

## Validation of a Scale for Measuring Christian Religiosity for Chinese Churches

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### ABSTRACT

Religiosity plays a pivotal role in the spiritual journey of Christians, influencing not only their faith but also the development of churches in difficult times. The recent substantial drop in worshippers may have detrimental effects on the religiosity of Christians in Hong Kong. Hence, this study proposes to find out the religiosity of Christians in Hong Kong after the impact of social events and COVID-19 through developing a validated instrument concerning the specific context of churches in Hong Kong. The questionnaire was distributed online to Christians at different time slots in September 2024. Respondents were asked to complete an online version of the questionnaire. A total of 400 completed responses were received and analysed from Christians coming from 150 churches in Hong Kong. There are around 1000 churches in Hong Kong; the sample covers Christians from around 15% of the churches in Hong Kong. The questionnaire was confirmed by Confirmatory Factor Analysis using AMOS version 29 to have validity and reliability. Serving in the Church and the years of service have positive effects on religiosity. There is no significant difference between male and female after controlling for other variables such as experience of serving in the church. Although churches in Hong Kong experienced a substantial drop in members after the social events and COVID-19, the Christians responding to this study show positive perceptions of their religiosity. The results of this study has cast light on what actions should be taken by churches in Hong Kong to fulfill the vision and mission of spreading the gospel and converting more people to Christianity. Importance should be attached to motivating more members to serve and pursue religiosity according to the Bible. The results of such action will have positive effects not only on the Church but also on the wellness of every Christian who follows the Church's direction.

**Keywords:** Religiosity, Christian spirituality, Demographic, Hong Kong, Quantitative survey, Confirmatory factor analysis

### INTRODUCTION

Hong Kong has experienced significant social upheaval since 2019, marked by widespread protests against government policies and perceived encroachments on civil liberties. This unrest was compounded by the onset of the COVID-19 pandemic in early 2020, which introduced additional restrictions and challenges for religious institutions. The combination of these factors presented many challenges to churches and Christians in Hong Kong from 2019 to the end of the COVID-19. The lack of physical gatherings diminished the sense of community and belonging during the COVID-19. Christian churches in Hong Kong experienced a significant decline in membership after the COVID-19 pandemic. According to the census figures of church members in Hong Kong provided by the Hong Kong Church Renewal Movement, compared to the 2019 census, the number of worshippers for the year 2024 has significantly decreased from 268,822 to 197,935 — a reduction of 70,887 people (26.4%).

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Religiosity plays a pivotal role in the spiritual journey of Christians, influencing not only their faith but also the development of churches in difficult times. The recent substantial drop in worshippers may have detrimental effects on the religiosity of Christians in Hong Kong. Hence, this study proposes to find out the religiosity of Christians in Hong Kong after the impact of social events and COVID-19 through developing a validated instrument concerning the specific context of churches in Hong Kong. The measurement of religiosity with the validated instrument may give us insights into the religiosity of Christians in Hong Kong and what actions should be taken by churches to fulfill their mission and to mitigate against the effects of the decline.

A review of the Bible and related literature on religiosity was conducted to build a theoretical framework for this study. A questionnaire was developed in September 2024 to measure Christian religiosity, and 400 Christians from over 150 churches responded to the study. Confirmatory Factor Analysis was used to confirm the validity and reliability of the questionnaire. A MIMIC Model was applied to find out what demographic factors are related to the religiosity of Christians in Hong Kong.

## LITERATURE REVIEW

### Demographic Factors, Religiosity, and Christian Spirituality in Hong Kong Since 2020

#### *Studies on Religiosity and Demographic Shifts in Hong Kong:*

- **Changes in Religious Affiliation:** A 2024 study in *The China Quarterly* notes an increase in the proportion of Hong Kong residents reporting no religious affiliation, rising from 58.3% in 1988 to 66% in 2021. While many still engage in folk religious practices, the trend suggests a shift in how people identify with organized religion.
- **Demographic Differences:** The same study identifies demographic differences in religious affiliation, with 46% of those surveyed being male and 54% female. This may point to gender as a factor influencing religious belief (Cai & Hung, 2024)
- **Declining Church Attendance:** A 2021 study indicates a decline in church attendance among young Christians in Hong Kong, with a decrease of over 35.9% from 2014 to 2019. This suggests a potential generational shift in religious practice (Chu, 2025).

These resources should provide a starting point for understanding the complex interplay of demographic factors, religiosity, and Christian spirituality in Hong Kong.

#### *Religiosity/Christian Spirituality*

Historically, spirituality and religiousness were not seen as separate until the rise of secularism in the twentieth century, coupled with widespread disillusionment towards religious institutions as barriers to personal encounters with the sacred (Zinnbauer et al., 2015). Spirituality and religiosity were often treated as having nearly the same meaning in many research studies (Cotton et al., 2010; Zwingmann et al., 2011). Over the past 25 years, interest in spirituality has surged (Roof, 1993), leading to a transformation in American religious life that now incorporates more elements considered "spiritual." Spirituality is a broad and complex concept with varying meanings and definitions across different cultural, religious, and academic backgrounds (de Brito Sena et al., 2021; Koenig, 2008). Historically, spirituality describes the practices related to religious services, beliefs and faith in God (de Brito Sena et al., 2021). Spirituality has taken on various meanings in recent decades, and sometimes it may not be directly tied to a specific religion.

#### *Meaning of Spirituality*

It is difficult to define spirituality due to its elusive and mysterious nature (Tanyi, 2002; Wright, 2003). There is a remarkable debate regarding the most accurate meaning and the possibility of having a single universal consensual definition for this concept (Peng-Keller, 2019). Some issues arise due to the linkage and overlaps of other important concepts, such as religion/religiosity and well-being/positive emotions (Hill et al., 2000).

Spirituality can be interpreted as the experience of conscious involvement in the project of life-integration through self-transcendence toward the horizon of the ultimate value one perceives (Schneiders, 2005). According to a literature review on the meaning of spirituality, Dyson et al., (1997) suggested spirituality to be defined through relationships between the self, others, and "God" (interpreted by individual as the highest value in their life). Spirituality is a broad concept that encompasses the search for meaning, purpose, and connection in life which may be affected by cultures, personal experiences, peace, individuality, harmony, beliefs, and practices that relate to the transcendent, whether through nature, meditation, or personal reflection (Dyson et al., 1997; Schneiders, 2005; Tanyi, 2002).

Spirituality can be independent of organised religion and is often more about individual exploration and inner peace. It is not necessarily tied to religious beliefs (Tanyi, 2002; Zinnbauer et al., 1997). Religiosity and spirituality share a large overlap but can also be differentiated. 48% of people in the US report being religious and spiritual, 27% report being spiritual but not religious, 18% consider themselves neither religious nor spiritual (18%), and 6%

report being religious but not spiritual (6%) (Lipka & Gecewicz, 2017).

Due to the subjective nature of spirituality, it is not easy to have a definite overall definition for the concept. Tanyi (2002) proposed that spirituality can be described as a personal journey with a search for meaning and purpose in life, which may or may not be related to religion. Spirituality involves a deep connection to personal or religious beliefs, values, and practices that bring meaning and purpose to life. This connection inspires and motivates individuals to strive toward their highest potential. It fosters faith, hope, peace, and a sense of empowerment. As a result, people may experience greater joy, the capacity to forgive themselves and others, acceptance of life's challenges and mortality, enhanced emotional and physical well-being, and the ability to rise above the limitations of human existence.

### ***Meaning of Religiosity***

Similar to spirituality, religiosity is also a complex and difficult-to-define concept (Holdcroft, 2006). Religiosity typically refers to the adherence to specific religious beliefs, practices, and rituals (Bergan & McConatha, 2001). It often involves participation in organized religion, including attending services, following religious doctrines, and engaging in communal worship. Religiosity is usually more structured and tied to specific traditions, religions and communities (Riegel, 2020). For example, the Duke University Religion Index (DURELL) measures religiosity with five items related to religion (Koenig & Büssing, 2010).

Donaldson et al. (2019) studied how young people define religiosity and spirituality through a qualitative and quantitative study and found that relationship to God or Higher Being, and "belief" or regarding God or a Higher Being are two main themes young people use to define spirituality. Three main themes for the definition of religiosity are: "Belief" or a "set of beliefs"; community affiliation sharing similar beliefs/religion; and ways of living, practices, rituals or traditions related to one's beliefs. The study further found that the majority of participants treated the two terms as slightly different but highly related concepts.

The connection between religiosity/spirituality and health has become a subject of increasing interest particularly within the field of health care research (Berry, 2005; de Diego-Cordero et al., 2022; Mishra et al., 2017). Zwingmann et al. (2011) suggested that the broad conceptualisation of spirituality may be less specific for particular religious denominations and measures of religiosity/spirituality can focus on quite different components, with religiosity as an integral aspect of a broader concept of spirituality and there are growing number of people identifying themselves as spiritual but not religious.

The above literature suggests that we need to specify the context and meaning of the study of religiosity/Spirituality in order to have a clearer definition and measurement of religiosity. Hence, this study defines religiosity in relation to Christianity and it can also be interpreted as Christian Religiosity or Christian Spirituality. Mansager (2000) pointed out that the term "spirituality" was fashioned by St. Paul, the major contributor to Christian Scripture. In this study, we study Religiosity (Christian Religiosity) from the Christian perspective and use the Bible and other research findings related to religiosity/spirituality as main sources of reference.

Thurston (2005) suggested that Christian spirituality is "what the early Christians did to put into practice what they believed. It was what they did to respond to a world filled with the presence of God and the risen Christ". From this perspective, Religiosity or Christian spirituality can be interpreted as how believers seek to respond to God's calling, grow in their relationship with God, live out their faith, and serve others. It is a holistic approach that integrates personal devotion, communal worship, and active service, ultimately aiming for transformation and a deeper connection with the divine. Villegas (2018) refers to Christian spirituality as the central beliefs in and relationship with God, and the transformation through the grace to follow and imitate Jesus.

### ***Definition of Religiosity in this Study***

This study adopts the interpretation of Religiosity (Christian spirituality) as the belief and practice of a personal relationship with God through Jesus Christ, nurtured through prayer, worship, and studying the Scriptures, with the goal of growing closer to God and understanding His will for their lives. In order to understand the concept and to develop a scale for measuring Christian Religiosity according to the above interpretation of religiosity, this study will adopt an approach of reviewing features of some well received measurement scales of religiosity, the teaching of the Bible and the practice of churches in Hong Kong to find out the key features of religiosity.

### ***Measurement Scales of Religiosity***

There are more than 177 scales for measuring religiosity but very few integrated efforts were found at defining the constructs of religion or religiosity (Cutting & Walsh, 2008). A review of the publication Measures of Religiosity (Hill & Hood, 1999) shows that scales measuring religiosity vary with the religions and the constructs measured. There are 17 broad categories of scales and for each category, there are many scales developed. For example, concerning the category of religious beliefs and practices, there are 21 scales. Some of them are Christian Conservatism Scale (Stellway, 1973), and Scripture Literalism Scale (Hogge & Friedman, 1967). There are 13 scales for Religious Attitudes and an example is Religion Scale (Bardis, 1961).

Cutting and Walsh (2008) observed that in the mid-20th century, religiosity typically was measured by asking participants if they identified with a denomination. Researchers then asked about membership in religious

organisations and involvement in religious activities, attitudes and beliefs. Most scales were developed with quantitative method. Confirmatory Factor Analysis of religious scales showed that the factors measured may not be invariant across culture (Brewczynski & MacDonald, 2006). Hence, in developing measurement scale, an important question of what and who are being measured must be addressed (Cutting & Walsh, 2008).

### ***Religiosity According to the Bible***

To address the question of “what” to be measured by a religiosity scale for Hong Kong Christians, it is proposed that the elements related to the construct of religiosity can be identified through a review of the Bible. The study of religiosity encompasses the various dimensions through which individuals express their spiritual beliefs and practices. For Christians, the Bible serves as a foundational text, rich with doctrines, narratives, and ethical guidelines that shape their faith. Utilizing the Bible to develop a religiosity scale for Christians is not only appropriate but essential for capturing the multifaceted nature of Christian belief and practice. Hence, using the Bible as a basis for a religiosity scale enhances the empirical validity and reliability of the measurement.

Through a review of the Bible, the following constructs, namely, relationship with God, prayer, scripture study, rituals, community and service are related to measurement of religiosity.

### ***Relationship with God***

At the core of Christian spirituality is the belief in a personal relationship with God through Jesus Christ. Jesus Christ said: "I am the vine; you are the branches. Whoever abides in me and I in them bears much fruit, because apart from me you can do nothing." (John 15:5). James advised Christians to "Draw near to God, and he will draw near to you." (James 4:8). This relationship is nurtured through prayer, worship, and studying the Scriptures, allowing individuals to transform through growing closer to God and understanding His will for their lives.

Comparing the teaching of the Bible stressing the importance of relationship with God, the Centrality of Religiosity Scale (CRS), Francis Scale of Attitude Toward Christianity (FAC) and the DURELL also have an item related to the belief or experience of the presence of God, respectively. Hence, this study proposes that the relationship with God is one key aspect related to religiosity.

### ***Prayer***

A review of the Bible shows that prayer includes various forms, such as asking God for help or guidance, thanksgiving, and contemplative prayer (Philippians 4:6-7). Jesus set the example of the importance of prayer (John 18:1; Luke 11:1, 22:44; Mark 14:39), and taught His disciples to pray (Luke 11:2). Paul attached importance to prayer as expressed in his letters to churches (Colossians 1:3; Thessalonian 5:17). Prayer is a fundamental practice in Christian spirituality. Prayer is one aspect related to religiosity in CRS, FAC and DURELL. From the above review, prayer is proposed to be one key aspect related to religiosity.

### ***Scripture Study***

Reading and meditating on the Bible is essential for understanding God's nature and His plans for humanity (Psalm 119:105). Scripture serves as a guide for moral and ethical living, providing wisdom and insights into the Christian faith (2 Timothy 3:16-17). Living according to the teaching of the Bible will guide one to become righteous and be blessed by God (Psalm 119: 1-3). Bible reading is one aspect related to religiosity in the CRS and FAC. Hence, Bible reading is proposed to be a key aspect related to religiosity in this study.

### ***Sacraments and Rituals***

Christian spirituality often involves participation in sacraments, such as baptism and communion, which are seen as means of grace (Matthew 28:19; 1 Corinthians 11:23-26). These rituals help believers connect with the historical and communal aspects of faith. Attending church meetings or religious activities is one aspect of religiosity in DURELL, FAC and CRS. In this study, it is proposed that sacraments and rituals will also be one key aspect of religiosity.

### ***Community, Service and Evangelising***

Connected to a religious community is an item for measuring religiosity in CRS. Engaging with a community of believers is vital for spiritual growth (Acts 2:42; Hebrews 10:24-25). Fellowship in the church provides support, accountability, and encouragement, fostering a sense of belonging and shared faith. Christian spirituality emphasizes the call to serve others in the Church, reflecting Christ's love and compassion (Acts 6:1-6). Acts of service and social justice are integral to living out one's faith, embodying the principles of love and humility (Matthew 25:40). Hence, another key aspect of religiosity will include activities related to community, service and evangelizing.

### ***Donations/Tithing***

Donation/Tithing is not treated as an aspect of religiosity in CRS, FAC and DURELL. However, the concept of tithing can be traced back to the Old Testament, where it is established as a commandment for the Israelites. In Leviticus 27:30, it is stated, "A tithe of everything from the land, whether grain from the soil or fruit from the trees,

belongs to the Lord; it is holy to the Lord." In contemporary Christianity, tithing is often viewed as a tangible expression of one's faith. Many churches encourage their members to tithe as a demonstration of trust in God's provision. This act of giving can signify a deeper commitment to one's faith community and the church's mission.

The act of donation/tithing can also serve as a personal spiritual discipline, encouraging believers to prioritize their faith in financial decisions. This prioritization reflects the teachings of Jesus, who emphasized the importance of where one places their treasure (Matthew 6:21). Thus, tithing becomes not merely a financial obligation but a spiritual practice that enhances one's relationship with God and the church.

Tithing can serve as a significant measure of religiosity for several reasons. First, it provides a quantifiable way to assess an individual's commitment to their faith community. Regular contributions signal active participation and investment in the church's mission. Second, the willingness to tithe often reflects personal convictions about stewardship, faithfulness and a deeper relationship with God. For many believers, the act of giving is a demonstration of obedience to God's commands and recognition of His blessings. Hence, donation/tithing is proposed to be an important aspect of Christian religiosity in this study.

## **REVIEW OF FOUR RELIGIOSITY SCALES**

This study reviewed some well-received and validated scales for measuring religiosity across different countries. Through comparing the following four scales, this study tries to compare the constructs and dimensions measured with the above six dimensions identified from the Bible.

### **Centrality of Religiosity Scale (CRS)**

The Centrality of Religious Scale (Huber & Huber, 2012; Riegel, 2020; Zarzycka et al., 2020) is a measure of the centrality or importance of religious meanings in personality that has been applied in more than 100 studies in 25 countries with validity and reliability for countries with different cultures and contexts. Lee and Kuang (2020) applied the Centrality of Religiosity Scale (CRS) to the context of Hong Kong on a specific target group of teachers and validated the scale in the Hong Kong context, using different versions, including CRSi-20, CRS-15, CRSi-14, CRS-10, CRSi-7, and CRS-5. The CRS-5 was confirmed by the Confirmatory Factor Analysis to have the better fit indices than all the other versions. The study showed that CRS is also applicable to Hong Kong with validity and reliability.

There are five dimensions of religiosity in the CRS: Intellectual, Ideology, Public Practice, Private Practice and Experience (Huber & Huber, 2012). The CRS-5 consists of one item from each dimension and captures the five dimensions with a measure of the general intensity of the personal religious construct system. The scale can also be applied to different religions. Using the lens of CRS to view the different aspects of Christian religiosity found by a review of the Bible above, the scripture study and relation with God can be interpreted as related to intellectual and ideology dimension of CRS. Prayer, meditation, sacraments and rituals are related to private and public practice. Relations with God, community, service and evangelism are related to the experience dimension. Hence, the five dimensions of the CRS have constructs similar to different aspects of religiosity supported by the Bible. The proposed five aspects of Christian religiosity may offer a scale more relevant to Christians in Hong Kong with construct validity similar to CRS.

### **The Duke University Religion Index (DURELL)**

The Duke University Religion Index (DURELL) is a five-item measure of religiosity supported by many studies (Koenig & Büssing, 2010). There are three dimensions: organizational, non-organisational and intrinsic/subjective religiosity. Three items of the scale are taken from Dean Hoge's 10-item Intrinsic Religiosity scale and two from large National Institutes of Health supported community and clinical studies in North Carolina.

A comparison of the five items of the DURELL shows that the three dimensions, which are not specific to Christianity, are also related to various aspects of Christian Religiosity proposed with reference to the Bible. Hence, the proposed Biblical aspects of Christian Religiosity are also supported by the construct of DURELL.

### **Attitudes towards Christianity (FAC)**

Francis Scale of Attitude towards Christianity (Campo-Arias et al., 2009; Ceballos et al., 2015; Riegel, 2020) is a religiosity scale with a one-dimensional measure of attitude towards five key features of Christianity, namely, God, Jesus, the Bible, church and prayer, which are quite similar to the various aspects of religiosity with reference to the Bible. The scale has been translated to different languages with validity and reliability in measurement. Furthermore, it can be modified to measure religiosity for other religions such as Islam (Hamid et al., 2016) and Hinduism (Francis et al., 2008).

Riegel (2020) found that FAC and CRS generate approximately the same measurement with correlation coefficient at 0.92. Hence, the proposed aspects of Christian Religiosity are also measuring constructs similar to FAC.

### **Religious Commitment Inventory (RCI)**

Worthington et al. (2003) developed and validated a 10-item RCI with Christian church-attending adults, College students, Buddhists, Muslims, Hindus and non-religious people. The 10 items measure two dimensions of religious commitment, namely intrapersonal religious commitment and interpersonal religious commitment as supported by exploratory factor analysis. The intrapersonal commitment is related to religious belief and its influence on dealings in life, private practices and religious readings. The interpersonal commitment is related to enjoyment, religious activities and financial contributions to religious organisation. The concepts of intrapersonal and inter-personal commitment can also be seen as related to the various aspects of Christian Religiosity developed in this study with reference to the Bible. Relationship with God, rituals, community, service and evangelising belong to extra-personal commitment, and prayer, bible study are related to inter-personal commitment.

### **Measurement of Religiosity across Cultures**

Koenig and Carey (2024) analysed studies in measuring religiosity across cultures and nations with data covering 60 countries with samples of persons aged 18 or older. The findings of their study showed that importances of God, importance of religion, frequency of praying, confidence in institutions, belief in God are the most invariant items. Importance of religion was found to be the most promising item for measuring religiosity in terms of invariance across countries. It can be seen that the above invariant items are also closely related to various aspects of religiosity developed through reviewing the Bible.

### **Proposed Religiosity Scale for this Study**

With the above literature review, this study proposes that the items for measuring Christian religiosity should cover prayer, relationship and importance of God through studying and acting according to the Bible, confidence in church, participation in evangelism and donations.

## **METHODOLOGY**

### **Development of the Measurement Scale**

In order to develop the measurement scale of a scale for measurement of Christian Religiosity with a review based on the Bible which can be used for the context of Christians in Hong Kong, Christian Religiosity is defined as how Christians seek to grow in their relationship with God, live out their faith according to the Bible, and serve others.

A scale with six items for the measurement of Christian Religiosity went through the following stages of development according to Hinkin (1995): (1) reviewing the Bible, related literature and instruments already developed and collecting input from academics with expertise in the area; (2) proposing constructs related to this study and defining the constructs to be measured; (3) developing instruments according to the proposed constructs and regarding instruments used in other studies; (4) seeking comments from focus groups and experts to refine the proposed instruments; (5) collecting data to validate the instruments by a pilot study; (6) conducting confirmatory factor analysis to validate the instruments.

The questionnaire adopted a 7-point Likert scale ranging from 1 as “very not agreeable” to 7 as “very agreeable” to the statement. There are six items in Chinese measuring respondents’ religiosity according to the literature review:

1. I always pray
2. I always study the Bible
3. I live according to the teaching of the Bible
4. I attach importance to practising evangelism
5. Through faith, I have confidence in facing the future.
6. I am happy to donate money to the church.

### **Sample and Procedure**

The questionnaire was distributed online to Christians at different time slots in September 2024. Respondents were asked to complete an online version of the questionnaire. A total of 400 completed responses were received and analysed from Christians coming from 150 churches in Hong Kong. There are around 1000 churches in Hong Kong; the sample covers Christians from around 15% of the churches in Hong Kong.

## DATA ANALYSIS AND RESULTS

### Demographic Data

This study collects demographic data of the respondents in line with the suggestion to include the norm groups (Cutting & Walsh, 2008). There are 400 respondents and all of them are ethnic Chinese coming from 67 Christian churches in Hong Kong. 176 (44%) of respondents are male and 224(56%) are female. Table-1, Table-2, and Table-3 shows the age distribution, years of accepting Christianity and years of attending churches respectively. 220 (55%) of respondents have experience in taking up some services in the Church and 180 (45%) have no service experience. The number of members of churches attended by respondents is reported in Table-4. The age ranges from under 20 to above 60, with 44.5% below age 50, 16.8% below the age of 30, and 10% below the age of 20. The above age distribution is quite similar to the 2024 census, which showed that 13.2% of church members in Hong Kong are young. 37% of respondents attend church less than 20 years, and 11.3% less than 5 years. 55% of respondents have experience in serving in the church with 69.5% of respondents having less than 10 years of experience in serving.

**Table 1.** Frequency Table

Age	N	%
20 and below	40	10
21 – 30	27	6.8
31 – 40	30	7.5
41 – 50	81	20.3
51 – 60	112	28
60+	110	27.5
<b>Total</b>	<b>400</b>	<b>100</b>

**Table 2.** Years become a Christian

Years	N	%
5 and below	39	9.8
6 – 10	24	6
11 – 20	65	16.3
21– 30	89	22.3
30+	183	45.8
<b>Total</b>	<b>400</b>	<b>100</b>

**Table 3.** Church Worship Attendance Numbers

Numbers of Person	N	%
50 and below	54	13.5
51 – 100	65	16.3
101 – 150	57	14.2
151 – 200	55	13.8
201 – 500	93	23.3
501 – 1000	41	10.3
1000+	35	8.8
<b>Total</b>	<b>400</b>	<b>100</b>

### Confirmatory Factor Analysis (CFA)

A confirmatory factor analysis with Amos version 29 was conducted to test the validity of model. The result of analyses supports the distinct factors with an excellent fit (CFI: 0.995; IFI: 0.995; RMSEA: 0.047;  $p$  for Chi Square = 0.078). The standardized regression weight of all items on the factor ranges from 0.659 to 0.851. The Cronbach's Alpha reliability of the scale is 0.870. In CFA, the testing criterion of a good model using Chi Square is  $p > 0.05$ . This criterion is quite challenging to achieve with a relatively large sample. In this study, all the criteria of an excellent model are fulfilled. Hence, it can be concluded that the measurement model has excellent

reliability and validity.

After confirming the factorial structure of the religiosity scale, the respondents are divided into five groups, namely, the whole set of respondents, male respondents, female respondents, respondents with service experience and respondents without service experience, to test the invariance property among the five groups using the multiple-group CFA. The results from AMOS version 29 are presented in **Table-4**. All invariance models demonstrated sufficient fitness to the data by themselves for all alternative fit indices. Furthermore, according to Putnick & Bornstein (2016) suggestion on traditional criteria ( $\Delta$ CFI of no more than 0.01 for measurement invariance tests), the configural, weak (measurement weights) and strong invariance (Structural covariance) between the five groups were supported, indicating that all of corresponding intercept and loadings between the five groups were identical. The strict model (measurement residuals) is not supported as indicated by the change in CFI of 0.034.

**Table 4.** Church Worship Attendance Numbers

Model	CMIN/DF	DF	CFI	Change in CFI	RMSEA	Support
Configural	2.582	35	0.983		0.036	Yes
Measurement Weights	1.881	55	0.985	0.002	0.027	Yes
Structural Covariance	2.053	59	0.981	-0.004	0.03	Yes
Measurement Residuals	2.356	91	0.961	-0.02	0.034	no

### Demographic and Descriptive Statistics

The means of the religiosity scale is 5.422 with a standard deviation of 0.9218 and a t-value of 30.854 compared to 4, the mean of a 7-point scale. The results show that the means of religiosity of the respondents are higher than the mean at a significance level smaller than 0.001, and respondents have quite positive perceptions of their religiosity.

There were 224 (56%) females and 176 (44%) males who responded to the questionnaire. The age ranges from under 20 to above 60, with 44.5% below age 50, 16.8% below the age of 30, and 10% below the age of 20. The above age distribution is quite similar to the 2024 census, which showed that 13.2% of church members in Hong Kong are young. 37% of respondents attend church less than 20 years, and 11.3% less than 5 years. 55% of respondents have experience in serving in the church with 69.5% of respondents having less than 10 years of experience in serving.

The correlations between religiosity and age, years of participation in church and years of having service experience are all significant as reported in **Table-5**.

**Table-5:** Correlations among Variables

Variable	1	2	3	4	5
1. Religiosity	—	.29*	.26*	.26*	.27*
2. Age	.29*	—	.68*	.63*	.38*
3. Years of Faith	.26*	.68*	—	.87*	.44*
4. Years Attending	.26*	.63*	.87*	—	.46*
5. Years of Service	.27*	.38*	.44*	.46*	—

\*p < .01

### Effects of Service and Gender on Church Life, Religiosity and Wellness

#### Service

T-test was also applied to check whether there is significant difference in religiosity between Christians with and without service for the three variables. The results show that Christians with service experience have significantly higher scores for religiosity as compared to those with no experience in service. This result suggests that Christians participating in service in a church have higher religiosity than those who do not serve in a church.

T-test was applied to check whether there is significant difference between different sexes. The results show that male Christians have significantly higher scores for religiosity as compared to female Christians. This result

is in the opposite direction of findings of some studies.

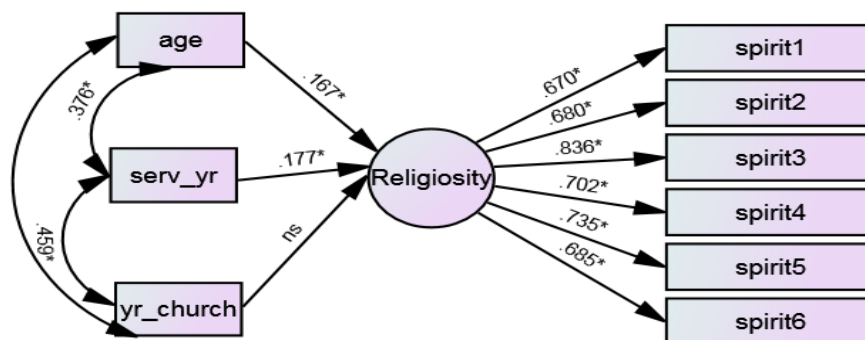
However, by controlling the service variable through using Christians with service or without service to conduct a t-test for the difference between sexes, the results show that there is no significant difference in religiosity between different genders.

### **Age, experience in church attendance and Service**

Correlation analyses in Table-5 show that age, experience in church attendance and service all have significant correlations with religiosity. However, the correlations between the personal factors are much stronger than their correlations with religiosity. To test the relations between personal factors and religiosity, multiple regression analyses with religiosity as dependent variables and age, the years of attending church and years of service as independent variables are conducted. The results show that religiosity is significantly affected by the three independent variables together with variance explained at 8.2% for religiosity. With stepwise regression, only the years of service and age have significant association with religiosity. The regression analysis shows that experience of service and age are the main personal factors significantly associated with religiosity. Structural Equation Model, a better statistical analysis of the relationships between variables as compared to multiple regressions, is conducted to examine the relationships between personal variables and religiosity.

### **Structural Equation Modelling (SEM)**

The above analyses show that there are significant relationships among various factors. Structural equation model is used to further analyse the relationships between variables. The model is put forward for analysis by AMOS version 29 and the results are shown in Figure-1. Structural Equation Model shows that the data have good fit indices with the theoretical framework (CFI=0.968; IFI=0.968; RMSEA= 0.072). Concerning the paths between the three personal variables and religiosity, only two paths, the path from years of service and age, have significant effects on religiosity, respectively.



**Figure 1.** The Theoretical Model with results

## **DISCUSSION**

### **Validity of Questionnaire**

The development and validation of the measurement scale for Religiosity can provide an instrument for measuring religiosity for Christians with Chinese context in future studies with validity and reliability. Since the questionnaire was in Chinese and validated by responses from Christians in Hong Kong, further studies are needed to confirm whether the scales can measure the construct for Christians with different cultures and locations. The questionnaire has the advantage of being relatively short compared to other validated scales and specially designed for Christians with reference to the Bible.

The term religiosity can be described as Christian spirituality, which is closely related to the religion practiced by Christians. The questionnaire for religiosity in this study is developed with reference to other validated questionnaires, the teaching of the Bible and the context of Christianity. Whether the items for measuring religiosity are suitable for other religions needs further studies.

### **Effects of Service**

T-test shows that Christians with service have higher perception in religiosity than Christians without service. Although the T-test shows that male Christians have higher perception in religiosity than female Christians, after controlling for the variable service, there is no significant difference among sex. The results show that service experience has determining positive effects on religiosity but not the gender factor. The result that gender has no significant effect on religiosity differs from other studies that find females are more religious.

In addition to the effect of having service experience or not, the relationships between the years of attending church, the age and the years of participating in serving and religiosity are analysed by the structural equation model. The result shows that only the years of service and age have significant effects on religiosity. The total variance of religiosity explained by years of service in church and age is 11.8%. The standardised direct effect of years of service and age are 0.177 and 0.167 respectively.

The findings suggest that participating in service has positive effects on religiosity. Furthermore, the longer the service experience, the larger effects will be. The results have significant implication for churches. The great commission calls for making disciples of all the nations (Matthew 28: 19-20) can be interpreted as attaching importance to the growth of the church with more members. Christians in the early church had the characteristics of being very religious to witness their faith even under severe persecution. As a result of their religiosity, the early church grew very quickly. Improving the religiosity of Christians under the present declining number of members experienced by churches in Hong Kong after COVID-19 may help churches to respond to the great commission and increase the number of church members. The finding in this study suggests that church should attach importance to teaching, encouraging and empowering members to participate in services as an effective way to achieve the mission and lead a religious life journey. Further studies are needed to find out how and what factors can mobilise members of the church to actively participate in serving.

In the early church, persecution and difficulties encountered had positive effects on the development of the church. Although the number of Christians attending church services dropped substantially after COVID-19, the findings in this study show that Christians remaining in the church have very positive perceptions of their religiosity. With high perception on religiosity, Christians may play a pivotal role in the further development of the church after COVID-19 if they can step up their service in the church and witness the positive effects of religiosity in life through their connection to the church.

## **CONCLUSION**

The questionnaire developed in this study to measure religiosity is reliable and valid, with invariance property among the five groups, namely the whole set of respondents, male respondents, female respondents, respondents with service experience and respondents without service experience. It may be used in future studies. Prayer, studying the Bible, living according to the teaching of the Bible, practising evangelism, facing the future with faith and donation to the church are found to be important aspects and can be used to measure religiosity for Christians in this study. Serving in the Church and the years of service have positive effects on religiosity. There is no significant difference between male and female after controlling for other variables such as experience of serving in the church.

Although churches in Hong Kong experienced a substantial drop in members after the social events and COVID-19, the Christians responding to this study show positive perceptions of their religiosity. The results of this study cast light on what actions should be taken by churches in Hong Kong to fulfill the vision and mission of spreading the gospel and converting more people to Christianity. Importance should be attached to motivating more members to serve and pursue religiosity according to the Bible. The results of such action will have positive effects not only on the Church but also on the wellness of every Christian who follows the Church's direction. Motivating Christians to serve in their church needs outstanding church leadership. Further research on how leadership influences church life, religiosity and wellness of Christians deserves special attention.

## **LIMITATIONS**

The sample only includes Chinese Christians in Hong Kong. Further research in other places with different cultures, ethnic groups and contextual factors is needed to cast more light on the validity of the questionnaire on measuring Christian Religiosity.

### **Consent for Publication**

The Authors hereby provide consent for publication by the Publisher.

### **Availability of Data and Material**

The Data and Raw Materials deployed in this research are available for access (under copyright) by the Corresponding Author.

### **Competing Interests**

The author declares NO conflict of interest. There are no other third parties in the design of the study, in the collection, analyses, or interpretation of data, in the writing of the manuscript, or in the decision to publish the

results.

### Funding Declaration

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### Ethics Approval and Consent to Participate

The investigations were conducted in accordance with the principles outlined in the Declaration of Helsinki (1975, revised in 2013). According to point 23 of this declaration, approval must be obtained from the local Ethical Committee or Institutional Review Board (IRB) prior to conducting the research, ensuring that the study adheres to both national and international guidelines. More information can be found at:

[https://www.mdpi.com/ethics#\\_bookmark9](https://www.mdpi.com/ethics#_bookmark9)

Ethical approval was granted by the Research and Ethics Committee of the Gratia Christian College with the details listed below. Written informed consents were obtained and recorded. Since this research is not involved in any tests on human bodies, there is no need for ethics approval and consent to participate.

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