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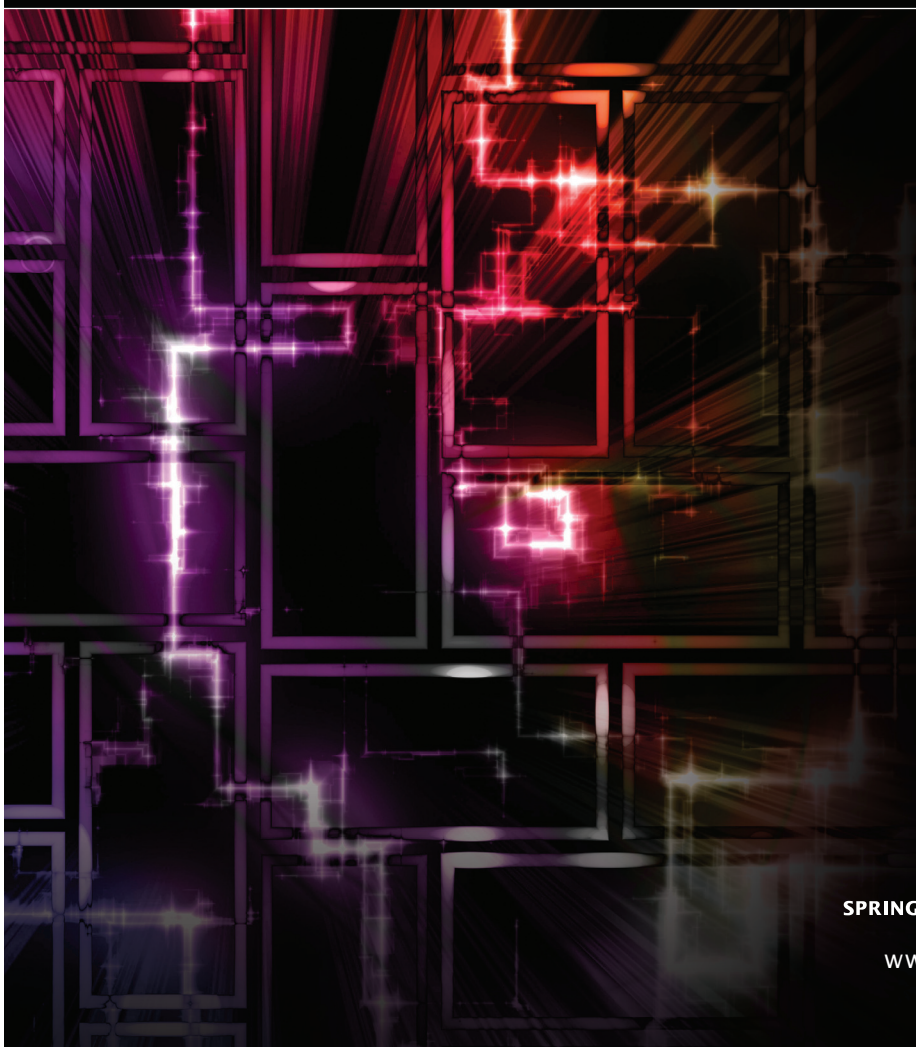

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Rigid Rules of Conduct and Duty: Prediction of Thought–Action Fusion

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Cognitive biases, such as thought–action fusion (TAF), play a crucial role in the cognitive-behavioral model of obsessional symptoms and have been shown to prospectively increase the risk of developing such symptoms. Much less research, however, has examined factors that might lead to the development of the cognitive biases themselves. This study aimed to replicate and extend existing work on correlates of moral (thinking about something is the moral equivalent of the corresponding action) and likelihood (thinking about a particular event increases the probability that this event will occur) TAF. A large sample of unscreened participants ($N = 407$) completed a measure of TAF, as well as measures of religiosity, motivation for religion, parental psychological control, and parental guilt induction. Results indicated that religion-related variables predicted the moral TAF, whereas parenting strategies were associated with likelihood TAF. Intrinsic motivation for religion also mediated the relationship between religiosity and moral TAF. Findings are discussed in terms of developmental psychopathology and limitations are addressed.

Keywords: thought–action fusion; religion; psychological control; guilt induction

Thought–action fusion (TAF) is a set of dysfunctional beliefs that are thought to underlie the misinterpretation of innocuous unwanted intrusive thoughts as highly significant and threatening, leading to obsessional problems (Shafran, Thordarson, & Rachman, 1996; for a review, see Berle & Starcevic, 2005). *Moral TAF* refers to the belief that thinking about something is the moral equivalent of the corresponding action (e.g., thinking of having sex with a relative is the moral equivalent of incest). *Likelihood TAF* refers to the belief that thinking about a particular event increases the probability that this event will occur (e.g., thinking about a relative's death increases the likelihood of his death). Prospective research indicates that the presence of TAF-like beliefs confers vulnerability to obsessional symptoms (Abramowitz, Khandker, Nelson, Deacon, & Rygwall, 2006; Timpano, Abramowitz, Mahaffey, Mitchell, & Schmidt, 2011). Accordingly, it is important to elucidate factors that might lead to the development of TAF so that effective prevention and intervention programs can be developed (e.g., Berman, Wheaton, & Abramowitz, 2013; Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001; Rachman, 1997; Salkovskis, Shafran, Rachman, & Freeston, 1999). In this study, we focused on certain types of childhood and adolescent experiences hypothesized to give rise to TAF.

Salkovskis et al. (1999) proposed five factors that could give rise to dysfunctional cognitions (such as TAF, an inflated sense of responsibility, and others) that underlie the development of

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obsessional symptoms: (a) an early developed sense of responsibility that is reinforced by significant figures and circumstances, (b) being shielded from responsibility early in life, (c) incidents in which one's actions or inaction *actually* contributed to misfortune, (d) incidents in which one's actions or inaction *appeared to* contribute to misfortune, and (e) exposure to rigid and extreme codes of conduct and duty. Of these hypothesized pathways, exposure to rigid rules of conduct and duty appears particularly relevant to TAF.

Salkovskis et al. (1999) asserted that religious doctrine, which contains standards for the unacceptability of certain thoughts, coupled with the threat of divine punishment for disobedience fosters TAF-like beliefs. In Christianity, for example, instructive Bible verses that reference "sin by thought" (e.g., Sermon on the Mount; Matthew 5:27–5:28) are considered to be religious directives that might promote TAF-like beliefs. Thus, if a devoutly religious individual experiences a negative or otherwise irreverent thought, this might be interpreted as unacceptable and perhaps needing to be neutralized (e.g., "undone" or "dealt with" via rituals or thought suppression). Consistent with this idea, previous studies indicate a positive relationship between religiosity and TAF (Abramowitz, Deacon, Woods, & Tolin, 2004; Berman, Abramowitz, Pardue, & Wheaton, 2010; Rassin & Koster, 2003; Siev, Chambless, & Huppert, 2010; Siev & Cohen, 2007).

Although a relationship between religiosity and TAF has been established, no research has examined whether this relationship is influenced by one's motivational orientation toward religion. Two types of motivational orientation have been identified: *intrinsic* and *extrinsic* (Allport & Ross, 1967). Individuals with high levels of intrinsic motivation toward religion find their "master motive in religion" (Allport & Ross, 1967, p. 434), perceive it to be a vital and guiding factor in their life, and believe that religion offers a foundational set of moral and personal values. They deeply internalize religious codes and directives, such as sin by thought, which might contribute to TAF-like beliefs. On the other hand, individuals with high levels of *extrinsic motivation* assess the importance of their religious beliefs based on external reward systems (e.g., social, personal, and political factors; Ellison, 2008; Meek, Albright, & McMinn, 1995). Thus, such individuals might not internalize religious doctrine to the same extent as those who are intrinsically motivated. One might therefore expect that religiosity, and an intrinsic (but not extrinsic) motivation toward religion, would predict moral and likelihood TAF; and that intrinsic motivation would mediate the relationship between religiosity and TAF among religious individuals.

Salkovskis et al. (1999) also proposed that parents (or other caregivers) could reinforce the sorts of strict standards for thinking and behaving that foster TAF. Specifically, two parenting styles that emphasize rigid rules of conduct are parental guilt induction and psychological control (PSY-C). Parental guilt induction refers to the caregiver (a) overemphasizing the sacrifices he or she has made for the child, (b) inappropriately blaming the child when he or she was not at fault, and (c) limiting the child's autonomy (Donatelli, Bybee, & Buka, 2007). Research suggests that chronic exposure to high levels of parental guilt induction interferes with the child's emotional and social growth and management of interpersonal conflicts (Rakow et al., 2009). Consequently, parental guilt induction has been associated with the development of childhood internalizing symptoms, even when traditional parenting factors (e.g., warmth, involvement, monitoring, and discipline) are accounted for (Donatelli et al., 2007; Rakow et al., 2009; Zahn-Waxler, Kochanska, Krupnick, & McKnew, 1990).

Parental PSY-C refers to attempts to influence a child's emotional development by intruding on and limiting his or her thinking processes, emotional expression, autonomy, and attachment (Barber, 1996). A critical element of PSY-C is the parents' management of children's *mental* processes (e.g., thoughts and emotions). For instance, if a child says, "My sister is so annoying! I wish she would die," the psychologically controlling parent might respond by telling the child that he or she "should *never* think or wish such terrible things!" In essence, psychologically controlling parents implicitly or explicitly exert control (e.g., "thinking is as bad as doing") over the child's

mental processes, thereby shaping the child's perception of the wrongfulness of certain thoughts and overemphasizing the need to be responsible for and control one's cognitions. The effects of parental guilt induction and PSY-C therefore both seem to overlap with TAF in that each involves a misappropriation of one's own role in external events that are beyond his or her control (likelihood TAF) and an overvaluation of the moral wrongness associated with certain thoughts, wishes, or beliefs (moral TAF).

Little research, however, has examined the relationship between religion and parental guilt induction or PSY-C (Berman, Wheaton, Fabricant, & Abramowitz, 2012). This is surprising given the potential overlap between these parenting strategies and certain religious directives to control one's thoughts and resultant emotions and behaviors. As a result of this communality, guilt induction and PSY-C might account for variance in TAF that had previously been accounted for by religiosity. Thus, given the existing theoretical and empirical work, parental guilt induction and PSY-C would be expected to predict both moral and likelihood TAF, with the parenting strategies also serving as possible mediators of the relationship between religiosity and TAF.

In summary, this study aimed to replicate and extend previous research on the relationship between TAF and developmental experiences with rigid rules of conduct. We evaluated five factors as potential predictors of TAF: (a) religious affiliation, (b) strength of religiosity, (c) motivational orientation toward religion, (d) parental guilt induction, and (e) parental PSY-C. To examine how these factors predict TAF, a large group of nontreatment seeking undergraduate students completed self-report questionnaires that assessed each construct. We elected to examine our hypotheses using this nonclinical sample because TAF is not a clinical symptom per se, but rather a vulnerability factor that occurs along a continuum and is widely distributed in the general population (e.g., Beck, 1976; Rassin, Merckelbach, Muris, & Schmidt, 2001; Shafran et al., 1996). For this study, we have four hypotheses:

1. Religiosity, parental guilt induction, and PSY-C would all predict moral and likelihood TAF.
2. Intrinsic, but not extrinsic, motivation for religion would predict moral and likelihood TAF.
3. Parental guilt induction, PSY-C, and intrinsic motivation would mediate the relationship between religiosity and both forms of TAF.
4. Of the potential mediators, intrinsic motivation would account for the greatest amount of variance between religiosity and TAF.

Method

Participants

Four hundred and seven undergraduate students in introductory psychology at a large public university completed the study and received course credit for their participation. As seen in Table 1, most participants were female (68.31%) with an average age of 19 years old. Moreover, participants most frequently identified themselves as White (71.25%) and as Christian (65.11%). A small number of ethnic (e.g., African American; 11.79%) and religious minorities (e.g., Jewish; 1.40%) also completed study measures.

Measures

Demographics. Participants were initially asked to report their gender, age, and identified racial or ethnic group and religious affiliation. They were also asked to indicate how similar their *present* religious beliefs and practices were to their religious beliefs and practices *5 years* earlier (1 = "*very much similar*" to 4 = "*very much dissimilar*"). This question was included to account

TABLE 1. Participant Demographic Characteristics ($N = 407$)

Gender	
Male	129 (31.69%)
Female	278 (68.31%)
Ethnicity	
White	290 (71.25%)
African American	48 (11.79%)
Hispanic	18 (4.40%)
Asian	34 (8.35%)
Other	17 (4.17%)
Religion	
Protestant	176 (43.24%)
Catholic	89 (21.87%)
Atheist or Agnostic	64 (15.72%)
Hindu	8 (1.90%)
Jewish	6 (1.40%)
Islam	5 (1.20%)
Buddhist	3 (0.70%)
Quaker	2 (0.50%)
Other	54 (13.27%)
Age (years)	
Mean (*SD*)	19.36 (1.69)
Range	17–27

Note. *SD* = standard deviation.

for the possibility that university students change their religious practices on matriculating and moving out of their parents' home.

Intrinsic/Extrinsic—Revised Scale (I/E-RS). The I/E-RS (Gorsuch & McPherson, 1989) is a 14-item self-report scale that measures one's intrinsic (e.g., "I try hard to live all my life according to my religious beliefs"; $\alpha = .83$) and extrinsic motivation ("I go to religious services mostly to spend time with my friends"; $\alpha = .65$). Each item is rated on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). It is recognized that the reliability of the extrinsic scale is not strong, but this measure of religious motivation best assesses the constructs of interest.

Maladaptive Guilt-Induction Measure (MGIM). The MGIM (Donatelli et al., 2007) is a 12-item self-report questionnaire assessing youth's perceived experiences with parental guilt induction. Respondents rate the truthfulness of statements on a Likert scale from 1 (*not at all true*) to 7 (*very true*). The MGIM has two subscales: the disparagement subscale assesses child-directed criticism (e.g., "[My primary caregiver] makes me feel guilty even when it's not my fault"; $\alpha = .84$). The self-serving elicitation subscale assesses the frequency that parents' exaggerate sacrifices that they have made for the child (e.g., [My primary caregiver] always reminds me of favors and sacrifices he or she has made"; $\alpha = .77$).

Parental Psychological Control—Youth Self-Report (PPC-YSR). The PPC-YSR (Barber, 1996) contains eight items that assess a primary caregiver's invalidation of feelings, restriction of verbal expression, personal attack, and love withdrawal (e.g., "[My primary caregiver] is always trying to change how I feel or think about things"). Respondents are asked to rate how well each statement describes his or her primary caregiver (1 = *Not like him/her*, to 3 = *A lot like him/her*).

Cronbach's alphas for the four possible dyads in the family were calculated, indicating adequate internal consistency: mother/son ($\alpha = .83$), mother/daughter ($\alpha = .83$), father/son ($\alpha = .80$), and father/daughter ($\alpha = .83$; Barber, 1996). In addition, the PPC-YSR is compatible with an observational coding scheme for parental PSY-C (i.e., PCS-Obs), which demonstrates this questionnaire's convergent validity (Barber, 1996).

Santa Clara Religious Faith Scale (SCRFS). The SCRFS (Plante & Boccaccini, 1997) is a 10-item self-report scale that provides a reliable and valid measure of one's strength of religiosity (e.g., "My relationship with God is extremely important to me"). Total scores range from 10 to 40, with higher scores indicating greater religiosity. The SCRFS has good reliability ($\alpha = .92$–$.95$) and converges with other valid measures of religiosity (Plante & Boccaccini, 1997).

Thought–Action Fusion Scale (TAFS). The TAFS (Shafran et al., 1996) is a 19-item self-report measure of beliefs about the importance of thoughts. It contains two subscales: moral (e.g., "Having a blasphemous thought is almost as sinful to me as a blasphemous action," $\alpha = 0.90$), and likelihood (e.g., "If I think of a relative/friend losing their job, this increases the risk that they will lose their job," $\alpha = .92$). Each item is rated on a scale from 0 (*disagree strongly*) to 4 (*agree strongly*). Items on the TAFS have good face validity and the measure shows good internal consistency (Shafran et al., 1996).

Procedure

After signing up for the experiment via an Internet-based software program, participants provided consent to participate and were directed to a secure project Website where they completed the study measures. All data were collected using Qualtrics, an online Web survey development tool. Upon accessing the secure project Website, participants were presented with an "instructions page." The demographic questionnaire and study measures then appeared on subsequent pages. At the end of the last questionnaire, a debriefing statement was presented. The study was reviewed and approved by the university's institutional review board (IRB).

Data Analysis

To test our hypotheses, the following data analytic strategy was used. We first conducted zero-order correlations among the continuous indicators and the TAFS. We next performed hierarchical regression analyses to determine how our indicators predict both biases of TAF. Third, to test for mediating variables between religiosity and TAF, we performed path analyses using the bootstrapping technique (see Preacher & Hayes, 2008) and evaluated the indirect effects.

Results

Preliminary Analyses

Given that this study is, in part, concerned with how developmental experiences impact the relationship between religiosity and TAF, it is important that only participants whose religiosity has not changed over time be included in certain analyses. Thus, when testing hypotheses related to religion, we included only the 260 (63.8%) participants who reported that their religiosity was "moderately similar" or "very similar" to what it had been 5 years earlier (i.e., when most participants would still have been living with their parents or guardians). If participants reported that their religiosity had moderately or drastically changed since this time, their current ratings might not accurately reflect their developmental experience with religion.

Table 2 presents the group means, standard deviations, and ranges for each study measure. As can be seen, for the religion-related variables, we computed separate descriptive statistics for

TABLE 2. Group Means, Standard Deviations, And Ranges On Study Measures ($N = 407$)

Variable and Group/Measure	*M*	*SD*	*Range*
Religiosity (SCRFS)[a]			
Christians ($n = 160$)	29.68	7.85	10–40
Atheists/Agnostics ($n = 47$)	13.91	5.59	10–33
Total sample ($N = 260$)	26.27	9.69	10–40
Motivational orientation			
Intrinsic			
Christians ($n = 160$)	26.03	6.40	12–40
Atheists/Agnostics ($n = 47$)	18.63	2.44	14–25
Total sample ($N = 260$)	24.51	6.45	12–40
Extrinsic			
Christians ($n = 160$)	17.68	5.33	6–30
Atheists/Agnostics ($n = 47$)	11.24	6.83	6–22
Total sample ($N = 260$)	15.92	6.16	6–30
Guilt induction ($n = 390$)			
Disparagement	10.86	7.37	6–42
Self-Serving Elicitation	12.19	7.97	6–42
Total	23.04	14.88	12–84
Parental psychological control ($n = 397$)			
Youth Self-Report (PPC-YSR)	11.50	2.91	8–22
Thought-action fusion ($n = 401$)			
Moral	9.41	8.69	0–36
Likelihood	1.98	3.52	0–18

Note. SCRFS = Santa Clara Religious Faith Scale.
[a]Descriptive analyses include participants whose religion has *not* changed in the past 5 years.

participants affiliating with Christianity and with Atheism/Agnosticism, as well as for the complete sample. This approach was used because participants affiliating with a religion would be expected to score differently than those identifying themselves as nonbelievers. Data for Christians, but not other religious groups, were reported because no more than 10 participants identified as members of any other religious group, raising power issues.

As expected, Christians scored significantly higher than Atheists/Agnostics on all measures related to religion (all $ps < .05$), with the former group reporting moderately high levels of religiosity and intrinsic motivation. The range of scores for Christians was also much larger than that for Atheists/Agnostics, a consequence of the latter group's expectedly low levels of religiosity. The sample, as a whole, reported moderate levels of PSY-C and parental guilt induction, with the mean scores being typical of nonclinical young adults (Donatelli et al., 2007). Finally, scores on the TAFS indicated moderate levels of moral TAF and low levels of likelihood TAF, both within the range of typical responses for a nonclinical sample (Rassin et al., 2001).

Correlational Analyses

Table 3 presents zero-order correlations among the study variables. Among Christians in the sample, both the SCRFS and intrinsic motivation for religion were moderately strongly associated with the TAFS-Moral subscale but not with TAFS-Likelihood. Extrinsic motivation for religion, on the other hand, was correlated weakly with both TAFS subscales. Scores on the SCRF were also

TABLE 3. Zero-Order Correlations Among Study Variables

Variable	Int M	Ext M	MGI-D	MGI-SS	MGI-T	PSY-C	TAFS-M	TAFS-L
SCRFS	.81***	.33***	−.12	−.14*	−.13*	−.08	.38***	−.009
Int Motivation	—	.14*	−.07	−.10	.08	−.10	.42***	.02
Ext Motivation	—	—	.08	.16*	.12	.16*	.21**	.17**
MGI-D	—	—	—	.87***	.96***	.61***	.05	.23***
MGI-SS	—	—	—	—	.97***	.57***	.05	.18***
MGI-T	—	—	—	—	—	.61***	.05	.21***
PSY-C	—	—	—	—	—	—	.07	.20***
TAFS-M	—	—	—	—	—	—	—	.26***

Note. Shaded region includes participants who were Christian and had no change in religious strength. Unshaded region includes all participants. SCRFS = Santa Clara Religious Faith Scale; Int M = intrinsic motivation; Ext M = extrinsic motivation; MGI-D = guilt induction-disparagement; MGI-SS = guilt induction–self-serving; MGI-T = guilt induction total; PSY-C = psychological control; TAFS-M = Thought–Action Fusion Scale Moral; TAFS-L = Thought–Action Fusion Scale Likelihood.
*$p < .05$. **$p < .01$. ***$p < .001$.

associated very strongly with intrinsic motivation for religion, and less so with extrinsic motivation and with scores on the MGIM subscales.

As can also be seen in Table 3, in the entire sample, both parenting strategies were significantly and positively related to TAFS-Likelihood, but not TAFS-Moral. Because the two MGIM subscales were strongly correlated with one another ($r = .87$, $p < .001$), we combined them to create a total guilt induction score for use in subsequent analyses. The MGIM subscales and the PSY-C were also strongly correlated (*r*s between .57 and .61, $p < .001$). Thus, as suggested by Barber and Harmon (2002), we conceptualized PSY-C and guilt induction as overlapping parenting strategies, yet independent constructs.

Religious Variables as Predictors of TAFS-Moral

Independent samples *t* tests revealed that as compared to Atheists/Agnostics, Christian participants had significantly higher scores on the TAFS-Moral subscale: $M = 4.71$ ($SD = 6.05$) and $M = 9.82$ ($SD = 8.42$), respectively, $t(202) = -3.83$, $p < .001$. Conversely, no group differences were found between Christians ($M = 1.77$, $SD = 3.23$) and Atheists/Agnostics ($M = 1.73$, $SD = 3.55$) on the TAFS-Likelihood subscale, $t(202) = -.07$, $p > .05$. Given the demonstrated differences between Christians and Atheists/Agnostics along with the fact that religious-related measures were not validated using "nonbelieving" samples, subsequent analyses of religion-related variables solely included participants reporting an affiliation with Christianity.

Next, we performed a hierarchical regression predicting TAFS-Moral. Strength of religiosity as measured by the SCRF was entered in Step 1, and both intrinsic and extrinsic motivation for religion were entered in Step 2. As seen in Table 4, among the Christian participants, strength of religiosity was a significant predictor of TAFS-Moral in Step 1, $F(1, 155) = 14.57$, $p < .001$. In Step 2, motivational orientation toward religion explained significant additional variance (R^2 change = .07), and both intrinsic and extrinsic motivation emerged as significant individual predictors. Together, these religion-related variables accounted for 20% of the variance in TAFS-Moral scores ($p < .001$).

TABLE 4. Regression Analyses Predicting Tafs-Moral From Religion Variables

Step	Predictors	R^2	β	*T*	*p*
1	Strength of religiosity SCRFS	.13			.00
2	Motivational orientation	.20			.00
	Intrinsic motivation		.43	4.30	.00
	Extrinsic motivation		.16	2.60	.01

Note. For regressions involving religion, only those (a) affiliating with Christianity and (b) reported that their strength of religiosity had not changed in the past 5 years were included ($n = 159$).

Parenting Variables as Predictors of TAFS-Likelihood

Next, we performed a regression predicting TAFS-Likelihood from the MGIM and PSY-C entered simultaneously. Results suggested that together, these parenting variables explained a significant, yet small, portion of the variability in TAFS-Likelihood ($R^2 = .05$; $F(2, 375) = 10.60$, $p < .001$). Moreover, the PSY-C ($\beta = .15$, $p < .05$), but not MGIM emerged as a significant individual predictor.

Mediation Analyses

Given the relationship between TAF and religiosity, we conducted mediational analyses to test whether intrinsic motivation (M_1), PSY-C (M_2), and guilt induction (M_3) mediated the relationship between *X* (religiosity) and Y_1 (TAF-Moral) or Y_2 (TAF-Likelihood). To statistically test for multiple causal pathways and potential mediation, we conducted path analyses and used the bootstrapping technique (see Preacher & Hayes, 2008) to test for indirect effects. For these analyses, participants were excluded if they reported a change in their strength of religiosity in the 5 years prior to the study. Moreover, because of multiple analyses and beta values, only significant findings are reported. Finally, the parameter estimates, indirect, direct, and total effects are reported in standardized form.

The first set of path analyses were conducted with the TAFS-Moral subscale as the dependent variable. Results indicated that for the mediator model (*M*s as outcome), religiosity significantly predicted PSY-C ($\beta = .46$, $SE = .08$, $p < .001$), guilt induction ($\beta = .11$, $SE = .02$, $p < .01$), and intrinsic motivation ($\beta = .26$, $SE = .06$, $p < .01$). For the *Dependent Variable Model* (*Y* as outcome), only intrinsic motivation was found to significantly predict TAFS-Moral ($\beta = .29$, $SE = .10$, $p < .01$).

Next, the indirect, direct, and total effects were examined. The direct (*c*) and total (*c*; direct + indirect) effects were not significant. The indirect effect of religiosity on TAF-Moral was significant ($ab_{total\_Christians} = .12$, 95%, Bootstrapping Confidence Interval [BCI] = .005–.24, $SE = .06$, $p < .05$) and the only significant mediator was intrinsic motivation ($ab_{intrin\_Christians} = .08$, 95%, BCI = .01–.14, $SE = .03$, $p < .05$). Specifically, for Christians, the relationship between strength of religiosity and TAFS-Moral was mediated by intrinsic motivation.

The next set of path analyses were conducted with the TAFS-Likelihood subscale as the dependent variable. However, because the zero-order correlations and regression analyses indicated that TAFS-Likelihood was not significantly related to religiosity, it is not surprising that, beyond the effects identified in the mediator model, no significant mediation or moderation effects were specific to TAFS-Likelihood.

Discussion

Cognitive biases, such as TAF, play a crucial role in the cognitive-behavioral model of anxiety disorders and have been shown to prospectively increase the risk of developing obsessional symptoms (Abramowitz et al., 2006; Abramowitz, Schwartz, & Moore, 2003). Little empirical research, however, has examined factors that might contribute to the development of such beliefs. Thus, in this study, we examined possible predictors of TAF. Specifically, we aimed to better understand how religiosity and parenting practices might relate to beliefs that thoughts are the moral equivalent of actions (i.e., moral TAF), and that thinking about harm could lead to harmful consequences (i.e., likelihood TAF).

Our hypothesis that strength of religiosity, parental guilt induction, and PSY-C would all predict both biases of TAF was partially supported. Among Christian participants, a stronger sense of religiosity was associated with stronger moral TAF beliefs. This finding is consistent with previous investigations reporting relationships between religiosity and TAF (Abramowitz et al., 2004; Abramowitz, Huppert, Cohen, Tolin, & Cahill, 2002; Rassin & Koster, 2003); particularly Siev and Cohen's (2007) work, which demonstrated a positive relationship between religiosity and moral TAF in a Christian sample. The strength of likelihood TAF beliefs, however, did not differ between Christians and Atheists/Agnostics, suggesting that neither affiliation with Christianity nor strength of religiosity was associated with misinterpreting one's thoughts as being able to cause external negative events. Although our results are not prospective, they (along with the previous studies) are consistent with Salkovskis et al.'s (1999) hypothesis that exposure to religious doctrine, which contains codes of conduct for thinking and acting, fosters the development of beliefs that certain types of thoughts are the moral equivalent of the corresponding actions.

Our finding that developmental experiences with guilt-inducing or psychologically controlling parenting uniquely predicted likelihood TAF is also consistent with Salkovskis et al.'s (1999) hypothesis, in that authoritative practices (or rigid rules) within the home can contribute to inflated responsibility for the occurrence of external events. Interestingly, and contrary to our hypothesis, neither parenting practice was predictive of misinterpreting the moral wrongfulness of thoughts (i.e., moral TAF).

Our hypothesis that intrinsic, but not extrinsic, motivation for religion would predict both biases of TAF in Christian participants was also partially supported. Consistent with our prediction, a stronger sense of intrinsic motivation for religion predicted moral TAF among the Christian participants in our sample. This result extends previous work on religion and TAF (as described earlier) and indicates that deeply internalizing religious codes and directives (e.g., the doctrine of sin by thought), as opposed to mere religious devotion per se, is predictive of equating thoughts and actions on a moral level.

Contrary to our prediction, extrinsic motivation also predicted moral TAF, albeit not as strongly as intrinsic motivation. Thus, individuals whose religiosity is motivated by social (e.g., attending church to meet friends) or political (e.g., being seen with the "right" crowd) values are also likely to morally equate thoughts and actions. Perhaps this is because of the communality of extrinsic and intrinsic motivation; these two constructs possess a positive association and are not mutually exclusive. Perhaps intrinsically motivated individuals are not only motivated by the values of religion but are also drawn to the strong community and social elements that are built into the foundation of religion.

Our hypothesis that guilt induction, PSY-C, and intrinsic motivation would mediate the relationship between religiosity and both types of TAF also received partial support. Although religiosity did possess positive relationships with the three potential mediators, intrinsic motivation emerged as the only significant mediator between strength of religiosity and moral TAF among Christians in our sample. Moreover, when intrinsic motivation was taken into account,

the relationship between religiosity and TAF-Moral was no longer present. This complete mediation further suggests that viewing religion as a guiding factor in life, and internalizing religious codes and values, explains the consistently demonstrated relationship between Christian religiosity and moral TAF beliefs (Abramowitz et al., 2004; Abramowitz et al., 2002; Berman et al., 2010; Rassin & Koster, 2003; Siev & Cohen, 2010).

Taken together, our findings align well with Salkovskis et al.'s (1999) proposed pathways for the development of dysfunctional cognitions found to give rise to obsessional symptoms. Within their framework, moral TAF might stem from codes of conduct set forth by authority figures within religious institutions. The stringent moral principles, in concert with the possibility of worldly or divine retribution for thinking "bad" thoughts, could lead to the development of beliefs involving the moral equivalence of thoughts and actions. For instance, a child who is raised as a Christian and possesses a strong sense of intrinsic motivation for his or her religion might be taught the phenomenon of sin by thought, which he or she internalizes as a youth. Consequently, as the child ages, he or she might feel morally responsible for controlling his or her thought processes, thus leading to a paradoxical preoccupation with immoral thoughts and the emergence of moral TAF beliefs.

The likelihood bias might also develop as a result of rigid rules of conduct and duty; however, our findings suggest this bias is related to a different form of authority—one's parents. Through particular types of parental communication, children might be taught that certain thoughts can lead to dangerous outcomes. For instance, a psychologically controlling parent might reprimand a child when he or she reports distasteful or catastrophic thoughts (e.g., "Don't even think about that! What if it happened?"). Consequently, the child might become anxious about thinking of unwanted topics and events because of the possibility of punishment, or worse, the thoughts coming true. Moreover, if unwarranted blame and responsibility are placed on a young child, he or she might not possess the cognitive capabilities to differentiate between problems that he or she actually caused and those that resulted from circumstances beyond his or her control (Rakow et al., 2009). As a result, in difficult to control situations, the child might blame himself or herself and assume responsibility for the outcome (Bybee, Zigler, Berliner, & Merisca, 1996). These examples typify how behavioral codes within the home can lead to both the development and reinforcement of responsibility over one's thought processes.

Although the correlational design of our study prohibits conclusions regarding causation, our findings lend themselves to postulating about possible TAF prevention programs. To do so, we can draw on existing risk and resilience research (for a review, see Cicchetti & Toth, 2009; Masten, 2011). For young people who evince the correlates of TAF identified in this study, a resilience framework might direct approaches for promoting healthy functioning. One such method is strength-based school counseling (Akos & Galassi, 2008) in which critical members of school staff (i.e., administrators, teachers) proactively build a nurturing academic community that promotes personal and social competence, while simultaneously paying special attention to cultural considerations. Within this environment, staff members are instructed to focus on students' assets.

Although it would be improper to refute children or families' religious beliefs, certain parenting strategies that are predictive of TAF can be therapeutically addressed. One approach that has received empirical support in prevention research involves screening children and adolescents in primary care (Jellinek et al., 1999) or school-based settings (Gail, Pagano, Desmond, Perrin, & Murphy, 2000). Broad measures of psychological functioning, parenting, and child safety could be administered, and youth who score highly on measures of parental PSY-C or guilt induction could be identified as "vulnerable." If parenting style is a significant concern, then family-based therapy and school-based approaches could be employed to increase effective communication strategies between parents and children (Dattilio & Epstein, 2004). In addition, vulnerable youth

could be administered a psychoeducational intervention for TAF (Zucker, Craske, Barrios, & Holguin, 2002) that has been shown to reduce (a) TAF beliefs and (b) the urge to neutralize the effects of thinking negative unwanted thoughts.

For several reasons, caution is warranted regarding the conclusions of this study. First, although a significant relationship between religiosity and the moral bias was observed, we only examined religious group differences between Christians and Atheists/Agnostics. Consequently, the relationships we found were only relevant for individuals in these groups; and we cannot draw broad conclusions about how religiosity or motivational orientation predicts TAF in other faiths. Recruiting more participants from different religious groups and accounting for the heterogeneity that exists within the Christian faith (i.e., differences between Christians and Protestants) would allow for a more nuanced understanding of this relationship.

In addition, the multicollinearity among study measures might have compromised the significance of indirect effects. Preacher and Hayes (2008) indicated that when mediating variables are correlated, like guilt induction and PSY-C, the effects of the mediators on the endogenous variable are weakened. To avoid this limitation in future research, multiple measures of a construct (e.g., maladaptive parenting tactics) should be used and a latent variable assessing the underlying construct should be created (Kline, 1991).

As demonstrated by the effect of multicollinearity in path analysis, it is evident that this study's correlational design weakened the power of statistical analyses. Moreover, as alluded to previously, the correlational design prohibits conclusions of causality. Longitudinal designs are necessary next steps to better understand how these experiences might prospectively contribute to the development of TAF. Furthermore, the amount of variance explained in TAF by the predicted variables in our regression models leaves open the possibility that other biological, psychosocial, and cultural variables contribute to this construct. It is also clear from our regression models that the included constructs better predict moral than likelihood TAF. This suggests that the moral and likelihood TAF bias might not possess the same developmental correlates and aligns with Rassin et al.'s (2001) and Shafran et al.'s (1996) findings that these cognitive biases are unique factors.

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