

# **NEVER ON SUN(NY)DAYS: LESSONS FROM WEEKLY ATTENDANCE COUNTS\***

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## **NEVER ON SUN(NY)DAYS? LESSONS FROM CONGREGATIONAL ATTENDANCE COUNTS**

In a world where “there is no new thing under the sun” the deck most certainly is stacked against original research. And all the more so for a subject like church attendance wherein scholars have wearied their flesh in the making of many books for more than forty years (Ecclesiastes 1:9, 11:12). Researchers have sliced and diced their data in every conceivable manner. With hundreds of surveys and scores of statistics, they have produced thousands of findings on the causes, consequences, and characteristics of church attendance, to say nothing of its long-run trends, demographic correlates, and cross-national variation.

Yet the empirical edifice stands upon a dangerously narrow base – a small set of survey questions including Gallup’s “Did you yourself happen to attend church within the past seven days?” and the GSS-style “How often do you attend religious services?” The hazards of inferring so much from so little are illustrated by the debate over “true” versus “stated” attendance (wherein Hadaway et al. (1993) have argued that national polls overstate actual rates by a whopping one hundred percent).<sup>1</sup>

Religious research would benefit from more attention to other sources of information.<sup>2</sup> In particular, it would benefit from more and better use of the attendance counts taken each week at thousands of congregations all over America (and indeed all over the world). Although a poor substitute for standard survey statistics, these numbers have their own special strengths and applications that range from cataloging facts to testing theory.

For any given congregation, attendance counts tell us much about the health of the church, the habits of its members, and the interplay of religious “supply” and “demand.” By comparing the attendance series of congregations from different denominations, we see aspects of denominational culture that surveys cannot capture. As with standard studies of attendance, weekly counts yield even more information when analyzed together with related data – on contributions, congregational characteristics, the local environment, and more.

This paper is an exploratory inquiry into the uses weekly attendance data. Although we frame our findings within a cost-benefit model of religious activity, our principal goal is to demonstrate the value of an overlooked body of data that is immense, informative, easily obtained, and relevant both to theory and to institutional research.

## **THE DATA**

Congregations routinely track the number of people attending their worship services. Some also count attendance at Sunday-school classes, and some keep counts of everything from choir practice and weekday prayer meetings to potluck dinners and mission trips to Mexico. Counts assume more significance in groups that emphasize outreach and growth, but the abstract character of most congregational “commodities” leads all groups to scrutinize measurable outcomes like attendance, membership, and giving. In Christian circles, the culture of counting dates back to the book of Acts, wherein Luke assured his early-Christian readers that although the post-resurrection church numbered only “a hundred and twenty,” the miracle of Pentecost “added that day about three thousand souls” and

Peter's subsequent works brought "the number of [additional converts] to five thousand" (Acts 1:15, 2:42, 4:4).

Gaining access to congregational counts is often quite easy, since the data convey no personal information and most record-keepers are delighted to find others with an interest in their numbers. Coding the numbers requires some effort, since the typical congregation keeps its "data" on random sheets of notebook paper. One must make judgment calls on everything from missing counts to offsite and special weekday events (such as Christmas eve services) that substitute for Sunday worship, but the task remains relatively straightforward.

Although attendance figures often work their way up the denominational ladder, we caution against placing much faith in attendance totals reported at the county, state, or national level. Counting procedures vary greatly from one congregation to another, and in our experience most counts fall well short of actual attendance.<sup>3</sup> Moreover, some congregations track attendance much more assiduously than others (typically thanks to an especially dedicated deacon). Faced with so much data that is biased, bad, or missing, most denominations pay little attention to attendance aggregates (preferring instead to track monies and membership).

Fortunately, weekly counts can fall far short of perfection and still constitute good *index* of trends and changes in the actual attendance of individual congregations. Undercount errors present no problem as long as they are relatively small and independent over time. Despite some downward bias, the counts should correlate strongly with actual attendance and, apart from some random "noise," fully

capture all the key time-series attributes of actual attendance, including trends, cycles, turning points, and special events.<sup>4</sup>

As with other time series, simple graphs provide the best overview of attendance data. Figure 1 plots four years of weekly attendance counts for a large, evangelical-leaning Reformed Church of America (RCA) congregation in San Jose. Figure 2 presents corresponding data for nearby United Church of Christ (UCC) congregation, established in the late-1800s. Figure 3 tracks the weekly attendance at a large American Baptist congregation located in Portland, Oregon. Figure 4 tracks the weekly attendance patterns of a smaller American Baptist congregation located on Washington's Olympic Peninsula. We make no claim that these congregations are representative of their denominations or regions. Even so, the attendance patterns prove interesting and informative.

**[Figures 1 through 4 about here]**

## **TIME SERIES CHARACTERISTICS**

Attendance displays all the characteristic features of time series – trends (reflecting long-run growth or decline), cycles (capturing seasonal effects), spikes (corresponding to special events), occasional turning points, and week-to-week random variation.

As for the spikes, notice that in all four congregations, attendance jumps each year on several special days. Not surprisingly, Christmas Eve and Easter Sunday remains the biggest draw in the Christian calendar.<sup>5</sup> But we have more difficulty accounting for Mother's Day, which competes with Palm Sunday and Thanksgiving Sunday as third highest holy day of the Christian year.<sup>6</sup> Attendance runs

high throughout the entire Advent-Christmas-New Year season, although the weekly effects are less strong and predictable than those of the Palm Sunday and Easter period because Advent stretches over the entire month of December and people' schedules are disrupted by vacations and visits (and, unlike Easter, neither Christmas Eve nor New Year's Eve is tied to a given day of the week).

Remove the holiday spikes and a seasonal cycle stands out. Attendance peaks in mid-to-late spring, bottoms out in July and August, and recovers in September. The graphs also capture exceptional events, such as sharp downward spikes in figures 3 and 4 due to freezing rain and snowstorms, and sharp upward spikes in figures 1 and 2 after terrorist attacks of September 11.

Note other patterns as well. The trend in figure 1 confirms that the RCA congregation enjoyed strong and steady growth from 1994 through 2001 – a fact celebrated by both leaders and members. In contrast, overall attendance remained relatively stable at the other congregations. Variance also differs across congregations. Attendance is least stable in the UCC congregation (figure 2) and most stable in the American Baptist congregation in Portland (figure 3). The UCC's Easter spikes are especially sharp, jumping almost 200% from a typical Sunday morning baseline just under 225 worshippers to an Easter average just over 630. No other group experiences such massive Easter change. Box plots and standard calculations likewise show that the overall distribution of attendance at the UCC congregation is far more skewed than those of the other three congregations.

There are, of course, numerous statistical methods that one may apply to time series like those of figures 1 through 4. They can be used to separate a series into different components (such as trend,

seasonality, serial correlation, and simple noise) and forecast attendance well into the future. They also help identify turning points, exogenous events, and level shifts. More sophisticated methods identify relationships across different series (such as attendance, membership, and giving) or exogenous factors (such as population growth and economic trends). With time series analysis, the sky is the limit.

Given the exploratory nature of this study, we will keep our feet on the ground and stick to simple methods.<sup>7</sup> Table 1 reports on regressions that capture long-run trends, seasonality, holidays and other special events, and random residuals. Cost-benefit thinking provides a natural way to interpret the results.

**[Table 1 about here]**

### **FROM OBSERVATION TO INTERPRETATION: A SIMPLE THEORY OF EVERYDAY ATTENDANCE**

It is a fact that most Americans – be they Christians, Jews, Moslems, or “other” – approach religious observance as a choice, an activity to be skipped or scheduled along with all the other time-consuming activities that fill their days. This may not be the theologically “correct,” nor the pattern of times past, but it is the way things are. On this point there is broad scholarly agreement, running from the “new paradigm” proponents of rational choice theory to their strongest critics. Steve Bruce (1999) thus began his most recent book – a broadside against rational choice – with the observation that “never before have so many people been free to choose [their religion] or had such a range to choose from.”

Weekly attendance patterns provide an excellent illustration of how religious choice works *at the margin* – that is, among the people who attend church with some regularity and who weekly choose (consciously or not) whether to attend or skip their church’s worship services. Theologians, philosophers, and academic researchers may find these choices of little interest compared to larger matters, such as belief in God, conversion and apostasy, new religious movements, or great works of faith. But for the vast majority of members and leaders nearly all the institutional “action” occurs at the margin, including membership growth, financial health, special initiatives, and community service.

In choosing whether or not to attend on any given day, attenders effectively turn religious observance into a type of “commodity” or “product.” Rational choice theorists characterize such choices as a matter of “demanding” or “consuming” those commodities that yield net benefits. In other words, they characterize choice as a matter of weighing perceived costs and perceived benefits (current and future, concrete and abstract, actual and expected). Although other researchers question the application of cost-benefit analysis to the fundamental features of religion (e.g., Bruce 1999), scholars of all stripes recognize its relevance in everyday observance. As Peter Berger emphasized long ago, our modern “pluralistic situation is above all, a *market situation*. ...

In it, the religious institutions become marketing agencies and the religious traditions become consumer commodities. And at any rate a good deal of religious activity in this situation comes to be dominated by the logic of market economics.” (Berger 1969)

If Berger was right on this point – and we think he was – then the logic of market economics should shape patterns of congregational attendance. More specifically, a cost-benefit model of religious

demand should explain many of the features our weekly counts. Standard demand determinants include: the product's own price and attributes; the prices and attributes of related products (both substitutes and complements); incomes; endowments of individual and social "capital"; and characteristics that shape people's underlying preferences.

Consider how these determinants arise in the context of weekly attendance.

*Product price:* In various times and places, religious practice has carried numerous costs, ranging from membership fees and sacrificial offerings to social stigma and state-sponsored persecution. These days, however, *time* is the principal cost of mainstream practice, or more precisely the total value of time forgone on account of the practice. To estimate the price of church attendance in monetary terms, it thus suffices to multiply the hourly *value* of a person's time (known as his or her "shadow wage") by the full *amount* of time sacrificed in order to attend. This price corresponds to what an economist would call the *marginal cost* of attendance – the minimal sacrifice required to attend one more service.<sup>8</sup>

*Product attributes:* Religious services are not homogeneous commodities like gallons of gasoline or bushels of wheat. Rather, more like cars or schools, their character varies dramatically across makes and models (denominations, regions, congregations), and even within a single congregation, the quality and character of services can vary dramatically from one week to the next. The demand for the services of a particular denomination or congregation will thus change when the character or quality of its product changes. Some of these changes are easy to predict, as when the

Sunday service features a famous speaker or special holiday program (or, on the down side, as when a series of undistinguished substitute speakers fill in while the senior pastor goes on vacation).

*Substitutes:* The price of attendance is intimately related to the range and value of competing activities, such as sleep, sports, gardening, shopping, and professional work. As these alternatives become more numerous and more attractive, attendance becomes more costly and, *ceterus paribus*, less frequent.

*Complements:* Church attendance makes some activities easier to pursue. Through church and church-sponsored events, people socialize, obtain child care, meet and make friends, extend their professional networks, and receive advice, support, and counseling. By increasing the total benefits associated with church membership or church involvement, these activities increase rates of attendance.

*Income:* On the basis of economic theory alone, we cannot predict whether increased income will raise or lower the demand for church attendance or, for that matter, other goods. The conventional wisdom, stretching back to ancient times, strongly suggests that rich people are less religious than the poor (“It is easier for a camel to go through the eye of a needle than for a rich man to enter the kingdom of God.” – Matthew 19:23, NIV). At the level of personal belief this may be true, but at the level of external involvement, nearly all survey data demonstrate a weak, but generally *positive* relationship between income and religious observance.<sup>9</sup>

*Capital and characteristics:* Many other individual and household characteristics affect rates of religious observance.<sup>10</sup> Women, blacks, married couples, and older people are all relatively frequent

church-goers. Education appears to increase rates of church attendance, and religious education has especially strong impact – as do most other measures of religious training and experience. Not surprisingly, those who profess the highest levels of religious belief attend most frequently.

Demand theory has the benefit of integrating numerous within a *single* explanatory framework. For examples of what we mean by “integration,” consider our own poor habits. Week after week, one or both of our families inadvertently illustrates the tradeoff between church attendance and sleep (or perhaps the tradeoff between attending church and staying up late the night before) by arriving late to church, or sometimes not at all. More importantly, any substantial increase in the “opportunity cost” of our time tends to reduce our rates of attendance – be it a critical deadline, a visit from friends or relatives, a special weekend event, or especially bad weather. We are not alone in falling prey to these temptations; they appear to shift attendance rates of a great many “weekly” churchgoers (and their idiosyncratic nature helps explain why standard regressions do such a poor job predicting across people or over time). Indeed, the ups and downs in most people’s rates of attendance almost certainly link more closely to cost changes than to changes in underlying religious beliefs. This insight is of sufficient relevance to congregational life that we list it as a proposition:

***Proposition:** Variation over time in a person’s level of religious observance is more closely linked to variation in the person’s **opportunity cost** time than to variation in underlying religious beliefs, concerns, or commitments.*

Weather: Figures 1 through 4 illustrate the impact that weather has on the cost and level of attendance. Extremely bad weather has the most striking (and least surprising) effect: it raises the cost

of travel so dramatically that very few people are willing to go to church, or for that matter anywhere else. In table 1, this phenomenon is captured by the large and negative “Bad Weather Sundays” coefficient for the two American Baptist congregations in Oregon.

If members approached churchgoing as an absolute obligation rather than a matter of choice, we would expect most weather changes to have little or no impact on their rates of attendance. (In the jargon of economics, demand for attendance would be highly “inelastic” with respect to weather and other components of its full price.) What we actually observe, however, is enough to make most pastors cry. Good weather leads to *lower* attendance – not because it raises the direct cost of attending, but because it makes alternative recreational activities more attractive (thereby raising the opportunity cost of church attendance).<sup>11</sup> The title of this paper was inspired by a taped lecture on church growth, in which the Vineyard pastor Ken Guilliksen described his efforts to “plant” a new congregation in the Boston area – “throughout the fall,” said he, “we always pray for rainy days.”

Seasonality: Although weather contributes to the seasonal swings in attendance, its effects are greatly augmented by school schedules and summer vacations. The monthly coefficients in table 1 document the collapse of attendance from mid-June through mid-August. As schools let out, weather improves, and vacation time abounds, the lure of alternative activities all but empties the churches. Dedicated members who attend regularly throughout the school year find that the price of attendance is now too high for their tastes. Instead, they substitute recreational activities, out-of-town vacations, home improvement projects, or even special religious activities, such as retreats, camps, Habitat for Humanity work projects, and conferences. The regular Sunday service may not have changed, but its

*relative* value has diminished in the face of these fair weather alternatives. Rather than fight the logic of economics, most churches accommodate their wayward members by adopting special summer schedules, which often include fewer (and earlier) worship services, discontinued weekday meetings, a pared down Sunday school program, and recreational activities such as church camping trips.<sup>12</sup>

If our argument is correct, then we would expect more seasonal variation among some age groups than others. Young adults and families with school-age children will experience the greatest change in their opportunities. The elderly would experience the least, since they have no direct links to the school year, are not constrained by professional vacation schedules, and often lack the vitality to pursue outdoor activities or out-of-town vacationing.<sup>13</sup> Hence:

***Proposition:*** *Seasonal variation in attendance will be relatively strong among young adults and families with school-age children and relatively weak among the elderly.*

As it turns out, the data from the RCA congregation provide an indirect test of this proposition. This church holds three worship services each Sunday (at 8:30am, 10:00am, and 11:30am) and explicitly targets the middle service for older people with more “traditional” tastes.<sup>14</sup> Figure 5, plots the attendance patterns for the 8:30 versus 10:00 services over several years. As predicted, attendance at the latter service varies much less from season to season, whereas attendance at the 8:30 service drops dramatically in the summer months. (In order to make the seasonal effects more visible, we have “smoothed” the time series and filtered out the effects of special days.)

**[Figure 5 about here]**

Time Constraints: Religious leaders often characterize erratic attendance as an unfortunate consequence of the “time pressures” that plague their members, but weekly data underscore the extent to which the fundamental problem is not lack of time, but rather its abundance. Never in human history have people been blessed with so many hours of non-working “leisure” (and almost any family willing to settle for a 1950’s standard of living could lower their working hours farther still).<sup>15</sup> But this growth in time pales relative to the accompanying growth real incomes and technology, which mean that each free hour is now “chased” by many more consumption opportunities – from video games and DVD’s to sports events and trips to Tahiti. This point too deserves special emphasis:

***Proposition:** It is not a lack of leisure but rather an abundance of alternatives that most frequently tempts members to skip church.*

***Corollary:** Fine weather and free weekends are enemies of attendance.*

Holy Days: Of course, the logic of economics cuts both ways. Attractive alternatives reduce the demand for church, but special services raise it. And as can be seen in table 1, religious holidays and special events attract many more worshippers than do ordinary Sunday services. Insofar as people take special pleasure in attending Christmas or Easter services (or special guilt in failing to do so) one can describe the holy-day effect as “demand driven.” On the other, supply-side shifts also enter insofar as churches labor to make worship especially attractive, spectacular, and moving on Easter, Christmas, Palm Sunday, Thanksgiving, and (it seems) Mother’s Day. The standard “product enhancements”

include grand choral performances, regal brass bands, dramatic scripture readings, colorful banners, and costly floral arrangements.

The holy day effect is even more pronounced in religious traditions that place less emphasis upon regular attendance. Thus, many Jewish synagogues find that they must ration attendance at Yom Kippur and Rosh Hashanah, giving priority to their own (dues-paying) members.<sup>16</sup> Faced with overwhelming “peak-time” demand, some groups, including Stanford’s Hillel association, have gone so far as to charge a special fee to non-members wishing to attend their Yom Kippur services (Acherd 2000).

**Intertemporal Substitution:** A more subtle phenomenon takes place immediately *after* holy days. As table 1 shows, attendance drops notably on the Sundays following Easter – not just relative to the preceding high, but relative to the average level for these times of the year. Table 1 shows a similar after-Christmas effect. We suspect that these drops are driven by “intertemporal substitution.” To understand what this means and why it occurs, note that it is probably semi-regular attenders (rather than unbelievers or Christmas/Easter “two timers”) who account for most of the holiday attendance boom. These members, who typically attend once or twice each month, make a special effort to attend on Palm Sunday, Easter and during the Advent-Christmas season. In doing so, they probably *shift* (or “substitute”) their attendance from the surrounding weeks toward the holiday weeks. Insofar as their underlying demand for church remains relatively constant, short periods of low attendance tend to follow short periods of exceptionally high attendance. (Just as people tend to balance their calorie intake over

time, so also periods of “religious dieting” tend to follow the holy days of “religious feasting.”)

Downers: If “holy days” pack them in, then horrid days keep them out. Attendance drops when members anticipate a poorer than usual performance – a phenomenon documented in table 1 by the negative coefficients associated with a period of interim pastorates at the UCC congregation. One of us can attest that the second interim pastor was a horrendous preacher, albeit a wonderful person. That person can also attest to the ingenious forms of substitution associated with this shift in product quality, including his wife’s sudden decision to volunteer to run the 2nd and 3rd grade Sunday school class that met *during* worship. (A series of poor sermons thus proved more persuasive than three years of invitations from the director of Christian education.)

Trends and “Circulation”: The data capture other interesting effects, including the RCA congregation’s upward trend from around 1994 through 1999. As we noted earlier in this paper, this record of strong and steady growth was widely celebrated by both leaders and members of the congregation. Unfortunately, it also was widely misinterpreted. Rates of increase this high almost never rest upon true conversions or even increased rates of individual attendance – they typically reflect mobility from one church to another (“brand switching” as opposed to “industry growth”). Years ago, Bibby and Brinkeroff (1973) labeled this phenomenon, “the circulation of the saints.” In this particular case, the circulation was especially direct – the consequence of crises in three nearby churches whose worship styles and theological orientations made the RCA church a natural alternative. Although we can personally attest to the quality of the RCA congregation’s leaders and the warmth and commitment of its members, these attributes rarely suffice bring many new “customers” into a mature market. Inattention

to this fact (and an understandable hesitancy to interpret their blessings as the consequence of “the competition’s” misfortune) encouraged unrealistic forecasts, an unsustainable emphasis on outreach, and a very costly construction program.

Stability and “Strictness”: When initially discussing figures 1 through 4, we noted that the UCC congregation had especially large holy day spikes and week-to-week variability. Although our data supply nothing approaching proof, this feature does seem consistent with the fact that the UCC church also is the most liberal of the four congregations. The RCA and ABC congregations are far more evangelical and (relatively speaking) place more demands on their adherents. One such demand is regular church attendance. The three evangelical congregations expect it; the UCC congregation hopes for it. Among groups with even weaker commitments to regular observance (e.g., the Hillel group in Stanford), it appears that attendance swings are greater still. The following hypotheses strike us as warranting future work:

***Proposition:** Week-to-week stability of congregational attendance constitutes a meaningful proxy measure of membership commitment.<sup>17</sup>*

***Proposition:** Other things being equal, attendance will be more stable for congregations associated with relatively strict and/or conservative denominations.*

We thus expect attendance rates to become substantially more stable as one traverses the denominational continuum from groups like the Episcopalians and UCC to groups Southern Baptists to “sects” like the Adventists, Mormons, and Jehovah’s Witnesses. We also expect an analogous pattern

running from Reform Jewish congregations, to Conservative congregations, and finally to Orthodox and Hassidic groups. And, applying the proposition to individual groups over time, we “predict” that Catholic average mass attendance did not merely decline, but also became less stable, after Vatican II.

September 11<sup>th</sup>: In the weeks after the terrorist attacks of September 11 2001, a religious boom throughout America was widely reported in the media. It struck us as odd, both at the time and in the months to follow, that these reports invariably cited opinion polls as their source. Congregational counts provided far more illuminating data, and whereas the pollsters took a couple of months to conclude that the shift was short-lived (Goodstein 2001), simple counts nailed down the full profile within three weeks. See figure 6, which superimposes attendance trends at all four congregations for the weeks surrounding September 11<sup>th</sup>. The obvious question for future research is whether similar patterns characterize people’s religious response to other disasters and, if so, why. A two-week revival certainly contradicts claims that 9/11 led many American’s to seriously rethink their priorities.

[Figure 6 about here]

## SUMMARY AND CONCLUSIONS

Regular observance is, and always has been, a fundamental aspect of religious commitment in Christianity, Judaism, and Islam. Modern scholars have has good reason to make attendance a focus of their research. On the other hand, focusing almost exclusively on self-reported attendance is unwarranted and unnecessary. Surveys help us understand the demographic correlates of attendance, and the relationship between attendance and other aspects of individual commitment, but they abstract

from its dynamics. Whether or not surveys bias our estimates of actual attendance levels, they color our view of religious commitment in many other ways. Attendance comes to be seen as a static attribute rather than a dynamic action, its everyday determinants are obscured, and its social context is largely lost.

Congregational attendance counts give us a very different view of attendance. For any given congregation, the time series of attendance counts tells us much about the health of the church, the habits of its members, and the interplay of religious “supply” and “demand.” By comparing the attendance series for congregations from different denominations, we see aspects of denominational culture that surveys cannot capture. In particular, the dynamics of weekly attendance leave little doubt that perceived costs and benefits – especially the opportunity cost of time – strongly influence people’s timing and rates of religious observance at the margin.

Given the ease with which attendance data can be collected, the many uses to which it can be put, and its importance for religious institutions, researchers would do well to study such data *much* more closely than they have in the past. We have reviewed some of the more salient features of attendance and have noted how well they fit cost-benefit (or “rational choice”) models of religious observance. We invite others to see if alternative models do as well or better. We also welcome more sophisticated analyses of weekly attendance data, using more powerful statistical methods. Above all, we look forward to research that analyzes weekly attendance data together with data on weekly contributions, membership growth, church activities and initiatives, attributes and activities of the leaders, attendance at neighboring churches, variation in weather, economic and demographic trends, and more.

Although membership studies have already covered some of this ground, we suspect that weekly attendance is a more sensitive “instrument” for the study of most subjects.

We recognize that direct experience has already taught many pastors much of what we have discussed. But this only underscores the potential benefits from academic researchers working more closely with religious professionals. For every rule of thumb we verified, there was another that did not stand up to scrutiny, and yet another that church leaders routinely overlook.

The first order of business is, of course, obtaining much more data spanning more congregations, locations, and denominations. The good news is that the data exist. Indeed they exist in abundance everywhere one looks. We sit atop a mountain of information ready to be mined. This was merely an exploratory dig.

## NOTES

<sup>1</sup> For related results, see Caplow (1998), Hadaway (1998), Hout (1998), Smith (1998), and Woodberry (1998).

<sup>2</sup> For an outstanding example, see Finke and Stark's (1986) "Turning Pews into People," in which they estimate nineteenth century denominational membership trends via census reports on church seating capacity. The work by Hadaway et. al (Hadaway, Marler et al. 1993; Hadaway and L. 1998) contrasts polls versus counts.

<sup>3</sup> Under-counts are inevitable. The problem starts with the very act of counting, which is inherently biased by the physiological fact that people have a greater tendency to overlook items (in this case, people) that are present than to visualize items that are not. The setting makes things worse. The counters seek to do their job as quickly, quietly, and inconspicuously as possible. The room is often large, full, and dimly lit room, with people spaced irregularly across high-backed pews – making it easy to count a couple as one or overlook a small person (let alone a child in a parent's lap, or sprawled across the pew, or hidden underfoot). Faced with these difficulties, we know people who resort to proxy counts, such as the number of used communion cups. Finally, there is no getting around the fact that some worshippers are always absent when counts are taken because they have left early, or have not yet arrived, or happen to be in odd areas of the church. In our experience, you can always find a few more members – in restrooms, hallways, the library, Sunday school rooms, church offices, the basement, the kitchen, recreational areas, or the parking lot.

<sup>4</sup> To be precise, let  $C_t$  denote the attendance count for week  $t$ , which by assumption equals actual attendance,  $A_t$ , plus an error term,  $e_t$ . Assume that the error terms are independent (or, at least, uncorrelated) over time, so that  $\text{Cov}(e_t, e_j) = 0$ , and have small variance  $V(e_t)$  relative to the variance in the random component of  $A_t$  over time. Then, even if  $E(e_t)$  is negative, thereby biasing counts downward,  $C_t$  will capture all the statistically relevant time-series characteristics of  $A_t$ .

<sup>5</sup> The largest Christmas Eve attendance figures occur when Christmas Eve lands on a Sunday when there are both morning and evening services.

<sup>6</sup> Thanksgiving Sunday refers to the Sunday *before* Thanksgiving (see Hickman, Saliers et al. 1986). Schmidt (1995) describes the history and commercialization of American holidays, including Mother's Day.

<sup>7</sup> For an overview of more advanced time series methods, see chapters 12, 19, and 20 of Greene (2003) and chapters 8-9 and 17-18 of Kennedy (1998). See Wonnacott and Wonnacott (1979) for a guide to the methods we have employed in this paper.

<sup>8</sup> We are speaking of short run demand. In the longer run, social pressure or explicit membership requirements might require that the full price of regular attendance include the cost associated with some minimal level of service or giving.

<sup>9</sup> This observation is, in fact, consistent with New Testament accounts, even those that rail against the rich. Jesus condemns the rich, not for their lack of observance, but, quite the contrary, for hypocritical observance designed to impress others (Matthew 6:2) or insufficient observance relative to their high status and wealth (Mark 12:41-43).

<sup>10</sup> The impact of these factors stands out in multivariate models that include numerous statistical controls. If they do not directly affect religious observance and commitment, they must certainly be very closely tied to the underlying factors that do. For a summary of findings on the correlates of attendance, see Argyle and Beit-Hallahmi (1975.)

<sup>11</sup> Based on personal observations and conversations with pastors, we predict that this good weather effect is especially pronounced in spring, when months of restrictive weather give way to beautiful days. For many church members, the urge to enjoy an exceptionally beautiful weekend proves too great to resist. We urge some enterprising student to test this hypothesis by coding up the weekly weather (and especially the deviations from past weeks) corresponding to our weekly attendance counts.

<sup>12</sup> For some extreme examples of accommodations to secular schedules, see Jeffrey's (2002) report on churches and synagogues "rejiggering worship schedules for busy congregants ... moving the pre-Easter 'Maundy' service from the traditional Thursday to Tuesday (for less hectic Easter weekends), holding Passover seders on the obscure third and fourth nights of the holiday week ... [scheduling a] 'late Shabbat' service [well after sundown] on Friday" and switching Easter service to Saturday night.

<sup>13</sup> One might corroborate this hypothesis by comparing a congregation's overall attendance figures to those for its Sunday school classes for children and, if available, the distribution of attendance across different types of adult classes (for singles, young adults, retirees, etc.).

<sup>14</sup> The "traditional" service differs from the others in several ways. The program includes more traditional hymns and fewer contemporary praise choruses. A piano and organ provide accompaniment, rather than a band. The order of service is printed in the bulletin. The pastor usually wears traditional robes, rather than a business suit.

<sup>15</sup> Despite some popular claims the the contrary (most notably Schor 1992), an overwhelming body of economic and demographic data witness to the dramatic increase in non-labor time available to Americans (and members of all developed countries) over the past half-century. Young people enter the labor force later than they used to. Older people retire earlier, enjoy better health, and life *much* longer. Women have fewer children, devote fewer hours to chores, and do far less heavy labor (in or out of the home). Paid jobs are less physically demanding, while offering more flexible hours, safer and more pleasant working conditions, and many more opportunities to socialize on the job. Moreover, recent research (such as Sundstrom 1999) indicate a growing divergence between the official and actual number on-the-job hours Americans are working. Alternative estimates, including those based on time-use studies point to substantially lower and declining actual hours on the job.

<sup>16</sup> In contrast to most Christian churches, in which regular attenders make up the bulk of holy-day attenders, many if not most Jewish holy-day attenders rarely if ever go to synagogue on other weeks of the year. This creates a tremendous "peak load" problem, as well as a potential free-rider problem (because a synagogue's operating costs are covered by the annual dues of the relatively few regular attenders who make up the bulk of a synagogue's official membership). To mitigate these problems, many synagogues issue tickets for the most popular holy day services, which regular members receive free of charge but others must purchase.

<sup>17</sup> The mathematical basis for this proposition can be illustrated as follows. Let  $A$  denote the average attendance rate at a church, and let  $M$  denote the total number of (unofficial) “members” who attend at least some of the time. For the sake of simplicity, assume that apart from holidays and other special days all such people attend at the same rate,  $r$ , and assume that this probability of attendance is distributed independently over the full membership. From the properties of the binomial distribution, it then follows that the expected value of  $A$  is  $E(A) = rM$ , the variance is  $V(A) = r(1-r)M$ , and the relative variability of attendance is  $V(A)/E(A) = 1/(1-r)$ . Thus, as the average attendance rate,  $r$ , increases, the relative variability of attendance falls (and reaches zero when the attendance rate hits 100%). Subject to a few provisos, the basic result continues to apply even when attenders do not all share the same underlying attendance rate.

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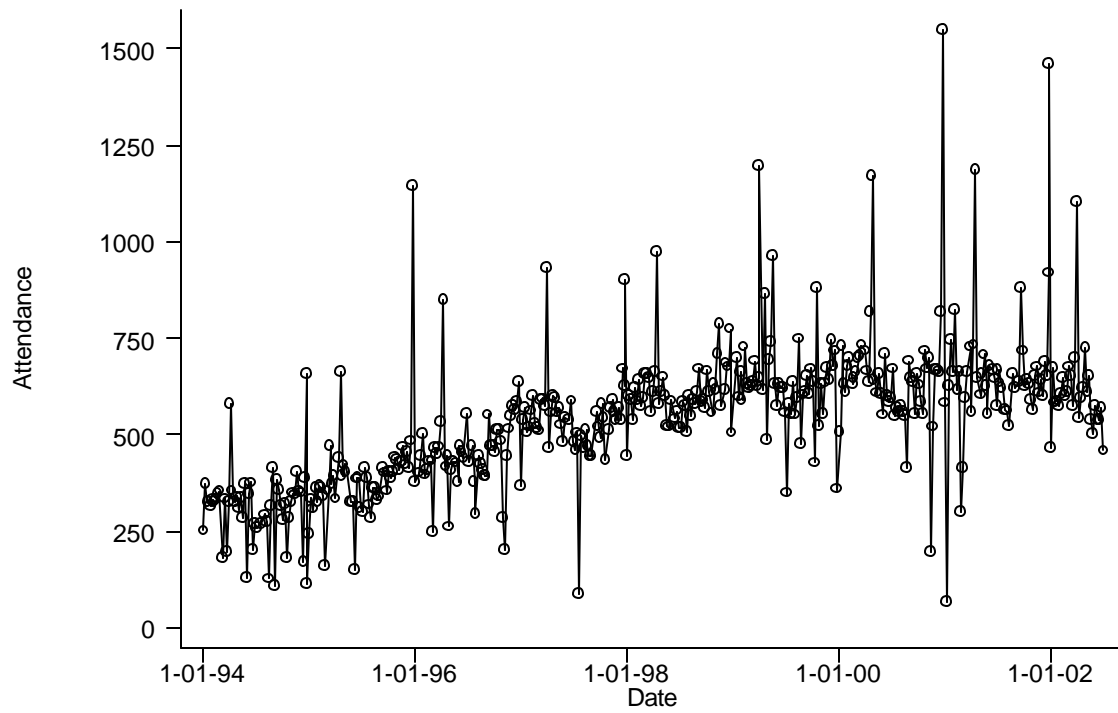
**Table 1: Time Series Regressions**

	<b>RCA No. Calif</b>	<b>UCC No. Calif</b>	<b>ABC Oregon</b>	<b>ABC Washington</b>
<i>Annual Trend</i>	76.597***	-3.510***	-1.534***	2.161**
<i>Months<sup>1</sup></i>				
January	95.715***	42.842***	55.527***	24.560***
February	58.244*	60.255***	36.100**	32.077***
March	95.690**	59.049***	63.271***	24.416***
April	89.811**	38.299***	49.605***	29.904***
May	52.310	49.491***	29.260***	28.215***
June	68.004*	6.570	9.661	19.703***
July	-4.852	-6.772	13.144	9.494
September	71.664**	41.255***	42.834**	35.334***
October	28.232	29.284***	47.329***	27.844***
November	84.725*	52.048***	73.587***	28.354***
December	77.469	72.085***	102.006***	26.211**
<i>Holidays and Seasons</i>				
Palm Sunday	42.124	101.996***	62.347**	4.567
Easter	339.405***	405.529***	306.265***	56.696***
Post-Easter Sunday	-17.375	-5.912	-21.484	-1.341
Mother's Day	41.861	37.158*	60.418**	19.792*
Memorial Day	-65.585	-44.174**	10.153	-36.108***
July 4 <sup>th</sup> Weekend	-66.632	-17.058	5.848	-18.954
Thanksgiving	46.062	33.278	51.109*	22.816*
Advent-Christmas	11.065	18.232	-19.340	9.329*
Post Christmas Sunday	-99.339	-92.823***	-79.750**	-23.269
Post New Year's Sunday	-8.475	-46.317**	-30.278	1.966
<i>Other Special Events &amp; Days</i>				
Special Events		126.364***	67.051***	
Interim Pastor 1		-8.508		
Interim Pastor 2		-16.452		
Bad Weather Sundays			-432.368***	-91.250***
Intercept	-2408.288	309.989	454.732	8.320
Model F	17.940***	63.770***	27.150***	10.220***
Adjusted R <sup>2</sup>	0.659	.829	.687	.432
D-W Statistic	1.958	2.103	1.733	1.472
N-periods	194	325	287	280

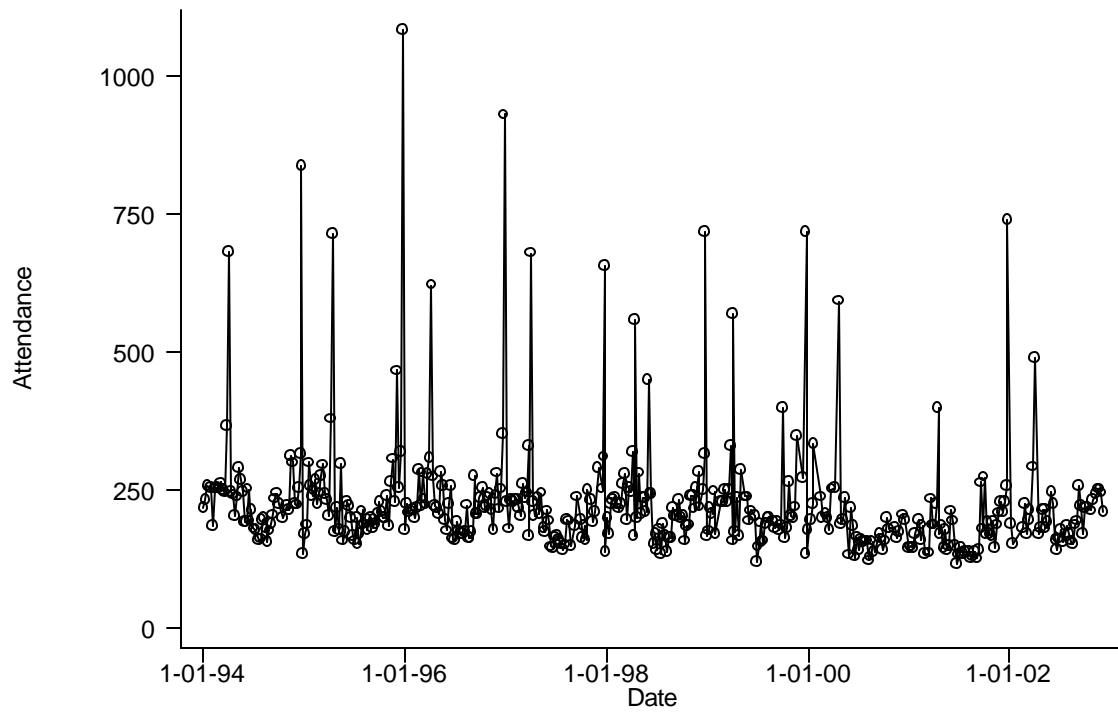
Notes: <sup>1</sup> August is reference category. Two-tailed sig. levels: \* p < .05, \*\* p < .01, \*\*\* p < .001

**NOTE:  
Figures Must be Reformatted and Updated**

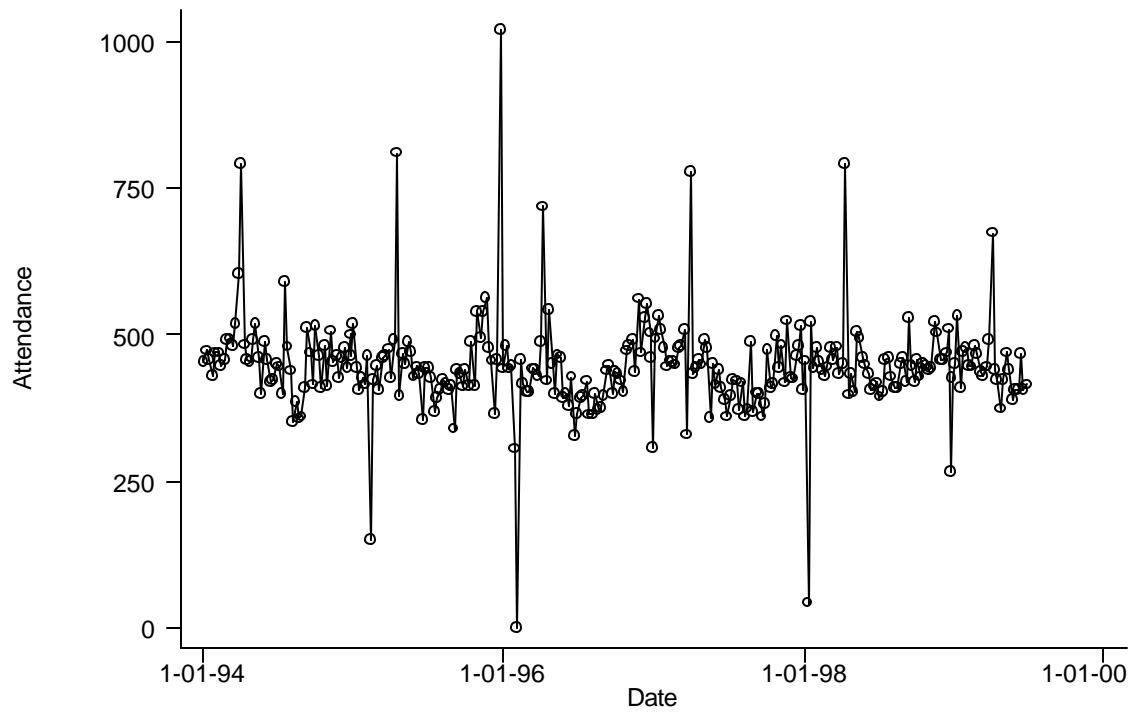
**Figure 1: Attendance Patterns of Northern California RCA Congregation, 1994-2002**



**Figure 2: Attendance Patterns of Northern California United Church of Christ Congregation, 1994-2002**



**Figure 3: Attendance Patterns of Portland, Oregon American Baptist Congregation, 1994-1999**

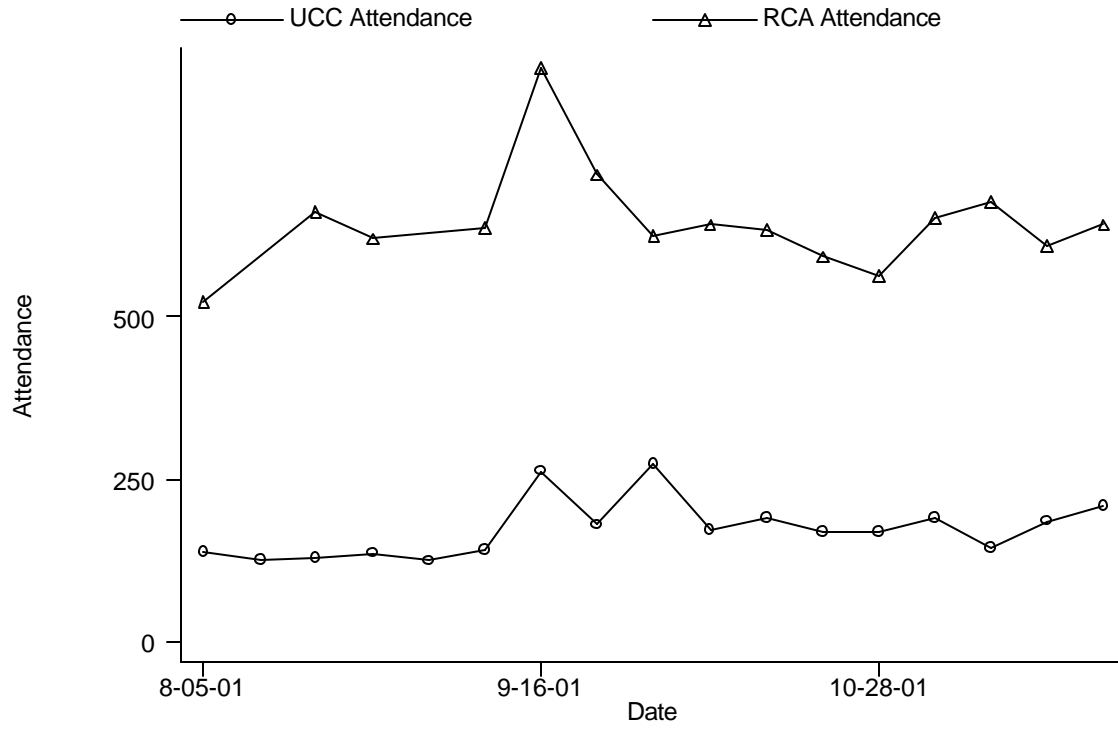




**Figure 5: Seasonality of RCA “Contemporary” versus “Traditional” Services**

[OMITTED]

**Figure 6: September 11 Effects: RCA and UCC Congregations**



*Note:* The UCC congregation had special event unrelated to September 11 on September 30.