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Religious Factors Associated with Alcohol Involvement: Results from the Mauritian Joint Child Health Project

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Abstract

Background—The purpose of this study was to examine religious factors associated with alcohol involvement in Mauritius. The three main religions on the island, Hinduism, Catholicism, and Islam, promote different views of the appropriate use of alcohol. Based on reference group theory, we hypothesized that both the content of a religion's alcohol norms and an individual's religious commitment would relate to alcohol use behavior.

Methods—Participants were from the Joint Child Health Project, a longitudinal study that has followed a birth cohort of 1,795 individuals since 1972 when they were 3 years old. All available participants (67%; 55% male) were assessed in mid-adulthood on religious variables, lifetime drinking, and lifetime alcohol use disorders.

Results—Across religions, individuals who viewed their religion as promoting abstinence were less likely to be drinkers. Religious commitment was associated with reduced probability of drinking only in those who viewed their religion as promoting abstinence. Among drinkers, abstention norms and religious commitment were not associated with lower likelihood of alcohol

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Contributors

Susan E. Luczak was the Principal Investigator for this study phase of the Joint Child Health Project. She trained and supervised staff on data collection and management and edited all interviews. On this manuscript she conducted the literature search and analyses and prepared the manuscript. Carol A. Prescott, Cyril Dalais, Adrian Raine, Peter H. Venables, and Sarnoff A. Mednick provided feedback on the manuscript. In addition, Drs. Mednick and Venables were the initial Principal Investigators, Dr. Dalais was the initial National Director, and Dr. Raine is the current International Director of the Joint Child Health Project. All authors approved the final manuscript.

Conflict of Interest

No conflict declared.

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use disorders. In Catholics who viewed their religion as promoting abstinence and still were drinkers, high religious commitment was associated with increased risk for alcohol use disorders.

Conclusions—Predictions based on reference group theory were largely supported, with religious norms and commitment differentially related to alcohol use and problems both across religions and among individuals within religions. Findings highlight the importance of examining multiple aspects of religion to better understand the relationship of religion with alcohol behaviors.

Keywords

Catholic; Hindu; Islam; Muslim; abstinence; alcohol use disorder

1. INTRODUCTION

This study applies reference group theory as the framework for examining the relationship between religious factors and alcohol involvement. Reference group theory proposes that individuals look to groups to which they belong for normative guidelines on how to behave properly (Merton, 1968; Merton and Rossi, 1968). As applied to the study of religion and alcohol, reference group theory predicts the impact of religion on alcohol use will be determined by the content and clarity of religious norms regarding alcohol use and by the strength of an individual's religious commitment to the religious group (Bock et al., 1983; Cochran et al., 1988). Religion is predicted to have a unique effect on alcohol behavior when religious norms are clear and differ from societal norms and when religious commitment is strong (Burkett and White, 1974).

We apply this framework to a birth cohort from Mauritius, an island country comprised of primarily of individuals ascribing to Hinduism, Catholicism, and Islam. Three factors must be understood to predict the impact of religion on alcohol involvement--1) societal norms regarding drinking, 2) religious norms regarding drinking, and 3) individual religious commitment. We first describe the broad cultural environment of Mauritius, then examine the proscriptive and prescriptive norms for alcohol use and heavy use held by the main religious groups on the island, and finally describe group cohesion within each religious group. We use this background to guide our predictions for differences in prevalence of alcohol consumption and problems across religious groups within this society.

1.1 Mauritian Society

Mauritius is a small tropical island state located in the Indian Ocean approximately 800 kilometers (500 miles) east of Madagascar. Mauritian culture has been referred to as a "mosaic", "rainbow", or "poly-ethnic" rather than a "melting pot" culture (Eriksen, 1992; 2003; Ng-Tseung, 2006). People of different ethnic origins have lived together on the island for many years and are exposed to the same economic and social environment, yet elements of each subculture remain prominent. The population is comprised of 68% Indo-Mauritian descendents of northern (Hindu), western (Muslim), central (Marathi and Telugu), and southern (Tamil) India and Pakistan (Muslim); 27% Creoles of primarily eastern African descent (Madagascar, Mozambique, Kilwa, Zanzibar); 3% Sino-Mauritians of Chinese descent (Canton and Hunan provinces); and 2% Franco-Mauritians of eastern European descent (CIA Factbook, 2013; Eriksen, 1998; Hollup, 1994). For Indo-Mauritians, ancestry, descent, and regional origin in India have been replaced by religious identity (Hollup, 1994). Muslims and Hindus are considered separate groups, with Hindu individuals further differentiated as Hindu, Tamil, Telugu, and Marathi. Most individuals of African, Chinese, and French descent are Catholic; Creoles are more likely to define themselves by their religion, whereas Sino- and Franco-Mauritians are more typically defined by their ethnicity

(Eriksen, 1998). A study in Mauritius found that religious and ethnic identities were nested within a national identity with high correlations between all identities, and the majority of individuals reported that all three identities were of equal importance (Ng-Tseung, 2006). Thus, although Mauritius is a relatively small society, within its culture exist three prominent religioethnic groups (Hindus, Catholics, Muslims) that have distinct traditions, beliefs, and views on appropriate social behavior.

The drinking culture of Mauritius as a nation has changed over recent decades. Per capita rates of average annual alcohol consumption in individuals 15+ years old increased by 4% from 1990 to 2000 to 4.9 liters/year, which was higher than African (3.5 L/yr) and world (4.1 L/yr) averages, but lower than European averages (10+ L/yr). Consumption rates in Mauritius, however, may be even higher when including “unrecorded consumption” based on home brews and unofficial statistics, although these rates have varied substantially across estimation sources, ranging from 1.0 to 11.0 L/yr (World Health Organization, WHO, 2004; 2011; see Bird and Wallace, 2003). Part of this increase in recorded consumption (during a period of time when the majority of countries experienced reduced rates of consumption) may be due to changes in import and taxation regulations (Rehm et al., 2004). In 1994, Mauritius drastically reduced customs duties on imported alcohol due to pressure from the tourist industry and in hopes of making better, more refined alcohol products available to the local population. In the years immediately following, a number of alcohol-related problems substantially increased, including arrests for driving under the influence of alcohol in connection with crashes, hospital admissions for alcohol problems, and age-adjusted death rates from chronic liver disease and cirrhosis (Rehm et al., 2004).

The government response in 1997 was to increase formal controls on drinking, including reducing the DUI limit to .05 BAL, requiring new permits for licensed premises, increased excise duties on alcohol, and limiting establishment hours of operation; the legal age for purchasing and consuming alcohol remained 18 years. A decade later, the government added further restrictions on the marketing and sales of alcohol in the Public Health Act of 2007. In 2011, the WHO rated Mauritius a 3 out of 5 on their risky drinking pattern scale, indicating moderate risk for consumption patterns indicative of alcohol-attributable burden of disease (WHO, 2011). Thus, over the past few decades Mauritius has become a nation with strong formal controls on drinking, but its population remains at risk for social and medical problems associated with alcohol consumption.

1.2 Religious Norms Regarding Alcohol Use

The content of norms can be described along a qualitative proscriptive-prescriptive dimension (Mizruchi and Perrucci, 1962). Proscriptive norms direct participants to avoid or abstain from a particular activity, whereas prescriptive norms direct participants to act in a particular way. Deviancy from norms can result in various levels of problems, with proscriptive norm violation having the potential to be more problematic than prescriptive norm violation.

The three prominent religions of Mauritius vary in their proscriptive and prescriptive norms regarding the appropriate use and heavy use of alcohol. Islam is generally considered to have strong proscriptive norms against the use of any alcohol (Shepard, 1987; Suliman, 1988), although absolute proscription is not universal across all Muslim groups in all societies (see Burazeri and Kark, 2010, and Michalak and Trocki, 2006). In Mauritius, Muslim leaders have stressed orthodoxy and non-drinking practices (Hollup, 1996). Given this proscription, Mauritian Muslims are predicted to have a high prevalence of abstinence. However, those Muslims who do drink are expected to have as high or higher rates of problems as drinkers from other religions, given drinking itself represents a rejection of religious norms and there are no prescriptive guidelines for how to drink appropriately in an

abstinence-promoting religion (Argyle and Beit-Hallahmi, 1975; Hawks, 1990; Luczak et al., 2001; Michalak et al., 2007).

Catholicism has prescriptive norms regarding alcohol use, with alcohol integrated into rituals such as religious ceremonies. Guidelines or restrictions on amount or purpose of alcohol use beyond during religious ceremonies are vague, with Catholic dogma being considered tolerant of a range of drinking including heavy drinking (Beigel and Ghertner, 1977; Greeley, 1980; Pittman and Snyder, 1962). In a U.S. national survey, however, approximately one quarter (26%) of Catholics reported their religion discourages alcohol use (Michalak et al., 2007), suggesting views on abstinence-promoting norms vary within Catholics. The early influences of Catholicism in Mauritius were French Catholic, which has been categorized as having over-permissive views toward alcohol use and heavy use (Dinan, 1986; Bowman, 1991). Thus, Mauritian Catholicism would be viewed as having weakly prescriptive norms for use and being non-proscriptive regarding heavy use. Given this, Mauritian Catholics are predicted to have relatively high prevalence of both alcohol use and problems.

Hinduism is generally accepting of moderate alcohol use although disapproving of heavy drinking (Fowler, 1997). According to Hindu concepts of purity, alcohol use might be considered a vyasana, or unhealthy dependence, and it is suggested to avoid all tamasic foods (like meat and alcohol) since they may bring “ignorance” and “violent tendencies” (Fowler, 1997). These norms regarding alcohol use and heavy use, although somewhat vague in Hinduism, are similar to the clear prescriptive norms for use and proscriptive norms against heavy use in Judaism (Glassner and Berg, 1980; Glatt, 1980; Westermeyer, 1995). Based on these norms, Mauritian Hindus are predicted to drink at a prevalence between Muslims and Catholics. Similar to Jews (e.g., Glassner and Berg, 1980; Yeung and Greenwald, 1992), they are also expected to drink in moderation, adhering to proscriptions against excessive use in a manner that reduces the likelihood of alcohol-related problems.

Tamils, in comparison to the other Hindu groups on Mauritius, are perceived to be a more permissive cultural group (Samarasinghe, 1995). The Tamil primary God Murugan is often referred to as a heavy drinker and drinking is incorporated into some religious rituals. Additionally, other Tamil rituals include body piercing as part of Cavadee, eating spicy foods, and walking on fire and on blades, all of which suggest a culture that accepts pushing one's body to the extreme. Because of this, drinking and even problematic drinking may be more prevalent in Mauritian Tamils than in other Hindus.

1.3 Religious Commitment

Religious commitment refers to an individual's faith or religious convictions, the strength of one's identity as a religious person, and the salience of religion in one's life (see Gartner et al., 1991). Strong religious commitment consistently relates to lower rates of alcohol use and misuse across religious affiliations (Burazeri and Kark, 2010; Gartner et al., 1991; Gorsuch, 1995; Michalak et al., 2007). However, the relationship between religiosity and alcohol use has been mixed for Catholics, with some studies finding increased risk for problems in Catholics with stronger religiosity or no relationship between religiosity and alcohol-related problems (e.g., Cochran et al., 1988; Welch et al., 1991).

In Mauritius, religious commitment is expected to vary between individuals within each religion, but across the three religious groups there exist different levels of commitment as indicated by group cohesion and distinction. Mauritian Muslims are seen by themselves and by others as a separate group (Eriksen, 2003). This view is consistent with Islamic totalism, which views Islam as not merely a religion, but a total way of life with guidance for political, economic, and social behavior (Shepard, 1987). The religious proscriptions against

alcohol use do not coincide with the culturally permissive norms of Mauritius, and thus are expected to have a strong influence on alcohol consumption in those who adhere strongly to Islam.

Mauritian Catholics are not a unitary religioethnic group like Hindus and Muslims, but instead are comprised of Creole, Chinese, and French Mauritians, as well as individuals of Indian heritage (Eriksen, 1998). Thus, Catholics may not be exclusively influenced by Catholic teachings about alcohol because they have additional drinking norms from their ethnic subcultures. Furthermore, strength of affiliation is less relevant for influencing drinking behaviors in Catholics since the drinking norms do not differ much from the broader Mauritian societal norms. Because of this, strength of affiliation within Catholicism is not expected to strongly influence alcohol use and problems.

Hindus in Mauritius are a mix of four main groups (about 77% Bhojpuri-/Hindi-speaking, 14% Tamil, 6% Telugu, and 4% Marathi). Together, however, they represent the majority culture and the majority voting block. Within Mauritian Hindus, the caste system as known in India has disintegrated and a communal solidarity has developed with the transfer of most political power to Hindus since independence (Hollup, 1994). They show strong unity, although less strong than Muslim but stronger than Catholics (Eriksen, 2003). However, because the religious drinking norms are somewhat ambiguous and similar to the Mauritian cultural norms, Hindus are not as strongly predicted to be influenced by religious commitment as Muslims. In Tamils, however, strength of religious commitment may be associated with greater use and problems.

1.4 Hypotheses

Based on variations in norms across religious groups in Mauritius, we predict Muslims will have lower alcohol use compared with Hindus, Tamils, and Catholics. We predict stronger religious commitment will be associated with lower prevalence of use in Muslims and with lower prevalence of problematic drinking in Hindus. Stronger religious commitment in Catholics and Tamils, on the other hand, may be associated with greater use and problems.

2. METHOD

2.1 Participants

This study assessed participants of the Joint Child Health Project (JCHP), an ongoing longitudinal cohort study of 1,795 children from the island of Mauritius (see Raine et al., 2010, for study overview). All children born in two towns (Vacoas and Quatre Bornes) during a one year period in 1969–1970 were recruited into the project when they were 3 years old. The present study examines data collected when participants were in mid-adulthood ($M = 36.9$, $SD = 1.39$, range 34–41 years). All available original participants were interviewed, which included 1,209 individuals (67% of the original sample); 77% were Indian, 20% Creole, and 4% other, and 55% were men. By religion, this included 118 (10%) Tamil, 487 (40%) other Hindu, 291 (24%) Catholic, 41 (3%) other Christian, 267 (22%) Muslim, and 5 (<1%) other. Among Catholics, 84% were of Creole ethnicity, 3% were of Chinese, 1% were of European, and 12% were of Indian heritage (often referred to as “Baptized Tamils” or “Baptized Hindus”). Non-Catholic Christians and non-affiliated were excluded due to the low numbers in each group and the heterogeneity of alcohol use norms among these groups.

Sample characteristics are presented in the top half of Table 1 by religious affiliation. The sample assessed in adulthood did not significantly differ from the full 3-year-old sample on ethnic distribution, psychosocial adversity (see Raine et al., 1998), or resting heart rate at age 3 years old, but were more likely to be male (55% vs. 52%, $z = 2.41$, $p = .016$), likely

due to the male subjects retaining their last names throughout their lives and being easier to locate.

2.2 Measures

2.2.1 Religious Variables—Three items were asked to obtain religious affiliation, commitment, and norms regarding alcohol consumption. Religious affiliation was categorized from an open-ended question into Hindu (including Marathi and Telugu), Tamil, Catholic, and Muslim. Importance of religion was rated on a four-point scale (very, important, somewhat, not at all). A Religious Commitment variable was created from this with 1 = very important and 0 = less than very important. Religion's view on alcohol consumption was rated on seven point scale (0 = abstinence is preferred, 3 = drinking in moderation is preferred, 6 = heavy drinking is preferred). An Abstinence Norms variable was created such that a rating of "0" on the 7-point scale was coded 1= abstinence is preferred, and all others were coded 0 = less than abstinence is preferred.

2.2.2 Alcohol Variables—Participants were coded for lifetime drinking (1 = lifetime use, 0 = lifetime abstinence) defined as ever consuming a standard drink (12 oz beer, 5 oz wine, or 1.5 oz liquor) at least once for non-medical purposes or consuming less than a standard drink on multiple occasions. Participants also reported on whether they used alcohol use over the past 12 months (1 = current use, 0 = current abstinence). The Structured Clinical Interview for DSM-IV Diagnosis (SCID) Alcohol Section (Spitzer et al., 1997) was used to diagnose lifetime alcohol abuse and dependence (alcohol use disorders, AUDs). Participants were coded 1 = lifetime AUD, 0 = no AUD.

2.3 Procedure

All interviews and questionnaires were translated by bilingual JCHP staff into Kreol, the common spoken language of Mauritius, with back translation to provide evidence of semantic and cultural equivalence. Trained research staff conducted structured interviews in the homes of the participants or at the JCHP site. All items were asked verbally to each participant. This research was approved by the University of Southern California Institutional Review Board and written informed consent was obtained from all participants.

2.4 Analyses

Analyses were conducted using data from the 1,165 participants who were from the four main religious groups on the island. We tested for differences among the four groups using cross-tabulations and likelihood ratio chi-square tests of significance. We conducted logistic regressions to obtain odd ratios and adjusted Nagelkerke pseudo R^2 (Homer and Lemeshow, 2000) while covarying for demographic variables (education, occupation, marital status, and gender).

3. RESULTS

3.1 Religious Affiliation

Religious and alcohol variables are presented in bottom half of Table 1 grouped by religion. Almost all Muslims reported their religion promotes abstinence, compared with about half of Hindus, a quarter of Tamils, and one fifth of Catholics. Most Muslims rated their religion as very important compared with about half of Hindus, Tamils, and Catholics. Within Hindus, Tamils, and Catholics, women were more likely than men to view their religion as very important (60–73% vs. 42–53%, $ps < .001$), but not in Muslims (90% vs. 88%). In addition, Tamil men were more likely than Tamil women to view their religion as promoting abstinence (33% vs. 16%, LR $\chi^2 = 4.7$, $p = .031$).

For all three alcohol variables, Muslims were significantly lower than all other religious groups, and Hindus were significantly lower than Catholics, with Tamils not being significantly different from Hindus or Catholics. These religious group differences remained when demographic variables were covaried in univariate logistic regressions (see Table 2). However, when analyses were restricted to only lifetime drinkers, Muslims rates of AUDs no longer significantly differed from Hindus or Tamils ($p > .13$). In addition, within each religion, women were less likely than men to be lifetime drinkers, current drinkers, or to have an AUD ($ps < .01$), with the exception of current drinking in Tamils (73% vs. 84%). Findings were consistent across men and women when data were stratified by gender instead of covaried for gender (results available upon request).

3.2 Abstinence Norms and Religious Commitment

Results of logistic regressions examining Abstinence Norms, Religious Commitment, and their interaction as predictors of alcohol use are presented in Table 3. All three religious variables predicted lifetime and current use. Individuals who viewed their religion as promoting abstinence were about one tenth as likely to be drinkers as those who did not, and those with high religious commitment were about one half as likely to be drinkers as those with lower commitment. Because of the significant interaction terms, we next grouped participants by Abstinence Norms and further examined the association Religious Commitment with alcohol use (see Table 4). Only in individuals who viewed their religion as promoting abstinence was high Religious Commitment a protective factor for lifetime and current use.

For AUDs, those who viewed their religion as promoting abstinence were about half as likely to have a lifetime AUD, but neither Religious Commitment nor the Abstinence X Commitment interaction term was significantly associated ($p > .17$; see Table 3). When only lifetime drinkers were included, none of the religious variables was a significant predictor of AUD.

Given this, it appears that these two religious variables are more important predictors of alcohol consumption than predictors of problems once an individual has decided to drink. Also consistent with initial findings, splitting the data by Abstinence Norms did not result in a significant association of Religious Commitment with AUDs in either group (see Table 4). In addition, Abstinence Norms remained a significant predictor of lifetime and current use (ORs both 0.29, $ps < .001$) when religious affiliation was also covaried in the model.

3.3 Religious Affiliation, Religious Commitment, and Abstinence Norms

Lastly, we examined Religious Commitment and Abstinence Norms within each religious group (results not shown). The pattern of findings was consistent across all four groups for alcohol use, but were less consistent for AUDs. In Hindus and Muslims, high Religious Commitment and Abstinence Norms were associated with lower likelihood of an AUD. Within all Catholics, high Religious Commitment was also associated with lower likelihood of an AUD. However, among Catholic drinkers only, those with high Religious Commitment were more likely to have an AUD if they also thought their religion promoted abstinence (OR = 2.30, 95% CI = 1.06–5.00, step $\chi^2 = 4.44$, 1 df, $p = .035$). Although statistically significant, the relatively small number of Catholic drinkers who view their religion as promoting abstinence ($n = 42$) suggests the need for caution when interpreting these results. The direction of these effects, however, does match the shift also seen in the Tamil drinkers, although this relationship was not significant in Tamils ($p > .15$).

4. DISCUSSION

This paper applies reference group theory as the framework for examining the relationship between religious factors and alcohol involvement. The island of Mauritius is an ideal location to conduct such research given religion is one of the primary ways people identify themselves within this society. Reference group theory posits that both religious norms regarding drinking and an individual's commitment to the religious group will affect how closely a person adheres to these norms. Results of this study largely support this prediction, indicating that religious variables have both unique and interactive effects in relation to alcohol behaviors and that these relationships differ by the type of alcohol behavior (i.e. use versus problem use).

4.1 Religious Factors Associated with Alcohol Use

When examined at the religious affiliation level, we found that Mauritian Muslims, who have strong religious proscriptions regarding alcohol use, were least likely to use alcohol, followed by Hindus with prescriptions for use in moderation, and Tamils and Catholics with prescriptions regarding use in religious ceremonies. At the individual level, however, there were differences in how people within each religious group viewed their religion's norms for alcohol use and heavy use. It was expected that the majority of Muslims would endorse that their religion promotes abstinence and almost all did, but the finding that half of Hindus, a quarter of Tamils, and one fifth of Catholics also endorsed their religion promotes abstinence was less expected. This is consistent, however, with a U.S. national survey that found a quarter of Catholics viewed their religion as proscriptive and a quarter of Muslims viewed their religion as not proscriptive (Michalak et al., 2007).

Both abstinence norms and strong religious commitment were associated with lower rates of use, with abstinence norms reducing the likelihood of using alcohol by ten-fold and high religious commitment reducing the likelihood by about two-fold. When the interaction of these variables was examined, high commitment was only a salient protective factor for alcohol use in individuals who believe their religion promotes abstinence. These results were found consistently across religious groups, indicating individual-level beliefs regarding abstinence norms are important regardless of how consistently these are reported within a religious group.

4.2 Religious Factors Associated with Alcohol-Related Problems

The protective associations of abstinence norms and religious commitment appear more relevant to lifetime and current alcohol consumption than to alcohol problems. Individuals who viewed their religion as promoting abstinence were about half as likely to have a lifetime AUD, but importance of religion was not significantly related to AUDs. When examined in drinkers only, neither of these religious variables nor their interaction was associated with AUD prevalence, and further analyses even suggested that individuals who think their religion promotes abstinence and still drink may be more at risk for an AUD if they have high religious commitment. We only found indication of this increased risk with higher religious commitment in individuals from Tamil and Catholic religions. This is somewhat consistent with prior studies finding increased religious commitment in Catholics being associated with increased likelihood of drinking (e.g., Cochran et al., 1988; Welch et al., 1991) and with Catholics having the highest prevalence of occasional and frequent heavy drinking of all religious groups in a U.S. national survey (Michalak et al., 2007).

In Muslims, prevalence of AUDs were lower overall, but when only drinkers were included in the analyses, Muslim drinkers did not significantly differ from Hindu and Tamil drinkers in their risk for problems. This suggests once an individual from an abstinence-promoting

religion does drink, they are not afforded additional protection from developing an AUD by these abstinence norms. This is consistent with prior studies that suggest prescriptive norms for how to drink appropriately may be more important for limiting problems once one does drink (e.g., Glassner and Berg, 1980; Glatt, 1980; Hawks, 1990). The only religion in this study that has prescriptions for heavy drinking without clear proscriptions against use is Hinduism. In Hindus in this study, the relationships of religiosity and abstinence norms followed similar patterns for both alcohol use and problem outcomes, suggesting the normative guidelines for drinking in moderation may be followed by those Hindus who do drink.

4.3 Generalizability of Findings

Rates of alcohol use in this Mauritian sample are consistent with those reported in national Mauritian surveys. A 2003 survey of Mauritius found past year use of alcohol was 74% for 18+ years-old men and 44% for women (WHO, 2004). In our sample, 70% of men and 49% of women reported past year alcohol use. Lifetime alcohol consumption was reported in similar proportion across Hindu, Tamil, and Catholic women, but very few Muslim women ($n = 2$) reported being lifetime drinkers. In addition, rates of AUDs were low in women. Also consistent previous reports (see Stark, 2002), women were more likely to endorse high religious commitment than men in all religious groups except in Muslims where rates were high in both genders. The relationships among religious and alcohol variables, however, were similar for men and women.

The WHO (2004) also reported that 59% of breathalyzer tests conducted by police during a six month period in 2003 in Mauritius were positive for alcohol. Past year estimates of alcohol use disorders in 2004, however, were only 1.2% in males and 0.5% in females age 15+ years (WHO, 2010). Our diagnoses of AUDs are for lifetime instead of past year and are higher than those reported by WHO in 2004, but are more consistent with the objective breathalyzer results that many people are driving after drinking, which can result in a diagnosis of alcohol abuse.

4.4 Limitations and Conclusions

There are several limitations associated with the study design that should be considered when interpreting our results. First, our sample was limited to a cohort of Mauritians all born in 1969–1970, thereby limiting the breadth of our results to other age groups born at different periods of time. However, our prevalences of past year drinking are consistent with those reported for a broader age range of Mauritians (WHO, 2004).

A second limitation concerns the accuracy of the SCID translation, as is the case in all research applying measures created in one society to another society. Although we attempted to minimize differences in meaning using a back translation procedure with bilingual individuals, subtle language differences may have introduced some variations. Nonetheless, all participants in this study were administered the same translated measure, so any unreliability is likely to be similar across groups.

Third, we measured three dimensions of religion and the relationships among these variables, but each dimension was only measured with a single item. Single-item measures, however, may be preferred over composite scores that combine religious dimensions when making cross-religion comparisons since it is clear what single items measure (Gorsuch, 1984).

Fourth, reporting biases may differ across religious groups given there are likely varying degrees of stigma attached to reporting alcohol use and problems across groups (Caetano, 1998). Our attempts to assure participants of confidentiality may have reduced this stigma,

but ultimately the reliability and validity of our data depend on the accuracy of self-reports of individuals.

Fifth, our findings cannot speak to the way religious alcohol norms operate within the individual to influence attitudes and behavior (e.g., via spouse or peer selection, leisure activities, health behaviors) or how they are transmitted within the religious groups (e.g., via informal controls, modeling, reinforcement, social coercion; see Ellison et al., 2008). Additional variables would be required to examine these relationships.

Lastly, this study cannot determine how religious commitment has changed over time within an individual or whether there is a reciprocal relationship between religious commitment and alcohol use. For example, those who previously experienced alcohol problems may have reduced their religious commitment if their religion did not help them through these problems or increased their religious commitment if it did. Future research will seek to better understand these more complex developmental relationships among religious norms, religious commitment, and alcohol use and problems.

Despite these limitations, this study found support for multiple aspects of religion, including religious affiliation, commitment, and normative views on alcohol use, being uniquely and interactively associated with alcohol-related behaviors. Our results support the use of reference group theory as a useful framework for understanding how individuals use groups to which they belong to guide their behaviors. This research was conducted with a cohort sample from the African country of Mauritius and examined religious groups that are understudied in the field of alcohol research. This study represents the first known study to demonstrate how individual and group level religious variables are associated with alcohol involvement across Muslims, Catholics, and Hindus in a non-Western society. Only through studies of this sort, examining a variety of subgroups, religious beliefs and behaviors, and comparative levels of analysis (e.g., Ellison et al., 2008), will the convergence of data lead to a clearer understanding of the relationships among religious factors and alcohol involvement.

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Table 1

Characteristics of Sample Grouped by Religious Affiliation

	Hindu (n = 490)	Tamil (n = 118)	Catholic (n = 291)	Muslim (n = 266)	LR χ^2 , df, p
Demographics					
Male (n = 1,165)	57	57	54	52	2.5, 3, .473
Married (n = 1,165)	84 ^a	76 ^b	76 ^b	86 ^a	14.8, 3, .002
Education (n = 1,157)					19.6, 9, .020
No certificate	15	13	14	13	
CPE	33 ^a	40 ^{a,b}	47 ^b	41 ^b	
Trade school or SC	26	27	20	26	
HSC or higher	26 ^a	20 ^{a,b}	19 ^b	21 ^{a,b}	
Occupation (n = 966)					23.1, 6, .001
Manual	45 ^a	54 ^{a,b}	62 ^b	47 ^a	
Mid-level	31 ^a	30 ^{a,b}	24 ^b	35 ^a	
Upper	24 ^a	16 ^{a,b}	15 ^b	18 ^{a,b}	
Housewife (n = 523, % of women)	32 ^a	29 ^a	27 ^a	49 ^b	16.2, 3, .001
Religious Variables (n = 1,164)					
High Religious Commitment	49 ^a	52 ^a	58 ^a	89 ^b	133.9, 3, <.001
Abstinence Norms	49 ^a	25 ^b	20 ^b	99 ^c	483.7, 3, <.001
Alcohol Variables (n = 1,165)					
Lifetime use	78 ^a	85 ^{a,b}	89 ^b	15 ^c	433.1, 3, <.001
Past year use (% of lifetime)	72 ^a	80 ^b	84 ^b	7 ^c	464.3, 3, <.001
Lifetime AUD (% of lifetime)	16 ^a	21 ^{a,b}	26 ^b	3 ^c	66.0, 3, <.001

Note: Each superscript letter denotes subset whose proportions do not significantly differ from each other at the .05 level.

CPE = certificate of primary education, SC = school certificate, HSC = high school certificate, AUD = alcohol use disorder.

Table 2Odd Ratios and ΔR^2 for the Association of Religious Affiliation with Alcohol Involvement

	OR (95% CI)	Step χ^2 (p)	Step ΔR^2	Model R^2
Lifetime Use				
Hindu	1.00 (reference)	445.1 (<.001)	.408	.543
Tamil	1.56 (0.87–2.81)			
Catholic	2.63 (1.65–4.20)*			
Muslim	0.03 (0.02–0.05)*			
Current Use				
Hindu	1.00 (reference)	456.7 (<.001)	.421	.508
Tamil	1.45 (0.87–2.43)			
Catholic	2.01 (1.35–2.98)*			
Muslim	0.02 (0.01–0.04)*			
AUD in total sample				
Hindu	1.00 (reference)	57.6 (<.001)	.072	.336
Tamil	1.25 (0.71–2.22)			
Catholic	1.99 (1.31–3.00)*			
Muslim	0.18 (0.89–0.38)*			
AUD in lifetime drinkers				
Hindu	1.00 (reference)	10.7 (.014)	.018	.263
Tamil	1.20 (0.67–2.15)			
Catholic	1.85 (1.21–2.81)*			
Muslim	0.69 (0.31–1.56) [#]			

Note.

*
p = .001.[#]
p = .02 from Catholics.Covariates include occupation, education, marital status, and gender. AUD = alcohol use disorder. R^2 = adjusted Nagelkerke pseudo R^2 . Model R^2 includes the covariates contribution to model fit.

Table 3Odd Ratios and ΔR^2 for the Association of Religious Variables with Alcohol Involvement

	OR (95% CI)	Step χ^2	Step ΔR^2	Model R^2
Lifetime Use				
Step 1. Abstinence Norms	0.09 (0.07–0.13) *	291.8 *	.278	
Religious Commitment	0.46 (0.33–0.64) *			
Step 2. Abstinence X Commitment		16.0 *	.013	.420
Current Use				
Step 1. Abstinence Norms	0.11 (0.08–0.14) *	310.7 *	.295	
Religious Commitment	0.50 (0.37–0.67) *			
Step 2. Abstinence X Commitment		17.3 *	.015	.392
AUD in total sample				
Step 1. Abstinence Norms	0.44 (0.31–0.64) *	23.1 *	.029	
Religious Commitment	0.85 (0.59–1.22)			
Step 2. Abstinence X Commitment		1.8	.003	.295
AUD in lifetime drinkers				
Step 1. Abstinence Norms	0.71 (0.49–1.04)	3.2	.005	
Religious Commitment	1.07 (0.74–1.54)			
Step 2. Abstinence X Commitment		0.5	.002	.252

Note.

* $p < .001$.

Covariates include occupation, education, marital status, and gender. Step 1 has 2 df, Step 2 has 1 df. AUD = alcohol use disorder. R^2 = adjusted Nagelkerke pseudo R^2 . Model R^2 includes the covariates contribution to model fit.

Association of High Religious Commitment with Alcohol Involvement Stratified by Religion Abstinence Norms

Table 4

Alcohol Outcome	Abstinence Norms (n = 594)			Not Abstinence Norms (n = 570)		
	OR (95% CI)	Step χ^2 (p)	ΔR^2	OR (95% CI)	Step χ^2 (p)	ΔR^2
Lifetime Use	0.29 (0.19–0.44)	34.5 (<.001)	.063	1.15 (0.66–2.02)	0.3 (.611)	.001
Current Use	0.30 (0.20–0.45)	35.3 (<.001)	.072	1.10 (0.67–1.79)	0.1 (.710)	.001
AUD	0.64 (0.36–1.14)	2.3 (.133)	.007	1.03 (0.64–1.63)	0.0 (.918)	.000
AUD in drinkers	1.22 (0.67–2.22)	0.4 (.517)	.002	0.96 (0.60–1.53)	0.0 (.860)	.000

Note. Covariates include occupation, education, marital status, and gender. R^2 = adjusted Nagelkerke pseudo R^2 . AUD = alcohol use disorder.