

Free Riders, Givers, and Heavy Users: Predicting Listener Support for Public Radio

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The economy of public radio in the United States has been changing from dependence upon government tax dollars to self-sufficiency based on audience service. In the largest recontact study ever conducted for public radio, 30,834 public radio listeners who kept Arbitron diaries in 18 major markets were interviewed. By linking questionnaire responses to Arbitron diary data, the study determined the predictors of which listeners become givers and which givers contribute at different levels. Giving is driven by reliance upon public radio as measured by listening behavior, along with the realization that public radio has become personally important to the listener. Consistent with economic theory, giving to public radio appears to be driven by impure altruism.

In the last two decades, the economy of public radio in the United States has been changing from dependence upon government tax dollars towards self-sufficiency based on audience service. According to audited financial data compiled by the Corporation for Public Broadcasting, tax-based support for public radio dropped from 72% of income in 1980 to 33% in 2001. Federal tax dollars passed through CPB dropped from 30% to 14% of public radio's income, while state tax dollars expended by universities dropped from 23% to 12%. In the same period, listener contributions increased from 10 to 32% of public radio's income, while underwriting increased from 8 to 19%. In 2001, listener support reached approximately \$200 million, double the 1991 amount when adjusted for inflation (Thomas, 2003).

Some academic critics have expressed their discontent with the evolution of public radio towards a self-sufficient medium. McChesney (1995) predicted that "there will be no more government-subsidized broadcasting in the United States by the end of the [1990's]. I believe this is unfortunate and that it is very much in our interest to be expanding through any number of measures the nonprofit and

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The Public Radio Tracking Study was funded by the Corporation for Public Broadcasting and 21 major market public radio stations. David Giovannoni of Audience Research Analysis processed the Arbitron diaries and built data files.

noncommercial media sector" (p.1). His concern is that public broadcasting, without tax dollars, would target an affluent rather than working-class audience, since upscale viewers and listeners have more disposable income to contribute. Thus, public broadcasting will eventually succumb to market forces and no longer provide an alternative to corporate media (McChesney, 1999).

McCauley (2002) observed, correctly, that NPR's intelligent programming appeals to a highly educated audience: "A quick review of NPR's history reveals a network that has virtually been forced, by strictures of funding and politics, to serve one particular audience and serve it better than anyone else" (p. 67). Yet, in the tradition of McChesney, he considers it inappropriate that NPR should target an erudite audience.

Less doctrinaire observers like Loomis (2001) point out that all sources of funding, including government tax dollars, come with their own costs: "Critics question a funding system that requires broadcasters to regularly lobby Congress for financial support. The broadcasters question the logic of having to continually delegate resources to raise funds from community and business sources" (p.524). Accordingly, public radio managers have turned to their own audiences, asking for support from those listeners who use the service.

Stavitsky (1995), who has chronicled the development of audience research in public radio, summed up the situation pragmatically: "Nonetheless, the fiscal realities of contemporary U.S. public radio—indeed of public radio worldwide—dictate that stations must be cognizant of their appeal to listeners who support them financially, and thus audience research will remain an essential management function" (p. 186).

Each year public radio strives to become more self-sufficient based on its own audience. Yet no individual listener has to send money to public radio. The programming is freely distributed on broadcast channels. Anyone may listen, whether or not they send money. In fact, most public radio listeners are "free riders," to use the economist's term (Kingma & McClelland, 1995). A "free rider" is an individual who uses the service but does not contribute to its support.

Social scientists interested in the theory of giving to public radio have addressed two research questions: Which listeners will give? Why do they give at different levels? This article reports two major analyses from the Public Radio Tracking Study, the largest recontact study ever conducted for public radio: a regression model that predicts which listeners become givers, and a segmentation analysis that reveals differences between light, moderate, and heavy givers.

Is Public Radio a Public Good?

A pure public good is one whose cost of production is independent of the number of people who consume it, because one person's consumption does not reduce the available quantity (Owen & Wildman, 1992). By that definition, the programming broadcast on any radio or television station would be a public good, but the

producer of a public good may sometimes need to deny the public good to nonpaying consumers (Owen & Wildman, 1992). After all, if no one paid, it would be impossible to produce the good.

Theoretical research on voluntary giving may be found in the literature of economics. According to Kingma and McClelland (1995), "[t]he early economic theory that charitable contributions supporting the output of a nonprofit organization could be modeled as a pure public good" has been refuted by findings that "free-riding would drive contributions to minimal levels" (p.65). They applied a censored regression model to data on charitable giving to public radio stations and found that if a donor's listening increases by 15 minutes, the contribution increases by about 50 cents. Their emphatic conclusion was that "public radio stations are really, really not public goods" (Kingma & McClelland, 1995, p. 65).

Instead, Kingma and McClelland proposed a theory of impure altruism which states that donors receive personal satisfaction from making a charitable contribution. One benefit might be the "warm glow" received from giving to a charity the donors will never use—e.g., medical supplies for African orphanages. A different benefit results from giving to a charity that is used by the donor, like public radio. Impure altruism could be motivated by a sense of responsibility to pay for personal use of the service.

Kingma and McClelland (1995) gained access to a data set that combined Arbitron diaries with household giving to public radio. In fact, this was the data set originally built for *Audience 88*, the landmark study commissioned by the Corporation for Public Broadcasting (Giovannoni, 1988). They explained how the impure altruism model could inform strategic action by professionals in the public radio industry:

Optimal nonprofit organization fundraising, marketing, and pricing strategy and optimal government policy may be influenced by the connection between use and donations. For example, if level of use (listening to public radio, camping, going to the opera) is strongly correlated with level of donation to a nonprofit organization (public radio, the Sierra club, the opera) then nonprofit fundraising strategies should focus more heavily on the customers, clients and patrons who are heavy users. However, if use increases the probability of a donation but not the level, then a nonprofit organization's marketing strategy may focus on users rather than heavy users (Kingma & McClelland, 1995, p. 68).

If actual use of public radio does raise both the probability of becoming a giver and the level of amount given, such findings would not only support the impure altruism theory, they could also inform public radio policy and strategy.

Brunner (1998) also sought to empirically test the public good theory with reference to public radio. He explained: "Economic theory hypothesizes that when a pure public good is voluntarily provided, incentives to free ride increase with the number of individuals consuming the good" (p. 587). He suggested that since we cannot prevent anyone from listening, public radio would be an ideal test case of the free rider hypothesis. In his study, Brunner found that the proportion of listeners who

contribute to a public radio station decreases as the size of audience increases, supporting the hypothesis.

Brunner (1998) elaborated the public good theory by suggesting that some public radio listeners might be "easy riders" as opposed to free riders. An easy rider is defined as one who gives but at less than a fair share with reference to the amount of consumption. For example, a listener who uses the station for 2 hours per day ought to give more than a listener who consumes only 1 hour per day.

Concepts of Public Service and Public Support

The Public Radio Tracking Study followed directly from *Audience 98*, which itself descended from *Audience 88*. Both were large-scale, national research projects commissioned by the Corporation for Public Broadcasting. Their major innovation was the use of recontact methodology, linking respondent-level Arbitron diary data with follow-up mail questionnaires about giving to public radio (Stavitsky, 1995).

Audience 98 articulated concepts and relationships that have become widely accepted by policy makers in the public radio system. The first is that "public service begets public support." Public service is defined as the product of listening and value. That is, public service happens when listeners use and value the programming, which results in public support.

The second relationship is that "public support focuses public service." That is, self-sufficiency based on audience creates an incentive for public radio stations to focus their programming (Giovannoni, 1998).

Focused programming means a coherent format that is designed for the needs of a particular target audience, rather than a crazy-quilt of various programs—each aimed at a different audience. Back in the 1970s, the crazy-quilt schedule was common, making listening difficult even for dedicated listeners. Listener-sensitive schedules began to appear in the 1980s. Based on a survey of program directors, Giovannoni (1992) predicted that the typical public radio station would offer fewer formats, a process that he called format focusing. That term was picked up by Stavitsky (1994), who noted that consistency of appeal had become the motto of public radio program directors.

Research Questions

Audience 98 was based on Arbitron data collected in fall 1996. After its publication, national policy makers and the managers of leading public radio stations agreed that such research should be carried forward. The author proposed a longitudinal study to track critical measures of listening and giving across three years, 1999-2001. This article addresses two research questions that are grounded in the theory of impure altruism:

RQ1: What are the characteristics of givers as opposed to free riders?

RQ2: What explains giving at light, moderate, or heavy levels?

Method

Stavitsky reviewed 15 articles published in this journal and called for more creative approaches to audience research by scholars with access to Nielsen or Arbitron data. In particular, he saw the need for close examination of Arbitron radio diaries on the respondent level, as opposed to audience estimates like ratings or shares (Stavitsky, 2000). As Stavitsky issued his call, the Public Radio Tracking Study, combining respondent-level diary analysis with recontact interviews, was already underway.

Sampling

All public radio stations that as of 1999 were reaching at least 250 Arbitron diaries in their metro market were identified. It was determined that a starting sample of that size would yield a sufficient tabulated sample to project semi-annual rolling average estimates on the station level. Stations that met our sampling requirements were located in large markets like New York and Phoenix or in high education markets like Austin and Raleigh.

The Corporation for Public Broadcasting issued a challenge grant that encouraged matching financial participation by stations. The number of participating stations changed over time, from 14 in the first quarter, winter 1999, to 13 in the last quarter, fall 2001.

Each quarter a recontact survey was fielded in the market, up to 12 independent samples for each station. After three years, 30,834 public radio listeners of 21 public radio stations were interviewed in 18 major markets. This large data set allowed comparisons across markets and trends over time.

By size of audience and amount of listener support, the stations in this study represented the most important in the public radio system: New York (WNYC-AM, WNYC-FM), Los Angeles (KUSC), Chicago (WBEZ), San Francisco (KQED), Philadelphia (WXPB), Boston (WBUR), Washington (WAMU, WETA), Cleveland (WCPN, WKSU), Portland (KOPB), Seattle (KPLU), Phoenix (KJZZ), Denver (KCFR), Tampa (WUSF), Austin (KUT), Hartford (WPKT), Cincinnati (WGUC), Raleigh (WUNC), and Houston (KUHF).

For any analysis based on an aggregation of independent samples, it is critical to maintain a constant set of stations. Accordingly, two distinct subsets of our data were analyzed, each appropriate for one of our research questions. For the first research questions, about givers and nongivers, data were analyzed from the most recent year, 2001. That subset consisted of 8,137 respondents from 13 stations constant across the four quarters. For the second research question, about levels of giving, a larger

subset was analyzed consisting of 17,591 listeners to 9 stations across all three years, 1999-2001. That provided finer detail on the amount given, across a constant list of stations.

Weighting

Each quarter, for each station, up to 250 of the station's diaries were randomly selected for a recontact interview. Overall, the completion rate for the telephone recontact interviews was 66%. It varied somewhat by station and by quarter. For example, in the fall 2001 quarter, KUT reached 306 Arbitron diaries in metro Austin. After a random selection of 250 KUT diary-keepers, 166 interviews, or 66.4%, were completed.

Arbitron uses an iterative marginal weighting technique to project audience estimates from diaries that are in the sample for a given market. Each diary is assigned a Person per Diary Value (PPDV) reflecting the number of persons each diary represents, after sample balancing for geography, age, sex, and ethnicity. Since not every diary keeper was recontacted, each respondent's PPDV was recalculated based on the number of completions. In fact, two separate weights were recalculated for each respondent, one up for projection to the station's audience and another down to the sample size for statistical tests.

Variables

For each respondent, based on diary data, several variables were calculated that measure radio listening on the individual level, as opposed to aggregate audience estimates like rating or share.

A core listener was defined as one who listened to the public radio station more than any competing station. The number of occasions of tune in and time spent listening in quarter hours were measured.

Loyalty was defined as time spent listening to the public station as a percentage of that respondent's listening to radio. For example, an individual who listened to WETA in Washington for 10 quarter hours out of a total of 30 quarter hours of radio listening was 33% loyal to the public radio station.

A separate variable was loyalty to public radio, meaning an individual's listening to more than one public radio station. For example, there are two public radio stations in Washington, WETA and WAMU. Suppose the above individual also listened to WAMU for 5 quarter hours. Loyalty to public radio would be 15 divided by 30, or 50%.

In addition to diary analysis, the recontact interview measured attitudinal variables derived from previous studies in the tradition of public radio research, especially Giovannoni (1988, 1998). Respondents were asked to agree or disagree with such statements as:

"The programming on [STATION] is an important part of my life. If it went away I would miss it."

"I generally think of public radio as being financially supported by contributing listeners."

"I generally think of public radio as being financially supported by universities or government tax dollars."

The response format was a 6-point Likert-type scale ranging from strongly agree to strongly disagree. Responses of no opinion or refuse were coded as missing data.

Household vs. Individual Giving

To determine how much money each respondent gave to a public radio station, this question was asked: "Thinking back over the last 12 months, how much money in total did your household give to support [STATION]?"

Note that the question asked about household giving. Public stations usually receive one gift from a household, not knowing the number of givers within that household. However, this study was interested in giving on the individual level.

A particular strength of the recontact method is that before any respondent was interviewed, all of the Arbitron diaries from that household had been obtained with information on how many radio listeners lived in that household, what stations they used, and for how many quarter hours.

Accordingly, it was possible to allocate the household's gift among those residents who listened to public radio. Assume that a household with three residents gave \$100, according to the recontact questionnaire. Assume that one resident did not listen to public radio, another listened for 8 hours and the third listened for 2 hours. The study allocated \$80 of the household gift to the second listener and \$20 to the third listener.

Results

Predicting Givers

Table 1 shows five radio listening variables that sharply differentiate givers from nongivers. On average, givers are 43% loyal to their public radio station compared to 29% for nongivers, $F(1, \text{wgt } n = 7872) = 309.51, p < .001$. Taking into account multiple stations per market, givers are 57% loyal to public radio, compared to 39% for nongivers, $F(1, \text{wgt } n = 7872) = 284.02, p < .001$.

The study found that 56% of givers are core listeners, compared to 37% of nongivers, $\chi^2(1, \text{wgt } n = 7873) = 285.98, p < .001$. Givers average 37 quarter hours of time spent listening per week compared to 24 quarter hours for nongivers, $F(1, \text{wgt } n = 7872) = 309.51, p < .001$. Givers average 8.3 occasions of tune-in to the

Table 1
Differences between Givers and Nongivers

Variable	Givers 43%	Nongivers 57%
Loyalty to Station	43%	29%
Loyalty to Public Radio	57%	39%
Core to Station	56%	37%
Time Spent Listening (QHRS)	37	24
Number of Occasions	8.3	5.5
Personal Importance		
Very Strong Agree	59%	34%
Moderate Agree	31%	38%
Belief in Listener Support		
Very Strong Agree	54%	36%
Moderate Agree	35%	43%
Belief in Government Support		
Very Strong Disagree	26%	17%
Moderate Disagree	27%	24%
Education		
College Graduate	36%	37%
Advanced Degree	48%	35%

Note. Unweighted N = 8,137, $p < .001$ for all differences.

station, compared to 5.5 occasions for nongivers, $F(1, \text{wgt } n = 7872) = 483.36, p < .001$.

Table 1 also shows attitudinal differences. For example, 59% of givers very strongly agree that public radio is important in their lives compared to 34% for nongivers, $\chi^2(5, \text{wgt } n = 7795) = 715.25, p < .001$. In addition, 54% of givers very strongly believe that public radio depends on listener support compared to 36% of nongivers, $\chi^2(5, \text{wgt } n = 7734) = 290.70, p < .001$. Also, 26% of givers very strongly disagree that public radio depends on government support compared to 17% of nongivers, $\chi^2(5, \text{wgt } n = 7569) = 176.91, p < .001$.

The most important demographic variable is education as shown by the finding that 48% of givers have an advanced degree compared to 35% of nongivers, $\chi^2(2, \text{wgt } n = 7856) = 239.296, p < .001$. In fact, previous research has shown that education is a stronger predictor than income (Giovannoni, 1998).

Regression Model

It is clear that givers differ from nongivers on radio listening variables and attitudinal variables. Logistic regression was used to build a model that predicts which listeners will give.

Logistic regression is appropriate when the dependent variable is dichotomous. A familiar example is the logistic model that predicts the odds of heart attack based on variables like smoking, obesity, and exercise.

Reagan (1998) suggested a list of standards for regression models in this journal. Multicollinearity is a problem if independent variables in the model correlate highly with each other. Radio listening variables like time spent listening and station loyalty do correlate with each other. Accordingly, a single listening factor called Reliance Upon Public Radio was constructed.

Factor analysis was run on eight variables of individual radio use. Principal component analysis with Varimax rotation extracted two factors. The first, Reliance Upon Public Radio (see Table 2), explained 45% of the variance, combining five variables including loyalty to station (loading .96) and core listening (loading .89). The second factor was an indicator of heavy overall radio use rather than relative use of public radio, and was deemed not useful to the analysis.

Table 2
Reliance Factor and Regression Model

Reliance Upon Public Radio	Factor Loadings				
Loyalty to Station	.96				
Core Listener	.89				
Loyalty to Public Radio	.72				
Occasions to Station	.71				
Time Spent Listening	.65				

Variables in the Equation	Regression Model				
	B	SE	Wald	Sig	Exp(B)
Givers vs. Nongivers					
Reliance Factor	.31	.026	138.00	.001	1.36
Personal Importance	.30	.018	296.04	.001	1.35
Education	.21	.019	119.28	.001	1.24
Listener Support	.16	.019	78.47	.001	1.18
Government Support	.13	.015	78.11	.001	1.14
Constant	-2.48	.105	560.63	.001	.08

Note. Unweighted N = 8,137.

Reagan (1998) advised that other problems with regression are reduced by large random samples. This model was built on 8,137 cases.

The strength of a linear regression model is measured by R^2 but logistic regression attempts to classify respondents into dichotomous values of the dependent variable (e.g., givers vs. nongivers). This analysis concentrated on building the highest correct percentage of classification and achieved 67.1%.

Consistent with theory and previous research, the most powerful single predictor in the model is Reliance upon public radio. Correct classification improved when personal importance, then education and beliefs about funding, were added. Reagan (1998) cautioned that effects cannot be presumed based solely on a regression model. Yet the model fulfills at least one logical requirement of causality: the dependent condition—becoming a giver—rarely occurs in the absence of the independent, actual use of public radio.

Light, Moderate and Heavy Givers

With reference to the second research question, the study sought to determine whether the same variables that differentiate givers from nongivers can also explain their level of giving. Zooming in to givers only, this analysis started with a larger number of 17,591 respondents from a constant set of 9 stations that each provided 12 quarterly samples, with 6,402 respondents qualified as givers.

Three segments of givers were defined based on the amount given per individual over 12 months: Light Givers gave \$49 or less, Moderate Givers gave \$50 to \$100 and Heavy Givers gave more than \$100. Heavy Givers are worthy of special attention because they constitute only 16% of givers, but they contribute 48% of the money. Moderate Givers constitute 44% of givers and give a reasonable 40% of the money. Light Givers constitute 40% of givers, but only 12% of the money given.

Table 3 shows how Light, Moderate, and Heavy Givers are sharply differentiated by radio listening variables. For example, Light Givers are 35% loyal to their public radio station, while Heavy Givers are 52% loyal, $F(2, \text{wgt } n = 6377) = 84.06, p < .001$. We found that 45% of Light Givers are core, compared to 64% of Heavy Givers, $\chi^2(2, \text{wgt } n = 6377) = 87.78, p < .001$.

Personal importance also predicts level of giving. For example, 69% of Heavy Givers very strongly agree that public radio is important in their lives, compared to 53% of Light Givers, $\chi^2(10, \text{wgt } n = 6377) = 103.76, p < .001$.

Education also relates to level of giving. Results indicate that 57% of Heavy Givers hold advanced degrees, compared to 45% of Light Givers, $\chi^2(4, \text{wgt } n = 6377) = 49.69, p < .001$. Highly educated listeners are more likely to give at higher levels.

Conclusions

This study confirmed that actual use of public radio not only predicts which listeners become givers, but also the level of amount given. Voluntary giving to public radio is explained by patterns of consumption, along with a perception of value—the realization of personal importance. Thus, on both research questions, these findings are consistent with the theory of impure altruism.

There are powerful implications for fund raising strategy. As Kingma and McClelland (1995) advised, "if level of use (listening to public radio, camping, going to the

Table 3
Differences between Giving Segments

Variable	Light 40%	Moderate 44%	Heavy 16%
Loyalty to Station	35%	45%	52%
Loyalty to Public Radio	53%	58%	64%
Core to Station	45%	57%	64%
Time Spent Listening	31	40	51
Number of Occasions	6.9	8.4	10.2
Personal Importance			
Very Strong Agree	53%	59%	69%
Moderate Agree	33%	31%	25%
Belief in Listener Support			
Very Strong Agree	47%	52%	59%
Moderate Agree	39%	36%	31%
Belief in Government Support			
Very Strong Disagree	24%	25%	32%
Moderate Disagree	26%	26%	24%
Education			
College Graduate	37%	34%	30%
Advanced Degree	45%	52%	57%

Note. Unweighted N = 6,402, $p < .001$ for all variables.

opera) is strongly correlated with level of donation to a nonprofit organization (public radio, the Sierra club, the opera) then nonprofit fundraising strategies should focus more heavily on the customers, clients and patrons who are heavy users" (p. 68). The findings would strongly encourage public radio development professionals to segment their givers by levels of amount given and treat those segments differently, in accordance with marketing principles, to maximize the station's income from listeners.

What are the implications for public radio programming? In an economy that is driven by audience service rather than government subsidy, each public radio station in a market will be motivated to advance from a mixed program schedule to a coherent format. By programming for loyalty, each station among the several public radio stations in a market would optimize its public service for a defined target audience. The resulting contributions from listeners can be reinvested in quality programming.

Quality means programming that resonates with the values and lifestyles of listeners, programming they find to be truly important in their lives. For the highly educated NPR audience, quality programming means intelligent, articulate, in-depth journalism from a global perspective. Thus it is difficult to understand the critics who

are certain that listener support will cause public radio to sound just like commercial radio. For evidence to the contrary, just touch the buttons—on NPR one hears informed, civil discourse, in contrast to the angry insults on commercial AM radio. In fact, the sharp, qualitative difference between public and commercial radio is what motivates listeners to send money.

Looking back to the Public Broadcasting Act of 1967, McChesney (1999) thought that Congress should have instituted a tax on receivers as in Britain for the BBC. Instead public broadcasters had to go to Washington each year and ask the politicians for an appropriation. "Thus public broadcasting was deprived of a stable source of income that was vital for planning as well as editorial autonomy. From the outset, it was determined that we would have a public system, but it would be severely handicapped. Moreover, the funding mechanism meant that the public broadcasters were watched carefully to see that they did not go outside the ideological boundaries established in the commercial media. In short, public broadcasting was set up in such a way to ensure it was feeble, dependent, and marginal" (McChesney 1999, p. 248).

That doctrine must be challenged by contemporary reality. As public radio has become self-sufficient based on listener support, NPR stations have become strong rather than feeble, independent rather than dependent, and central rather than marginal to the lives of politically-active citizens. Each year public radio has become a more powerful and positive force in our democracy. Listener support provides a source of income that is not only stable but also encourages public radio to sharply differentiate itself from commercial formats.

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