Chapter 4: Model Testing

In the last chapter, eight new religious orientations and four religious suborientations were introduced, along with an inventory (the CROI) that was designed to measure these religious orientations. The last chapter also presented evidence that these orientations were distinct and could be measured reliably in both America and Romania. In this chapter, we will explore whether there is a theoretical model that can help understand the new orientations as well as shed new light on the established religious orientations (see Chapter 5).

A theoretical model should ideally provide a comprehensive understand of a phenomenon. This means that a theoretical model should be able to incorporate, explain and summarize current and past findings. This also means that a theoretical model should also be able to suggest meaningful empirical research.

Yet, all theoretical models that are empirically meaningful assume two things: 1) that the phenomenon in question is identifiable and 2) that it behaves at least somewhat consistently across time and situations. I.e., theoretical models useful to science assume that the phenomenon can be empirically identified (and can therefore be empirically studied), and that the phenomenon behaves in a consistent, non-random fashion (which allows for its effects to be predicted). In short, without the ability to identify the phenomenon and without at least some consistency in its behavior, there can be no theoretical models of scientific interest.

In regards to religious orientation, this means that the religious orientations must be identifiable and must behave in at least a somewhat consistent manner before a theoretical model can even be introduced. The last chapter showed some preliminary evidence that each of the eight orientations are indeed identifiable via factor analysis in both Romania and America. Thus, the first criterion for the introduction of a theoretical model appears to be met. However, it is still unclear whether the CROI orientations behave at least somewhat consistently across situations, time, and groups.[1] As the most basic model regarding the CROI orientations would simply predict the relationships between the orientations, it appears that an examination of the stability of the relationships between the CROI orientations would be a logical first step toward a model of religious orientation. Accordingly, evidence needs to be shown that the relationships between the CROI orientations form a consistent pattern.

There are many statistical techniques that can be employed to show that the CROI orientations relate consistently to each other. However, to make things easier, it would probably be best if the same statistical method that is used to check the CROI's structure is also used to test the various model of religious orientation that may be able to explain the CROI's structure. Luckily, there are several methods that would allow both model testing and a study of the relationships between the orientations, which enables us to pick the most appropriate method for both purposes.

The first, and most basic method would be to calculate the correlations between all the measures. This method is one of the easiest ways to study the relationships between variables. Yet, there are a couple problems with this approach. First, since the CROI has 10 principle scales, the correlation matrix will be very difficult to make sense out of. I.e., it may be hard to see a pattern (the forest) when presented with 45 correlations (the trees). This problem is compounded by the fact that there is not just one sample, but six samples in two cultures. In addition, examining the correlation matrixes does not provide any way to objectively test between the various models of religious orientation. I.e., there are no clear decision-making rules that can be used in model testing with this approach, which means a large degree of subjectivity would be present in whatever conclusions would be made.

Another possibility lies in factor analyzing the CROI scales, much like the CROI items were studied in the previous chapter. However, the use of factor analysis (again) would force the user to look at, and make sense of, multiple matrixes of numbers. As this can be difficult to do, especially for those who are not very familiar with factor analysis, it may be difficult to build a convincing theoretical model using factor analysis at this point. Plus, with factor analysis there is a danger of overlooking theoretically important dimensions, especially if these dimensions are correlated with other, larger dimensions and are represented by only one or two scales.

Multidimensional scaling is another method that would allow for an examination of the relationships between the CROI as well as model testing. "Multidimensional scaling (MDS) is a method that represents measurements of similarity (or dissimilarity) among pairs of objects as distances between points of a low-dimensional multidimensional space" (Borg & Groenen, 1997, p. 1). As correlations are basically measurements of the similarity between two objects, the use of MDS would therefore enable us to literally look at a graphic representation of a correlation matrix and visually inspect its structure. It thus

makes it very easy to see patterns in data. In addition, MDS provides a distinct set of rules that can be used to decide the number of dimensions that best represent the data, thereby reducing the subjectivity of model testing. However, as in factor analysis, there is a danger that MDS may overlook theoretically important dimensions, especially if these dimensions are only represented by only one or two scales.

In short, there are several statistical methods that would allow us to study the pattern of relationships between the CROI orientations as well as to perform model testing. Studying either the correlation matrixes or performing factor analysis on the CROI scales would be exceedingly difficult, and the results of both approaches may be somewhat questionable. On the other hand, MDS is relatively easy to use and has clear decision-making rules to make model testing more objective. Thus, it appears that using MDS would be the best way to study the CROI's structure.

Multidimensional Scaling and the CROI

MDS can be used to study the pattern of relationship between the CROI orientations through a simple two-step process. First, the number of dimensions that best represent the CROI need to be identified. Second, the structure of the CROI needs to be visually examined in terms of the number of dimensions that have been previously identified.

As was stated earlier, MDS can be used to graphically display the similarities (or dissimilarities) between the CROI scales in a multidimensional space. However, the number of dimensions will greatly affect how accurately the graphic depiction corresponds to the real similarities (distances) between the scales, with a perfect depiction potentially requiring nearly as many dimensions as there are scales. Yet, a ten dimensional depiction of ten scales, though perfectly depicting the data, would reveal no more information than a simple correlation matrix would. Because of this, MDS is usually made to depict the similarities between the 10 scales as *approximately* as can be done in 9 or less dimensions. In addition, when real data are being used, the presence of error (due to measurement imprecision, unreliability, sampling effects, etc.) further ensures that MDS representations are just approximations of the real structure.

To try to help the user evaluate how good an MDS configuration represents the data, MDS provides a "badness-of-fit" measure, which is typically referred to as "stress." This "badness-of-fit"

measure (stress) also allows the user to determine the number of dimensions needed to best illustrate the data. This can done by looking at the amounts of stress that various dimensional configurations have, with the correct number of dimensions being found at the point in which the addition of more dimensions creates a much smaller decrease in stress than was created by the addition of the current dimension. The logic behind this approach is that at this point of diminishing returns, additional dimensions are thought to only help represent the error contained in the sample and are not substantial (Borg & Groenen, 1997). In short, the proper dimensionality of MDS solutions is determined through the use of a scree plot, much like is commonly done in factor analysis.

In order to determine the proper solution for the CROI scales, the stress for one to five dimensions in the 3 US samples and 7 Romanian samples with over 100 participants were computed using ordinal MDS based on the Euclidean distances calculated between the ten CROI scales. In all 10 samples, there is a large "elbow" in the stress at two dimensions. This suggests that two dimensions are all that is needed to accurately represent the CROI in MDS. Moreover, the average stress of the two-dimensional configurations was good (average stress = .05), which suggests the configuration fit the data quite well (Borg & Groenen, 1997, p. 38). Figure 4.1 displays the mean US and Romanian stress values for each of the five dimensions.

Figure 4.1: The mean stress for one- to five-dimensional MDS solutions
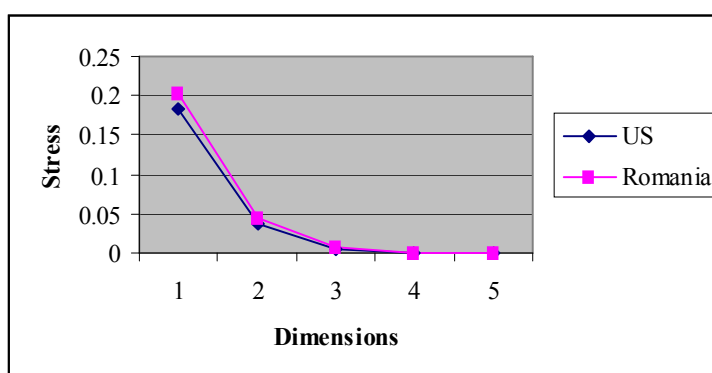
Next, an interpretation of the dimensions was attempted. In every sample, the two dimensions appeared to represent committed versus uncommitted orientations and reflective versus unreflective

orientations. Figures 4.2 shows the MDS configuration for the largest Romanian sample (Romanian

sample 4) and Figure 4.3 shows the MDS configuration for the largest American sample that completed the

original version of the CROI (American sample 3). The similarity of these two configurations is striking,

with the commitment dimensions correlating at .80 and the reflectivity dimension correlating at .93, despite

the fact that procrustean rotations were not yet employed (see Table 4.1). Interpretation standards have not

yet been established in the use of correlations in the manner in MDS (Borg & Groenen, 1997; Borg &

Leutner, 1985; Langeheine, 1982), but by using the standards derived from factor analysis (c.f., Church &

Burke, 1994; McCrae et al., 1996; van de Vijver & Leung, 1997) it would appear that the reflectivity

dimension is invariant across cultures and that the commitment dimension is similar in both cultures. In

fact, the only apparent differences between the configurations is that the Rewards and Punishments

orientation (Gain and Punishment) is more closely related to the Religiosity orientation (Centrality and

Personal) in the Romanian sample, and that Doubt, Tentativeness, and Dialog appear to have shifted around

in regards to their placement on the commitment dimension in both cultures. In short, while the

dimensions are the same in both cultures and all of the orientations are located in pretty much the same

regions in both cultures, there is some evidence that a few orientations may shift a little around within the

region of the configuration. For example, Tentativeness, Doubt and Dialog are always found together.

However, Dialog is the most committed of these orientations in the US and the least committed of these

orientations in Romania.

Table 4.1 : CROI Configuration in Romania and America

	Romanian		American	
	Commitment	Reflectivity	Commitment	Reflectivity
Centrality	-.19	.68	-.98	.50
Personal	-1.15	.53	-1.38	.32
Interest	-.99	-.14	-.95	-.26
Dialog	.34	-.47	-.41	-.70
Tentativeness	-.53	-.80	.49	-.52
Doubt	.00	-.97	.13	-.65
Obligation	1.12	.27	.76	.13
Social	1.68	.12	1.67	.18
Punishment	.14	.29	.35	.28
Gain	-.44	.49	.32	.70

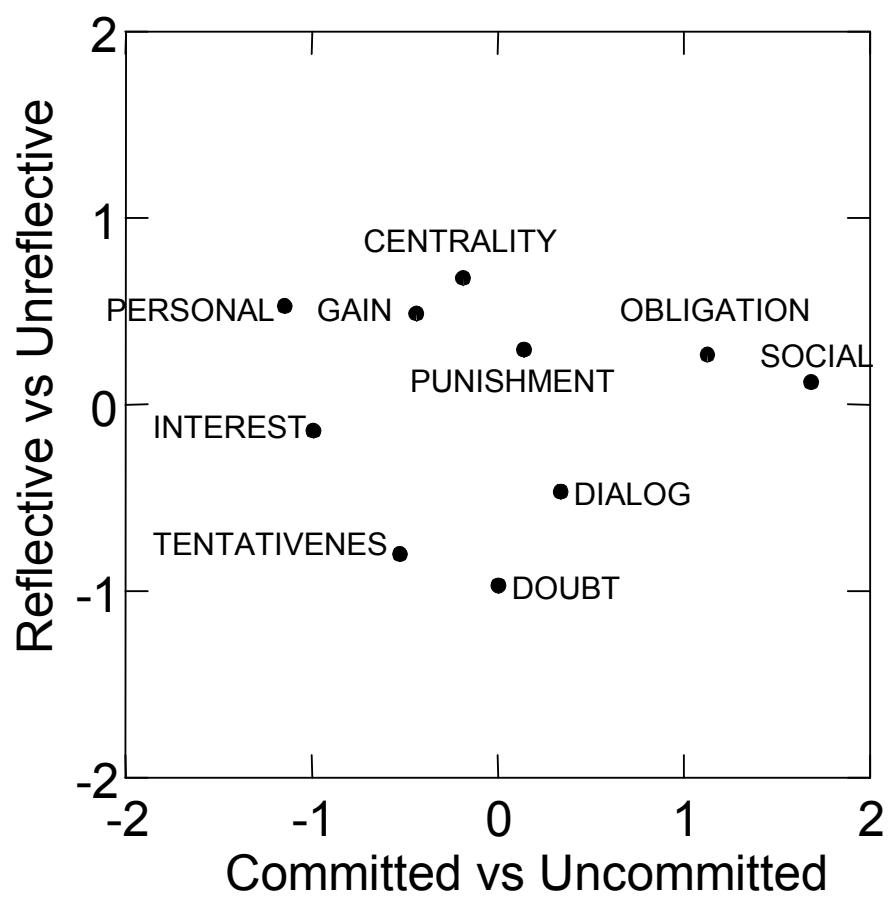Figure 4.2 The configuration of the CROI in a Romanian sample

Figure 4.3: The configuration of the CROI in an American sample
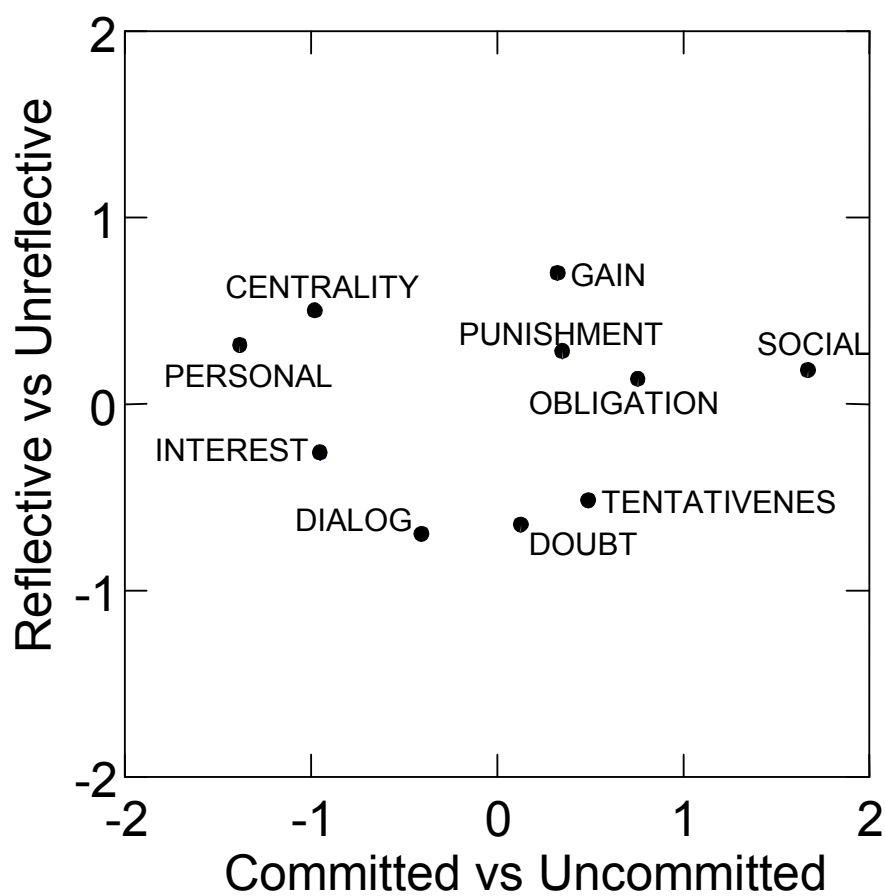
To more thoroughly examine whether the structure of the CROI is stable across samples,

orthogonal procrustean rotations were performed to rotate the configurations of the samples to match the

largest sample from that culture that completed the original version of the CROI (Romanian samples 4, and

American sample 3). Orthogonal procrustean rotations were used in order to "eliminate *apparent*

differences [in two configurations, which are defined as] those [differences] that are not determined by the

data" (Borg & Groenen, p. 339). After these procrustean rotations, the correlations between the dimensions were calculated independently for each culture.

The mean correlation for the commitment dimension was .96 for the three American samples and .95 for the seven Romanian samples. These correlations suggest that the commitment dimension was invariant across the American samples and the Romanian samples. The mean correlation for the reflectivity dimension was .90 for the three American samples and .93 for the seven Romanian samples. These correlations suggest that the reflectivity dimension is invariant across the American and Romanian samples. The mean correlation for the overall configuration was .93 for the three American samples and .94 for the seven Romanian samples, which suggests that the overall configuration was virtually identical across samples in both cultures.

To explore the degree to which the CROI structure is stable across cultures, all the samples were subjected to procrustean rotations to the largest sample available (Romanian sample 4). The correlations between the dimensions were then calculated to determine the stability of the dimensions between the cultures. The mean correlation for the commitment dimension was .83 across cultures (see Table 4.2). The mean correlation for the reflectivity dimension was .90 across cultures. The mean correlation for the overall configuration was .87 across cultures, which indicates a that the configurations were highly similar across cultures, but that were not invariant. In summary, all the samples show quite a bit of similarity to one another, with the larger samples and those completing the revised version of the CROI showing a little more similarity with each other than the smaller samples and those completing the original version did.

Table 4.2 The Similarity of commitment dimension across 10 samples

	RO 3	RO 4	RO 5	RO 6	RO 7	RO 8	RO 9	US 2	US 3
RO 4	.93								
RO 5	.89	.93							
RO 6	.87	.94	.99						
RO 7	.90	.92	.99	.99					
RO 8	.86	.93	.99	1.00	.97				
RO 9	.90	.95	.99	.98	.98	.97			
US 2	**.77**	**.81**	**.81**	**.79**	**.81**	**.76**	**.86**		
US 3	**.72**	**.79**	**.83**	**.84**	**.85**	**.83**	**.85**	.92	
US4	**.77**	**.83**	**.89**	**.88**	**.90**	**.87**	**.91**	.96	.96

Note. Correlations in bold represent correlations between samples from different cultures.

Table 4.3 The Similarity of reflectivity dimension across 10 samples

	RO 3	RO 4	RO 5	RO 6	RO 7	RO 8	RO 9	US 2	US 3
RO 4	.91								
RO 5	.91	.96							
RO 6	.73	.88	.92						
RO 7	.86	.97	.97	.94					
RO 8	.83	.94	.97	.96	.99				
RO 9	.88	.97	.98	.95	.97	.97			
US 2	**.95**	**.89**	**.91**	**.79**	**.86**	**.82**	**.89**		
US 3	**.90**	**.95**	**.95**	**.84**	**.92**	**.92**	**.93**	.88	
US4	**.89**	**.92**	**.96**	**.89**	**.93**	**.92**	**.96**	.94	.89

Note. Correlations in bold represent correlations between samples from different cultures.

In summary, the degree of similarity between samples drawn from the same culture is so high as to suggest near invariance in the structure of the CROI within cultures. In addition, there also exists quite a bit of similarity in the structure of the CROI between cultures, though this degree of similarity is not as great as that which exists within cultures. Overall, the findings suggest that the structure of the CROI is stable enough to posit a single theoretical model for use in both America and Romania.

Models of Religious Orientation

As the CROI structure is so similar in different samples and cultures, it is possible that a single theoretical model can explain the structure of the CROI in both Romanian and America. The MDS results may provide a clue, for they suggest that the structure of the CROI can be understood as a product of two dimensions: commitment and reflectivity. These results would appear to support a new theoretical model of religious orientation. However, the MDS analyses were run and interpreted without any particular theoretical model in mind, which means that it is possible that the established models may be able to best explain the structure of the CROI. This would mean that would be no need for an additional theoretical model. Yet, even if the established models cannot explain the structure of the CROI, it would still be interesting to see where they were inaccurate. Thus, it may be beneficial to review the major models of religious orientation, and then to test how well they fit the data.

Established Models of Religious Orientation

The most famous and influential models of religious orientation are those of Allport and Batson (see Chapter 2). Perhaps one of these models will be able to suitable incorporate the CROI orientations through an accurate series of predictions about how they relate to each other. Yet, if these models do not adequately explain what was found, then it may be beneficial to flesh out the new two-dimensional model in greater detail.

Allport

Allport's theory of religious orientation is probably the best known and most relevant important theory about the structure of religious orientation. Allport's (1950) early theory of religious orientation suggests that the different religious orientations will be organized along a continuum of mature (committed, intrinsically motivated, and reflective religion) versus immature religion (uncommitted, extrinsically motivated, unreflective religion). However, as Batson et al (1993) suggest, Allport's later writings (Allport, 1966a, 1966b; Allport & Ross, 1967) can be interpreted as presenting a slightly different theoretical structure of religious orientation: a continuum of intrinsic (intrinsically motivated, committed

religion) versus extrinsic religion (extrinsically motivated, uncommitted religion) that does not including religious questioning or complexity. Yet, Allport's later writing could also be interpreted in still another way, as predicting a two-dimensional model consisting of intrinsic motivations and extrinsic motivations (c.f., Gorsuch, 1994; Pargament, 1992)

In regards to the CROI orientations, Allport's (1950) early theory of mature versus immature religion seems to make the prediction that the orientations will be located along a single dimension with the more intrinsically motivated orientations (centrality) together with the more reflective orientations (Interest, Dialog, Tentativeness, and Doubt) at one end of the dimension, and the more extrinsically motivated, unreflective orientations (Personal, Gain, Punishment, Social and Obligation) located at the other end of the dimension. Allport's later writings on Intrinsic and Extrinsic religion (1966a, 1966b; Allport & Ross, 1967) can be interpreted in two different ways. First, they can be read as predicting a single dimension of intrinsic *versus* extrinsic religion (Kirkpatrick & Hood, 1990). Second, they can be read as predicting that intrinsic and extrinsic religion will form two distinct regions (Parga

ment, 1992), presumably within a two dimensional configuration.[2] Both of these interpretations of Allport share the central prediction that as religion becomes more central in an individual's life (higher Centrality), the individual would be less likely to use religion in an extrinsically motivated fashion (lower Gain, Punishment, and Personal). However, neither of these models make any predictions about the reflective, questioning CROI orientations (Interest, Dialog, Tentativeness and Doubt), so neither of them can be classified as inclusive models of religious orientation (Batson et al., 1993).

Batson

The second major theory that makes predictions about the structure of religious orientation is Batson and colleagues (Batson & Ventis, 1982; Batson et al., 1993) reformulation of Allport's theory. Batson, like many researchers, noticed that Allport's theories about the structure of religious orientation were not well supported by empirical research. Instead of the single continuum of Intrinsic versus Extrinsically motivated religion that Allport (1950, 1966) hypothesized, the I and E scales appeared to be orthogonal from the very beginning (Allport & Ross, 1967). Like most researchers and theorists have done (Kirkpatrick & Hood 1990), Batson attempted to solve this problem by postulating the existence of

separate, orthogonal dimensions of intrinsically motivated (which Batson terms "religion as an end") and extrinsic motivated religion (which Batson terms "religion as a means"). In addition to this modification of Allport's theory, Batson and colleagues also attempted to reintegrate the complex questioning and reflectivity that was originally a part of Allport's (1950) conception mature and immature, but he thought had disappeared from Allport's later conceptions of intrinsic and extrinsic religion.   Batson did this through the postulation of a third orthogonal dimension of religious orientation: religion as a quest (Q).   In short, Batson and colleagues (Batson & Ventis, 1982; Batson et al, 1993) theorized that religious orientation can be measured along three orthogonal dimensions: religion as an end (intrinsically motivated religion), religion as a means (extrinsically motivated religion), and religion as a quest (complex religious searching and questioning).

In regards to the CROI, Batson's theory could be interpreted as predicting the existence of three different models, which are all mutually exclusive. In the first model, each of the orientations will form an orthogonal dimension of its own, much like I, E and Q form their own dimension in Batson's system.   In other words, in this model there would be no real structure to the CROI; that each orientation will be unrelated to the others and that there would not be a forest in which to place the trees. However, it has already been shown that the CROI orientations form a consistent pattern, so this prediction will not be mentioned further.

In the second model, the CROI orientations would form three distinct regions.   The first region would contain intrinsically motivated orientations (i.e., Centrality, and possibly Doubt and Interest). The second region would contain the extrinsic motivated orientations (i.e., Gain, Punishment, Social, Obligation, and perhaps Personal as well). The third region would contain orientations reflecting complex religious questioning and searching (e.g., Doubt, Tentativeness, Dialog, and Interest). I will call this model Batson's Three-Regional model.

In the third model, the CROI orientations would be aligned along three dimensions. One of these dimensions would represent intrinsic motivations for being religious (Centrality, and possibly Doubt and Interest). The second dimension would represent extrinsic motivations for being religious (Gain, Punishment, Social, Obligation, and perhaps Personal as well). The third dimension would represent

complex religious questioning and searching (Doubt, Tentativeness, Dialog, and Interest). I will call this model Batson's Three-Dimensional model.

Empirical Model Testing

In order to test and compare the various theoretical models, two compatible methods will be used. In the first method, the badness of fit (stress) of each model will be evaluated. In the second method, regions in the MDS configurations in which a majority of the points share a predicted trait (e.g., complexity, intrinsic motivation, extrinsic motivation) will try to be located. The boundaries for each region will be drawn so as to maximize the overall number of correct placements. The results of both these methods will then be summarized, which hopefully will allow the best model to be identified.

Mature versus Immature Religion

Allport's (1950) early theory of mature and immature religion would predict that the CROI would best be presented as a single dimension with two regions representing mature and immature religion. Theoretically, the region representing mature religion should be composed of Interest, Centrality, Dialog, Doubt, and Tentativeness, while the region representing immature religion should be composed of Social, Obligation, Gain, and Punishment. Personal is something of a mixed orientation, so it should be in the middle of the two regions and accordingly will not be scored when calculating the number of correct predictions.

Table 4.4 reviews the results of these analyses. In two of the US samples (US samples 2 and 3) and one of the Romanian samples (sample 3), regions representing mature and immature religion were quite distinct. However, in the other seven samples, the regions were not very distinct, with Gain and Punishment frequently residing in the center of the mature religion region. Personal, which was thought to be a motivationally mixed orientation, was consistently at the very center of the mature region. In short, some evidence of the existence of mature and immature religion was found in every sample when inspecting the content of the configurations.

Yet, the mean level of stress in the samples was .20, which means that the one-dimensional configuration this model predicted tended to fit the data poorly. In addition, there was at least one error in

placement in nine of the ten samples. Thus, Allport's theory of mature versus immature religion did not appear to fit the data very well.

Table 4.4: Mature vs. Immature Religion

	Mature Religion		*Immature Religion*			
Sample	*Number correct (out of 5)*	*Incorrectly included orientations*	*Number correct (out of 4)*	*Incorrectly included orientations*	*Percent incorrect (out of 4)*	*Stress*
US 2	5	Personal	4		0%	.20
US 3	4	Personal	4	Tentativeness	25%	.18
US 4	5	Personal, Gain	3		25%	.17
RO 3	4	Personal	4	Dialog	25%	.25
RO 4	5	Personal, Gain, Punishment	2		50%	.21
RO 5	5	Personal, Gain, Punishment	2		50%	.18
RO 6	5	Personal, Gain, Punishment	2		50%	.20
RO 7	5	Personal, Gain, Punishment	2		50%	.22
RO 8	4	Personal, Gain, Punishment	2	Doubt	75%	.15
RO 9	5	Personal, Gain, Punishment	2		50%	.20
Mean	4.7		2.7		40%	.20

Intrinsic versus Extrinsic Religion

Allport's one-dimensional model of intrinsic versus extrinsic religion was also tested. In this model, only six orientations were included, with Centrality expected to be by itself in the intrinsic region and Personal, Gain, Punishment, Social, and Obligation expected to be in the extrinsic region. The configuration was split into two regions based on the placement of Centrality, for if the number correct were maximized as was done previously, then at most there could only be one incorrectly placed orientation.

Table 4.5 shows the results of these analyses. In every sample, the dimension was defined by Personal versus Social (as it was when all 10 orientation were included), with Centrality landing somewhere towards the middle of the dimension. This meant that every sample had at least one orientation, normally Personal, that was misplaced.   However, the average level of stress was .026, which suggests the configuration mathematically fit the very data well. But even so, the high number of errors in placement did not seem to give much support to the theory that religious orientation is best understood as existing on a single dimension of intrinsic versus extrinsic motivation, especially considering that all the CROI orientations are not accounted for by this model.

Table 4.5: Intrinsic vs. Extrinsic Religion

	Intrinsic Religion		*Extrinsic Religion*			
Sample	*Number correct (out of 1)*	*Incorrectly included orientations*	*Number correct (out of 5)*	*Incorrectly included orientations*	*Percent incorrect (out of 2)*	*Stress*
US 2	1	Personal	4		50%	.0800
US 3	1	Personal	4		50%	.0003
US 4	1	Personal, Gain	3		100%	.0810
RO 3	1	Personal	4		50%	.1000
RO 4	1	Social, Obligation	3		100%	.0010
RO 5	1	Personal	4		50%	.0003
RO 6	1	Personal	4		50%	.0000
RO 7	1	Personal	4		50%	.0004
RO 8	1	Personal	4		50%	.0000
RO 9	1	Personal	4		50%	.0004
Mean	1		3.8		60%	.0263

Intrinsic and Extrinsic Religion

Next, the two-dimensional configurations were examined for the presence of intrinsic and extrinsic regions. Table 4.6 shows the results of these analyses. Centrality was clearly separable from the other orientation in the Romanian samples. However, in the three American samples, either Personal or

Gain was more closely related to Centrality than it was to the other orientations. The average level of stress was .0007, which suggests the configuration, mathematically fit the extraordinarily well. Still, it is concerning that, in the US samples, Personal or Gain was consistently more closely related to Centrality than to the other orientations, even though the reflective orientations were not included.

Table 4.6: Intrinsic and Extrinsic Religion

| | *Intrinsic Religion* | | *Extrinsic Religion* | | | |
Sample	*Number correct (out of 1)*	*Incorrectly included orientations*	*Number correct (out of 5)*	*Incorrectly included orientations*	*Percent incorrect (out of 2)*	*Stress*
US 2	1	Personal	4		50%	.0030
US 3	1	Personal	4		50%	.0020
US 4	1	Gain	4		50%	.0003
RO 3	1		5		0%	.0003
RO 4	1		5		0%	.0000
RO 5	1		5		0%	.0000
RO 6	1		5		0%	.0003
RO 7	1		5		0%	.0003
RO 8	1		5		0%	.0003
RO 9	1		5		0%	.0003
Mean	1		4.7		15%	.0007

Batson's Intrinsic, Extrinsic, and Quest Model

As stated previously, Batson's theory can be interpreted as predicting either three regions (the Three-Regional model) or three dimensions (the Three-Dimensional model) that are both composed of intrinsic motivation, extrinsic motivation, and religious questioning. Batson's Three-Region model will be analyzed first, followed by his Three-Dimensional model.

Batson's Three-Regional model predicts that the CROI orientations would form three distinct regions composed of intrinsic motivation (Centrality), extrinsic motivations (Personal, Gain, Punishment, Obligation, and Social), and questioning orientations (Interest, Dialog, Doubt, and Tentativeness).

However, this model is silent on the number of dimensions that are necessary to see these regions. Yet, it was earlier found that the CROI is best viewed using two dimensions, so Batson's model will be tested using a two-dimensional configurations.

As can be seen in Table 4.7, Batson's Three-Regional model seems to fit the data fairly, with a stress of .04 and an average of 1.2 placement errors per sample. The one consistent problem in placement was the Personal orientation, which tended to be separated from the other more extrinsic orientations by Centrality, which seems to suggest that Centrality is more extrinsic than Personal. However, the model does seem to fit the US data a little bit better than it fits the Romanian data. Overall, with the exception of placing Personal in the extrinsic category, Batson's Three-Regional model fits the data quite well.

Table 4.7: Batson's Intrinsic, Extrinsic, and Quest Model

| Sample | *Intrinsic Religion* | | *Extrinsic Religion* | | *Quest Religion* | | | |
	Number correct (out of 1)	*Incorrectly included orientations*	*Number correct (out of 5)*	*Incorrectly included orientation)*	*Number correct (out of 4)*	*Incorrectly included orientations*	*Percent incorrect (out of 4)*	*Stress*
US 2	1	Personal	4		4		25%	.03
US 3	1	Personal	4		4		25%	.04
US 4	1	Personal	4		4		25%	.04
RO 3	1	Personal	4		4		25%	.06
RO 4	1	Personal, Gain	3		4		50%	.05
RO 5	1	Personal, Gain	3		4		50%	.04
RO 6	1	Personal	4		4		25%	.05
RO 7	1	Personal	4		4		25%	.04
RO 8	1	Personal	4		4		25%	.04
RO 9	1	Personal	4		4		25%	.04
Mean	1		3.8		4		30%	.04

One the other hand, Batson's Three-Dimensional model did not fair so well. In the three US samples, the first two dimensions could be interpreted as commitment/motivation (Personal, Interest and Centrality versus Social and Obligation) and reflectivity (Interest and Doubt versus Punishment and

Centrality), while the third dimension was not interpretable (Obligation and Dialog versus Social and Interest). In the Romanian samples the three dimensions tended to be interpretable as commitment (Gain, Interest, and Centrality versus Obligation and Social), reflectivity (Interest and Doubt versus Punishment and Centrality), and perhaps motivation (Dialog, Interest and Centrality versus Social, Gain, and Personal). Thus, in not one of the samples did the expected dimensions of intrinsic motivation, extrinsic motivation, and reflectivity appear. In short, the results did not support Batson's Three-Dimensional model. Further, the uninterpretable nature of the third dimension in the US samples also suggests that two-dimensional configurations are more meaningful representations of the CROI than are three-dimensional configurations, which is supported by the previously analysis of the stress levels in two-dimensional and three-dimensional MDS configurations.

Summary

Overall, Allport's model of mature versus immature religion was inaccurate in nine of the samples, and the level of stress present in the model indicated that the MDS configuration did not fit the data very well. Allport's later model of intrinsic versus extrinsic religion was somewhat inaccurate in every sample, and did not account for all of the CROI orientations. Allport's model of intrinsic and extrinsic regions was relatively accurate, but it too did not account for all of the CROI orientations. Batson's Three-Dimensional model was very inaccurate. On the other hand, Batson's Three-Regional model was relatively accurate in comparison to the other four models, but it still made a significant number of mistakes.

The Commitment-Reflectivity Circumplex

As none of the established models seem to accurately predict the relationships between the orientations of the CROI, the new Commitment-Reflectivity Circumplex model (the CRC model) should probably be given in greater detail. Intuitively, the orientations of the CROI seem to be able to be aligned along two basic dimensions: committed versus uncommitted and reflective versus unreflective. On the committed versus uncommitted dimension, Religiosity (Centrality and Personal), Rewards and Punishments (Gain and Punishment), and Interest seem to indicate higher levels of commitment, while Social, Obligation, Doubt, Tentativeness and Dialog seem to indicate lower levels of commitment. On the

reflective versus unreflective dimension, Interest, Dialog, Tentativeness and Doubt seem to be more reflective orientations, while Centrality, Personal, Gain, Punishment, Social, and Obligation seem less reflective. As positive, loving visions of God seem to be at the heart of religion in general, Punishment intuitively should be at about the middle of committed dimension and Personal should be in the middle of the reflective dimension.[3] In addition, Social appears to be less compatible with the committed orientations than is Obligation, for Social implies a true lack of commitment to religion, while Obligation just indicates feeling pressured to act religious. As every orientation seems able to be located on both dimensions, the theoretical pattern illustrated in Figure 4.4 seems plausible.

Figure 4.4: Theoretical Structure of the CROI
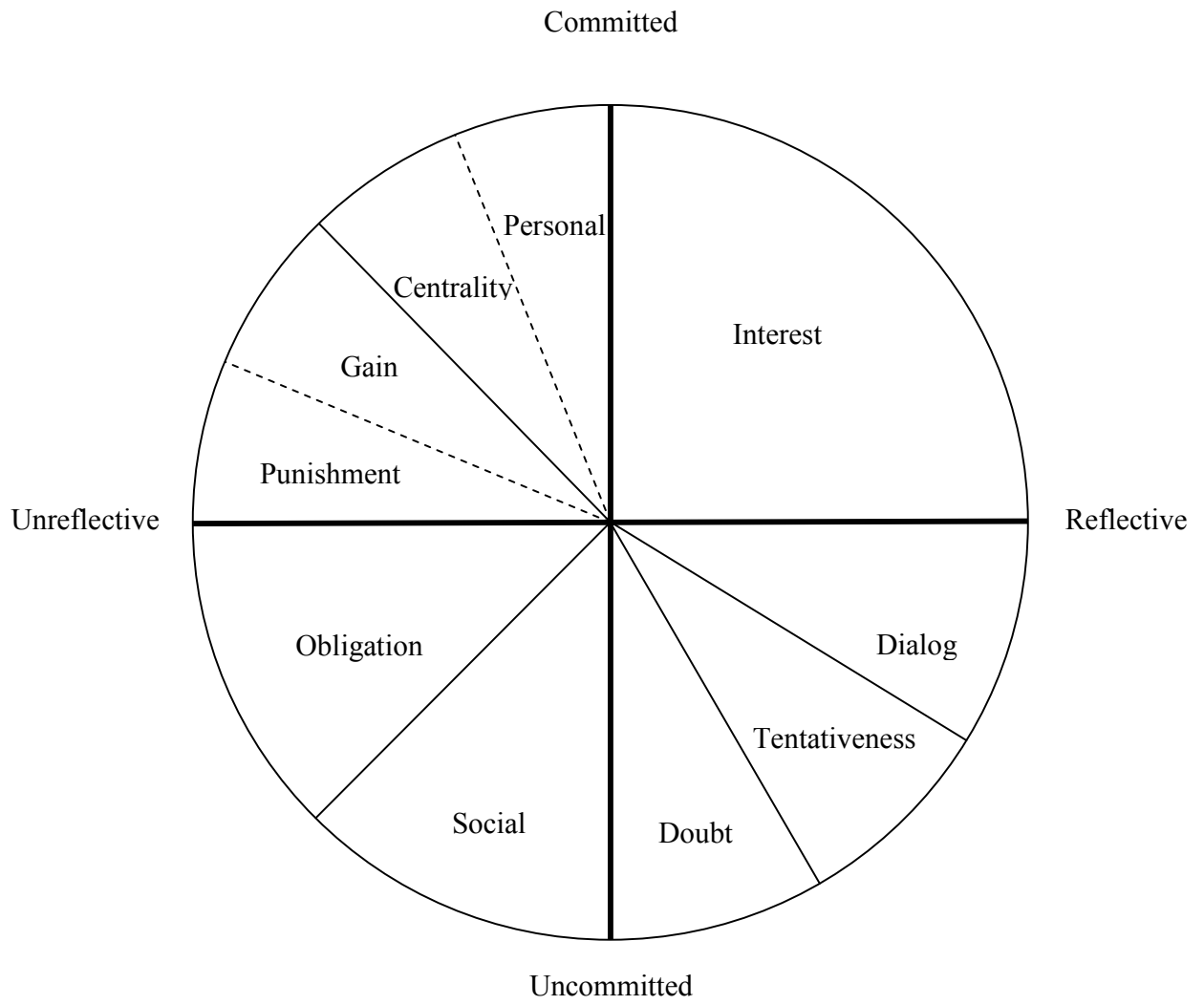
Empirical Testing of the CRC model

The CRC model is the most complete model that has yet been presented and it makes two major predictions and several smaller predictions. Its first major prediction is that the CROI is best represented by a two-dimensional configuration, which has already been confirmed through examining the stress levels across configurations with various numbers of dimensions. Its second major prediction is that the 10 CROI orientations can be located in four regions: committed and unreflective orientations (Personal, Centrality, Gain and Punishment), committed and reflective orientations (Interest), uncommitted and reflective orientations (Dialog, Tentativeness, and Doubt), and uncommitted and unreflective orientations (Social and Obligation). To test this prediction the two-dimensional configuration of all ten samples were examined. As predicted, the uncommitted and unreflective orientations (Social and Obligation) and the uncommitted and reflective orientations (Dialog, Doubt and Tentativeness) formed distinct regions in all ten samples. Also as predicted, the committed and unreflective orientations (Personal, Centrality, Gain and Punishment) and the committed and reflective orientation formed distinct regions in all 10 samples. In short, every one of the ten samples used in this analysis showed the presence of the four regions with not one error in placement. Moreover, the regions were positioned in relation to each other exactly as predicted, which means that the theoretical structure presented in Figure 4.4 can be taken as a reasonably accurate representation of the CROI regions and their composition.

The CRC model also makes a several specific predictions about the structure within the regions. In the committed and unreflective region, the CRC model predicts that Personal is the most compatible with reflective orientations and that Punishment is the least compatible with committed orientations, which was supported in all 10 samples   In the uncommitted and unreflective region, the CRC model predicts that Social is the least compatible with committed orientations but not necessarily with the reflective oreinations, while Obligation is the most compatible with these orientations. These hypothesis was also supported by all ten of these samples.[4] In short, all the predictions of the CRC model appeared to be accurate in all 10 of the samples. Therefore, out of the six models tested, the new Commitment-Reflectivity Circumplex model seems to be the most accurate in both the US and Romania

Conclusions

In conclusion, the established models of religious orientation, which are based on the writings of Allport and Batson, were all shown to be at least somewhat inaccurate in predicting the structure of the CROI. A new model of religious orientation, the Commitment-Reflectivity Circumplex (CRC) Model, was then presented that was shown to accurately predict the structure of the CROI in both Romania and the US. The next chapter will examine whether this new model can be extended to include the established religious orientation scales, most of which are designed to measure models of religious orientation presented by Allport and/or Batson.