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# Personality Traits in Adolescence as Predictors of Religiousness in Early Adulthood: Findings From the Terman Longitudinal Study

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*The authors examined the associations of the Big Five personality factors with religiousness in adulthood for a 19-year longitudinal sample of 492 adolescents age 12 to 18. Among the Big Five, Conscientiousness in adolescence was uniquely related to higher religiousness in early adulthood. For adolescents high in Emotional Stability, the link between strength of religious upbringing and religiousness in adulthood was weaker than it was for adolescents who were less emotionally stable. These findings replicate the work of others demonstrating the importance of Conscientiousness as a predictor of religiousness and suggest that emotionally unstable adolescents might be more likely to adopt levels of religiousness that are similar to those of their parents.*

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**Keywords:** religion; personality; traits; Big Five; longitudinal; Terman

If we ask what psychology has contributed to our understanding of the religious nature of man, the answer is, "Less than we might wish."

—Allport (1955, p. 93)

Personality psychology has had a longstanding, if somewhat estranged, relationship with the scientific study of religion. On one hand, some of personality psychology's most noteworthy pioneers, including Galton, Freud, Jung, Allport, and McClelland, viewed religious phenomena as interesting and worthwhile topics of scientific inquiry. On the other hand, even during Allport's era, mainstream personality researchers devoted scant empirical attention to religiousness. Forty-five years later, the relationship between personality psychology

and the scientific study of religion appears to be warming. Personality researchers from diverse theoretical camps (e.g., Kirkpatrick, 1999; Piedmont, 1999; Saucier & Goldberg, 1998) have begun to view religiousness and spirituality as potentially fruitful areas for personality theory and research. Indeed, a recent issue of *Journal of Personality* was devoted to the topic of religion (Emmons & McCullough, 1999).

## RELIGIOUSNESS, THE BIG THREE, AND THE BIG FIVE

Determining how religiousness is related to the major dimensions of human personality has been an important starting point for improving relations between personality psychology and the scientific study of religion. In the last decade, many researchers have investigated whether individual differences in religiousness are associated

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**Authors' Note:** This research used *The Terman Life Cycle Study of Children With High Ability 1922-1986* data set (made accessible in 1990 through machine-readable data files and microfiche data). These data were collected by L. Terman, R. Sears, L. Cronbach, and P. Sears and are available through the archive of the Henry A. Murray Research Center of Radcliffe College, 10 Garden Street, Cambridge, Massachusetts (Producer and Distributor). This research was generously supported by a grant from the John Templeton Foundation and funds given by the John D. and Catherine T. MacArthur Foundation to the Murray Research Center of Radcliffe College. We are grateful to Deborah Laible for her thoughtful comments on a previous version of this article. Correspondence regarding this article should be sent to Michael E. McCullough, Department of Psychology, University of Miami, PO Box 248185, Coral Gables, FL 33124-2070; e-mail: mikem@miami.edu.

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with individual differences in the personality traits of the Big Three, or P-E-N (i.e., Psychoticism, Extraversion, and Neuroticism) taxonomy, and the Big Five, or five-factor (i.e., Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) taxonomy.

#### *Religiousness and the Big Three*

Cross-sectional studies using Eysenck's P-E-N model (e.g., Eysenck, 1991) indicate that religiousness, as measured by a variety of indicators including frequency of attendance at worship services, frequency of private prayer, and positive attitudes toward religion, is inversely related to Eysenckian Psychoticism (e.g., Francis, 1997; Francis & Bolger, 1997; Francis, Lewis, Brown, Philipchalk, & Lester, 1995; Lewis & Maltby, 1995, 1996; Maltby, 1997, 1999; Maltby, Talley, Cooper, & Leslie, 1995; Robinson, 1990; Smith, 1996; Svensen, White, & Caird, 1992; Wilde & Joseph, 1997) but essentially uncorrelated with Extraversion or Neuroticism. Indeed, the basic finding that religiousness is negatively related to Eysenckian Psychoticism (i.e., sex-adjusted correlations in the neighborhood of  $-.30$ ) (e.g., Francis et al., 1995) and essentially uncorrelated with Eysenckian Neuroticism and Extraversion has been replicated with children, adolescents, adults, and older adults from around the world.

#### *Religiousness and the Big Five*

Several recent studies have employed measures of the constructs in the Big Five, or five-factor personality taxonomy (e.g., John & Srivastava, 1999; McCrae & Costa, 1999), to examine the association of religiousness and personality. Kosek (1999), MacDonald (2000), and Taylor and MacDonald (1999) found that measures of Agreeableness and Conscientiousness were positively associated with measures of religious involvement and intrinsic religious orientation. These results are not surprising in light of the robust link between Eysenckian Psychoticism and religiousness because Eysenckian Psychoticism appears to be a conflation of Big Five Conscientiousness and Agreeableness (Costa & McCrae, 1995).

#### BY WHAT MECHANISMS ARE PERSONALITY TRAITS AND RELIGIOUSNESS RELATED?

Given the remarkable consistency across age groups and cultures in the associations of religiousness with Conscientiousness and Agreeableness (in the Big Five system) and Psychoticism (in the P-E-N system), it would seem that researchers have succeeded in unearthing a basic fact about the personality correlates of religious-

ness. Yet the mere fact that measures of religiousness are related to measures of a personality construct does not explain why such measures are related. One possibility that seems to underlie many explanations for the existing empirical findings is the proposition that personality traits influence the development of religiousness over the lifespan. For instance, a core principle of Eysenck's model of personality (e.g., Eysenck & Eysenck, 1985) is that people low in Psychoticism are prone to developing tenderminded social attitudes such as religiousness because they are especially amenable to social conditioning. Thus, one possible account of the Psychoticism-religiousness association is that people low in Psychoticism can be more easily influenced by social factors (e.g., family conditioning, peer relations, spousal interactions) to become religious.

Theories derived from the Big Five or five-factor model yield similar (and perhaps even more detailed) explanations. According to the tenets of five-factor theory (McCrae & Costa, 1995, 1996, 1999), traits such as Openness, Conscientiousness, and Agreeableness are basic, biologically grounded, and largely heritable tendencies toward certain patterns of thought, feeling, and behavior. These tendencies motivate people to develop certain characteristic adaptations to their environments. For example, as McCrae and Costa (1996) write, "extraverts join social clubs and learn to dance; disagreeable people cultivate cynical attitudes" (p. 74).

By understanding the Big Five personality traits as basic tendencies, religiousness can be conceptualized as a characteristic adaptation that some people in some cultural contexts adopt to "fulfill" or express basic personality tendencies (McCrae & Costa, 1996). One way this might occur is that conscientious and/or agreeable people (in some cultural contexts) tend to fulfill their tendencies toward conformity, order, or prosociality by being religious. People high in Conscientiousness and Agreeableness both are motivated to conform to rules and laws, although for different reasons (Costa & McCrae, 1995). Conscientiousness motivates people to abide by rules and conventions because the behavior of conscientious people tends generally to be rule-governed. Therefore, highly conscientious people might be more likely to stay faithful to religious activities and beliefs developed in childhood because of their general comfort with discipline and order, whereas the religious habits and rituals of less conscientious people might fall away as they age and their lives change. Moreover, formal religious practices often provide a clear, delineated value system that might appeal to conscientious people but that might cause less conscientious people to bristle.

Agreeableness also motivates people to abide by conventions, particularly out of concern for the feelings and

rights of others. Therefore, Agreeableness might move people toward religiousness in adulthood in part out of concern for minimizing conflict and maintaining harmony with their families by remaining faithful to the family's religious systems. It is also possible that agreeable people are more amenable to maintaining a religious faith in part out of an earnest desire to maintain positive relations with God or to be involved in a value system that promotes kindness, altruism, forgiveness, and love.

#### PERSONALITY TRAITS AS MODERATORS OF RELIGIOUS SOCIALIZATION

Although much of the theorizing regarding the dynamics of the personality-religiousness relationship has focused on how certain traits might influence people's responses to external religious influences (e.g., by predisposing people to adopt the religious teachings of their caregivers), most empirical work has been focused on the bivariate associations between personality traits and measures of religiousness, overlooking their potential interactions with socialization processes. That is to say, most investigators have examined the so-called main effects of personality on religiousness. To be sure, clarifying the simple bivariate associations is important, but it is also important and perhaps more theoretically interesting to examine how personality traits might exert an influence on religiousness through their interactions with socialization processes during adolescence.

Socialization processes themselves are crucial determinants of religiousness in adulthood. Parents, for instance, tend to be fairly good at socializing their children to become as religious as they themselves are (Flor & Knapp, 2001), but the association between growing up in a religious home and becoming a religious adult oneself is far from unity (correlations between measures of parents' religiousness and the religiousness of their young adult children are almost always  $r < .60$ ) (e.g., see Hunsberger, 1976).

Given the fact that the transmission of parents' religious sentiments is not a foolproof process, it is possible that religious socialization is more effective for people with certain traits than for people without those traits. Indeed, recent cross-sectional evidence (Flor & Knapp, 2001) suggests that religious socialization may be more effective for boys than for girls. Could personality traits play a similar role in moderating the effectiveness with which religious parents and/or their home environments cause children to grow up religious? If personality traits such as those in the Big Five taxonomy influence people's religiousness in adulthood by enhancing or reducing their likelihood of responding positively to religious socialization processes in the home, these would manifest themselves not in main effects of person-

ality traits on religiousness but rather as interactions between particular personality traits and the extent of religious influences in one's home. Thus, it seems reasonable to hypothesize that Agreeableness and Conscientiousness in adolescence are correlated with religiousness in early adulthood to a much greater extent for adolescents who grew up in religious homes (where, presumably, strong socialization pressures motivated the adolescents to become religious themselves) than for adolescents who did not grow up in religious homes. Likewise, one might hypothesize that adolescents who are high in Openness to Experience (a dimension that subsumes a willingness to consider a wide variety of beliefs and value stances) would be less influenced by their parents' own religious beliefs and values than would children who were less open to experience. To date, such interaction effects have not been examined explicitly with the Big Three or Big Five taxonomies as reference points.

In addition, the existing studies on religion and personality suffer from one or both of two methodological and conceptual limitations. First, all of the existing research to date has been conducted on cross-sectional data, which confound individual developmental processes with individual differences among persons. To know whether certain personality traits cause psychological processes that deter or encourage religiousness, longitudinal data collected over periods in the lifespan in which a great deal of religious change typically occurs would be immensely more informative. Adolescence has been noted to be a period in which a great deal of religious change, including a great deal of heterogeneity in patterns of change, occurs (King, Elder, & Whitbeck, 1997). For example, the fact that conversions are most common in adolescents has been well established since at least 1959 (Argyle, 2000), but it also appears to be the case that, on average, religious belief declines sharply during adolescence (e.g., Tamminen, 1991). Thus, it appears that many people become considerably more religious through adolescence, whereas others become appreciably less so (King et al., 1997). The confluence of forces that might be driving religious development toward greater religiousness for some but lower religiousness for others suggests that much may be learned from studying the traits in adolescence that predict people's religiousness after the adolescent years are concluded.

Second, all of the studies conducted to date have used self-reports to measure both personality and religiousness. To the extent that the apparent associations of personality traits and religiousness are caused by overlapping method variance (e.g., pressure toward socially desirable responding), the observed correlations between particular traits and religiousness may be

artifactual rather than substantive. By using measures of personality that are not based on self-reports, we might gain a more accurate look at the true nature of the correlations of personality traits and religiousness.

#### SUMMARY, OVERVIEW, AND HYPOTHESES

In the present study, we used 19-year longitudinal data to examine the extent to which the adolescents' standing on the Big Five—Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism—predicts the extent to which they became religious in early adulthood. The present study extended the existing research in three important ways. First, we used measures of the Big Five that were constructed from teachers' and parents' ratings, not self-reports. Second, the longitudinal nature of the data collection allowed us to examine developmental hypotheses with more realism than is possible exclusively on the basis of cross-sectional data. Third, we examined not only the so-called main effects of personality on religiousness but also the possible interactions of personality traits and religious socialization. We predicted that religiousness would be positively associated with both Conscientiousness and Agreeableness. We also hypothesized that Openness to Experience, Conscientiousness, and Agreeableness would moderate the effects of religious upbringing on religiousness in adulthood.

#### METHOD

##### *Participants*

For this study, we used participants from the Terman Life Cycle Study of Children With High Ability. Throughout the 1920s, Terman and his associates recruited 1,528 children (56% boys) who were mostly White or Caucasian (i.e., less than 1% Asian, African, or Native American). Children were selected from California public schools through nominations by teachers and eventual confirmation that the children had IQs of 135 or greater. Follow-up surveys were conducted every 5 to 10 years until 1999, the year of the most recent follow-up.

For the present study, we used data from 492 participants (280 boys, 212 girls) who were adolescents ( $M$  age = 14.11 years,  $SD$  = 1.91 years, range = 12-18 years) at the time of the 1922-1923 survey<sup>1</sup> and for whom the necessary questionnaires were complete and available. These 492 participants constituted 32.2% of the original sample of  $N$  = 1,528. For each of these participants, teacher ratings and parent ratings of personality were both available from the 1922-1923 era, as was the questionnaire data from the 1940-1941 follow-up surveys. A small amount of missing data was estimated using the estimation-maximization routine (Dempster, Laird, & Rubin,

1977) but only to estimate responses to individual missing items on questionnaires that were otherwise completed and available.

##### *Measures*

*The Big Five.* In approximately 1922, parents of the children in the study rated their children on 25 personality traits. One teacher of each child also completed the same 25 items. This set of items resulted from pretesting a larger set of 46 traits in 1918 and 1920 (Terman, 1926). Parents' and teachers' responses to these items were scored on a 13-point scale (where 1 = *extremely low levels of the trait* and 13 = *extremely high levels of the trait*).

Openness was measured with eight items (actually four items completed by both parents and teachers): musical appreciation, appreciation of beauty, desire to know, and originality. Conscientiousness was measured with six items (three from teachers and parents): prudence and forethought, willpower and perseverance, and desire to excel. Extraversion was measured with six items (three from each source): amount of physical energy, fondness for large groups, and leadership. Agreeableness was measured with six items (three from each source): freedom from vanity and egotism, sympathy and tenderness, and generosity and unselfishness. Neuroticism (or rather, Emotional Stability, which is the inverse of Neuroticism) was measured with six items (three from each source): self-confidence, cheerfulness and optimism, and permanency of moods.

We determined that these items were adequate measures of each respective trait by comparing them to unequivocal markers of the Big Five used by other researchers (e.g., Benet-Martínez & John, 1998; John & Srivastava, 1999). Then, we examined how self-report versions of these items correlated with the Big Five as measured with John, Donahue, and Kentle's (1991) Big Five Inventory (BFI) by conducting a validation study with a sample of 153 undergraduate psychology students at Southern Methodist University.

The 153 students in our validation sample were mostly (76%) women, mostly (75%) White/Caucasian, and had a mean age of 20.45 years ( $SD$  = 2.31 years). We confirmed that a self-report version of each prospective Big Five item from the Terman data set was correlated at  $r$  = .30 or greater with the target trait as measured by the BFI and at  $r$  < .30 with the other four traits.<sup>2</sup> Based on these results, we summed the relevant items into linear composites to form new multi-item measures of the Big Five. The resulting measures of the Big Five correlated strongly with the target traits as measured by the BFI (i.e., monotrait-heteromethod correlations ranged from  $r$  = .43-.56, with a median  $r$  = .52) and correlated less highly with the nontarget traits on the BFI (i.e., the median heterotrait-heteromethod correlation was  $r$  =

TABLE 1: Descriptive Statistics and Correlations for Major Study Variables

	M	SD	1	2	3	4	5	6	7
1. 1940-1941 religiousness	2.35	0.71	<b>.74</b>	.11*	.20**	.06	.15**	.08	.43**
2. Openness	9.34	1.10		<b>.62</b>	.43**	.37**	.34**	.36**	.06
3. Conscientiousness	9.34	1.47			<b>.68</b>	.27**	.39**	.38**	.14*
4. Extraversion	8.07	1.44				<b>.67</b>	.21**	.47**	.05
5. Agreeableness	8.72	1.42					<b>.64</b>	.30**	.11*
6. Emotional stability	8.95	1.23						<b>.56</b>	.06
7. Religious upbringing	2.76	0.77							<b>.86</b>

NOTE: Coefficients in boldface are internal consistency reliability estimates ( $\alpha$ ).

\* $p < .05$ . \*\* $p < .001$ .

.08). Thus, the resulting scales appeared to possess adequate convergent and discriminant validity, even though their internal consistency reliability estimates in the students' self-report data were rather modest,  $\alpha$ s ranging from .51 to .66. Given the small number of items on each scale, however, this is unsurprising.

Based on the results of our validation study, we combined the teacher-ratings and parent-ratings of each of the relevant items from the Terman data set into measures of the Big Five.

*Strength of religious upbringing.* Participants rated the strength of their religious upbringing with two items. The first item, which participants completed in 1940, instructed them to indicate religious training received, where 1 = none and 5 = very strict. A second item, which participants completed in 1951, instructed them to indicate their religious training in childhood and youth, where 1 = none and 4 = very strict. Despite the fact that these two items were completed approximately 10 years apart, their correlation was  $r = .78$ . We used a two-item linear composite based on the mean of the two items, which had an internal consistency reliability of  $\alpha = .86$ .

*Religiousness: 1940-1941.* As of 1941, approximately 45% of the participants were Protestant, 3% were Catholic, 5% were Jewish, 2% were Other, and 45% indicated no church affiliation. We measured participants' degree of religiousness in 1941 with a four-item scale of items measuring both the overt, behavioral manifestations of religiousness as well as the more private, attitudinal aspects. Participants indicated their degree of interest in religion with a single item using a 5-point scale (where 1 = none and 5 = very much). Second, they indicated how much they liked reading the Bible with a 3-point scale (where 1 = like, 2 = indifferent, and 3 = dislike, reverse-scored). Third, they indicated their agreement with the idea that giving children religious instruction is essential for the successful marriage using a 5-point scale (where 1 = very essential and 5 = decidedly not desired; reverse-scored). Fourth, participants indicated the number of religious

activities in which they were involved (out of five possible activities). The linear composite of these four items had an internal consistency of  $\alpha = .74$ . Similar items are widely interpreted as valid measures of religious commitment for largely Protestant and Roman Catholic samples (Mockabee, Monson, & Grant, 2001).

In our validation sample, the sum of these four items measured had an internal consistency reliability of  $\alpha = .77$ . Their sum was correlated at  $r(N = 149) = .80$  with the five-item Duke University Religion Index (Koenig, Meador, & Parkerson, 1997), which measures engagement in public and private religious activities as well as the presence of an intrinsic motivation for engaging in such religious activities. Corrected for attenuation due to unreliability per Schmidt and Hunter (1996), the correlation between the two variables soared to  $r = .98$ . In the validation sample, the scale was also correlated at  $r(N = 153) = .72$  with a single-item self-rating of importance of religion and  $r(N = 153) = .66$  with a single-item self-rating of frequency of religious service attendance. Thus, scores from the 1940-1941 religiousness items appear to have both adequate reliability and adequate validity as a measure of an intrinsic orientation to religious faith that involves both public and private religious activities.

## RESULTS

### *Descriptive Statistics*

The means and standard deviations of major study variables, along with their internal consistency reliability estimates ( $\alpha$ ), appear in Table 1. To facilitate interpretation of the regression results (especially the interaction effects), we centered each of the Big Five factors on its mean. The median correlation among our measures of the Big Five was  $r = .37$ ,  $p < .001$ . Table 1 shows that children who were rated as Open to Experience ( $r = .11$ ), Conscientious ( $r = .20$ ), and Agreeable ( $r = .15$ ) in adolescence went on to be slightly more religious 19 years later,  $p < .05$ . In addition, adolescents who became highly

**TABLE 2: Regression of 1940-1941 Religiousness on Religious Upbringing, Gender, the Big Five, and the Interactions of the Big Five and Religious Upbringing**

Predictor	Entry of Set 1				Entry of Set 2				Entry of Set 3				Trimmed Model			
	B	SE	$\beta$	R <sup>2</sup>	B	SE	$\beta$	R <sup>2</sup>	B	SE	$\beta$	R <sup>2</sup>	B	SE	$\beta$	R <sup>2</sup>
Religious upbringing	.40	.04	.42***		.38	.04	.40***		.38	.04	.40***		.38	.04	.41***	
Gender	.17	.06	.11**		.13	.06	.09*		.15	.06	.10*		.13	.06	.09*	
Agreeableness					.00	.02	.05		.02	.02	.05					
Conscientiousness					.05	.03	.10*		.05	.03	.11*		.07	.02	.14***	
Extraversion					-.01	.03	-.02		-.01	.03	-.03					
Openness					.01	.03	.01		.01	.03	.01					
Emotional stability					.01	.03	.02		.02	.03	.04					
Agreeableness × Religious Upbringing									.01	.03	.02					
Conscientiousness × Religious Upbringing									-.01	.03	-.02					
Extraversion × Religious Upbringing									.01	.03	.02					
Openness × Religious Upbringing									.04	.04	.04					
Emotional Stability × Religious Upbringing									-.09	.04	-.12*		-.07	.03	-.09*	
Model total				.20				.22				.23				.22

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

religious reported having had relatively strong religious upbringings,  $r = .43$ ,  $p < .001$ .

*Multiple Regression Analyses*

To examine the unique associations of the Big Five with 1940-1941 religiousness, as well as the extent to which the Big Five might interact with religious upbringing to predict adult religiousness, we ran a series of hierarchical set multiple regression analyses. These models are summarized in Table 2.

In the first model, we entered three sets of predictors. The first set consisted of two known correlates of religiousness: gender (coded 0 for men and 1 for women) and strength of religious upbringing (which was centered on its mean to facilitate interpretation). In a second set, we entered the Big Five (each of which was centered on its mean). In a third set, we entered the interactions of strength of religious upbringing with each of the Big Five. These interactions were based on product terms created by multiplying people’s scores on each of the Big Five (mean-centered) by their scores on the measure of strength of religious upbringing (mean-centered). In other models not shown in Table 2, we also examined the two-way interactions of gender with the Big Five and with the religious upbringing. However, none of the interaction terms involving gender were significant so we do not report models including those terms.

*Entry of Set 1.* When the first set of variables entered the equation, both gender ( $\beta = .11$ ) and strength of

religious upbringing ( $\beta = .42$ ) made significant contributions to the prediction of 1940-1941 religiousness,  $ps < .01$ . Together, these two variables accounted for 19.6% of the variance,  $F(2, 489) = 59.6$ ,  $p < .001$ .

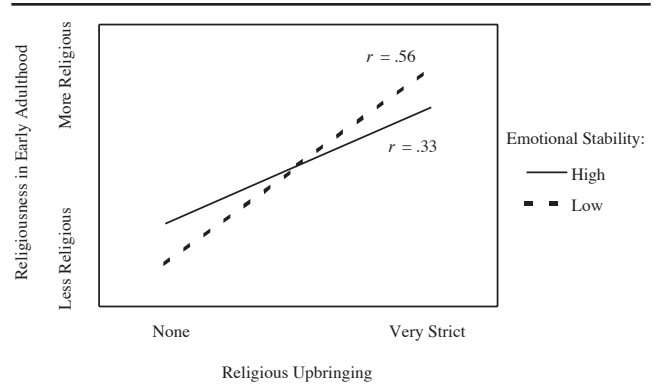
*Entry of Set 2.* When the Big Five measures were entered as a second set, both gender ( $\beta = .09$ ) and strength of religious upbringing ( $\beta = .40$ ) maintained their significance as unique predictors of 1940-1941 religiousness. In addition, Conscientiousness ( $\beta = .10$ ) was a significant unique predictor of 1940-1941 religiousness. No other Big Five trait predicted unique variance in 1940-1941 religiousness. Together, these seven variables accounted for 21.5% of the variance in 1940-1941 religiousness,  $F(7, 484) = 20.00$ ,  $p < .001$ . This second set of variables explained a significant amount of unique variance in 1940-1941 religiousness, change in  $R^2 = .019$ ,  $F(5, 484) = 2.35$ ,  $p < .05$ .

*Entry of Set 3.* When the interactions of each of the Big Five with strength of religious upbringing were entered at Step 3, gender ( $\beta = .10$ ), strength of religious upbringing ( $\beta = .40$ ), and Conscientiousness ( $\beta = .11$ ) maintained their statistical significance as predictors of 1940-1941 religiousness. In addition, the interaction of Emotional Stability and strength of religious upbringing ( $\beta = .12$ ) was a statistically significant predictor of 1940-1941 religiousness. Together, the 12 variables in this model accounted for 22.6% of the variance in 1940-1941 religiousness,  $F(12, 479) = 11.66$ ,  $p < .001$ . This third set of variables did not explain a significant amount of unique variance in 1940-1941 religiousness, change in  $R^2 = .011$ ,

$F(5, 479) = 1.36, p = .24$ . As indicated above, we also ran a series of models in which the interactions of gender with the variables entered in Steps 1 and 2 were entered, but none of these interaction terms were significant.

**Trimmed model.** To simplify our presentation and interpretation of these results, we recomputed the regression model using only (a) gender, (b) strength of religious upbringing, (c) Conscientiousness, and (d) the interaction of Emotional Stability and strength of religious upbringing. The results of this model are shown in Table 2. As before, gender ( $\beta = .09$ ) was a significant predictor of 1940-1941 religiousness, which suggested that, on average, women's scores on the measure of 1940-1941 religiousness were .09 standard deviation units higher than were scores for men. Strength of religious upbringing ( $\beta = .41$ ) was also a significant predictor, suggesting that for every standard unit increase in the strength of participants' religious upbringing, their 1940-1941 religiousness increased by .41 standard units. Conscientiousness ( $\beta = .14$ ) was also a significant predictor of 1940-1941 religiousness, suggesting that for each standard unit increase in adolescents' Conscientiousness, their religiousness in 1940-1941 increased by .14 standard units.

Finally, the interaction of Emotional Stability and strength of religious upbringing was a significant predictor of 1940-1941 religiousness ( $\beta = -.09$ ),<sup>3</sup> suggesting that the correlation between the strength of people's religious upbringing and their religiousness during adulthood weakened, on average, by .09 standard units for every standard unit increase in Emotional Stability. In other words, the most emotionally stable adolescents were the ones who showed the weakest connections between the extent of their religious upbringing and the level of religiousness that they developed in adulthood. To interpret this interaction, we computed the partial correlations (controlling for gender and Conscientiousness) of religious upbringing and religiousness for participants who were more than one-half of a standard deviation above the mean on Emotional Stability. We calculated the same partial correlation for participants who were more than one-half of a standard deviation below the mean on Emotional Stability. For participants whose Emotional Stability ratings were greater than 1/2 SD below than the mean, the partial correlation of religious upbringing and religiousness in adulthood was  $r(135) = .56, p < .001$ , whereas for participants whose Emotional Stability ratings were greater than 1/2 SD above the mean, the partial correlation of religious upbringing and religiousness in adulthood was considerably lower,  $r(145) = .33, p < .001$ . These slopes are illustrated in Figure 1. We emphasize that, for illustrative purposes, we created this large difference in correlations by using



**Figure 1** Partial correlation of strength of religious upbringing and religiousness in early adulthood for participants high and low in emotional stability.

extreme scores (i.e., omitting participants less than 1/2 SD above or below the mean on Emotional Stability).

#### DISCUSSION

In the present study, we examined the associations of the Big Five (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) in adolescence with religiousness in early to midadulthood. In examining these associations through multiple regression analyses, we were able to confirm other well-established correlates of religiousness, including the importance of religious upbringing (Flor & Knapp, 2001) and the robust gender difference in religiousness (Beit-Hallami & Argyle, 1997), with women being more religious on average than are men. More central to the major goals of the article, however, our findings also revealed that religiousness in adulthood was associated at the bivariate level with higher Conscientiousness and Agreeableness in adolescence (see also Kosek, 1999; Taylor & MacDonald, 1999). As expected, adolescents who were rated as more conscientious and agreeable by their parents and teachers grew up to be, on average, more religious in adulthood.

Somewhat surprisingly, adolescents who were rated as more open to experience by their parents and teachers went on to be more religious in adulthood. This finding contradicts recent statements by five-factor theorists (e.g., McCrae, 1999) regarding the role that Openness might play in deterring the development of firm religious beliefs. Because Openness reflects, in part, a willingness to consider new ideas, as well as to question one's values and beliefs, one might argue that Openness would predict lower religiousness in adulthood. On the other hand, because religious and spiritual matters are to a large extent about ideas, beliefs, and values, it is possible that Openness might, *ceteris paribus*, predispose adolescents to a consideration of the spiritual or religious dimension of life.

In part, the Openness-religiousness association may simply reflect the variance that Openness shares with the rest of the Big Five—and Conscientiousness in particular—in this sample. Measures of Openness and Conscientiousness were related at  $r = .43$ , which is not surprising because participants' traits were being evaluated within an achievement setting (i.e., they were rated by their teachers as well as parents), which might cause children who are more conscientious about their studies and assignments also to appear more open to experience (i.e., higher in intellect). Indeed, when we controlled for the intercorrelations among the Big Five through multiple regression, Openness and Agreeableness did not retain significant unique associations with religiousness, but Conscientiousness did.

#### *Why Is Conscientiousness Uniquely Related to Religiousness?*

The significant unique association of Conscientiousness with religiousness shines through in our multiple regression analyses. These findings, along with data from previous cross-sectional studies (e.g., Kosek, 1999; Streyffeler & McNally, 1998; Taylor & MacDonald, 1999), indicate that religious people tend to be more conscientious than are their less religious counterparts. Because the associations we found in the present study reflect links between variables measured in adolescence and variables measured 19 years later, we think there is good reason to believe that these associations might in part reflect developmental processes.

Although it would be wise to remain open to a wide variety of explanations for the Conscientiousness-religiousness association (including both causal and noncausal ones), an interpretation of these results that fits neatly with modern theory and research on the Big Five is that Conscientiousness is a biologically based tendency (e.g., McCrae & Costa, 1995, 1996, 1999) and that religiousness might be considered a characteristic adaptation to the environment that people high in Conscientiousness are slightly more prone to adopt. Assuming that religiousness does serve as an adaptation especially for more conscientious people, what adaptive functions might it serve? Conscientious people might seek out religious worldviews for the order and structure that such worldviews can afford. Also, perhaps conscientious people may simply tend to possess the personal self-control that can be required to maintain a vigorous religious faith (e.g., adhering to spiritual practices, attending religious services, being personally involved in religious organizations, etc.). Because conscientious people are more dutiful, they may simply find it easier to keep up with the religious habits that they learned in childhood, whereas such habits might fall away with increased age for less conscientious people.

We had hoped that we might be able to shed more light on this correlation by finding that the link between Conscientiousness and religiousness in adulthood was especially strong for children who were raised with strong religious upbringings, but this was not the case. The Conscientiousness-religiousness association appeared to apply to all adolescents equally irrespective of their degree of religious upbringing. This suggests that Conscientiousness might influence religiousness not by enabling children raised in religious homes to persist in the religious systems of their parents but rather by facilitating the development of a religious perspective on life regardless of the degree to which people were encouraged as children to become religious.

#### *The Interaction of Emotional Stability and Strength of Religious Upbringing*

Although Conscientiousness did not interact with the strength of participants' religious upbringing, we did find evidence that Emotional Stability (i.e., the mirror image of Neuroticism) interacts with the strength of religious upbringing to predict religiousness in early adulthood. To clarify the nature of this interaction, we examined the relationships between religious upbringing and adult religiousness for adolescents who had extreme scores on Emotional Stability. For adolescents rated as low in Emotional Stability (i.e., greater than  $1/2$  *SD* below the mean), the correlation between religious upbringing and religiousness in adulthood was  $r = .56$ , whereas for adolescents rated as high in Emotional Stability (i.e., greater than  $1/2$  *SD* above the mean), the correlation of religious upbringing and religiousness in adulthood was much lower,  $r = .33$ . In other words, although the association between religious upbringing and religiousness in early adulthood was positive across the range of Emotional Stability, adolescents who were rated as more emotionally unstable experienced more continuity between their degree of religious upbringing and their own level of religiousness in adulthood (32% shared variance) than did children who were more emotionally stable (10% shared variance).

How might Emotional Stability deter continuity between one's religious upbringing and the degree to which one becomes religious? One answer might come from viewing Neuroticism as both an affective and perceptual trait. Neuroticism clearly colors people's perceptions of negative interpersonal events in such a way that they are perceived as more severe. As a result, negative life events appear to produce more negative emotional reactions among people high in Neuroticism (Gunthert, Cohen, & Armeli, 1999; Larsen & Ketelaar, 1991) than among those who are lower in Neuroticism. Because parental conflict can be stressful for many adolescents, those who are particularly prone to emotional instability



may experience such conflict with their parents as all the more difficult.

Disagreements about religion can create considerable relational distress between children and their parents, and this discord probably leads at times to affective distress—perhaps especially people who are prone to affective instability and negative emotions in the first place. For example, emotionally unstable adolescents might be more likely to experience negative emotions such as anger, sadness, or guilt when clashes occur with their parents about religious values and beliefs. In attempts to minimize the affective distress that results from such conflict, emotionally unstable adolescents might try to minimize it.

If this is the case, developing a level of personal religiousness that is consistent with the degree to which one was raised in a religious home may be one way that relatively emotionally unstable adolescents foster harmony with their parents and thereby conserve their emotional well-being. Conversely, emotionally stable adolescents may find that their affective well-being is less affected by conflicts with their parents regarding religious issues, which might allow them to choose a level of personal religiousness that is less dependent on the religious value systems of their parents.

A simpler explanation that does not require making assumptions about family conflict might be that children who are low in Emotional Stability use the religious structures that they were exposed to as children to foster harmony within themselves (e.g., as a way of coping with stressful life events or mitigating the effects of their own affective instability). In any case, it should be noted that we offer these explanations after the fact, not having expected an interaction between Emotional Stability and religious upbringing. Therefore, future researchers should attempt not only to replicate the basic finding but also to explain its occurrence—perhaps by examining parent-child transactions regarding religious matters (see also Flor & Knapp, 2001).

#### *Contributions of the Present Work*

These findings, coupled with findings from a variety of other studies on personality and religiousness, allow us to conclude that conscientious adolescents grow up to be relatively religious adults. Our use of multiple regression to control for the (frequently substantial) correlations among measures of the Big Five is an important advance from much existing work (e.g., Kosek, 1999), and our use of teacher ratings and parent ratings to derive measures of our participants' standing on the Big Five makes this study particularly valuable for ruling out self-report biases as an explanation for the Conscientiousness-religiousness relationship. Moreover, our findings are important because they are derived from longi-

tudinal data during a section of the lifespan that is crucial for the development of religiousness (King et al., 1997), whereas every other study on the Big Five and religiousness of which we are aware has been conducted with cross-sectional data.

Our findings also demonstrate that some of the most interesting advances to be made in the study of religion and personality might come not by examining simply the linear relationships between personality traits and religiousness but by considering how personality might moderate the effects of people's social worlds (e.g., the extent to which they were raised in religious homes) on the development of religiousness in adulthood.

#### *Limitations*

*Inferential limitations.* Although the data used in the present study were longitudinal data, and although we have focused on causal explanations for the obtained results, it would be wise to keep in mind that the data used herein were collected in a correlational design. Moreover, because measures of religiousness were not available prior to 1940-1941, initial levels of religiousness could not be controlled statistically.

In addition, it is important to note that the associations of adolescent personality and adult religiousness were small, with bivariate associations ranging from  $r = .06$  to  $.20$ . Even if these coefficients were corrected for the imperfect reliability of the predictors and criterion, they would still be small associations (i.e., corrected bivariate associations would range from  $r = .09$  to  $.28$ ). Moreover, in multiple regression analyses, the Big Five and their interactions with religious upbringing only accounted uniquely for 3% of the variance in adult religiousness. Therefore, the potentially causal influence of the Big Five personality traits on the development of religiousness may be relatively modest, even if reliably greater than zero.

*Limitations due to sampling of persons.* The participants in the Terman study were not representative of the American adult population circa 1940-1941. They were mostly White, middle class, and 2 *SDs* above the mean intelligence of the population. Moreover, the Terman participants were less religious than the American general public. Only 40% of the Terman participants were church members in 1941, whereas 72% of American adults belonged to a church or synagogue in 1940 (Gallup Organization, 2000). Moreover, 45% of Terman participants indicated no religious affiliation in 1941, an astounding percentage that is more than 7 times higher than that of adults in the general population as of 1947 (6%; Gallup Organization, 2000). These factors could have influenced the results of the present study in unknown ways.

The final wave of data included in the present study was collected more than 60 years ago—a second way in which the sampling of persons for the present study might fail to represent the population today. All research data are, of course, locked in the historical period in which they were collected, and the data from the Terman study are no different. However, the fact that the basic relationship of Conscientiousness with religiousness has been replicated in modern samples suggests that the bias in our results due to historical effects is minimal. Moreover, many other research projects with considerable theoretical importance to modern psychology have been based on data collected many years prior, even data collected before those of Terman and his associates (e.g., Deary, 1996; Ganzach, 1995; Hepworth & West, 1988; Simonton, 1976). Of course, one must keep in mind also the contributions to psychological knowledge that have been made through reanalyses of the Terman data themselves (e.g., Friedman, Tucker, Schwartz, Martin, et al., 1995; Friedman, Tucker, Schwartz, Tomlinson-Keasey, et al., 1995; Lippa et al., 2000). Thus, the fact that we replicated the basic relationships between personality and religiousness with data collected more than a half-century ago is actually a testimony to the robustness and potentially time-invariant nature of this association.

*Limitations due to sampling of items.* The items used to measure both religiousness and the Big Five were not randomly selected from the universe of admissible observations—an assumption of both classical measurement theory and generalizability theory. Of course, Terman et al. had no intention of sampling items from the universe of admissible observations for the Big Five (the notion of a Big Five was not even imagined until years after Terman's initial data collection) (e.g., Tupes & Christal, 1961). Indeed, the fact that measures of the Big Five were recoverable at all—especially using teacher ratings and peer ratings—is a testimony to the robustness of the Big Five taxonomy.

Nevertheless, to the extent that our measures of the Big Five and religiousness failed to capture each construct's centroid in multivariate space, the relations of the measured constructs might have been biased relative to the true relations among the constructs (Little, Lindenberger, & Nesselroade, 1999). Relatedly, by failing to represent all of the facets that are subsumed by each of the Big Five (e.g., see Paunonen & Ashton, 2001), our measures of the Big Five may have lacked bandwidth and, as a result, failed to reflect perfectly how these traits might influence adult religiousness. Nevertheless, it is difficult to develop measures of the Big Five that assess centroids that are exactly orthogonal (i.e., trait-trait  $r$ s often are in the .20-.35 range), even after controlling for method effects (e.g., see John & Srivastava, 1999), so the bias in the present results might

be only quantitatively different than the bias to be expected in other research using standard measures of the Big Five (but cf. Saucier, 2002, for evidence that orthogonal measures of the Big Five are possible).

Despite these limitations, our confirmation of the correlation of Conscientiousness with religiousness provides some comfort that the net effects of these design limitations were probably limited. It seems unlikely that ameliorating these design limitations would create qualitatively different results because the obtained results mirror so closely those of other relevant studies (e.g., Francis et al., 1995; Kosek, 1999; Taylor & MacDonald, 1999). Even so, future research on religiousness and personality would make substantive advances by using (a) data structures that permit the use of conventional analytic techniques for causal modeling with panel data (e.g., Finkel, 1995), (b) representative sampling of persons so that the results are generalizable to a broader population of persons, and (c) more standard measures of religiousness and personality.

#### *Other Accounts for the Relationships Among Religious Upbringing, Personality Traits, and Adult Religiousness*

In framing this study and discussing its results, we have conceptualized traits so that they are analogous to filters or lenses that focus people's reactions to environmental factors, but this is not the only possible approach for making sense of our findings. Moreover, there may be additional relationships among religious upbringing, personality traits, and adult religiousness that we did not explore. For example, it is possible that the genetic factors that give rise to religious sentiments (Waller, Kojetin, Bouchard, Lykken, & Tellegen, 1990) are the same genetic factors responsible for traits such as Conscientiousness. It is also plausible that a strong religious upbringing fosters the development of Conscientiousness as well as religiousness. Although our data were clearly not suitable for investigating these questions, they merit future investigation.

#### *Conclusion*

Although personality psychology has made admirable advances since Allport's (1955) lament about our ignorance regarding religiousness, we still know considerably less about this domain of human functioning than we might wish. Even so, the present study, coupled with the other studies that have used cross-sectional data and self-report measures of both religiousness and personality, suggest strongly that the association of Conscientiousness with religiousness is sturdy and substantive. Moreover, the results from the present study help to shed light on how personality traits—namely, Emotional Stability—might interact with social factors such as religious socialization to promote religious inclinations in adult-

hood. Moving from these studies to stronger longitudinal studies, as well as studies that can evaluate more thoroughly the interplay of personality traits and social factors in the formation of religiousness, would be logical and incremental steps in pursuing Allport's vision for a psychology of personality that sheds light on the religious dimension of human functioning.

## NOTES

1. For 94.5% of participants, the surveys nominally known here as the "1922-23 surveys" were actually completed in 1922 or 1923. For 15 participants, these surveys were completed in 1921 or before, and for 12 participants, they were completed between 1924-1926.

2. There were some exceptions to this selection rule. The Agreeableness item "freedom from vanity/egotism" only correlated with Big Five Inventory (BFI) Agreeableness at  $r = .29$  in our pilot study. Also, the Emotional Stability items "cheerfulness and optimism" and "permanency of moods" correlated with BFI Agreeableness with  $r > .30$  in our pilot study. However, these latter two items did correlate more highly with BFI Neuroticism ( $r = .42$  and  $.38$ , respectively), and the resulting correlations of Emotional Stability and Agreeableness were not very large (i.e.,  $r = .30$ ). Thus, the extent to which our Emotional Stability measure and our Agreeableness measure are mutually confounding is likely to be minimal and in any event would be controlled through our use of multiple regression for the major data analyses.

3. We also calculated a trimmed model that included the main effect of Emotional Stability because product terms are not, strictly speaking, interpretable as interactions unless the variables that compose the interaction are controlled simultaneously. However, doing so had no appreciable effect on the results that we report here.

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