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# Defining information worlds for information needs and uses research: Methodological issues

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*Social network theory has been used in information needs and uses research to help explain the way in which individuals seek and disseminate information. When such theory is employed in information science research, mechanisms to identify the world of the individual or group being studied must be discovered. This paper focuses on method. In it the author discusses the way in which boundaries of social worlds were determined for a study of the information seeking behaviour of pastoral clergy. It was necessary to identify theological worlds. Issues related to the validity and the reliability of instruments which were developed for the study are raised. Proposals and cautions for future research into information worlds are advanced.*

## 1. Introduction

For seventy years, social network theory has attracted the interest of scholars in such fields as anthropology and sociology. Scholars have used that approach to study African tribal societies, factory life, friendship choices, the spread of disease through social networks, and many other topics. In each case, the group being studied has had to be defined and as a result various methods to that end have been devised, among them the sociogram (a technique for illustrating social configurations (Moreno 1934), mathematical modelling of group relations (Lewin 1951), and applications of graph theory (Cartwright and Zander 1953).

More recently, social network theory has been used to help explain the way in which individuals use information. Derek de Solla Price (1963) used the term "invisible colleges" to describe informal networks of scholars. Crane (1972) developed the concept further, using the term "social circle" to describe a social organization of researchers working in a common area of study. Crawford (1971) studied sleep researchers, Budd et al. (1967) communication among members of the news media, Granovetter (1974) job seekers, and Chatman (1991, 1992) janitors and older women in a nursing home.

In this paper it is not my intention to revisit these studies, but rather to present a case study that suggests approaches can be used to define the boundaries of information worlds. Two examples from my own research into the information-seeking behaviour of pastoral clergy are presented. In that study it was necessary to identify theological worlds. I intend to address issues related to the validity and the reliability of instruments which were developed for that study and to offer some proposals and cautions for future research into information worlds.

When social network theory is applied to information needs and uses research, the premise is that the social networks (or worlds) to which individuals adhere affect the way in which they seek information. If such theory is to be employed in information science studies, mechanisms to identify the world of the individual or group being studied must be discovered. Laumann, Marsden and Prensky (1989), in an article on boundary specification and social network analysis, caution investigators to be careful in how they define the social worlds:

Because individual behavior is viewed as at least partially contingent on the nature of an actor's social relationships to certain key others, or the outcomes of events are seen to be partially dependent on the presence of a specific network configuration, care must be given to specifying rules of inclusion. Such rules pertain both to the selection of actors or nodes for the network *and* to the choice of types of relationships among those actors to be studied (p. 62).

Chatman points to such characteristics as age, gender, frequency of contacts among individuals, and what is exchanged by certain people as factors that help determine the boundaries of the network. Dunn (1983, 454) adds cognitive factors such as "congruence of beliefs, orientations, and meanings".

Lauman et al. (1989) identify three sets of components which are used to define network boundaries. These are actors, relations, and activities. "Actors" are individuals or collective entities sharing an interconnectedness. Examples of this from my own research are individual ministers who are part of a denomination or the denominations themselves which join together in a broader association such as the World Council of Churches. "Relations" refers to interconnectedness based on interaction frequencies. An example of this would be a group of pastors within a denomination who have frequent purposeful contact with one another. The third set of components, "activities", identifies people or organizations by their participation in a defining event or activity. Here the example might be lobbying the government in regard to a cause. Such activity often results in the formation of a network that

transcends denominational, credal, geographical or other boundaries. Lauman et al. use the terms "realist" and "nominalist" to describe the way components are selected to define the boundary of a social network. In the realist approach, the actors themselves are understood to be aware that a social entity (that includes themselves) exists, while in the nominalist approach the analyst imposes a conceptual framework which serves his or her analytic purpose. Crane, for example, used the nominalist approach when she decided that participation in a particular field of research regardless of discipline would define her network (Laumann et al. 1989).

My own research asked, among other things, whether the information worlds (or networks) of pastoral clergy had any bearing on the way in which they sought information. Thus it was necessary to define the worlds. These worlds were understood as networks of contacts with which an individual interacts in acquiring and dispensing information. Three worlds were chosen for examination: the denominational, the congregational, and the theological worlds. A survey method in two parts was followed and it consisted of a mailed questionnaire ( $n=378$ ) as well as interviews with 20 pastors.

The denominational world was easy to define. Ministers in the study belonged to one of six denominations and thus were Roman Catholic, United Church, Anglican, Presbyterian, Baptist, or Pentecostal. To identify the congregational world, participants were asked questions about the size, location, age distribution of the congregation, age of the church itself, and size of the staff. Defining the theological world involved a more rigorous process and that process is the subject of the remainder of this paper.

## **2. Defining an information world**

One hypothesis of my research was that the theological world to which a minister belongs influences the pastor's information seeking when she or he is performing the preaching role. In order to test this hypothesis it was necessary to identify the theological position of participants and to determine whether the sources they used were theologically liberal and conservative. In both instances, precautions were taken to enhance the reliability and validity of these measures.

### *2.1 The theological world and the participants*

#### *2.11 Literature Search*

The theological position of the minister was identified as "liberal" or "conservative" based on a religious scale developed for use in this study. As a first step, a literature search was undertaken to discover what research on religious scales had already

been done. Various tests or scales of religious belief have been employed by researchers. (A representative list is found in Table 1.)

Common to all these religious scales is a series of questions about the orthodoxy of the subject's beliefs, e.g. belief in the existence of God, the deity of Jesus Christ, the reality of sin, the need for personal repentance, the reality of heaven, the authority of the Bible). In addition, some scales seek information on the subject's position on some social, moral, or ethical issues.

While questions dealing with theological orthodoxy have tended to remain the same over the passage of time, questions about a person's social, moral, or ethical beliefs have changed and have included such issues as Sunday observance, use of alcoholic beverages, premarital sex, shoplifting, civil disobedience, and abortion.

**Table 1**  
**Representative Scales of Religious Belief**

<i>Source</i>	<i>Scale</i>	<i>Purpose</i>
Brown & Lowe (1951)	inventory of religious belief	to measure attitudes among undergraduates
Allport & Ross (1950, 1967)	religious orientation scale	to measure prejudice among church goers
Faulkner & De Jong (1966)	five dimensional religiosity scale	to assess interdependent nature of religious dimensions
Fagan & Breed (1970)	short measure of religious dogmatism	To study relationship of peak experiences to religious belief
King & Hunt (1975)	Basic and Composite Religious Scales	To test the multi-dimensional nature of religion
De Jong, Faulkner & Warland (1976)	Religiosity Scale	To assess the multidimensional nature of religiosity
Marshall (1993)	Angus Reid Group Religion Poll	To survey the Canadian public's religious beliefs
Bibby (1993)	Survey of Canadian Religious Scene	To survey Canadian belief and practice

I chose for my instrument questions that had previously been used in the two Canadian studies of 1993. The Angus Reid Group, a research company, polled 4,510 Canadians in order to gather a portrait of Canadian religious belief and practice (*Maclean's*, April 12, 1993). In that part of its "Religion Poll" which dealt with beliefs, the company asked participants to identify on a five-point scale whether they agreed or disagreed with the following statements:

- (a) Jesus Christ was the divine Son of God.
- (b) Jesus Christ was crucified but resurrected to eternal life.
- (c) His death and resurrection provided forgiveness for my sins.
- (d) God is an old superstition, no longer needed to explain things in these modern times.
- (e) Man/woman is a special creature made in the image of God, not a development of evolution.
- (f) I believe Satan the devil is active in the world today.
- (g) I believe the Bible is God's word and is to be taken literally word for word.
- (h) I feel it is very important to encourage non-Christians to become Christians.

The poll also asked people whether they supported gay rights. Bibby (1993, p. 86) similarly asked Canadians about their position on gay rights, as well as the ordination of homosexuals, premarital sex, and the availability of abortion either on demand or when the life of the mother was in danger.

For my scale of theological position I used the eight Angus Reid statements referred to above, plus the following ones regarding contemporary social issues, taken from Bibby's research:

- (i) I support the ordination of homosexuals.
- (j) It is permissible for unmarried people to have sexual relations.
- (k) Abortion should be available on demand.

Participants were asked to indicate their position relative to these statements by choosing a number between 1 (strongly disagree) to 5 (strongly agree). The purpose was to establish the theological world of the participating ministers. These questions were consistent in nature with the type of questions which have been used in similar surveys over the past four decades.

## 2.12 Design

For seven of the statements used, the choice of a "5" indicated a very conservative position, but for four of the statements a "1" indicated conservatism. This

procedure encouraged participants to read the statements carefully and hopefully avoid errors which might come from blindly repeating selections.

### *2.13 Inter-item reliability*

One method for assessing the reliability of a scale is to examine the correlation between individual scale items. The degree of inter-item reliability can be measured using Cronbach's alpha (Hair, Anderson, Tatham and Black, 1992). In this case, the overall inter-item reliability was high ( $\alpha = 0.8969$ ).

### *2.14 Pre-test*

In order to check the validity of the scale, the scale was first administered to a test group of ten ministers along with the Brown and Lowe "Inventory of Religious Belief" (1951), a scale constructed to differentiate between those who believe and those who reject Christian dogma and was used originally in a study of the religious beliefs of college students, and again later in a study of the Jesus People and their position with respect to fundamentalist beliefs (Stones, 1978). In the Brown and Lowe instrument, respondents are asked whether they strongly agree, agree, are not sure, disagree, or strongly disagree with the following statements:

1. It makes no difference whether one is a Christian or not as long as one has good will for others.
2. I believe the Bible is the inspired Word of God.
3. God created man separate and distinct from animals.
4. The idea of God is unnecessary in our enlightened age.
5. There is no life after death.
6. I believe Jesus was born of a Virgin.
7. God exists as: Father, Son, Holy Spirit.
8. The Bible is full of errors, misconceptions, contradictions.
9. The Gospel of Christ is the only way for mankind to be saved.
10. I think there have been many men in history just as great as Jesus.
11. I believe there is a heaven and hell.
12. Eternal life is the gift of God only to those who believe in Jesus Christ as Saviour and Lord.
13. I think that a person can be happy and enjoy life without believing in God.
14. In many ways the Bible has held back and retarded human progress.
15. I believe in the personal, visible return of Christ to the earth.

Participants in the test group were also asked to describe their own theological position, using a five-point scale, from strongly liberal to strongly conservative.

It was held that, if for a majority of the respondents, the three measures were found to be in substantial agreement, my scale of theological position would be assumed to be a valid measure. Eight of the 10 questionnaires were returned, as follows: 2 Anglican clergy, 3 Baptist, 1 Presbyterian, 1 Roman Catholic, and 1 United Church minister. Of those returned, the theological position of three of the respondents was seen to be the same according to all three measures. In three other cases, the results of the Brown and Lowe instrument and of the instrument prepared for this study were in agreement, though the ministers in these cases declared themselves to be slightly more liberal than the two instruments indicated. In one case, the self-declared theological position of the respondent was identical to the result from the instrument prepared for this study, though the Brown and Lowe instrument indicated a slightly more liberal position. In the last case, the measures varied from strongly liberal (self-declared) to middle (my instrument), to conservative (Brown and Lowe instrument). Thus, in only one case were all three measures in disagreement, while in seven cases two out of three measures were in agreement, with the two instruments yielding the same result in six of those cases. Since the amount of agreement was substantial, it was decided that the instrument prepared for this study would be a meaningful indicator of theological position.

## *2.2 The theological world and the sources*

One of my goals was to see if ministers were open or closed in their information seeking. Thus, once the theological world of the participant was determined, it was necessary to see what type of source was chosen to prepare for the preaching task. If a pastor selected sources akin to that person's theological world, he or she would be said to be closed in his or her information seeking. Sources, then, had to be identified as open or closed. "Open" referred to a source not tied to the minister's theological world. "Closed" referred to a source that is in some way bound to that world.

Sources could not be labeled "open" or "closed" without reference to a particular world. In the theological world, I followed an inter-rater reliability testing procedure to designate sources as either theologically liberal or conservative. In the April 1, 1997 questionnaire used in the study, respondents had the opportunity to identify specific books and/or religious magazines or journals used in the performance of three roles, preaching, caregiving and administration. Most books or authors were mentioned by only one respondent, and many responses were generic in nature (e.g. "commentaries", "magazines"); however, for the preaching role, twenty-seven books and five journals or magazines were identified by two or more of the participants. In order to use these data in the analysis of the influence of the theological world on the choice of information sources used in the preaching

role, the sources listed by respondents were coded into "liberal" and "conservative" categories. The inter-rater reliability procedure described below was followed in order to enhance the reliability of this coding, which in turn supported the validity of this approach.

The raters were the author and two seminary professors from two different institutions representing two different denominational affiliations.

The thirty-two sources were listed in alphabetical order by author and with bibliographic details (author/editor, title, publisher, date) in table form along with boxes in which a rater could check the theological inclination of the source. Raters could select "Liberal", "Conservative", or "Can't Say". The sources were then rated by the three individuals who were unaware of the choices of the other two.

The goal was to test the reliability of the subsequent coding of all 378 returned questionnaires to be done by the investigator. Viney (1983) notes that the use of independent raters or coders to determine the consistency of interpretation of written or verbal communications is a widely accepted approach. The idea in this case was to test consistency between the investigator and seminary professor #1, and the consistency between the investigator and seminary professor #2, i.e. two separate inter-rater reliability checks.

A measure of simple proportional reliability was applied, using a formula suggested by Holsti (1969):

$$R = \frac{2(C1, C2)}{C1 + C2}$$

where C1, C2 is the number of category assignments on which both coders agree, and C1 + C2 is the total of category assignments made by both coders. Budd, Thorp and Donohew (1967) observe that there is no standard reliability figure accepted as adequate. The best possible figure is 1 (total agreement).

Table 2 summarizes the results of the test of inter-rater reliability. The investigator and Rater #1 had a rate of agreement of 0.781 (agreeing 25 times and disagreeing 7 times).



**Table 2**  
**Inter-rater reliability agreement**

	All Answers Included	"Can't Say" Answers Excluded
Investigator & Rater #1	0.781	0.877
Investigator & Rater #2	0.781	0.923

The investigator and Rater #2 had the same rate of agreement (0.781) — agreeing and disagreeing the same number of times as for the author and Rater #1, but the agreement and disagreement sometimes occurring with respect to different sources. If the "Can't Say" selections are excluded, the investigator and Rater #1 had a reliability rating of 0.877 and the investigator and Rater #2 a rating of 0.923.

Differences were resolved through mutual discussion and through a decision to rely on the author's judgement, since the agreement level was sufficiently close to 1 to be considered very satisfactory. The author then coded all the returned questionnaires, assessing the "liberal" or "conservative" nature of book and journal sources identified as having been used by participants in each of the three roles.

### **3. Results**

#### *3.1 Calculating scores*

In an attempt to determine the theological world of each participant, ministers were asked to indicate their level of agreement with eleven statements designed to reveal theological position. A pastor choosing the most theologically liberal answer received one point per question for a total of eleven, while a pastor choosing the most theologically conservative position received five points per question for a total of fifty-five. The returned surveys yielded the results shown in Table 3 which follows (with the first three categories subsequently collapsed into one named "total liberal", as indicated):

**Table 3. Theological world of participants**

	no. of points	no. of respondents	% of sample
very liberal	35752		
liberal	20-28		
middle	29-37		
<i>total liberal</i>		94	24.9
conservative	38-46	102	27
very conservative	47-55	182	48.1

### 3.2 Findings

An analysis was performed to see if there existed any significant relationship of theological world to type of source chosen. The findings relate to this discussion of boundary definition in information needs and uses research. For example, liberal and very conservative ministers are more likely than conservative ministers to use only a minimal number (1 at most) of print sources in the caregiving role, and conservative ministers are the most likely to use several interpersonal sources in the administrative role.

In the preaching role, once the "Can't Say" sources (those for which the investigator was unable to determine the theological position) were eliminated, there were 218 cases to examine. A significant relationship was found to exist between theological world and the theological nature of sources [chi square (d.f.= 4) = 131.5,  $p < .00001$ ]. Ministers classified as having a liberal theological stance cited sources coded as being liberal considerably more frequently (90.5%) than other sources, while those having a very conservative stance identified conservative sources far more frequently (77.5%) than others. Respondents in the intermediary conservative theological position cited sources coded as liberal more often (73.6%) than the other sources. Thus, pastors classified at either extreme of the theological spectrum (that is, as liberal and very conservative) can be considered to have reported closed information-seeking behaviour while in the preaching role, while those in the middle of the scale (conservative ministers) exhibited more open information-seeking behaviour.

#### 4. Conclusions

Some lessons for defining boundaries of social networks emerge from this research into the relationship of worlds to information use.

The participants in the study were very concerned about the way in which the theological world was defined. Many comments were added to the questionnaires and these comments suggest issues to be addressed in future attempts to place professionals within a network context.

Fifty-one pastors (13.5%) expressed dissatisfaction with statement e. Most wanted to agree with the first half of the statement ("Man/woman is a special creature made in the image of God") and disagree the last half ("not a development of evolution"). Twenty comments addressed statement f ("I believe Satan the devil is active in the world today"), most of which indicated an agreement with the concept of evil as a reality but questioned whether it should be personified. Statement g ("I believe the Bible is God's Word and is to be taken literally word for word") inspired 35 comments, most concerning the word "literal". Some wanted to support the statement as long as it was understood that "literal" did not preclude the presence of figures of speech. Others would have preferred that the statement omit the word "literal" while retaining the idea of divine inspiration. Statement i ("I support the ordination of homosexuals") prompted 27 written comments, most reflecting a desire to add the word "practising" before "homosexuals".

Distinctions of this type were also present during the 20 interviews which were conducted. In each interview, the participant was asked to characterize his or her theology. Eight ministers described themselves as theologically conservative, six as liberal, and six as middle of the road.

When describing their position, the conservative pastors used words or phrases such as "tend to lean towards conservative" (the Roman Catholic), "evangelical" (Anglican, Baptist, Pentecostal, Presbyterian), "historic orthodox" (Baptist), and "conservative" (Baptist, Pentecostal).

The liberal ministers used terminology such as "at least middle . . . probably a bit more liberal than I am conservative" (Roman Catholic), "radical . . . centre left" (Roman Catholic), "moderately liberal" (United Church), "liberal" (United Church, Anglican), "liberal catholic" (Anglican), and "slightly more liberal . . . tending towards universalism" (Presbyterian).

Those in the middle group used terms such as "middle of the road" (United Church, both Roman Catholic priests), "conservative in a liberal tradition . . . I'm not sure . . . wouldn't want to stand at either end of that [spectrum] in protest against the other" (United Church), and "liberal conservative" (United Church).

It can be seen, then, that participants often chose terminology other than "liberal" or "conservative" to define their theological position. Defining an

individual's theological world is not a straightforward proposition. The same might be said for defining an individual's political world or a person's adherence to a particular theoretical approach within a discipline of knowledge.

In any of these cases, standard practices for the field of study should be followed to develop and administer the instruments that are designed to establish boundaries for the social network under investigation. In my research, established approaches to developing a scale of theological beliefs were used. These practices are evident in scales of this type used in a variety of studies over the past forty years and include the statement of an "orthodox" belief related to doctrine or practice, and an opportunity to select a phrase or number that indicates a measure of agreement or disagreement. The expressed desire for different wording on the part of the ministers surveyed may indicate that such scales should be tailored for the targeted group. My scale used statements developed for the general public and not for professional clergy, who are, not surprisingly, more attuned to nuance in theological language and therefore more careful about how they express their positions. A new approach to measuring theological belief may need to be developed, especially where theologically literate participants are being surveyed. Also, frequent revision of the part of the scale dealing with social issues may be necessary as the issues change from one generation to the next.

The scale used for this study revealed that many of the participants are conservative or very conservative. This may indeed reflect their positions. The Angus Reid (Marshall, 1993) and Bibby (1987, 1993) surveys of the Canadian public reveal that a higher than expected number of Canadians hold orthodox religious beliefs. On the other hand, the results may reflect a conservative weighting in the scale itself. By combining the "very liberal", "liberal", and "middle" respondents into one category for purposes of analysis, some of the potential weighting problem may have been answered. In any event, it was possible to distinguish among three distinct units of analysis, namely liberal, conservative, and very conservative theological positions, thereby enabling me to assess the degree to which these views affected the participants' information seeking patterns in the conduct of their work.

Laumann et al. (1989, 79) in their article on the problems of boundary specification conclude, "[M]ore explicit attention to boundary specification will contribute to the success of network methods in the study of social structures and systems." Membership in some worlds (such as a denominational affiliation, a particular corporation, or an academic department) is clearly delineated, but not so affiliation with other worlds (such as the theological worlds discussed in this paper). For these less-easily defined worlds, carefully-worded instruments must be developed. Where professionals (like the clergy who were the focus of this study)

are concerned, attention should be given to the precision of terminology used in questionnaires. Such attention, supported by accepted checks on the validity and reliability of the instruments employed to describe the participants' worlds, will contribute to meaningful research.

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