroborated. A previous study examined the relation between religiousness, monitoring by other people, monitoring by self, and self-control after controlling for sex in a sample of undergraduates (Carter, McCullough, & Carver, 2012). As hypothesized, higher religiousness (measured as interpersonal and intrapersonal religious commitment) was associated with a higher sense of monitoring by other people which, in turn, was associated with higher monitoring by the self. Subsequently, higher monitoring by the self was associated with higher self-control (total indirect effects coefficient = .15, $p < .05$). Resultantly, the individuals with higher self-control are less likely to experience EP (e.g., Wills, Walker, Mendoza, & Ainette, 2006).

A second way in which R/S foster self-monitoring, and thus ultimately lowers EP, is through God monitoring. Divine interaction theory operates parallel to social control theory in that a sense of a relationship with a divine being may foster feelings of oversight and guidance just as other monitoring. Since many religious groups see their God as omniscient and omnipotent (Norenzayan & Shariff, 2008), it follows that they may see God monitor, judge, reward, or punish human behaviors and intentions (Gervais & Norenzayan, 2012). Therefore, God monitoring may induce feelings of self-awareness and self-monitoring in the same sense that other monitoring does in a religious community. A previous study has indicated that thinking about God induces a sense of public self-awareness in the same sense of thinking about social evaluation by other people ($r^2 = .13$; Gervais & Norenzayan, 2012) and thus has a number of effects on human behavior (e.g., Shariff & Norenzayan, 2007).

Similarly, in the previously mentioned study by Carter and colleagues (2012), researchers found that God monitoring was a significant mediator between R/S and self-control. Specifically, higher religiousness was associated with higher God monitoring which in turn was associated with higher self-monitoring, which was subsequently associated with higher self-control. As a result, the researchers concluded that God monitoring operates similarly to other monitoring by fostering a sense of self-awareness that leads to behaving in a way that is in line with one's standards and expectations. Such findings have also been directly

corroborated in other samples. Specifically, another study identified a four-path mediated effect from religiousness (measured as a composite of organizational, personal, and private religiousness) to decreased substance use in a sample of adolescents (Kim-Spoon et al., 2014). Significant indirect effects of adolescent religiousness on substance use were found through God monitoring → self-monitoring → self-control (indirect effects 95% CI for $b = [-.01, .00]$), after controlling for age. Taken together, these findings provide evidence that higher R/S are linked to lower EP via higher self-monitoring and this effect occurs, in part, by increased perceptions of God monitoring. Moreover, such findings highlight the way in which multiple mediators may operate in tandem (e.g., God and other monitoring) or directionally (e.g., self-monitoring → self-control) as the transactional nature of the developmental psychopathology framework would suggest.

Delay discounting and time orientation—The effects of R/S on the intraindividual also extend to delay discounting and, relatedly, time orientation. Delay discounting or temporal discounting refers to the phenomenon by which future reinforcers are devalued as a function of the amount of time until those rewards can be obtained. Delay discounters may not be prone to exhibit self-control because they do not perceive demanding or sacrificial actions in the present (such as declining a sooner, smaller reward) as being worth a larger, future reward. For example, a previous study has demonstrated that adolescents were more willing to accept a smaller reward delivered sooner than a larger one that is delayed compared to their older counterparts, indicating that adolescents are higher delay discounters and less future oriented, compared to adults (Steinberg et al., 2009). Similarly, a recent study using a sample of adolescents and young adults (aged 12-27 years) indicated a linear decline in delay discounting with age across adolescence and young adulthood (de Water, Cillessen, & Scheres, 2014). Taken together, the findings suggest that high delay discounting among adolescents may leave them susceptible to EP (especially crime, drug use, and risky sexual behaviors) that may be perceived as rewarding in the short term, but long term risks are not considered (e.g., Bickel et al., 2010).

However, R/S may exert protective effects on the relatively lower future oriented and higher delay discounting nature of adolescents. A value that almost every world religion extols is delay of gratification (Carter et al., 2012). As a result, we would expect that religious adolescents compared to non-religious adolescents are lower delay discounters and more oriented toward the future, thus encouraging actions of self-control. Indeed, a previous study found in a sample of early adolescents who were substance use naïve that higher religiousness (measured as personal religiousness) is associated with later initiation and lower levels of substance use mediated by lower levels of delay discounting (indirect effects 95% CI for $b = [-.05, -.01]$) after controlling for age (Kim-Spoon et al., 2015). This finding led the researchers to conclude that higher religiousness exhibits a protective effect against substance use by encouraging lower levels of delay discounting. A similar finding was found in a sample of undergraduates such that higher religiousness (measured as religious commitment) was associated with lower delay discounting partially mediated by higher future time orientation (measured as a subjective sense that the future is very close in time and is rapidly approaching) after controlling for sex and Big Five personality traits (indirect effects 95% CI for $b^* = [-.10, -.01]$; Carter et al., 2012). Here, too, it may be concluded that

religiousness is a protective factor by discouraging delay discounting and present-oriented thinking, which may lead to a host of risk factors for EP.

The relation between high R/S and low delay discounting may stem from the afterlife beliefs of higher R/S individuals. It has been proposed that religious individuals, who are more likely to believe in an afterlife in which their behavior in this life is judged, will be more willing to deny short-term gains in order to achieve long-term and eternal gains (McCullough & Willoughby, 2009). This perspective has been empirically justified by demonstrating that religious undergraduates (measured via intrinsic religiousness) report more consideration for their future in current decision making than non-religious undergraduates (Oner-Ozkan, 2007). This evidence has been further corroborated in a longitudinal analysis of sequential mediation linking religiousness → afterlife beliefs → future orientation → substance use behaviors, after controlling for initial levels of substance use in a sample of adolescents (Holmes & Kim-Spoon, 2015). Specifically, the findings directly indicated that higher religiousness (measured as a composite of organizational and personal religiousness and private practices) was associated with lower EP through higher afterlife beliefs as afterlife beliefs may lead an adolescent to think more about the future, which ultimately may deter cigarette and marijuana use (indirect effects 95% CI for $b^* = [-.05, -.003]$ for cigarette use and 95% CI for $b^* = [-.06, -.001]$ for marijuana use).

Furthermore, another study found that religious priming of undergraduates in Canada led participants to accept a larger monetary reward one week later than a smaller, immediate reward (Calculation by current authors of $d = .55$; Rounding, Lee, Jacobson, & Ji, 2012). From this finding it may be concluded that religious primes activate thoughts of delaying gratification and encourage followers to be more future oriented. However, these findings were not replicated in a similar study examining the effects of religious priming on delaying gratification in a sample of undergraduates in Australia (Harrison & McKay, 2013). More complication arises when another study is considered from a sample of undergraduates in the United States (Weatherly & Terrell, 2011). In this study, individuals reporting higher religiousness (measured as organizational religiousness) were actually higher delay discounters for monetary rewards ($\eta^2 = .01$).

Taken together, in light of mixed findings, the results need to be taken with a skeptical consideration. It may be that specific dimensions of R/S may be differentially related to delay discounting. The study conducted by Weatherly and Terrell (2011) examined only organizational religiousness (attendance) so they may have captured more introjected driven believers who are concerned with outward demonstrations of R/S and the extrinsic rewards these demonstrations bring. Such introjection motivated religiousness has been demonstrated as being inversely related to self-control (Holmes & Kim-Spoon, in press). Another possible explanation for the discrepancy of the findings may be the differences in religious ecology. That is, as prescribed by the religious ecology model (Stark et al., 1982), community level religious ecology may have played a role in the effect of R/S on delay discounting across the three different religious cultures (America, Canada, and Australia). Unfortunately, these studies do not provide data on the levels of religiousness in the specific surrounding communities from which the samples were recruited; therefore, religious ecology differences cannot be directly compared. However, this very idea of differential

effects of religious ecology is underscored by the discrepancies in delay discounting seen across different denominations in a study examining delay discounting between Dutch Calvinists and Italian Catholics attending university (Paglieri, Borghi, Colzato, Hommel, & Scorolli, 2013). In particular, Italian Catholics were higher discounters than Dutch Calvinists while two atheist groups were found to be intermediary. These results led researchers to conclude that denominations which have some conceptual differences (e.g., pre-destination versus sin-confession-expiation) may influence delay discounting differentially. Taken together, recent work highlights the need to consider religious ecology and denominational factors when examining how R/S are associated with delay discounting and time orientation.

Neurobiological regulatory systems—At the neurobiological level, research has demonstrated the effects of R/S on neurobiological regulatory systems suggesting that R/S function as protective factors at the neurobiological level to buffer against EP. The effects of R/S on neurobiological regulatory systems may be particularly important given the neurobiological changes that occur during adolescence that leave individuals susceptible to risk as previously noted (Casey et al., 2012; Steinberg, 2010). Prior studies have noted the effects of R/S on a number of neurobiological regulatory systems including the sympathetic nervous system (SNS), the hypothalamic-pituitary-adrenal axis (HPA), and the anterior cingulate cortex (ACC). Namely, previous studies have indicated that meditation, forgiveness, and other common religious thoughts and practices reduce arousal in the stress regulatory systems such as the SNS and HPA (Thoresen, 1999). Resultantly, the body's stress response may be reduced which will reduce the amount of norepinephrine and cortisol that is released which in turn prevents the body from reaching unhealthy levels of functioning. Indeed, such effects have been seen in a variety of bodily systems (e.g., Seybold & Hill, 2001; Tartaro, Luecken, & Gunn, 2005; Uchino, Uno, & Holt-Lunstad, 1999; Weisbuch-Remington, Mendes, Seery, & Blascovich, 2005). In turn, previous research has indicated that individuals with neurobiological alterations in brain circuits associated with chronic distress may use substances in order to cope with the distress (Brady & Sinha, 2005; Khantzian, 1985; Nemeroff, 1996; Sapolsky, Alberts, & Altmann, 1997). Ultimately, R/S's effects on these regulatory systems would therefore buffer against EP outcomes associated with stress such as substance use.

Similarly, Inzlicht and colleagues (2011) found an association between religiousness (measured separately as religious zeal, belief in God, and religious attendance) and the ACC in a sample of religious undergraduates. Their findings indicated that religiousness buffered against error-related negativity (ERN) in the ACC, thus attenuating bodily states of distress. Another study found that reflecting on God's love reduces neurophysiological responses to errors compared to those reflecting on God's potential to enact punishment ($d = 0.59$) and those in a control condition ($d = 0.62$) in a sample of undergraduates (Good, Inzlicht, & Larson, 2015). This finding may help to clarify what it is about R/S that reduce ERN in the ACC. Specifically, believing that a loving, forgiving, and understanding God who monitors humans' errors will forgive mistakes will reduce one's own negative reaction to such errors. However, believing that a vengeful and punishing God may not be prone to forgiveness will not attenuate one's own response to an error. Taken together, the findings suggest that R/S

may buffer against states of arousal and distress that could lead to EP such as conduct problems, hyperactivity, or substance use.

Furthermore, a specific practice of R/S, meditation, has been linked with prefrontal cortical activation in adult samples which may indicate similar associations for adolescents. Specifically, Cahn and Polich (2006) reviewed neuroimaging studies that suggested prefrontal cortical regions including the ACC and dorsolateral prefrontal cortex are influenced by meditation. Such studies indicated that experienced meditators who had practiced Kundalini meditation (a practice of the Hindu religion) for at least four years had greater activation in their dorsolateral prefrontal cortex when meditating than when generating a random list of animals, in a sample including both emerging adults and adults (Lazar et al., 2000). Furthermore, experienced meditators had a thicker cortical mantle in their dorsolateral prefrontal cortex in a sample of adults (Lazar et al., 2005). From these findings, Urry and colleagues (2012) surmised that R/S may be associated with regulatory abilities through strengthened brain regions associated with regulation and demonstrated such effects in a sample of undergraduates. Thus the finding suggests that protective effects of R/S may be exerted by elevating adolescents' developing neurobiological control system which will contribute to less EP.

Ecological Factors

The factors by which R/S are associated with EP go beyond the intraindividual level. Ecological factors contribute to this link while also interacting with intraindividual factors. The current review focuses on proximal levels of ecology, including the family unit and religious/spiritual community, leaving more distal levels such as regions, countries, and cultures as a future direction in this line of research. Such proximal ecological factors fit soundly within social control theory and the religious ecology model. That is, within families and religious/spiritual communities, R/S place adolescents in a context in which social control may operate, although the effects will vary depending on the norm behaviors of the family or religious/spiritual community.

Intergenerational transmission and parent-child relationships—Intergenerational transmission of R/S appears to be a primary way through which R/S in the family unit may demote EP. In particular, when examining the contributions of adolescents' religiousness to their EP, consideration of parent religiousness is crucial because of its relation to both adolescent religiousness and adjustment. Adolescents' religious commitment is often influenced by their parents' endorsement of such religious beliefs or engagement in religious activities (Kim-Spoon, Longo, & McCullough, 2012a) and previous research has found a strong resemblance between parent and adolescent religiousness (Flor & Knapp, 2001; Laird et al., 2011; Landor, Simons, Simons, Brody, & Gibbons, 2011). Thus one way by which parent religiousness can influence adolescent EP is through adolescent religiousness.

Additionally, the intergenerational transmission of R/S promote congruency of these beliefs and practices as parents take measures to raise their adolescent with the same beliefs that they have themselves (Kim-Spoon, Longo, & McCullough, 2012b). Congruent beliefs and practices in turn may foster higher quality relationships. For example, congruent mother-

child religious attendance and importance of religion have been associated with a higher quality mother-child relationship (Pearce & Axinn, 1998). Furthermore, another study indicated adolescents who disagreed with their parents about the importance of religion showed greater delinquency than adolescents who agreed with their parents that religion was very important (Pearce & Haynie, 2004). Furthermore, a more recent study clarified that adolescents who are less religious than their parents were at risk for EP through lower parent-adolescent relationship quality (Kim-Spoon et al., 2012b). Specifically, boys who had lower organizational religiousness than their parents (Calculation by current authors of $d = .50$), and for both boys and girls who had lower personal religiousness than their parents (Calculation by current authors of $d = .40$), showed more EP symptoms than did adolescents whose religiousness better matched their parents' via parent-adolescent relationship quality. The apparent effects of sub-parental religiousness on adolescents' psychological symptoms were mediated by adolescents' perceived quality of their relationships with their parents. Taken together, it may be concluded that higher parental R/S are associated with lower adolescent EP by promoting adolescents' R/S (i.e., intergenerational transmission) or improving parent-adolescent relationship quality.

Religious norms also encourage parents to spend more and better quality time with their children (Bartkowski, Xu, & Levin, 2008) which will also reinforce parent-adolescent relationship quality and, additionally, increase parental monitoring. As described above, God and other monitoring influence self-monitoring to promote self-control and, ultimately, lower EP within the framework of social control theory as God and others act as supervising and guiding entities for behavior. Similarly, parental monitoring may operate to encourage higher self-control and thus less EP in their adolescents. Empirical evidence from a recent longitudinal study has supported this idea by demonstrating that higher parental religiousness (measured as a composite of organizational and personal religiousness and private practices) was associated with lower adolescent substance use via a three path mediated effect of parental religiousness $\rightarrow$ parental monitoring $\rightarrow$ adolescent self-control $\rightarrow$ adolescent substance use (indirect effect 95% CI for $b = [-.015, -.001]$; Kim-Spoon et al., 2014). As such, parents' religiousness seems to play an important role for their children's self-control and substance use, above and beyond the contributions of adolescents' own religiousness.

Community relationships—It is not just at the family level that we see positive effects stemming from R/S, but such effects are apparent at the community level as well (Weber & Pargament, 2014). As stressed by social control theory, R/S bolster adult oversight of adolescent behaviors and promote adolescents' internalization of adult norms for appropriate behavior. Religious communities create social networks which provide sanctions and encourage parents to fulfill their role as a caregiver (Bartkowski et al., 2008). Furthermore, R/S may operate at the community level to increase monitoring from not only other adults but also religious and spiritual peers.

Additionally, R/S oriented community level socialization may help deter adolescent EP by providing social support that may strengthen feelings of control and providing the benefits of embeddedness in an integrated social network (e.g., Idler et al., 2003). Previous literature has demonstrated that religion creates social communities (e.g., Graham & Haidt, 2010) and

these communities provide a network of social support which provides high quality social relationships (Diener, Tay, & Myers, 2011). Indeed, previous studies have indicated that social support from a religious community limits youth's health-risk behaviors (Holder et al., 2000; Resnick, Harris, & Blum, 1993). Furthermore, religious youth report higher levels of social interaction ($\eta^2 = .03$) and trust ($\eta_p^2 = .01$) with their friends compared to their less religious peers (King & Furrow, 2004) and religious communities may help to promote healthy behaviors in adolescents by fostering emotion regulation (Vishkin, Bigman, & Tamir, 2014). There is a dearth of empirical studies directly examining the role of the religious support in adolescent EP, yet there is evidence for negative associations between religious support (measured by emotional support received from congregations) and adolescents' alcohol ($r = -.22, p < .01$) and marijuana ($r = -.22, p < .01$) use (Kim-Spoon et al., 2015). Similarly, available evidence in the adult literature indicates that higher religious social support (measured by reports of interaction with other religious individuals) is associated with less drug (odds ratio = .66, $p < .0001$) and alcohol (odds ratio = .70, $p < .0001$) dependence and antisocial behavior (odds ratio = .62, $p < .01$; Kendler et al., 2003), and beneficial effects of religious institutional participation on mental health are mediated by religious community based social support (indirect effects $b^* = -.08, p = \text{significant}$, but unreported; Nooney & Woodrum, 2002). Religious communities are unique in the sense that it is the only social institution that explicitly strives to facilitate religious and spiritual beliefs and behaviors, including a connection to the divine, sanctification of the body, and religious coping strategies (Pargament, Magyar-Russell, & Murray-Swank, 2005). Social sharing of negative emotional events has been found as a positive mechanism for coping (e.g., Rimé, 2007) as religious and spiritual community members may allow for the diffusion of life's burdens. In addition, religious coping has been shown to impede adolescent substance use (Brechtling & Giancola, 2006; Pargament, 1997).

As demonstrated through a review of the literature, multiple ecological factors propagate the relation between adolescent R/S and EP. Primarily, R/S operate as forms of social control. That is, R/S communities provide supervision and role models that demonstrate healthy behaviors for adolescents. Resultantly, the adolescents may internalize those healthy behaviors in addition to having adults monitoring their behavior, evoking higher self-monitoring and self-control. More abstractly, spirituality may also provide parallel processes through a sense of God as a supervisor, role model, and monitor. Furthermore, religious/spiritual communities may provide social support for dealing with the burdens of life and foster higher quality relationships with peers, parents, and other adults. In sum, these transactional processes contribute, independently as well as jointly, to lower EP in adolescence.

Conclusions and Future Directions

A broad range of constructs both within the individual and in the environment may contribute to the link between adolescent R/S and EP. In general, these relations are characterized such that R/S are associated with less EP or protect against EP via these intermediating constructs, but there are certainly conditions in which there is no association or even a negative effect. Although many other intraindividual and ecological constructs influence EP (which falls in line with the developmental psychopathology framework), R/S

seem to show consistently moderate effect sizes on EP even when potential confounds are controlled for in the model. Therefore, R/S represent important areas of research given their demonstrated ability to influence healthy development of adolescents. Furthermore, by orienting to these processes from a developmental psychopathological framework and using the principles of multifinality and equifinality, researchers are encouraged to explore processes that are simultaneously explaining the effects of R/S (e.g., intraindividual versus ecological processes) as well as influencing each other (e.g., self-monitoring → self-control) in a probabilistic manner. These processes create a developmental cascade which may influence a wide array of negative outcomes under the EP umbrella and beyond. As these processes can be seen as co-occurring at multiple levels of analysis (including neurobiological, behavioral, psychological, and environmental), and clusters of beneficial processes may be identified that can inform prevention and intervention strategies as well as social policy for reducing EP among adolescents.

However, there are still a number of areas within the R/S research that can be improved to advance our understanding of developmental processes that explain the R/S—EP association. First, the majority of studies examining adolescents' R/S with EP are cross-sectional and non-experimental studies which preclude researchers from drawing conclusions about directionality of the effects. Moreover, given both R/S and EP are dynamic processes that change over time and circumstance, it is critical to examine developmental changes within the individual to illuminate directionality of the R/S—EP association, and the effects may very well be bidirectional. In particular, the selection hypothesis presents a substantial theoretical challenge to R/S preceding many health outcomes such as substance use. The selection hypothesis posits that individuals who do things such as using substances will select out of religion as a result of feeling uncomfortable around religious peers and community members who disapprove of such behavior (Regnerus & Smith, 2005). Studies that have attempted to empirically test the selection hypothesis have either found no significant effect of substance use on future religiousness (e.g., Good & Willoughby, 2011) or found partial support (e.g., Steinman & Zimmerman, 2004). With these studies in mind, further longitudinal studies are needed to elucidate directionality between R/S and EP considering the possible role of a selection effect of R/S on EP outcomes. It must be also acknowledged that the selection effect may be harder to detect during adolescence because risk-taking and antisocial behaviors are more normative during this period (Moffitt, 1993) and thus these behaviors may be less likely to be seen as negative or disapproved of by peers, compared to other developmental periods.

As can be seen in Table 1, given that the prior studies of R/S are limited in the methodological approach by primarily relying on self-reports which are prone to biases (e.g., Hathaway, Marler, & Chaves, 1993), we recommend that future researchers consider alternatives to self-report as predictors of youth outcomes. For example, response time, a measure of attitude accessibility, can be used to assess the centrality or importance of religion without being confounded by social desirability bias (Hill, 1999). Indeed, Wenger (2004) showed that priming religion made intrinsically religious people identify religious events as religious more quickly, but this was not true for extrinsically religious people. R/S may only have effects on behavior when R/S schemas are activated (Norenzayan & Shariff, 2008). There is also evidence that self-reported religiousness interacted with religious belief

accessibility such that faster reaction times correlated with higher mental health for more religious people, whereas faster reaction times correlated with lower mental health for less religious people (Cohen, Shariff, & Hill, 2008).

However, conclusions from prior studies that utilized an experimental design approach in lieu of self-reports to detect the effects of R/S on behavior do not seem to be clear cut. A recent replication of Shariff and Norenzayan's (2007) study showing greater allocation of money in an anonymous game after implicit religious priming failed to show significant associations between implicit religious primes and generosity (Gomes & McCullough, in press). As was concluded by the authors, one potential explanation for the discrepancy in the findings may be differences in the sample (i.e., Vancouver, Canada; ethnicity unreported; ages 17-82 in Shariff and Norenzayan's study vs. Miami, Florida; 51% Hispanic; ages 18-85 in Gomes and McCullough's study). Indeed, this explanation is plausible as differences in community level R/S may create substantial differences in the effects religious priming as proposed by the religious ecology model (Stark et al., 1982). Even so, experimental methodologies such as these are critically important to pursue as they may enhance our ability to draw conclusions regarding causality and directionality which are sorely lacking in the field.

From a methodological point view, future researchers are encouraged to use diverse methodological approaches to evaluate how different approaches independently and interactively work together to assess R/S and their effects. For example, one area which may be considered as an opportunity for use of experimental design is the research on intergenerational transmission and relationships where researchers have almost exclusively relied on self-reports. Specifically, R/S may be manipulated with priming followed by a Trust or Dictator Game as an indicator of generosity within parent-adolescent dyads. Then, individual differences in experimentally observed generosity and self-reports of parent-child relationship quality can be integrated to generate converging evidence that enhances our confidence in inference quality to conclude that R/S influence relationship quality between parent and adolescents which in turns fosters lower EP as previously reviewed.

Furthermore, greater attention needs to be given to the potential negative effects of R/S. To date, most studies have operated under the pretense that R/S are mainly positive for an individual both mentally and physically. However, recent evidence suggests that there are instances when R/S may be negative for mental and physical health among adolescents, such as introjected religiousness predicting higher health risk behavior and lower health promoting behavior (Holmes & Kim-Spoon, in press) and higher religiousness predicting higher anxiety (Peterman, LaBelle, & Steinberg, 2014). Furthermore, fundamentalism in R/S beliefs may be inflexible and used to justify negative or risky behaviors. For example, researchers have suggested that adolescents who are highly religious are less likely to use a form of contraception or use a less effective method as a result of their sexual activity being unplanned (Adamczyk & Felson, 2008; Davidson et al., 2004). Some researchers have expressed concern over the physical disciplinary tactics used more frequently in religious families to punish children (Bartkowski et al., 2008). It has also been demonstrated that religion may be used to justify non-moral risk taking as individuals may feel safe and perceive a situation as less threatening when they consider God as a source of protection and

safety (Kupor, Laurin, & Levav, 2015). Considering potentially dangerous consequences of engaging in such behaviors, it is critical for future researchers to address negative consequences of being highly religiousness or spiritual, and elucidate ways in which these effects may be abated. Along such lines, we recommend that researchers go beyond testing a linear relation between R/S and EP as there may be a curvilinear relation indicating that when R/S are extremely high, undesirable or negative effects on adolescent EP may be present.

The bias that exists in the amount of literature towards Western religions (e.g., Christianity, Judaism, and Islam) also makes it difficult to generalize findings to relatively understudied religions. Although many available studies note the present of “other” religions in their studies, these individuals typically make up a small percentage of the sample precluding further meaningful statistical analyses comparing different religions. Moreover, in line with the religious ecology model, it is not enough to draw conclusions about “other” religions when they are such a small percentage of a sample because this ecological difference may not represent a typical adherent of that particular religion which resides with a higher percentage of similar believers. Therefore, future research will benefit from examining the processes by which R/S may influence adolescent adjustment across diverse religious groups while considering ecological validity.

In sum, recent research has made strides in identifying how and why R/S are typically considered positive and protective constructs for adolescent adjustment problems, particularly EP. The findings allow for better informed prevention and intervention that are targeted toward this particular developmental period that has been known for heightened neurobiological susceptibility to risky and health-demoting behavior. Previous literature has highlighted the potential clinical importance for reduction of EP by R/S (Pargament, Mahoney, Shafranske, Exline, & Jones, 2013). For example, Johnson (2013) reviewed the role that R/S may play in treatment of substance use disorders and noted that R/S can either play a vital role in treatment or actually be the treatment itself. As the clinician comprehensively approaches evidence-based practices in psychology they take the time to explore “patient characteristics, culture, and preferences” (APA Presidential Task Force on Evidence-Based Practice, 2006, p. 273). This approach may allow for understanding of how R/S are affecting or affected by EP and thus the clinician may help identify or create R/S goals and values, provide R/S resources or communities which may help with monitoring and social sharing of the disorder, or take other steps in helping to alleviate EP associated problem behaviors from central importance and replacing them with a more healthy, meaningful, and organizing force.

In conclusion, previous research on adolescent R/S thus far primarily focused on understanding *why* R/S are related to EP by investigating intermediate processes that explain the R/S—EP association. We emphasize the importance of future research that comprehensively involves multiple levels of analysis across different risk and protective processes (including adolescent neurobiology, personality, social relationships, and family and community environment) to examine *how* R/S and these processes involved in the effects of R/S interface with one another to contribute to the emergence and progression of EP in adolescence. Furthermore, a better understanding of *who* may be most at risk for EP in

the context of R/S and related processes is particularly important as this information can guide formation of effective, individualized interventions designed to reduce EP.

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Table 1

Relevant construct, measure of religiousness and spirituality (R/S), sample description, design, and findings of reviewed empirical studies focusing on R/S

Study	Measure of R/S	Sample <i>n</i> (mean age in years at baseline), sex, largest % of ethnicity	Design	Findings
Self-Control				
Desmond, Ulmer, & Bader, 2013	Attendance, importance, prayer	20,745 (16), 55% female, 50% White	Self-report	Religiousness associated with lower alcohol and marijuana use via higher self-control
Dewall et al., 2014	Prayer, commitment, attendance	210-971 (18-35), 59-80% female, 51-83% Caucasian	Self-report	Religiousness predicts lower substance use mediated by self-control
Holmes & Kim-Spoon, in press	Identification, introjection	220 (15), 55% male, 88% Caucasian	Self-report	Religious motivation differentially associated with health promotion and demotion via higher or lower self-control
Laird, Marks, & Marrero, 2011	Importance, attendance	166 (13), 51% male, 49% European American	Self-report	Religiousness associated with lower antisocial and rule breaking behavior via higher self-control
Pirutinsky, 2014	Personal	1,354 (16), 86% male, 40% African-American	Self-report	Religiousness associated with lower criminal behaviors via higher self-control
Shepperd, Miller, & Smith, 2015	Values, belief, practices	1,140 (16), 53% female, 69% White	Self-report	Religiousness associated with lower aggression via higher self-control
Vazsonyi & Jenkins, 2010	Attendance, prayer, reading texts, importance	904 (21), 54% female, 88% European American	Self-report	Religiousness associated with lower risky sex via higher self-control
Walker, Ainette, Wills, & Mendoza, 2007	Membership, importance, attendance, value	1,273 & 812 (12 & 15), 49% & 57% female, 32% & 42% Hispanic	Self-report	Religiousness associated with lower substance use via higher self-control
Monitoring				
Carter, McCullough, & Carver, 2012	Interpersonal, intrapersonal commitment	583 (Undergraduates), 58% female, 53% White	Self-report	Religiousness associated with higher self-control via God, other, & self-monitoring

Study	Measure of R/S	Sample <i>n</i> (mean age in years at baseline), sex, largest % of ethnicity	Design	Findings
Gervais & Norenzayan, 2012	Intrinsic, priming thoughts of God	38-277 (19-20), 63-76% female, 43-49% East Asian	Priming, self-report	Religion induces self-monitoring by increasing self-awareness
Kim-Spoon, Farley, Holmes, Longo, & McCullough, 2014	Organizational, personal, private	220 (12), 55% male, 87% White	Self-report	Religiousness associated with lower substance use via higher God & self-monitoring and higher self-control
Delay discounting & future orientation				
Harrison & McKay, 2013	Priming thoughts of religious themes, attendance	69 (24), 71% female, unreported	Priming, self-report	Implicit religious thoughts not associated with delay discounting
Holmes & Kim-Spoon, 2015	Organizational, personal, private	131 (12), 50% female, 92% Caucasian	Self-report	Religiousness associated with lower substance use via higher afterlife beliefs and future orientation
Kim-Spoon, McCullough, Bickel, Farley, & Longo, 2015	Personal, organizational	106 (11), 52% female, 85% White	Self-report	Personal religiousness associated with lower substance use via lower delay discounting
Oner-Ozkan, 2007	Intrinsic	244 (Undergraduates), 55% male, unreported	Self-report	Religious individuals consider future and afterlife more than non-religious
Paglieri, Borghi, Colzato, Hommel, & Scorolli, 2013	Denomination	89 & 90 (University students), unreported, unreported	Self-report	Italian Catholics higher discounters and Dutch Calvinists lower discounters than atheists
Rounding, Lee, Jacobson, & Li, 2012	Priming thoughts of religious themes	60 (18), 76% female, unreported	Priming	Implicit religious thoughts associated with lower delay discounting
Weatherly & Terrell, 2011	Attendance	301 (20), 73% female, 91% Caucasian	Self-report	Religiousness associated with higher delay discounting for monetary rewards
Neurobiological regulatory systems				
Good, Inzlicht, & Larson, 2015	Reflection on God's love, zeal	108 (Undergraduates), 62% female, unreported	Priming, self-report	Reflecting on God's love reduces neurophysiological responses to errors
Lazar et al., 2000	Religious practice of meditation	5 (range 22-45), 80% male, unreported	Neuroimaging	Meditators had greater activation of brain regions

Study	Measure of R/S	Sample <i>n</i> (mean age in years at baseline), sex, largest % of ethnicity	Design	Findings
Lazar et al., 2005	Religious practice of meditation	20 & 15 (38 & 36), 65% & 67% male, 100% & 100% Caucasian	Neuroimaging	associated with self-control Meditators had thicker cortical mantle in brain regions associated with self-control
Intergenerational transmission & relationships				
Diener, Tay, & Myers, 2011	Importance, attendance	353,845 & 455,104 (48 & 38), 52% & 51% female, unreported	Self-report	Religion creates social networks for high quality social relationships
Flor & Knapp, 2001	Belief, attendance, prayer	171 (12), 51% male, 100% Caucasian	Self-report	Parents' religiousness associated with higher adolescents' religiousness
Kendler et al., 2003	Social	2,616 (range 25-65), unreported, unreported	Self-report	Social religiousness associated with lower substance use and antisocial behavior
Kim-Spoon, Longo, & McCullough, 2012	Organizational, personal	322 (12), 55% male, 88% White	Self-report	Parent-child religious incongruence associated with higher externalizing problems
Kim-Spoon et al., 2014	Organizational, personal, private	220 (12), 55% male, 87% White	Self-report	Parents' religiousness associated with lower adolescents' substance use via higher parental monitoring
Landor et al., 2011	Attendance, commitment	612 (15), 55% female, 100% African-American	Self-report	Parents' religiousness associated with lower adolescent risky sexual behavior via higher adolescents' religiousness
Nooney & Woodrum, 2002	Attendance, prayer, religious social support, religious coping	337 (18 or older), 50% female, 81% White	Self-report	Beneficial effects of religious institutional participation on mental health are mediated by religious social support

Study	Measure of R/S	Sample <i>n</i> (mean age in years at baseline), sex, largest % of ethnicity	Design	Findings
Pearce & Axinn, 1998	Attendance, importance	867 (15), unreported, unreported	Self-report	Higher parent-child relationship quality when religiousness congruent
Pearce & Haynie, 2004	Attendance, importance	10,444 (15), 50% female, 68% White	Self-report	Parent-child religious incongruence associated with higher adolescent delinquency